DGNB System

DGNB SYSTEM

NEW CONSTRUCTION, BUILDINGS

CRITERIA SET

Version 2026 international



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Sustainable Development Goals – Icons: United Nations/globalgoals.org

Foreword





Dear building owners, property developers, planners from around the world, DGNB Auditors and Consultants,

The DGNB was founded as a non-profit organisation in 2007 to promote a sustainable and climate-friendly transformation of the built environment. Certification plays a central role in making this mission a reality, by motivating and incentivising developers to meet the full range of requirements that a truly sustainable building demands. The DGNB System serves as the underlying framework, setting out all the criteria that can help to improve building quality and make them fit for future needs.

The practice of building certification has spread rapidly over the past two decades. In many countries, it has long been standard practice to have construction projects certified to demonstrate their sustainability credentials. The DGNB has played a pioneering role in this field compared to other certification bodies. Unlike other systems, the DGNB System has taken a consistently holistic approach to sustainability from its very first version in 2009. Many methods originally applied under DGNB standards have since been written into policy, such as life cycle assessment, life cycle costing, and indoor air quality measurements.

In addition to this, the DGNB has always set itself apart from other internationally recognised systems by taking a performance-based approach that goes beyond simply assessing measures and focuses on their actual impact. For those who want more than just an assessment but to plan and deliver a future-proof building that delivers real added value, DGNB certification is the first choice.

It's no surprise that the DGNB is the undisputed market leader among certification system providers in Germany. However, the DGNB's approach is also gaining more popularity internationally – and not just in countries where the DGNB has its own system partners, like Austria, Denmark, Switzerland, Spain, Croatia, Bosnia-Herzegovina and Ukraine. The number of projects in other countries undergoing DGNB certification also continues to grow. At the time of writing, over 13,000 projects in almost 40 countries have already been recognised by the DGNB.

Projects outside Germany are certified by the DGNB using the international version of the DGNB System presented here. One unique feature of this system is that it already incorporates a process for adapting to regulatory, climatic and cultural conditions within its criteria – which in turn has a positive impact on the verification process. The DGNB hopes that this will help to minimise unnecessary bureaucratic documentation, so that every investment delivers a measurable improvement in building quality wherever possible.

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For the DGNB, sustainable construction is not about taking a 'one size fits all' approach, but rather about long-term investment and finding the best solution. The certification scheme must be flexible enough to treat each different construction task, location and budget on its own merits. The DGNB System has therefore also been designed as a tool for planning and optimisation, not merely for assessment. Certification helps to address all essential aspects of holistic sustainability early on, resolve any conflicting objectives that arise and proactively avoid future risks. Our experience from almost 20 years of the DGNB has shown that once a developer or building owner consistently applies our systematic planning approach in one project, they will continue to do so due to the significant added value achieved.

In this revised international version of the DGNB System for New Construction of Buildings, we have aligned all criteria with key regulatory requirements (such as the EU taxonomy and the EU Energy Performance of Buildings Directive (EPBD)) as well as the relevant, internationally recognised ISO standards. The system is designed to serve as a basis for green finance and to allow you to easily extract the key metrics you need for reporting purposes. Instead of needing to resort to multiple systems, DGNB certification covers every requirement.

This new version of the international DGNB System sets out our vision of good, future-proof architecture. Issues that will become increasingly significant in future, such as biodiversity, climate adaptation, water, climate and resource protection, are all addressed in full in the criteria set. Social aspects and the avoidance of pollutants also continue to play a central role, while sufficiency – in the sense of using no more than is strictly necessary – serves as an over-arching guiding principle. The certification therefore provides an incentive to retain parts of the existing building stock, as this leads to a better rating in the life cycle and circularity criteria.

Finally, we would like to thank all those who have contributed to this new version of the international DGNB System. You have all helped to create a practical, forward-looking and ambitious certification system that helps to improve our built environment project by project. Now let's work together to ensure that it is applied as widely as possible so that it can fulfil its full potential. Together we can make a real difference!

On behalf of the DGNB



Dr Christine Lemaitre

CHIEF EXECUTIVE OFFICER (CEO)



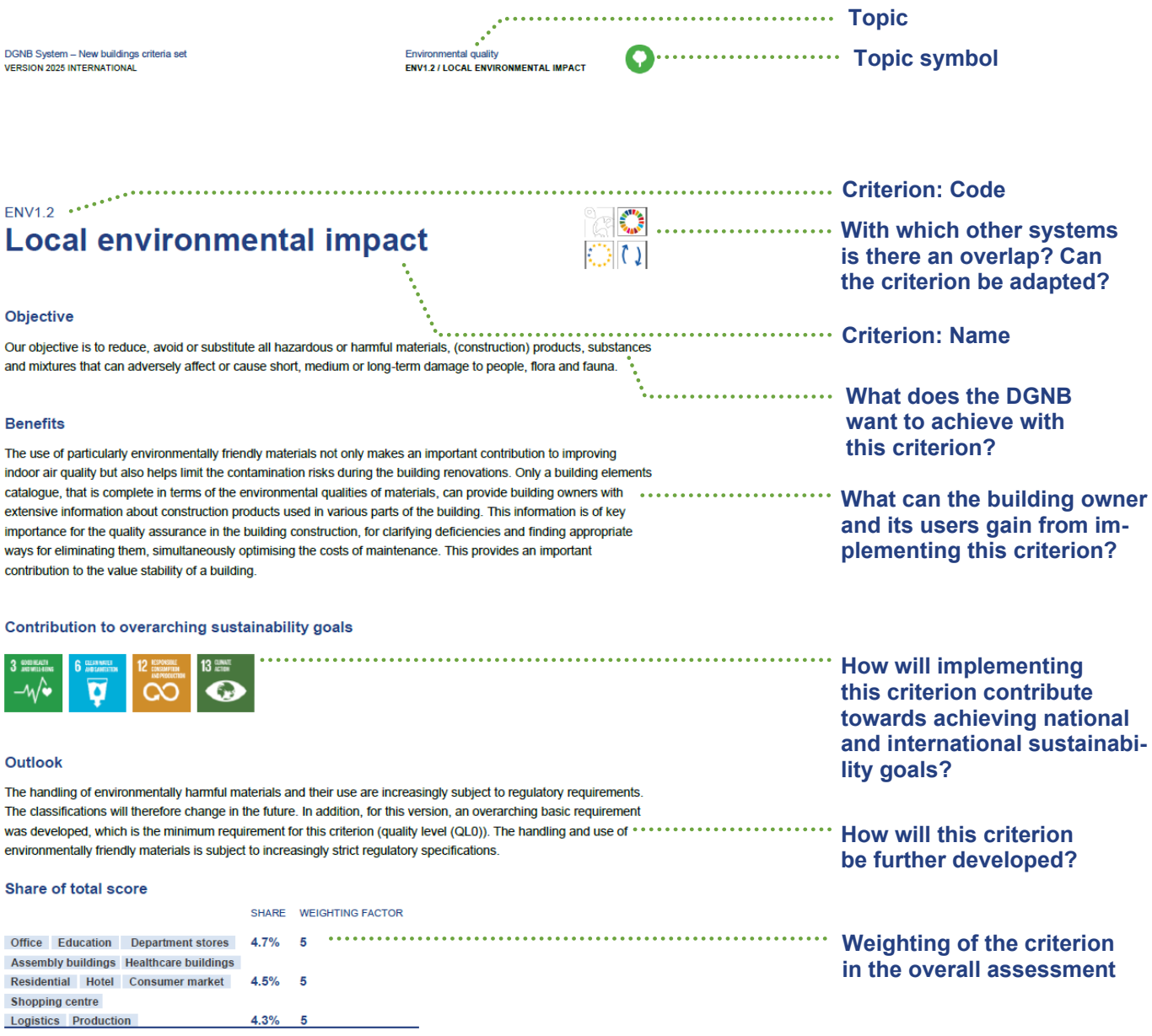
Johannes Kreißig

CHIEF EXECUTIVE OFFICER (CEO)

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How the criteria are structured

In order to further increase the applicability of the DGNB System, all criteria have been restructured with a view to ensuring clarity, readability and user-friendliness. The structure has been organised to make the most relevant aspects more prominent for the project decision-makers. The direct results of addressing each criterion have been visually highlighted. An outlook is also provided outlining how the DGNB will proceed in the future with regard to the criterion in question. More technical content on documentation relating to the certification process – which is primarily relevant for auditors – can be found in a separate document. The image below is an example drawn from various criteria.



The biodiversity strategy, as described by indicator 1, sets the path for the preservation of diverse ecosystems and the creation of new habitats. It shows how the area can have a positive impact on environmental diversity. The creation and maintenance of diverse and structurally rich habitats is addressed by indicator 2. Only through the diversity of habitats and through semi-natural and site-appropriate plant selection described by indicator 3 can animals be provided with their specific livelihoods. This indirectly influences the species richness of the animal world. If ecosystems are networked or the movement patterns of animals are supported, this can be made clear via indicator 4. Indicator 5 shows potential hazards for animals caused by the construction work and attempts to encourage their avoidance or reduction. In order to ensure the permanent preservation of the environmental areas, professional maintenance is necessary. This long-term commitment is rewarded by indicator 6 "maintenance and monitoring". From available 150 points, a maximum of 100 regular points can be awarded for the criterion, or a maximum of 110 points Including bonuses.

How will the objective of the criterion be implemented using the indicators?

Tailored evaluation by means of a project-specific allocation to a points range

NO.	INDICATOR		POINTS
2.3	**Biodiversity index (BDI)**		**0–20**
	The points are interpolated between 0 and the respective target BDI (see method)		
	■ Object-related biodiversity index (BDI) 0 ≤ BDI = 0.6 (target BDI = 0.6)	Residential	0-20
	■ Object-related biodiversity index 0 ≤ BDI = 0.4 (target BDI = 0.4)	Education, healthcare buildings Hotel	0-20
	■ Object-related biodiversity index 0 ≤ BDI = 0.3 (target BDI = 0.3)	Office, Logistics, Production, Department stores, Consumer market, Shopping centre, Assembly buildings	0-20

Name of indicators and special features of the evaluation

How it appears for interpolation

2.4	**AGENDA 2030 BONUS – Green Building** **Green building:** 1 bonus point for each 0.05 increase over and above the object-related target biodiversity index (max. 5 bonus points)	**Max. 5** +1

Bonuses for overfulfilment

Use-specific evaluation

Office Education	10
■ Wider column spans are designed that allow for more flexible floor layouts	+2.5
■ Facade pattern are designed with narrower bays that allow for more	+2.5

How it appears when points can be added

1 Indoor air quality – Volatile organic compounds (VOCs)

1.1 Measurement of volatile organic compounds

Office Education Hotel Assembly buildings Healthcare buildings

■ Evaluation of the indoor air concentration of volatile organic compounds according to the ISO 16000-6, -3 standards

TVOC [µg/m³]	Formaldehyde [µg/m³]	Max. 50
> 3000	> 100	0
≤ 3000	≤ 100	10
≤ 1000	≤ 60	25
≤ 500	≤ 30	50

How it appears when there are different options (either/or) to choose from

Re 4 INNOVATION AREA

Innovative, individual solutions that create a pleasant, suitable qualities of space in the access and circulation areas.

as 4.1

Innovation area

SUSTAINABILITY REPORTING AND SYNERGIES

Sustainability reporting

Appropriate key performance indicators (KPIs) include, in the case of positive evaluation of indicator 2, not using certain refrigerants for the communication or communicating selected relevant emission parameters for construction products used.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	No use of halogenated and partially halogenated refrigerants that are persistent by themselves or have persistent degradation products	[yes]
KPI 2	Emission profiles for construction products used, stating carcinogenic, mutagenic and toxic volatile organic compounds, formaldehyde and volatile organic compounds VOCs (tested in accordance with CEN/TS 16516); corresponds to Level(s) indicator 4.1.2 and Regulation (EU) 2020/852 (Taxonomy) on Pollution prevention and control - Do no significant harm ('DNSH') criterion.	[µg/m³], [-]
KPI 3	Only products with SVHC ≤ 0.1 % used	[yes/no]

Building-related key performance indicators for sustainability reporting

DGNB System – New buildings criteria set
VERSION 2026 INTERNATIONAL

Environmental quality
ENV1.2 / LOCAL ENVIRONMENTAL IMPACT
APPENDIX

The blue background is used (among other things) to denote all appendices

APPENDIX A – DETAILED DESCRIPTION

Appendix A: Contains additional explanation regarding relevance and a detailed description of the method

I. Relevance

Certain substances, construction products and preparations are dangerous to the soil, air, groundwater and surface water and to people, flora and fauna. This concerns their entire life cycle – from manufacturing, processing on the construction site and use in the existing building to their disposal (dismantling, recycling, disposal in landfill). The local risks are evaluated on the basis of substances and products, as the toxicological impact categories for the environment and humans have not yet been recorded in the life cycle assessment due to lack of recording and evaluation processes.

II. Additional explanation

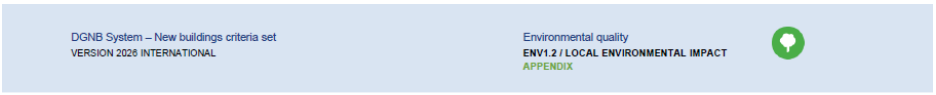
In the DGNB certification system, high-risk material and substance groups are investigated and evaluated individually and on the basis of products. The following material groups, among others, are currently considered (as products or as ingredients in compositions):

- Halogenated and partially halogenated refrigerants
- Halogenated and partially halogenated propellants
- Heavy metals
- Substances that fall under the Biocidal Products Directive (528/2012/EC)[1]
- Substances that fall under the Persistent Organic Pollutants (POPs) Regulation[2]
- Hazardous substances in accordance with the CLP Regulation (1272/2008/EC)[3]
- Organic solvents and plasticisers
- Substances of very high concern (SVHC in accordance with the European Chemicals Regulation (REACH) (1907/2006/EC))[4]

III. Method

Criterion ENV1.2 contains specific requirements for a wide range of construction materials. For all materials and products listen under the Appendix 1, fulfilment of the basic requirements is a mandatory minimum overarching rule for this criterion, i.e. without fulfilment of the basic requirements listed below, no positive assessment for this criterion is possible.

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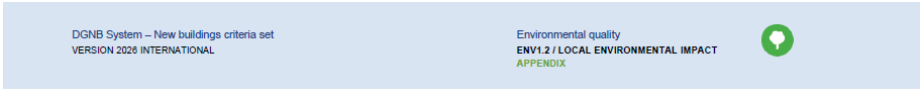
APPENDIX B – DOCUMENTATION

Appendix B:
Lists all the documentation required for certification

I. Required documentation

Documentation submitted must comprehensively and clearly demonstrate compliance with the requirements for the target evaluation of the individual indicators. The components/construction materials and areas listed in the criteria matrix (Appendix 1) must be considered:

- Complete declaration and verification of relevant components/construction materials applied in points or lines (e.g. sealant) using the documentation required in the criteria matrix. In principle, the verification process should deal with all consecutive numbers in the criteria matrix. Irrelevant aspects of the criteria matrix should be explicitly identified as irrelevant, and technical exceptions should be explicitly marked as exceptions and justified.



APPENDIX C – LITERATURE

Appendix C:
Contains information on any changes to the criterion and versions of the criterion

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

Fundamental sources chosen from the available lists of substances and material data:

- CLP Regulation 1272/2008/EC including alignment regulations*
- European Chemicals Regulation (REACH) (EC 1907/2006) *
- Biocidal Products Directive 98/8/EC *
- Independently verified declarations, such as Environmental Product Declarations (EPD)
- Certifications developed within industries

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Evaluation and structure of the DGNB system

The following nine chapters provide an overview of the DGNB system as a whole. This includes the criteria and their weighting, the logic of the DGNB award as well as explanations of essential terms and applications of the DGNB system.

Basic structure of the DGNB system
Overview of the criteria
Weighting of the criteria
The DGNB award logic
Advantages of the system
Overarching requirements
General rules
Scheme-specific information
Terms and definitions

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Basic structure of the DGNB System



The sustainability concept of the DGNB System has a broad scope and goes beyond the well-known "Three Pillars" model. It covers all the fundamental aspects of a sustainable building. These encompass the following six topics: ecology, economy, sociocultural and functional aspects, technology, processes and site. The first three topics are given equal weighting in the evaluation. This means that the DGNB System is the only system to place equal importance on both the economic and the ecological criteria of a sustainable building. The qualities that fall outside of the scope of the "Three Pillars" model have an interdisciplinary function within the DGNB System and have different weightings. The scores achieved in the assessment are always evaluated over the building's entire life cycle.

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Overview of the criteria*

TOPIC	CRITERIA GROUP	CRITERIA NAME
ENVIRONMENTAL QUALITY (ENV)	EFFECTS ON THE GLOBAL AND LOCAL ENVIRONMENT (ENV1)	**ENV1.1** Climate action and energy
		ENV1.2 Local environmental impact
		ENV1.3 Responsible resource extraction
	RESOURCE CONSUMPTION AND WASTE GENERATION (ENV2)	**ENV2.2** Potable water demand and wastewater volume
		ENV2.3 Land use
		ENV2.4 Biodiversity at the site
ECONOMIC QUALITY (ECO)	LIFE CYCLE COSTS (ECO1)	**ECO1.1** Life cycle cost
	ECONOMIC DEVELOPMENT (ECO2)	**ECO2.1** Flexibility and adaptability
		ECO2.2 Commercial viability
		ECO2.6 Climate resilience
SOCIO-CULTURAL AND FUNCTIONAL QUALITY (SOC)	HEALTH, COMFORT AND USER SATISFACTION (SOC1)	**SOC1.1** Thermal comfort
		SOC1.2 Indoor air quality
		SOC1.3 Sound insulation and acoustic comfort
		SOC1.4 Visual comfort
		SOC1.6 Quality of indoor and outdoor spaces
		SOC1.7 Safety and security
	FUNCTIONALITY (SOC2)	**SOC2.1** Design for all
TECHNICAL QUALITY (TEC)	TECHNICAL QUALITY (TEC1)	**TEC1.1** Fire safety
		TEC1.3 Quality of the building envelope
		TEC1.4 Building technology
		TEC1.5 Ease of cleaning building components
		TEC1.6 Circular construction
		TEC3.1 Mobility infrastructure

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TOPIC	CRITERIA GROUP	CRITERIA NAME
PROCESS QUALITY (PRO)	PLANNING QUALITY (PRO1)	**PRO1.1** Quality of project preparation
		PRO1.4 Sustainability aspects in tendering and contracting
		PRO1.5 Documentation for sustainable management
		PRO1.6 Procedure for urban and design planning
	CONSTRUCTION QUALITY ASSURANCE (PRO2)	**PRO2.1** Construction site/construction process
		PRO2.3 Commissioning and monitoring
SITE QUALITY (SITE)	SITE QUALITY (SITE1)	**SITE1.1** Local environment
		SITE1.3 Transport access
		SITE1.4 Access to amenities

* All criteria must be considered as part of the certification process. If any of the criteria have not been processed, certification cannot be awarded.

Please note:
The DGNB accepts no liability for the accuracy or applicability of this content to actual construction projects and strongly recommends that you consult a DGNB-certified auditor or consultant to ensure that it is correctly and successfully applied to projects in practice.

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Weighting of the criteria

TOPIC	CRITERIA GROUP	CRITERION	OFFICE		EDUCATION		RESIDENTIAL		HOTEL		CONSUMER MARKET		SHOPPING CENTRE		DEPARTMENT STORES		LOGISTICS		PRODUCTION		ASSEMBLY BUILDINGS		HEALTHCARE BUILDINGS	
ENVIRONMENTAL QUALITY (ENV)	EFFECTS ON GLOBAL AND LOCAL ENVI-RONMENT (ENV1)	**ENV1.1**	10	9.4%	10	9.4%	10	9.0%	10	9.0%	10	9.0%	10	9.0%	10	9.4%	10	8.7%	10	8.7%	10	9.4%	10	9.4%
		ENV1.2	5	4.7%	5	4.7%	5	4.5%	5	4.5%	5	4.5%	5	4.5%	5	4.7%	5	4.3%	5	4.3%	5	4.7%	5	4.7%
		ENV1.3	2	1.9%	2	1.9%	2	1.8%	2	1.8%	2	1.8%	2	1.8%	2	1.8%	2	1.7%	2	1.7%	2	1.9%	2	1.9%
	RESOURCE CONSUMPTION AND WASTE GENERATION (ENV2)	**ENV2.2**	2	1.9%	2	1.9%	3	2.7%	3	2.7%	2	1.8%	2	1.8%	2	1.9%	2	1.7%	2	1.7%	2	1.9%	2	1.9%
		ENV2.3	2	1.9%	2	1.9%	2	1.8%	2	1.8%	2	1.8%	2	1.8%	2	1.9%	3	2.6%	3	2.6%	2	1.9%	2	1.9%
		ENV2.4	3	2.8%	3	2.8%	3	2.7%	3	2.7%	4	3.6%	4	3.6%	3	2.8%	4	3.5%	4	3.5%	3	2.8%	3	2.8%
ECONOMIC QUALITY (ECO)	LIFE CYCLE COSTS (ECO1)	**ECO1.1**	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%	4	10.0%
	PERFORMANCE (ECO2)	**ECO2.1**	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%
		ECO2.2	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%	1	2.5%
		ECO2.6	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%	2	5.0%
SOCIOCULTURAL AND FUNCTIONAL QUALITY (SOC)	HEALTH, COMFORT AND USER SATISFACTION (SOC1)	**SOC1.1**	2	3.5%	2	3.5%	2	3.5%	2	3.5%	2	4.5%	2	4.1%	2	4.1%	2	4.5%	2	4.5%	2	3.2%	2	3.2%
		SOC1.2	2	3.5%	2	3.5%	2	3.5%	2	3.5%	2	4.5%	2	4.1%	2	4.1%	2	4.5%	2	4.5%	2	3.2%	2	3.2%
		SOC1.3	2	3.5%	2	3.5%	2	3.5%	3	5.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	3.2%	2	3.2%
		SOC1.4	2	3.5%	2	3.5%	2	3.5%	1	1.7%	2	4.5%	2	4.1%	2	4.1%	2	4.5%	2	4.5%	2	3.2%	2	3.2%
		SOC1.6	2	3.5%	2	3.5%	2	3.5%	2	3.5%	1	2.3%	2	4.1%	2	4.1%	2	4.5%	2	4.5%	2	3.2%	3	4.8%
		SOC1.7	1	1.7%	1	1.7%	1	1.7%	1	1.7%	1	2.3%	1	2.0%	1	2.0%	2	4.5%	2	4.5%	1	1.6%	1	1.6%
	FUNCTIONALITY (SOC2)	**SOC2.1**	2	3.5%	2	3.5%	2	3.5%	2	3.5%	2	4.5%	2	4.1%	2	4.1%	0	0.0%	0	0.0%	3	4.8%	2	3.2%

Importance factor
Share of total score

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TOPIC	CRITERIA GROUP	CRITERION	OFFICE		EDUCATION		RESIDENTIAL		HOTEL		CONSUMER MARKET		SHOPPING CENTRE		COMMERCIAL BUILDING		LOGISTICS		PRODUCTION		ASSEMBLY BUILDINGS		HEALTHCARE BUILDINGS	
TECHNICAL QUALITY (TEC)	TECHNICAL QUALITY (TEC1)	TEC1.1	2	2.5%	2	2.5%	2	2.5%	2	2.5%	2	2.3%	2	2.3%	2	2.3%	2	2.5%	2	2.5%	2	2.3%	2	2.5%
		TEC1.3	2	2.5%	2	2.5%	2	2.5%	2	2.5%	2	2.3%	2	2.3%	2	2.3%	2	2.5%	2	2.5%	2	2.3%	2	2.5%
		TEC1.4	2	2.5%	2	2.5%	2	2.5%	2	2.5%	2	2.3%	2	2.3%	2	2.3%	2	2.5%	2	2.5%	2	2.3%	2	2.5%
		TEC1.5	1	1.3%	1	1.3%	1	1.3%	1	1.3%	1	1.2%	1	1.2%	1	1.2%	1	1.3%	1	1.3%	1	1.2%	1	1.3%
		TEC1.6	3	3.8%	3	3.8%	3	3.8%	3	3.8%	3	3.5%	3	3.5%	3	3.5%	3	3.8%	3	3.8%	3	3.5%	3	3.8%
		TEC3.1	2	2.5%	2	2.5%	2	2.5%	2	2.5%	3	3.5%	3	3.5%	3	3.5%	2	2.5%	2	2.5%	3	3.5%	2	2.5%
PROCESS QUALITY (PRO)	PLANNING QUALITY (PRO1)	PRO1.1	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
		PRO1.4	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
		PRO1.5	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
		PRO1.6	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
	QUALITY OF CONSTRUCTION (PRO2)	PRO2.1	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
		PRO2.3	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%	2	2.1%
SITE QUALITY (SITE)	SITE QUALITY (SITE1)	SITE1.1	4	2.5%	4	2.5%	4	2.5%	4	2.5%	4	2.2%	4	2.2%	4	2.2%	4	2.5%	4	2.5%	4	2.2%	4	2.2%
		SITE1.3	2	1.3%	2	1.3%	2	1.3%	2	1.3%	3	1.7%	3	1.7%	3	1.7%	2	1.3%	2	1.3%	3	1.7%	3	1.7%
		SITE1.4	2	1.3%	2	1.3%	2	1.3%	2	1.3%	2	1.1%	2	1.1%	2	1.1%	2	1.3%	2	1.3%	2	1.1%	2	1.1%

Importance factor
Share of total score

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The DGNB award logic

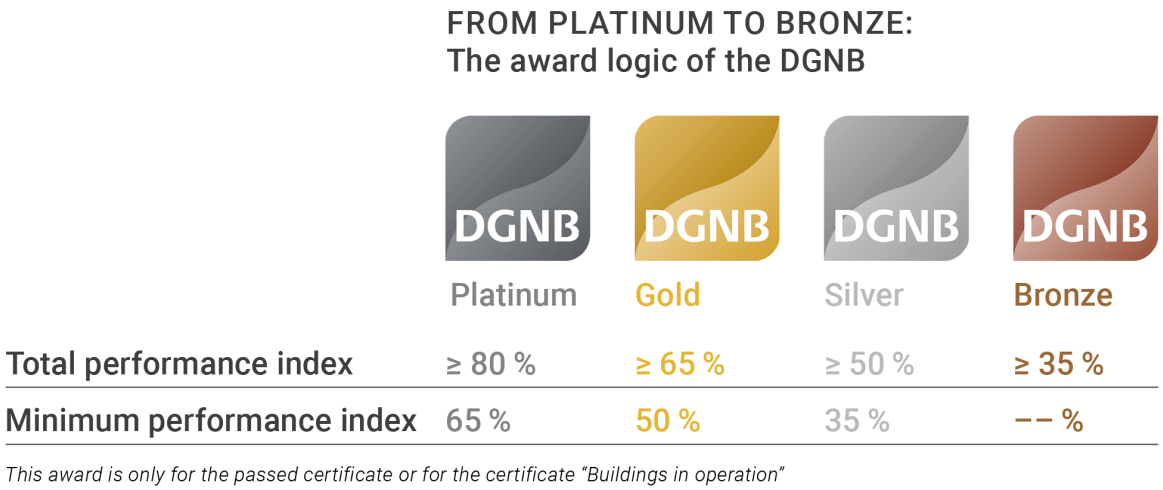


Figure 1: Principles for DGNB award allocation

The DGNB System uses performance indices to grade buildings. The total performance index is calculated using all six topics, taking their individual weighting into account. The platinum certificate is the most prestigious award issued by the DGNB.

Total performance indices of 50% or more earn the building a DGNB Silver certificate. Total performance indices of 65% or more are awarded a DGNB Gold certificate. To achieve a DGNB Platinum certificate, the project must be awarded a total performance index of at least 80%.

The DGNB is committed to encouraging high quality standards in every aspect of a building. Therefore, the award of a certificate is not solely based on the total performance index. In order to obtain a particular award, a certain minimum performance index must be achieved in each of the relevant topics (with the exception of "Site quality"). For example, to obtain a platinum certificate, a performance index of no less than 65% is required for each topic. For a gold certificate, a performance index of no less than 50% is required for each topic. For a silver certificate, the threshold is 35% for each topic.

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Advantages of the system

The International DGNB New Construction Catalogue, Version 2026 has been significantly streamlined and redesigned to enhance user experience and accessibility compared to its predecessors. The updated catalogue now features 32 clearly defined criteria, down from the 38 in the previous version of the system. This reduction reflects a focused effort to eliminate redundancies and simplify the evaluation process without compromising on quality. The catalogue's optimized and integrated criteria allow project teams to address key environmental priorities, such as reducing greenhouse gas emissions, enhancing energy efficiency, promoting the use of low-carbon materials and improving climate resilience in the built environment.

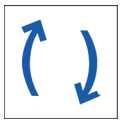
The criteria set for this international system version are also harmonised with the requirements of various other systems, standards or classifications. The aim is to allow officials providing DGNB Certification to cover the criteria of the other systems at the same time. Each criterion includes visual indicators, i.e. either active or inactive icons or logos, which highlight the relevance of each topic to that specific criterion:



Adaptability



EU Taxonomy



Level(s), EU reporting Framework



UN sustainable development Goals(SDG)

Adaptability

This international version of the New Construction Catalogue, Version 2026, introduces greater flexibility and adaptability to different local contexts. It incorporates considerations such as regional norms and regulations, local materials, local climate conditions, regional water scarcity issues, regional cost factors, etc. to ensure that sustainability criteria can be applied effectively across a wide range of geographic and economic settings. If this icon is active, it indicates that the criteria have a high degree of adaptability to local conditions, including climate, availability of materials, cost variations, and other contextual factors. Generally speaking, all 32 criteria may be subject to adaptation, however, for those marked with the active "Adaptability" indicator, the adaptation is pre-defined and requires implementation.

EU Taxonomy

The European Green Deal seeks to make the EU economy sustainable and climate-neutral by 2050, supported by a common EU Taxonomy[1] that defines sustainable activities and guides investments toward them. Companies and financial market participants are required to report how their activities align with this taxonomy –in the buildings and real estate sector, this covers construction, renovation, services, and property ownership. For the economic activity of new construction, the applicant can now choose one of the following as an environmental objective to which they aim to make a significant contribution: Climate Change Mitigation, Climate Change Adaptation or Transition to a Circular Economy.

[1] EU Taxonomy Compass: https://ec.europa.eu/sustainable-finance-taxonomy/taxonomy-compass

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Since the requirements of the EU Taxonomy are now deeply anchored in the DGNB New Construction Catalogue, Version 2026, buildings can be strategically designed and constructed to make a substantial contribution to all three EU Taxonomy sustainable activities mentioned above. As a result, buildings certified under the V2026 framework are better positioned to demonstrate compliance with the EU Taxonomy's technical screening criteria. This ensures that they not only minimize environmental impact but also support long-term sustainability and risk management in the face of climate change. Detailed explanations of the ESG Verification for the EU Taxonomy and a relevant list of indicators are provided in a separate document on the DGNB website and in the DGNB System software. These include tables showing the criteria and indicators in relation to EU Taxonomy requirements. This additional document supplements the New Buildings Criteria Catalogue, Version 2026.

Level(s), EU reporting framework

The European Commission has developed Level(s)[2] as a voluntary and standardised reporting framework for improving the sustainability of buildings. Level(s) takes an essential step in the context of sustainable development by formulating a common EU framework for sustainability in construction. It supports experts in considering sustainability goals in the planning, design, financing and implementation of construction projects, making a clear contribution to environmental and climate protection.

The DGNB New International Construction Catalogue, V2026 is also aligned with the Level(s) framework. The catalogue integrates a range of criteria that correspond to the different indicators and reporting methods outlined in the Level(s) structure (levels 1, 2 and 3), enabling a flexible, step-by-step approach to sustainability assessment throughout the building life cycle. Criteria within the DGNB system are mapped to relevant Level(s) indicators, ensuring that projects can systematically collect data, monitor performance, and report progress. There is also a table provided on the DGNB website, where the DGNB indicators and macro targets of Level(s) are mapped, providing information on which criteria must be met and how processes can be carried out. This additional document supplements the New Buildings Criteria Catalogue, Version 2026.

United Nations (UN) Sustainable Development Goals (SDG)

The DGNB New International Construction Catalogue, V2026 includes the topics relating to the role buildings can play in contributing to the global sustainability goals of the United Nations. The catalogue reflects the Sustainable Development Goals (SDGs), illustrating the potential impact of sustainable planning and construction. As such, it provides architects and planners, as well as building owners and local authorities, with useful guidance on playing a more meaningful role in sustainable development. The relevant active icon also highlights the connection between the UN SDGs and certain criteria in this catalogue. As many as 15[3] of the 17 UN SDGs are covered by this International Construction Catalogue version.

[2] Level(s) common framework: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents

[3] 14 Sustainable Development Goals (SDGs) are directly addressed based on various criteria, while one additional SDG is reflected under the overarching requirements of the catalogue.

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Overarching requirements

DGNB is committed to certifying buildings that uphold the highest ethical, social, and environmental standards, prioritizing the well-being of communities and the broader public. Our certification process considers the far-reaching impact of buildings on all stakeholders including users, neighbours, investors, and owners. Certification is only awarded if projects demonstrably meet criteria in sustainability, fairness, and social responsibility. The following principles and standards must therefore be upheld in full:

Labour standards and worker well-being
All projects must uphold fundamental labour rights as defined by ILO Conventions[4], including the prohibition of child and forced labour, non-discrimination, and equal pay for equal work. Workers must receive fair contracts in accessible language and living wages that meet basic needs, and their rights to freedom of association and collective bargaining must be protected. Health and safety are paramount: employers must provide training on occupational hazards, implement protective measures, and ensure safe living conditions with access to potable water, sanitation, and medical care. Workplace accidents should be documented, and first-aid facilities provided.

Social equity and community empowerment
Projects must actively promote equity and inclusion, engaging all stakeholders, particularly vulnerable groups. Prioritising local hiring and sourcing supports economic development, while skills training, including literacy and financial education, empowers the workforce. Supply chains must uphold human rights through rigorous supplier assessments and codes of conduct.

Cultural and environmental responsibility
Buildings must respect indigenous rights, cultural heritage, and local ecosystems, avoiding displacement and resource conflicts. Using local materials and traditional techniques enhances sustainability, reduces costs, and aligns projects with local climates and social structures. Preserving architectural knowledge strengthens resilience, fosters cultural pride, and promotes community ownership.

Ethical business practices
Companies must operate transparently, prevent corruption, comply with legal and governance frameworks, and report social and environmental impacts. Integrating Corporate Social Responsibility (CSR) principles demonstrates a genuine commitment to ethical and sustainable practices.

Resilience and sustainable development
Projects must address local risks including climate change, resource scarcity, and social instability through resilient infrastructure, disaster preparedness, and support for social systems. Combining traditional knowledge with modern solutions ensures context-appropriate, sustainable outcomes. Community involvement is essential to ensure projects reflect local needs, aspirations, and long-term well-being.

[4] Labour Standards: Adhering to core labour standards as outlined by ILO Conventions is essential for ethical practices. This includes the prohibition of child labour (Conventions 138, 182) and forced labour (Conventions 29, 105). Fair contracts and wages that meet (as min.) basic needs (Convention 131). Non-discrimination in the workplace with equal pay for equal work (Conventions 100, 111). Workers' rights to collective bargaining and freedom of association (Conventions 87, 98) – or similar. Worker safety and well-being: Employers must implement training on occupational hazards and ensure protective measures against risks such as chemicals, noise, and vibrations (Conventions 148, 170, 155) – or similar. First-aid training and kits provided. Living conditions must be adequate, with access to potable water, sanitation, and nearby medical facilities.

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General rules

The general principles for applying the DGNB System are explained below. For further information, please refer to the DGNB Guideline for Certification (working title).

Definitions

The DGNB design area ($\mathbf{A_{DGNB}}$) is the area used for classifying a project within a specific scheme (use profile) or schemes, if more than one use exists (mixed-use buildings) and for identifying the primary use and other secondary uses in a building.
This area is defined as follows:

$$\mathbf{A_{DGNB} = UA - VA + CA} \qquad \mathbf{(1)}$$

where:

A_{DGNB}	DGNB design area [m²]
UA	Usable floor area [m²]
VA	Vehicle parking area [m²]
CA	Circulation areas in corridors and halls [m²][5]

Primary use
The scheme with the largest proportion of the overall DGNB design area is referred to as "primary use". If the building is **mixed use**, then the scheme occupying the largest area is referred to as “primary use”. If assignment to one main category is not clear-cut (e.g. 40% **office**, 40% **residential**, 20% **department stores**), the primary use must be decided by the auditor, who should justify their decision.

Secondary use with an area ≥ 15% of the DGNB design area
One or more uses that are categorised under a scheme other than the primary use and that occupy **≥ 15%** of the DGNB design area are referred to as "secondary use". The areas designated to a secondary use must be assessed using the corresponding scheme. Buildings with primary and secondary uses must comply with the application rules for **mixed use**.

Secondary use with an area < 15% of the DGNB design area (sub-use)
One or more uses that are categorised under a scheme other than the primary use and that occupy < 15% of the DGNB design area (or a total of < 30% if there are multiple uses) are referred to as "sub-use". These areas must be allocated to the primary use and assessed in accordance with the primary use scheme. If there are multiple sub-uses that occupy ≥ 30% of the DGNB design area in total, the sub-use occupying the largest area is considered to be the secondary use and must comply with the application rules for **mixed use**.

[5] Area definitions and applicable standards explained under the chapter “Terms and definitions” below.

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Building's completion status

As a general rule, a building must be completed when the documentary evidence is submitted to the DGNB for conformity assessment.

Fittings are the only exception to this rule. A room is considered to be completed for the purposes of DGNB certification when the enclosing faces (walls, ceilings, floors, etc.) have finished surfaces (paint, floor coverings, etc.) and at least basic lighting has been installed.

1. The following must be completed:
    a. All circulation areas CA
    b. All vehicle parking areas (Usable Area 7 – UA 7)
    c. Outdoor areas that are located within the system boundary and are to be included in the DGNB certification.
    d. The fittings in at least 80% of the DGNB design area.

2. In contrast to 1d, if there are tenant obligations in place for the remaining areas, it is considered completed when there are fittings in at least 25% of the DGNB design area. The completed areas and areas covered by tenant obligations, for which documentary evidence is provided, must occupy at least 80% of the DGNB design area.

3. In contrast to 1d and similar to 2, for primary and secondary uses in mixed-use buildings, it is considered completed when there are fittings on at least 25% of the DGNB design area (on a proportional basis) if there are tenant obligations in place for the remaining areas. The completed areas and areas covered by tenant obligations, for which documentary evidence is provided, must occupy a total of at least 80% of the DGNB design area.

4. As an alternative to points 2 and 3, it is possible to have a building that is ready for interior finishing certified. The "Ready for Interior Finishing" DGNB certificate (working title) can be used to certify buildings for which a firm decision has yet to be made with regard to some or all of the fittings for which the tenant is responsible. In order to receive this certificate, the common areas must be completed; these must be proportionally assessed in addition to the rented areas in which interior finishing work has already been completed. Incomplete finishing work will be reflected in the certification result. It is possible to have the building evaluated subsequently once further interior finishing work has been completed, e.g. by means of interior certification. An overview of the criteria to be assessed for the "Ready for Interior Finishing" DGNB certificate (working title) can be found on the DGNB website.

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System boundary and minimum requirements

Unless otherwise specified in the individual criteria, only the building and open spaces directly allocated to it are taken into consideration for the assessment. Some criteria stipulate or allow for the assessment of outdoor areas. The building will primarily be used in accordance with its scheme. In addition to the overarching requirements stated above, the following DGNB minimum requirements apply:

1. Climate action plan (minimum requirement in accordance with ENV1.1, Indicator 3.2) and disclosure of life cycle assessments (Indicator 3.1.1)
2. Indoor air quality (minimum requirements in accordance with SOC1.2 criterion)
3. Design for all (minimum requirements in accordance with SOC2.1 criterion)
4. Fire safety (minimum requirements in accordance with TEC1.1 criterion)
5. Statutory requirements: The statutory requirements that apply to the building to be certified must be fulfilled.

Where individual regulations with regard to minimum requirements exist, these are listed in this document in the section titled "Scheme-specific information".

Current validity of expert reports, analyses and simulations:

Expert reports, analyses and simulations must refer to the current planning status or the building as it was actually constructed. If expert reports and simulations referred to a previous planning status, evidence must be provided to clearly demonstrate that they continue to be valid and relevant.

Required documentation that must be submitted for the project (certificates)

The required documentation must be produced in accordance with the requirements described in the criteria. Alternatively, the following forms of documentation can be provided:

Alternative evidence

The requirements of the criterion/indicator remain unchanged.
The criteria specify the required or permissible forms of documentation. The evidence can be provided in another form as long as it clearly demonstrates that the objective of the criterion/indicator has been achieved. Before submitting documentary evidence in an alternative form, the proposed alternative form must be agreed with the DGNB certification body. The decision lies with the DGNB certification body.

Documentation for innovation areas (to replace "Individual project solutions")

If a criterion for an indicator allows for an alternative solution in the form of an innovation area, the indicator in question can be fulfilled by this solution. This enables the objective of a criterion/indicator to be fulfilled by a quality of the building that has previously not been described in this way in the criterion/indicator. Before submitting documentary evidence in an alternative form, the proposed alternative form must be agreed with the DGNB certification body. The decision lies with the DGNB certification body.

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Evaluation points

The DGNB has defined target values for every criterion. To fulfil the objectives, evaluation points are awarded in each case. Depending on their scheme, some criteria are weighted differently based on how essential they are to the scheme in question.

Key to how the evaluation is presented

In each criterion, a maximum of 100 regular points can be granted (even if there are more points available). The maximum number of regular points that can be obtained per indicator(s), is specified for each indicator, as illustrated below. The scoring appears differently depending on whether points can be awarded using **interpolation**, whether points can be **added** or whether there are **different options** to choose from:

How it appears for interpolation:

2	**Soil sealing**	**Max. 20**
2.1	**Soil sealing factor and/or compensatory measures**	**0-20**
	Soil sealing factor	
	■ The soil sealing factor of the total developed and undeveloped area is more than 80%	0
	■ The soil sealing factor of the total developed and undeveloped area is no more than 50%	20
	Implementation of compensatory measures	

How it appears when there are different options to choose from (either/or):

3	**Assessment of other external influences**	**Max. 35**
3.1	**Outdoor noise**	**Max. 10**
	Noise level specified in accordance with table 1 or with comparable local minimum requirements for noise protection or country-specific noise maps.	
	The worst value e.g. on map is considered for the evaluation of this indicator.	
	■ < 75 dB(A) (noise level range IV and V in accordance with table 1)	2
	■ < 65 dB(A) (noise level range II and III in accordance with table 1)	5
	■ < 55 dB(A) (noise level range I in accordance with table 1)	10

How it appears when points can be added:

3	**External works**	**Max. 6**
3.1	**Watering and retention**	
	■ Watering the outdoor facilities with potable water is not foreseen, or only intermittent irrigation (based on choice of plant species)	+2
	■ The outdoor facilities include rainwater retention devices	+4

Overfulfillment of a criterion due to bonuses:

For a number of criteria, it is possible to obtain additional points due to circular economy bonuses or Agenda 2030 bonuses, meaning that the number of points awarded could exceed the maximum number of points for that particular criterion. These additional points can only be credited within a main criteria group/topic and cannot be transferred to other qualities. The foreword provides an overview of all the available bonuses.

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Scheme-specific information

The primary use of each of the schemes is defined below.

Office

Offices are any building that is used primarily for office and administrative activities (UA 2 – Office space)

Education

This scheme encompasses all educational buildings, such as:

a. General education schools
b. Vocational schools
c. Special needs schools
d. Further education and training institutions
e. Kindergartens

The primary uses of these buildings are rooms for education, training, seminars, lectures, workshops and classrooms. Secondary uses in the building being assessed, such as offices, kitchen, dining hall, laboratory, library, gym, etc., are assessed within the same scope. Separate buildings such as sports halls, libraries, canteens, etc. are excluded from this.

Individual regulations for secondary use (sub-use):
If the areas occupied by the secondary use are ≥ 200 m² or ≥ 10% of the DGNB design area, documentary evidence must be provided for Indicator 1 in criterion "SOC1.2 – Indoor air quality" and criterion "SOC2.1 – Design for all" to demonstrate that the minimum requirement has been met in each case.

Residential

Residential buildings are any building that is used primarily for residential purposes.
This scheme applies to multiple-family dwellings with > 6 accommodation units. It can be applied to boarding schools, halls of residence and nursing homes in agreement with the DGNB office. For buildings with ≤ 6 accommodation units, the "New buildings: small residential buildings" scheme is used.

Individual regulations for secondary use (sub-use):
If the areas occupied by the secondary use are ≥ 200 m² or ≥ 10% of the DGNB design area, documentary evidence must be provided for Indicator 1 in criterion "SOC1.2 – Indoor air quality" and criterion "SOC2.1 – Design for all" that the minimum requirement has been met in each case.

Retail buildings: **Consumer market** **Shopping centre** **Department stores**

Retail buildings are buildings that are used for the sale of goods and do not host any significant processing or production activities on site.

Consumer market

Extensive sales area for one or more users. Partial product assortment or full product assortment (from 800 m²). The entire building is assessed, including the interior finishing. The DGNB defines the following as consumer markets: Supermarkets, discount stores and specialist retail stores (e.g. pharmacies, building supplies stores).

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Shopping centre

Shopping centres are large facilities built on the basis of a central planning concept and cater for short-, medium- and long-term demand. A large number of retail outlets, food outlets and service businesses of varying sizes are densely packed in one area and the facility is centrally managed. The system takes into consideration the central infrastructure, utility and business operation areas with interior finishing and some of the tenant fit-out. Shopping centres are distinguished from department stores in that shopping centre owners do not trade on their own but act only as landlord and manage the centre. Department store owners, on the other hand, generally combine trading on their own with managing the property.

Department stores

The “Department stores” scheme covers retail establishments that sell a wide variety of goods. These usually include ready-to-wear apparel and accessories for adults and children, fabrics and household textiles, small household wares, furniture, electrical appliances and accessories, and, often, food. A department store has several departments housed under the same roof to facilitate buying, customer service, and merchandising.

Department stores can include general areas such as customer toilet facilities, car parks and staff rooms for the employees working in the rented trading spaces. In contrast to shopping centres, department stores do not have a central shopping street. This set of criteria is based on the criteria set for shopping centres. The system takes into consideration the central infrastructure, utility and business operation areas with interior finishing and some of the tenant fit-out.

Industrial buildings: Logistics Production

Logistics buildings are defined as buildings used in the distribution and delivery of goods. This scheme is also used to certify high-bay warehouses. Production buildings are any building in which merchandise or consumer goods are manufactured from raw materials or primary products using energy, labour, etc.

Individual regulations for secondary use (minimum requirements):
If the areas occupied by the sub-use are ≥ 400 m² or ≥ 20 permanent working stations available, documentary evidence must be provided for Indicator 1 in criterion "SOC1.2 – Indoor air quality" and criterion "SOC2.1 – Design for all" that the minimum requirement has been met in each case. When individual regulations for sub-use exist, these are listed in the relevant scheme in the section entitled "Scheme-specific description".

Individual regulations for secondary use (assessments):
If the usable floor area for permanent workspaces is 400 m² or more, or if there are 20 or more permanent workspaces in the building, the indicators for the share occupied by offices must also be assessed in criteria SOC1.1 and additionally for **Logistics** SOC1.4, as described under the criteria, chapter “Scheme-specific description”.

Hotel

Hotel buildings are any buildings that provide the main range of services offered by hotels. These include, for example:

1. Accommodation service (lodging/reception): Includes reception, housekeeping and reservation
2. Food and beverages (F&B): Kitchen, restaurant, bar, room service and catering service
3. Logistics: Purchasing office, goods inspection, storage
4. Administration: A combination of management, bookkeeping/accounting, controlling, secretarial staff, marketing/sales, HR department and workshops/maintenance.
5. Additional services: e.g. telephone/fax, internet connection, television, laundry service, fitness and wellness facilities, conference room rental, entertainment programmes

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The main function of a hotel varies from hotel to hotel: They can be health resorts and wellness hotels (spa), holiday or sports hotels, or business, conference and seminar hotels.

Accommodation in the hospitality industry that does not fall under the definition of a hotel is any facility that does not offer all of the main range of services offered by hotels. This includes, in particular, B&Bs, guest houses, inns, hostels, halls of residence, serviced or self-catering accommodation, such as apartments, shelters, lodges and chalets, camp-sites, holiday houses and flats, youth hostels, Friends of Nature guest houses, dormitories and villas, and any other types of accommodation available for rental.

Assembly buildings

The scheme “Assembly buildings” covers structures or parts of structures that are intended for the simultaneous presence of many people at events, in particular educational, economic, social, cultural, artistic, political, sporting or entertaining, as well as bars and restaurants. This scheme is to be applied to all buildings or parts of buildings that fall under the respective regulations for assembly buildings in accordance with the building regulation codes or the state regulations on the construction and operation of “Assembly buildings” (if defined by the local building code, alternatively, the scheme can be defined via “Project-specific inquiry”). This usually includes buildings with (assembly) rooms for more than 200 people or buildings that can accommodate more than 200 visitors, whereby the (assembly) rooms have common escape routes (with the exception of schools and laboratories).

Under the scheme “Assembly buildings”, the following building types can be considered:

- Congress buildings;
- Fair Trade fair and city halls;
- Theatres and concert halls;
- Museums;
- Cultural, civil (community) centres and libraries;
- It is also possible to certify other types of assembly buildings” that are not listed above. Communication with the DGNB office regarding the scheme-specific / project-specific questions via the PCQ format is essential.

Note: In some criteria, the above-mentioned building types are summarized in the different categories. This varies from criterion to criterion accordingly. If it is not possible to clearly assign the building to certain type or different assignment makes sense due to special features, it is advisable to communicate with the DGNB office.

Other “Assembly buildings”, not listed above can be also certified. Coordination with the DGNB with regard to the assignment to a building type is also recommended here.

Healthcare buildings

"Hospitals are facilities in which illnesses, ailments or physical injuries are to be diagnosed, cured or alleviated through medical and nursing assistance or in which obstetrics is provided and in which the persons to be cared for can be provided with accommodation and catering" (Act on the Economic Security of Hospitals (KHG), Section 2, 1999)

According to DIN 13080, a hospital is defined by the following functional areas with the following key numbers:

- 1.0 Examination and treatment
- 2.0 Care
- 3.0 Administration
- 4.0 Social services
- 5.0 Supply and disposal
- 6.0 Research and teaching
- 7.0 Other (emergency services, childcare, housing, etc.)

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A hospital must cover at least the functional area "examination and treatment" or "care". The functional areas mentioned above can be concentrated in one building or spread across several buildings. For the DGNB assessment, healthcare buildings, according to the building function, are to be assigned to one of the following building types:

Type I: Buildings predominantly without Operating Rooms (OR) and/or an intensive care unit (ICU), such as:

- Rehabilitation clinics;
- Psychosomatic clinics;
- Polyclinic, etc.

Note: For residential homes and care facilities see **Residential**

Type II: Buildings with Operating Rooms (OR) and/or an intensive care unit (ICU), such as:

- Hospitals
- University Hospitals, etc.

Project-specific flexibility

Variable indicators within criteria

In the scheme, an indicator that is marked as “variable” can be treated as “irrelevant”. Such indicators do not have to be processed for the project certification if their irrelevance can be demonstrated. A reason as to why the indicator is "not relevant" must be attached to the submission documents.

Variable indicators enable the actual project to be mapped more effectively. This changes the weighting of the remaining indicators within a criterion. Where not all indicators are applicable to a project, the available points are recalculated proportionally using the weighting formula, based only on the relevant indicators.
In criteria with variable indicators, the degree of fulfilment is determined as follows:

$$\text{Criterion}_{\text{with variable indicators}} = \text{Points}_{\text{achieved}} / \text{Points}_{\text{max, relevant}} * 100$$

where $\text{Points}_{\text{max, relevant}}$ represents the total points of the applicable indicators relevant for the specific project.

Variable indicators can be found in the following criteria:

Criterion	Variable Indicator
SOC1.4	Indicator 4: No glare in daylight

Mixed use

Minimum requirements

The DGNB minimum requirements (exclusion criteria) stipulated in the criteria for the scheme in question must be met, for both the primary use and all secondary uses.

Secondary requirements

The secondary requirements only need to be met at whole-building level.

Partial certification (building separation rules)

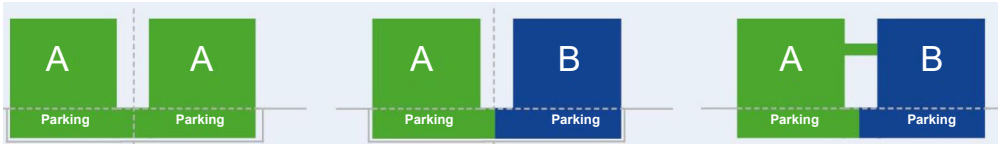
If a proper distinction can be made between the different uses, an application for partial/separate certification can be submitted. The use to be assessed must be clearly defined and must be agreed with the DGNB on a case-by-case basis (project-specific certifiability enquiry – see DGNB website). The following parameters should be complied with:

- Separate energy performance certificates are available.
- Self-contained building unit
- The sub-area(s) is recognisable, for example, by the façade design.

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- The building services of the sub-area(s) are independent. This is the case when:
  - there are separate supply systems for heat, electricity, water and multimedia
  - an independent heat supply for the different uses is possible
  - a sufficiently large technical room is available

Note: building can be certified partially/separately only if the structures/functions are clearly separated from each other (vertically):



The underground garage is to be allocated to the building structures in accordance with the parking space verification. Certification deviating from this must be agreed with the DGNB in individual cases (Project-specific enquiries).

A certificate for the entire building

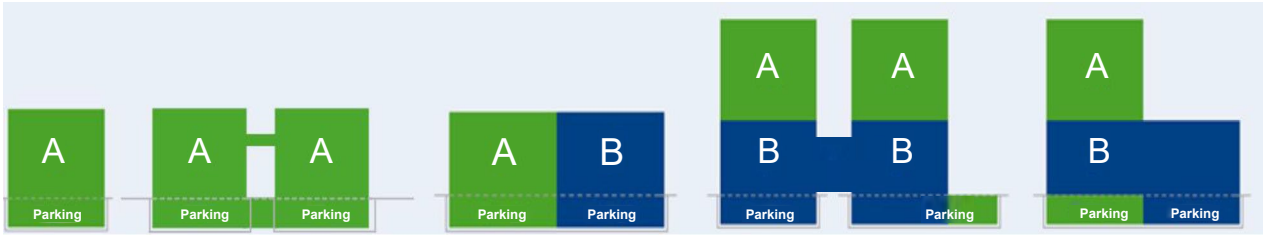


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

Fig. 1 There is only one type of use in the building.

Fig. 2 If two structures of the same use are connected to each other above ground (e.g. with bridges or base floor), these can be certified together.

Fig. 3-5 Multiple uses: Delimitation in accordance with the DGNB application rules for mixed use. Certification deviating from this must be agreed with the DGNB in individual cases (Project-specific enquiries).

Terms and definitions

In the DGNB System, some terms and definitions are repeatedly used across different criteria; for this reason, these are described here in detail once and then briefly mentioned in the relevant criteria.

Official scale of fees for services by architects and engineers (*HOAI*)

For the purpose of DGNB certification, the terminology and chronology of the service phases is based on the German official scale of fees for services by architects and engineers (namely the *Honorarordnung für Architekten und Ingenieure* or abbreviated as *HOAI*). This document defines nine service phases (see Table 1) for the provision of architectural services during the building development process and is referenced in, for example, the criterion ECO1.1. “Life cycle cost”.

Table 1: Service phases according to the official scale of fees for services by architects and engineers (HOAI)

	SERVICE PHASE	DESCRIPTION
1	STRATEGIC DEFINITION (GRUNDLAGENERMITTLUNG)	Establishing the framework and context for the design brief.
2	CONCEPT DESIGN (VORPLANUNG)	Outlining options and proposals for addressing the requirements of the design brief.
3	DEVELOPED DESIGN (ENTWURFSPLANUNG)	Preparing the final design proposal to meet the requirements of the design brief.
4	PLANNING APPROVAL (GENEHMIGUNGSPLANUNG)	Preparing and submitting the document package required for planning approval and any other relevant approval processes.
5	TECHNICAL DESIGN (AUSFÜHRUNGSPLANUNG)	Preparing finished working drawings and detail specifications ready for construction.
6	TENDER PREPARATIONS (VORBEREITUNG BEI DER VERGABE)	Conducting quantity surveys and preparing specifications of services put out to tender.
7	TENDER SUPPORT (MITWIRKUNG BEI DER VERGABE)	Obtaining cost estimates, calculating overall cost and assisting with the selection of bidding contractors.
8	CONSTRUCTION (OBJEKTÜBERWACHUNG)	Supervision of construction works on site.
9	COMPLETION AND DOCUMENTATION (OBJEKTBETREUUNG UND DOKUMENTATION)	Compiling snagging lists and supervising snag remediation (*property management including warranty tracking*) Documenting the condition of the building after final completion.

Gebäudeenergiegesetz (GEG) – German Building Energy Act based on the DIN 18599

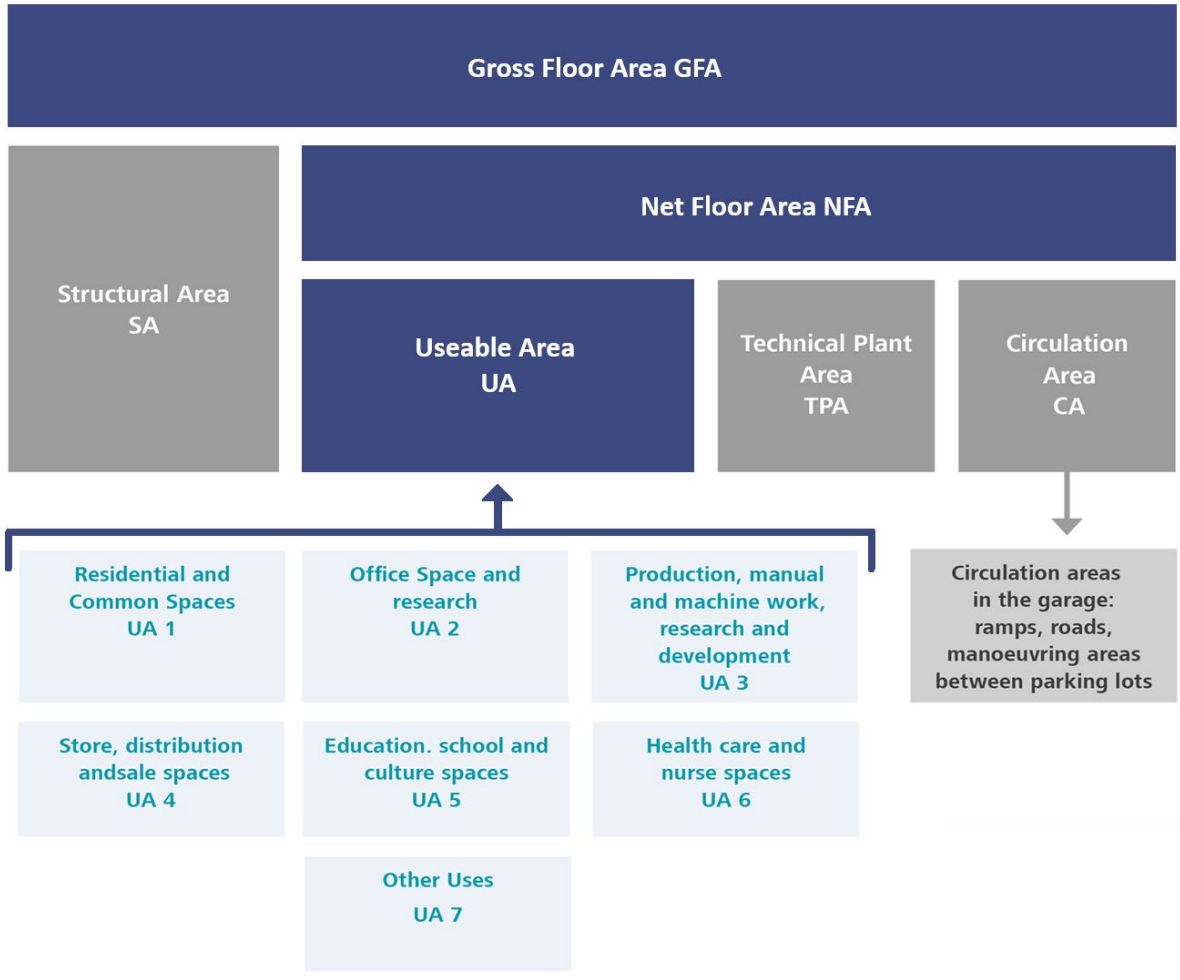
The Building Energy Act is a German regulation defining minimum requirements for buildings' energy efficiency and it is applicable for both new buildings and renovations of existing buildings. On this basis, the local (German) Energy Performance Certificate (EPC) is issued. This certificate provides complex information about the energy quality of a building envelope and installations serving the building or its parts. The certificate refers to the energy demand for heating, water heating, ventilation and cooling. It also includes the recommendations for possible improvements to the energy performance of the building. The certificate is valid for the 10 years from the date of issue. There are two types of EPC, the energy demand certificate and the energy use certificate. The demand certificate is based on the analysis of the technical performance, while the use certificate verifies the actual energy consumption during the past three years. The certificate can be issued by qualified and licensed experts.

Building surface area and volume: key definitions

Areas and volumes of a building are defined according to the German standard DIN 277-1:2016-01: Areas and volumes of buildings – Part 1: Building construction (*DIN 277-1:2016-01: Grundflächen und Rauminhalte im Bauwesen – Teil 1: Hochbau*), alternative similar definition according to the ISO 9836:2017.

This standard refers to particular surface areas within the building (see Figure 1) and has been adopted by DGNB to standardise calculations. Please note that the definitions of floor areas vary depending on the country and, for the purpose of the DGNB certification, the surface calculations must be conducted as described below.

Figure 2: Definition of areas according to DIN 277-1:2016-01



Gross Floor Area – GFA (in German *Brutto-Grundfläche – BGF*)
Sum of all floor areas within all floors of the building. The following areas are NOT included in the GFA:

- areas within a floor plan that do not exist e.g. airspace area over atriums, galleries or ceiling openings
- areas e.g. at the attic which do not have access, are not walkable or not being used because of other reasons
- areas exclusively dedicated to servicing, maintenance, inspection and maintenance of structure and technical systems (e.g. unusable roofs, fixed access ladders and roof gangways, servicing gangways in suspended ceilings, crawl space, catwalks in suspended ceilings)
- external parts of the building that are not structurally connected to the building (e.g. external stairs, external ramps, pergolas, outdoor sitting areas, terraces)

Net Floor Area – NFA (in German *Netto-Raumfläche NRF*)
Sum of all useable areas within all floors of the building. It includes useable areas UA (in German *Nutzfläche NUF*), technical plant areas TPA or simply TA (in German *Technikfläche TF*) and circulation areas CA (in German *Verkehrsfläche VF*):

$$NFA = UA + TPA + CA$$

Following elements are included in the NFA:

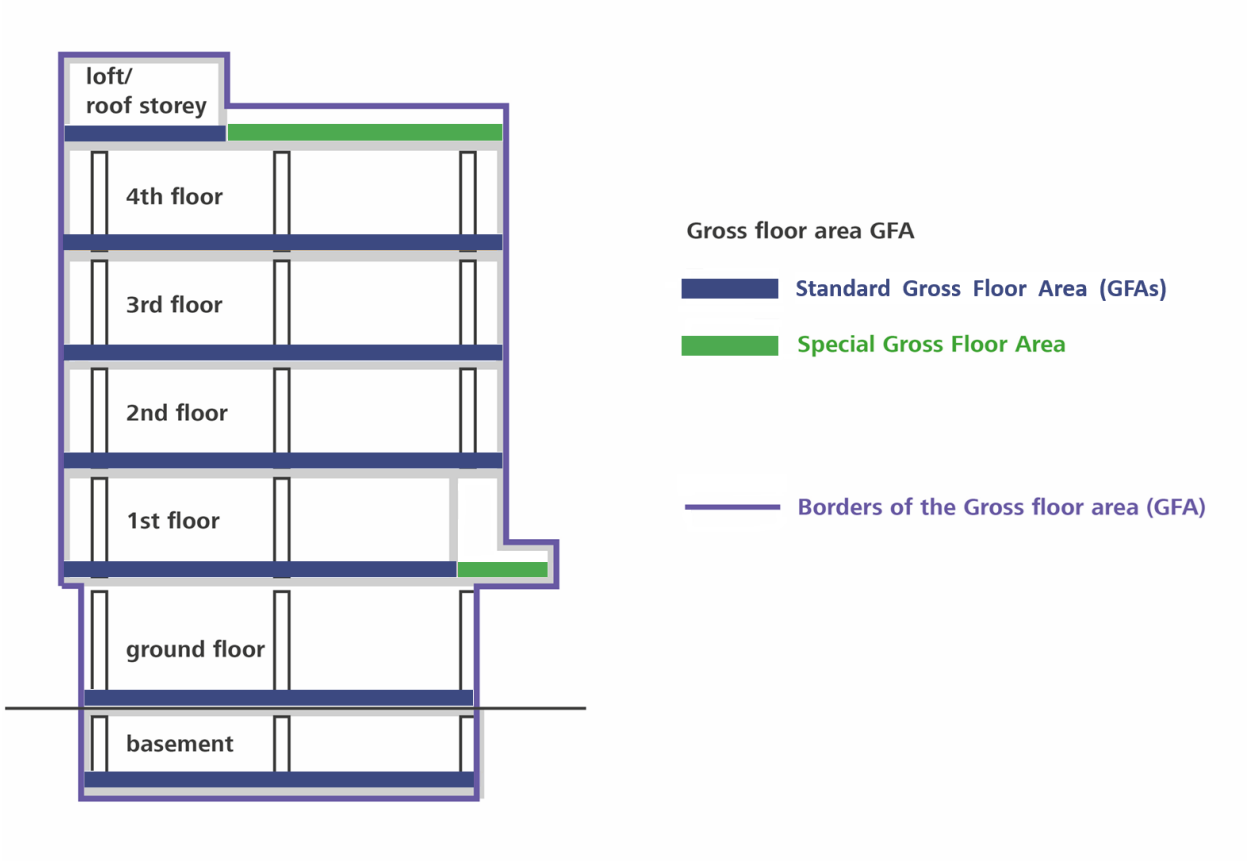
- exposed installations
- objects that are permanently built-in (e.g. ovens, heating and air-conditioning appliances, baths and showers)
- brick facing and cladding that is not floor to ceiling height
- built-in furniture (e.g. built-in wardrobe, shelving)
- movable partitions (e.g. curtains, folding partition walls)
- areas of the walk-in installations and lift shafts where clear cross section > 1.0 m² when not walkable, considered as part of SA

When determining the NFA, measurements between the building structures at the level of the floor or ceiling covering are considered. Structural and design projection and recesses, skirting boards, kerbs, undercutting, nosing such as projecting parts of windows and doors are not considered.
Base areas of sloping structures (e.g. stairs, ramps or stands) are to be added in case they do not overlap with other floor areas.
Floor areas under the lowest staircase or ramp are assigned to the floor plan level on which the staircase or ramp begins. According to their use, they are shown as usage area (UA), technical plant area (TPA) or circulation area (CA).
Base areas of installation and elevator shafts with a clear cross-section > 1.0 m² are only determined in the plan view planes as net floor area (NFA) when walkable. Otherwise, their base area is added to the structural area (SA).

Standard Gross Floor Area (GFA_S) and Net Floor Area (NFA_S)
Includes those parts of the GFA/NFA that are covered by a roof and fully enclosed (floor, ceiling and wall enclosure) (see figure 3). Rooms that are partially enclosed are not included (e.g. perforated garage door, shutters)

Special Gross Floor Area and Net Floor Area
Refers to all rooms and floor areas that are based on GFA/NFA and are structurally connected to the building but not fully enclosed such as loggias, balconies, terraces on flat roofs, courtyards, entrance areas, external stairs (see figure 2).

Figure 3: Definition of standard and special GFA/NFA



Heights (h) can be deleted from the drawing and only surfaces accepted by DGNB can be highlighted on the scheme. When determining the gross floor area (GFA), the outer dimensions of the building structures, including cladding (e.g. outside of plaster layers or outer shells of multi-shell wall constructions), must be measured at the height of the top of the floor or ceiling coverings.

Structural Area – SA (in German *Konstruktions-Grundfläche KGF*)
The structural area (SA) includes the floor areas of the vertical structural elements on all floor levels of the building (e.g., walls, columns, piers, chimneys).:

$$SA = GFA – NFA$$

When determining the SA, the measurements of the building structure together with the cladding at the level of the floor or ceiling covering are considered. Wall openings (e.g. doors, windows or passageways), installations and lift shafts that are not walkable or ≤ 1.0m^2 Instead of a determination based on individual dimensions of the structure, the structural area (SA) can be determined by calculating the difference between the gross floor area (GFA) and the net floor area (NFA).

Usable Area – UA (in German *Nutzungsfläche NUF*)

Part of the area used for the primary purpose of the building is determined as usable area (UA). The usable area (UA) can be further subdivided according to Table 2.

Table 2: Type of usable area (UA)

USE GROUP	FLOOR AREAS AND ROOMS
1 – Residential and common spaces (UA 1)	1.1 Living spaces 1.2 Common rooms 1.3 Break rooms 1.4 Waiting rooms 1.5 Dining rooms
2 – Office space (UA 2)	2.1 Office rooms 2.2 Open-plan offices 2.3 Meeting rooms 2.4 Design rooms 2.5 Rooms with counter(s) 2.6 Control rooms 2.7 Surveillance rooms
3 – Production, manual and machine work, research and development (UA 3)	3.1 Workshops (if permanent working areas) 3.2 Technological laboratories 3.3 Physics, engineering physics and electrical engineering laboratories 3.4 Chemistry, bacteriology and morphology laboratories
4 – Store, distribution and sale spaces (UA 4)	4.4 Acceptance and distribution areas (if permanent working areas) 4.5 Sales rooms 4.6 Showrooms 3.2 Workshops (if permanent working areas)
5 – Education, school and cultural spaces (UA 5)	5.1 Classrooms with fixed seating 5.2 General classrooms and practice rooms without fixed seating 5.4 Dedicated classrooms and practice rooms without fixed seating 5.5 Library rooms 5.6 Assembly rooms or areas 5.7 Stages, studios 5.8 Exhibition rooms

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6 – Healthcare and nurse spaces (UA 6)	6.1 Rooms with general medical equipment 6.2 Rooms with specialized medical equipment 6.3 Rooms for surgical procedures, endoscopy and childbirth 6.4 Rooms for radiation diagnostics 6.5 Rooms for radiation therapy 6.6 Rooms for physiotherapy and rehabilitation 6.7 Patient rooms with standard equipment in hospitals, nursing homes, and healthcare institutions 6.8 Patient rooms with specialized equipment 6.9 Other care rooms
7 – Other uses (UA 7)	Storage rooms, bicycle storage, refuse collection rooms, vehicle parking areas (garages, halls, protective roofs), passenger accommodation areas (railways and piers, etc.) Technical installations for the operation of equipment specific to use (computerized server room, compressor room for a workshop compressed air system, switching rooms for medical facilities, control rooms, control centres, etc.), technical installations for the supply and disposal of other structures (power stations, gasworks, transformer stations, sewage treatment plants, etc.), shelters. Sanitary facilities (toilets including vestibules, washrooms, shower rooms, sauna rooms, cleaning rooms, etc.), changing rooms (locker rooms, dressing rooms, etc.), cleaning locks

Gross Volume – GV (in German *Brutto-Rauminhalt BRI*)

Gross volume (GV) includes the volume of all rooms and building structures above the gross floor area (GFA) of the building. The heights for determining the gross volume (GV) are the vertical distances between the surfaces of the ceiling coverings in the respective floor plan planes or, in the case of roofs, the surfaces of the roof coverings. The height of the lowest floor of the building is defined as the distance from the underside of the subfloor and floor slabs, which do not form part of the foundation, to the top of the ceiling covering the level above it. In the case of structures or parts of buildings that are bounded by non-vertical or non-horizontal surfaces, the volume shall be determined according to appropriate geometric formulas.

The volume of the following elements does not belong to the gross volume (GV):

- deep and shallow foundations;
- light wells;
- external stairs and external ramps not connected to the structure by building constructions;
- entrance roofing;
- roof overhangs, as far as they do not represent coverages for space contents of area (S) according to 5.6.2;
- projecting sun protection systems;
- chimney heads, ventilation pipes or ventilation ducts that extend beyond the roof covering;
- skylights ≤ 1.0 m³;
- pergolas and paved patios or terraces.



Environmental quality

The six criteria of environmental quality allow an assessment to be made with regard to the **effects of buildings on the global and local environment** as well as the **impact on resources and the generation of waste**.

ENV1.1	Climate action and energy
ENV1.2	Local environmental impact
ENV1.3	Responsible resource extraction
ENV2.2	Potable water demand and waste water volume
ENV2.3	Land use
ENV2.4	Biodiversity at the site

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ENV1.1

Climate action and energy

Objective

Our objective is to ensure a consistent life cycle approach to the planning of buildings to reduce emissions-related impacts on the environment and the consumption of non-renewable resources to a minimum across all stages in the life of a building.

Benefits

Life cycle-oriented building design helps the commissioning parties and designers to make climate-based and environmentally oriented decisions. Variants that consider both the climate and environmental effects of the building operation and structure can be compared using comprehensive accounting/assessment procedures to identify optimal solutions. The use of the accounting method also facilitates the disclosure of relevant climate, energy and environmenttal indicators of the building, e.g. to financial institutions.

Contribution to overarching sustainability goals



Outlook

The environmental quality criterion will continue to increase in relevance. The reference values are adapted to the new solutions and future needs of national climate protection, emission and resource consumption targets for industry and the building sector. The criterion also introduces an appropriate expansion of the system limits in order to promote positive measures relating to energy demand (which is not covered by building energy legislation, e.g. non-EPBD[1] services). This will enable benchmarks to be generated for non-regulatory building energy and quantitative assessment in the future. Indicators 1 and 2 are included as incentives to promote earlier and more consistent integration of the life cycle assessment method into building planning processes and refers to the EU Level(s) common framework Indicators 1.1, 1.2 and 2.1[2];

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Department stores** **Assembly buildings** **Healthcare buildings**	**9.4%**	**10**
Residential **Hotel** **Consumer market** **Shopping centre**	**9.0%**	**10**
Logistics **Production**	**8.7%**	**10**

[1] Energy Performance of Buildings Directive: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401275
[2] EU Level(s) common framework: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents

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EVALUATION

Points are awarded for incorporating the life cycle assessment results into the early planning process, using an energy consumption analysis with a scope that at least meets the local statutory requirements, and comparing variants with life cycle assessment calculations (life cycle Global Warming Potential – GWP) at the early conceptual phase (Indicator 1) and more detailed calculations based on calculations, simulations and drawings at the approval (building permit) phase (Indicator 2). The results of a complete building life cycle assessment, calculated in accordance with predefined conventions, are evaluated on basis of the comparison values (Indicator 3). Bonus points are also awarded for achieving climate-neutral operation and climate action through dimensional sufficiency (Indicator 4 – Bonuses). A maximum of 100 regular points can be credited in the criterion. A maximum of 120 points can be achieved, including bonuses.

MINIMUM REQUIREMENT

FOR ALL TYPES OF BUILDINGS:

Disclosure of life cycle assessments (Indicator 3.1.1)

Climate action plan (Indicator 3.2.1): for buildings that are not originally designed for net greenhouse gas neutral operation, a simplified decarbonization plan for carbon neutral operation (module B6.1) must be outlined with the target year of 2050 or in line with the national legal targets.

NO.	INDICATOR	POINTS
1	**Life cycle assessment in the planning process**	**Max. 10**
1.1	**Integration of the life cycle assessment into the conceptual design phase**	**10**
1.1.1	In early project phases (determination of basic principles, definition of needs, site assessment, preliminary planning or design planning) climate action-oriented life-cycle assessments (GWP and energy) are developed and incorporated into the decision-making process for the project.	
	■ Building operation (energy demand for operation) – at least two of the following aspects are evaluated: upscale energy standard - (energy design, building envelope, passive/active measures, etc. and detailing according to principles for cost-optimal minimum requirements[3] or similar), Nearly-Zero Energy Buildings (NZEB) or Zero Emission Buildings (ZEB)[4] standard, integration of renewable energy[5] technologies into the building site and/or nearby, for future net green-house gas neutral operation. Other variants worth considering – see method	+5
	■ Building components that contribute most to GWP, or 'hot spots', along a building life cycle can identified in order to improve design concepts; at least two of the following aspects are evaluated: optimised/reduced use of material quantities/ lightweight construction, use of CO_2 -reduced material types (low embodied carbon), optimised/reduced use of building technology (low tech/simple design), circular construction method with consideration of pre-use and post-use phases, longer-lasting building service life, optimised service life of building components. Other variants worth considering – see method	+5

[3] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52012XC0419%2802%29
[4] according to the new EPBD definition (Article 7 and 11) or national/regional/international standard – see method
[5] The meaning of 'energy from renewable sources' is as defined in Article 2(14) of the Directive, mirroring the definition of Directive (EU) 2018/2001 – see method

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2	**Life cycle assessment detailed design**	**Max. 10**
2.1	**Life cycle assessment in approval and detailed design phase**	**10**
2.1.1	Life cycle assessments are conducted regularly during the design phase (based on calculations-/simulations/drawings) and communicated within the planning team according to the specific planning aspects (differentiated according to operational and building-related emissions).	
	■ Building operation (energy demand for use) – at least two of the following aspects are evaluated: upscale energy standard – (energy design, building envelope, passive/active measures, etc. and detailing according to principles for cost-optimal minimum requirements or similar), Nearly-Zero Energy Buildings (NZEB) or Zero Emission Buildings (ZEB) standard, integration of renewable energy technologies into the building site and/or nearby, for future net greenhouse gas neutral operation. Other variants worth considering – see method	+5
	■ Building components that contribute most to GWP, or 'hot spots', along a building life cycle can be improved in the detailed design phase; at least two of the following aspects are evaluated: optimised/reduced use of material quantities/ lightweight construction, use of CO_2 -reduced material types (low embodied carbon), optimised/reduced use of building technology (low tech/simple design), circular construction method with consideration of pre-use and post-use phases, longer-lasting building service life, optimised service life of building components. Other variants worth considering – see method	+5

3	**Comparative values of life cycle assessment (as built)**	**Max. 100**
3.1	**Evaluation of results**	**100**
3.1.1	Evaluation of the building life cycle assessment results: Global Warming Potential total [kg CO_2-eq./m²*a] and Primary Energy non-renewable [kWh/m²a] (points can be interpolated linearly)	0–90
	Over-fulfilment (= 0.55 * reference value)	90
	Target value (= 0.7 * reference value)	80
	Reference value	40
	Limit value (= 1.4 * reference value)	0
	Going a step further:	
3.1.2	Quantitative results of the other life cycle assessment indicators declared:	5
	Total primary energy [kWh/m²a]	
	Renewable primary energy [kWh/m²a]	
	GWP fossil [kg CO2-eq./m²*a]	
	GWP biogenic [kg CO2-eq./m²*a]	
	GWP luluc [kg CO2-eq./m²*a]	
	Acidification potential (AP) [mol H+ eq. m²*a]	
	Eutrophication aquatic freshwater [kg PO4 eq. m²*a]	
	Eutrophication aquatic marine [kg N eq. m²*a]	
	Eutrophication terrestrial [mol N eq. m²*a]	
	Photochemical ozone formation (POCP) [kg NMVOC eq. m²*a]	
	Ozone depletion (ODP) [kg CFC 11 eq. m²*a]	
	Water (user) deprivation potential [m³ world eq.]	
	Abiotic depletion potential (ADP) for non-fossil resources [kg Sb eq.]	
	Abiotic depletion potential (ADP-fossil) for fossil resources [MJ, net calorific value]	

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3.1.3	Quantitative results of the Global Warming Potential total [kg CO_2-eq./m²*a] from all other modules declared: Transport and construction processes (modules A4–A5) Use stage (modules B2–B5)[6] Operational stage, non-regulated and user related energy (modules B6.2–B6.3) Deconstruction and transportation (modules C1–C2)	5
3.2	**Climate action plan**	**10**
3.2.1	Climate action plan for buildings that are not designed to operate in a net greenhouse gas neutral manner, plausible measures with the target year of 2050 or national target year has been drafted. Calculation is based on the simplified DGNB "Framework for carbon neutral buildings and sites"[7] (see method) within the scope of building operation (B6.1). The results of the calculation and the relevant measures are drafted and communicated to the building owner/investor.	10

4	**AGENDA 2030 BONUS – CLIMATE PROTECTION GOALS**	**Max. 20**
4.1	**Ambitious climate protection goals – carbon-neutral buildings**	**10**
4.1.1	A building fulfils all characteristics of climate action Category 2 / 2+: “Buildings prepared for climate neutrality”, according to the DGNB "Framework for carbon neutral buildings and sites – 2025". (see method)	5
4.1.2	A building fulfils all characteristics of climate action Category 1 / 1+: “Climate-neutral buildings”, according to the DGNB "Framework for carbon neutral buildings and sites – 2025". (see method)	10
4.2	**Accounting scope building structure – CO_2 reduced building materials**	**5**
4.2.1	The total greenhouse gas emissions from the building structure fall below the DGNB reference value GWP tot c.ref.(construction reference) by at least 50%	5
4.3	**Climate action through dimensional sufficiency**	**5**
4.3.1	Significant greenhouse gas reductions are achieved through clearly defined and measurable eco-sufficiency measures. Quantitative data are available for measures such as increased density of use and quantified data on the reductions achieved. A prerequisite for the bonus is that the effects cannot be represented or cannot be sufficiently represented by other indicators in the criterion, as they use alternative needs-based reference variables.	5

[6] Module B7 – Boundary of the operational water use is covered by the criterion ENV2.2
[7] DGNB Framework for carbon neutral buildings and sites, published August 2025 https://www.dgnb.de/en/sustainable-building/climate-action/framework-for-carbon-neutral-buildings-and-sites/revised-version

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SUSTAINABILITY REPORTING

The life cycle assessment results and calculation basis can be used for reporting in accordance with the "Level(s) – Common EU framework of core environmental indicators" and for EU Taxonomy / ESG verification.

NO.	KEY METRICS/KPI	UNIT
KPI 1*	Greenhouse gas emissions of structural parts and processes in the building's life cycle (sum of modules A1–A3, B1, B4, C3, C4 for the assessment and modules A4, A5, B2, B3, B5, C1 and C2 for declaration)	[kg CO2eq./m² a]
KPI 2*	Greenhouse gas emissions during operation and use (modules B6.1, B6.2 and B6.3 and B1)	[kg CO2eq./m² a]
KPI 3*	Greenhouse gas emissions of the recycling potential and the effects of exported energy (module D1 and D2)	[kg CO2e/m² a]
KPI 4*	Primary energy demand non-renewable, structural parts and processes in the building's life cycle (sum of modules A1–A3, B1, B4, C3, C4, D1 and D2)	[kWh/m² a]
KPI 5*	Primary energy demand non-renewable, in operation and use (sum of modules B6.1, B6.2 and B6.3)	[kWh/m² a]
KPI 6	Primary energy demand according to national EPC (Energy performance certificate)	[kWh/m² a]
KPI 7	Final energy demand according to EPC	[kWh/m² a]
KPI 8	Renewable energy self-sufficiency rate according to monthly balance method according to EPC	[kWh /m² a]
KPI 9	Building mass according to LCA	[kg/m² a]
KPI 10	Detailed building components list/catalogue with units of measure, material and LCA dataset allocation, useful lives	[-]
KPI 11	Life cycle assessment results for additional environmental indicators: GWP $_{fossil, biogenic, luluc}$, AP, EP, POCP, ODP, WDP, ADP	[-]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Buildings generate emissions and consume resources throughout their life cycle, from construction (e.g., through materials and products used) to operation and maintenance, and finally to demolition. These emissions affect the air, water and soil, leading to environmental issues like global warming, ozone depletion, summer smog, forest decline, fish mortality, and water and soil eutrophication. Adopting a life cycle approach in building planning enables owners and designers to make decisions that optimize environmental outcomes across different locations and timeframes.

II. Additional explanation

With the help of life-cycle assessment data, emissions and resource consumption are calculated over the entire life cycle – for production, operation, use and end of life – and can thus be incorporated into decisions throughout the planning process. Benchmarks can be used to evaluate the results of life-cycle assessments. If possible, the life-cycle assessment of a building should be developed as early as the planning phase. It can serve as an important tool for optimising the environmental quality of the building.

III. Method

Indicator 1: Life cycle assessment in the planning process

Indicator 1.1: Integration of the life cycle assessment into the conceptual design phase

The objective of Indicator 1 is to present preliminary LCA results/estimates transparently from an early design phase, adapted to the respective context or the time and scope of planning, and to integrate them into the decision-making process.

In early planning phases (service phases 2–3), preliminary LCA estimations/results suitable for the decision-making process should be set up for this purpose (Indicator 1.1.1) and a minimum scope of defined or freely developed variants should be considered. Variants are evaluated and compared qualitatively or quantitatively in terms of their climate impact. In this context, both building-structure (embodied carbon) and building operation (energy demand) related greenhouse gas emissions are assessed in a transdisciplinary manner. For the evaluation, specific calculations, generic parameters (typically expected results) or appropriate checklists can be used to review the climate impact of options and variants in the decision-making process. Information from various specialist planners (e.g. structural engineers, HVAC planners, building physics planners, energy planners) should be included in the determination of the variants. Following aspects are to be considered/evaluated for the building operation:

- High energy standard, e.g. national NZEB or ZEB[8] building according to the EPBD EU 2024/1275 definition or any other standard which is significantly below the local minimum standards regarding the energy efficiency (minimise the energy demand of the building operation using various measures, e.g. through designing and specifying a high performance and air-tight building fabric, designing and specifying high performance HVAC systems, etc.)
- Carbon-neutral or ready for carbon-neutral building operation, through integrating renewable energy technologies into the building and/or site (as far as possible) and/or nearby.

[8] Zero Emission Buildings (Articles 7 and 11) https://energy.ec.europa.eu/document/download/24516ed2-177f-474c-b86d-5124cca4ee69_en?filename=Zero-emission%20buildings%20%28Articles%207%20and%2011%29%20-%20annex%207.pdf

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Beyond these minimum variants, some other aspects may also be considered at the planning phase, e.g. site-specific conditions, maintenance-optimised options, building smart/intelligent monitoring and control systems. Alternatively, aspects to be evaluated can be taken from the DGNB Framework for carbon neutral buildings and sites “Focus areas for the accounting scope ‘Operation’”.

In general, the meaning of the “renewable sources” is defined in Article 2(14) of the Directive, mirroring the definition of Directive (EU) 2018/2001, i.e. “energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogases”. Article 2(55) defines energy from renewable sources produced “nearby” as energy from renewable sources produced within a local or district-level perimeter of a particular building. An example of renewable energy produced nearby is a heating system powered by solar-thermal energy and/or bioenergy that produces the energy for a group of buildings located in the vicinity of each other, where there is a direct connection between the building and the system and where the renewable share and associated primary energy factor can be identified and calculated.

At least two of the following variants will be considered/evaluated for the building structure:

- Optimised/reduced use of material quantities/lightweight construction
- Use of CO_2-reduced material types/materials
- Optimised/reduced use of building technology (“low tech”)
- Circular construction method with consideration of the pre-use and post-use phases
- Longer service life of buildings and optimised service life of building components
- Optimised available space, area to volume ratio of a building and individual units

Beyond the minimum variants, other aspects such as the adaptability of the building or the efficiency of the building shape can be considered. Alternatively, aspects to be evaluated can be taken from the DGNB Framework for carbon neutral buildings and sites “Focus areas for the accounting scope ‘Construction’”.

Indicator 2: Life cycle assessment detailed design

Indicator 2.1: Life cycle assessment in approval and detailed design phase

Variants should be identified in early (Indicator 1) and later planning phases (Indicator 2) and can thus be included separately in the evaluation. For the evaluation, specific calculations, generic parameters (typically expected results) or appropriate checklists can be used to review the climate impact of options and variants in the decision-making process. The following applies to Indicators 1.1.1 and 2.1.1: The findings are presented and explained to the planning team and are demonstrably incorporated into decision-making processes.

In the detailed design phase (service phases 3–5), the assessment of the building operation (energy demand) should be based on more detailed calculation/simulations that include and take into account the minimum scope and framework for assessing building energy performance (see method – Indicator 3). This may include, for example, not only building operational energy demand (B6.1) differentiated by energy carrier, but also on-site (on-building) energy generation, as well as the complete energy demand of building installations (module B6.2) – e.g. lifts, escalators, or similar – which are not typically covered by the standard national EPC (energy performance certificate).

The objective of Life Cycle assessment optimisation during the detailed planning phase for building structure is to create a more detailed building model based on drawings and information on specific building components, volumes and masses. Environmental impacts identified in the preliminary assessment (e.g. in the form of a partial life cycle assessment (see method – Indicator 3)), should be further optimised via variant calculations.

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Variants may take into account: the potential trade-off between reducing GWP in the use stage and the “embodied” emissions associated with the manufacture of higher performance building fabric, the duration of use of planned components or use of alternative manufacturers, the feasibility of reusing the structure of an existing building if applicable. Plausible alternatives that provide opportunities for improvement are communicated among the project team and incorporated into the decision-making process.

Indicator 3: Comparative values of life cycle assessment (as built)

Indicator 3.1: Evaluation of results

This indicator aims to quantify the Global Warming Potential (GWP), Primary Energy non-renewable and other environmental impacts of a building throughout its entire life cycle, from manufacturing to operation/maintenance to end of life. The results of this building life cycle assessment are compared with scheme-specific reference values for the quantitative evaluation.

Methodological basis for the building life cycle assessment

Scope of application, assessment and reference standards

The main reference standard providing the calculation method for a building life cycle assessment is EN 15643:2021 in conjunction with EN 15978:2025. Reference is also made to ISO 14040/44 and the revised EN 15804+A2 standard. The units of measurement for the two main indicators of this criterion – Global Warming Potential (GWP) and Primary Energy non-renewable (PEnr) – are kg CO_2 equiv. and kWh per m² of the enclosed net floor area (NFAs)[9] and annum, where the total reference study period $\mathbf{t_d}$ equals **50 years** (for all types of buildings). In some exceptional cases, where no standard building type exists for the given project, the duration of the building use may deviate from the specified study period. All exceptional cases must be plausibly explained and agreed with the DGNB during the system adaptation process.

Description of the evaluated building

The subject of the evaluation is the entire building; detailed building elements and materials are listed under Appendix 1 (similar to the Level(s) Indicator 2.1 – “Bill of Quantities (BoQ) materials and lifespans”), where the element hierarchy of construction products and materials is described. The evaluated building must be described in terms of its material and time-dependent properties; recommended lifespans of the relevant materials are listed under the same Appendix 1 of this criterion. If specific product lifespans are available (e.g., from Environmental Product Declarations (EPDs) or relevant databases), these can be used for calculations in place of the recommended lifespans. In addition, a clear description of the technical and functional properties of the building, the building type and the scheme must be recorded. Details regarding documentation are described in more detail under Appendix B – "Documentation".

Calculation rules for the building model

All relevant elements and components of the physical building model must be quantified in the relevant reference units, e.g. mass, volumes, areas. In addition, energy flows relevant to the building operation must also be quantified and described in detail, especially if complex energy concepts are developed and implemented. Quantitative results must be linked to the corresponding life cycle assessment datasets, which enables the life cycle assessment indicators to be determined. To enhance the assessment verification process, the results must be organised and documented in a structured way. The documentation of the building must be divided as follows:

- Building constituent parts (all building elements, structural parts, construction products and construction materials).
- The associated processes such as maintenance, replacement and end-of-life processes as well as reuse, recycling and energy recovery.

[9] Net Floor Area (standard case), according to DIN 277:2016, see document “Evaluation and Structure” of the DGNB System, chapter: “Terms and Definitions”; alternatively, the area can be defined according to ISO 9836:2017.

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- Use stage, energy (and refrigerants – variable) during the building operation.

In principle, for a life cycle assessment, there are only two methods of the building modelling possible:

- Partial calculation method (PCM) – which enables simplified recording of the constituent parts of the building, and which is only applicable for the pre-certification and for Indicators 1 and 2 of this criterion.
- The complete calculation method, which includes recording all constituent parts and their associated processes for assessment.

Partial calculation method (PCM) – This method is relevant for the pre-certification and/or design phase only. The calculation of the production phase includes only the limited number of components listed below, Table 1 (corresponds to partial "shell" elements of the Level(s) Indicator 2.1). All other building elements – such as windows, doors, technical installations – are omitted.

Table 1: Constituent parts of a building for the PCM

Tier 1	Tier 2	Tier 3	Tier 4
Shell	Foundations	Piles	Permanent piles
		Basements	Concrete blinding, raft footings, column bases, wall footings, strap beams Tie beams, substructure walls, substructure columns, lowest floor slabs (considering ground floor slab), lowest floor beams (considering ground floor slab), lift pit wall, lift pit slab
	Loadbearing structural frame	Frame (beams, columns and slabs)	Structural internal walls Columns Upper floor beams Staircases
		Upper floors	Slabs
		External walls	Structural external walls Including balconies beams, slabs.
	Non-load bearing elements	Ground floor slab	Slab blinding, bottom slab
		Internal walls, partitions	Non-structural internal walls* Non-structural internal partitions* (*only if made of bricks, concrete blocks)
		Stairs and ramps	Staircases (only if made of concrete or metal)
	Facades	External wall systems	Non-structural external walls Thermal insulation (building envelope)
	Roof	Structure	Roof beams, roof slabs
		Weatherproofing	Thermal insulation (building envelope)

Note: For all elements, no fittings and/or finishes to be considered, e.g. cladding, painting, plastering, adhesives. Only main materials like mineral/metal-based materials, e.g. concrete including reinforcement, concrete blocks, bricks, structural steel frames (without any covering layers).

The constituent parts of the building and associated quantities should be listed systematically and organised in accordance with Table 1 or in any similar plausible form. The building model must be sufficiently transparent to allow a unit of reference to be determined for the life cycle assessment datasets; DGNB provides a default dataset: ISUCO

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(international sustainable construction material database, formerly ESUCO and CHISUCO) for this purpose. In general, any other verified LCA dataset aligned with EN 15804+A2 can also be used. Each unit of reference for the calculated quantity of the building model must be checked to ensure that it matches the unit of the assigned life cycle assessment dataset and adjusted to match if necessary (e.g. via density or weight per unit area). If there is no life cycle assessment data available that precisely matches a component, a technically similar life cycle assessment dataset must be used. If there are multiple similar datasets available, a conservative approach must be selected (worst-case scenario principle). Since quantities according to the . CM cover only a limited number of building components/materials, results for the production phase (A1–A3), replacement (B4) as well as for end-of-life (C3, C4, D1) must be multiplied by a **factor of 1.4**. If comprehensive passive measures are taken into account and recognised in criterion TEC1.4, Indicator 1, the factor of 1.4 for the partial method can be reduced to a factor of 1.3 for passive buildings.

Complete calculation method

Structural work and fit-out must be incorporated into the calculation for the life cycle assessment values as built. Structural and technical components must be ordered in accordance with Appendix 1, whereby the **cut-off** rules must be considered, see below:

- Materials that do not make up more than 1% of the total mass of the building. The ignored materials/-material groups must not make up more than 5% of the total mass of the entire building.
- Up to 1 % of renewable and non-renewable primary energy usage, the ignored amount must not make up more than 5% of energy usage.

The completeness of the quantity calculations must be verifiably demonstrated (as above). The construction model must be linked to life cycle assessment datasets as described in the PCM method.
In order to simplify the calculation while maintaining the completeness of the results, predefined lump sum factors, may be applied as demonstrated in the Table below, for the following technical installations, such as:

- Wastewater, water and gas systems: downpipes, connection pipes for all sanitary fixtures
- Heat supply systems: pipes, distribution valves for room heating appliances, room heating appliances
- Air conditioning and ventilation systems: pipes, distributors, connection ducts for ventilation
- Electrical systems: low-voltage main distribution boards, cables, wires, sub-distribution boards
- Telecommunications and information technology systems: ductwork, cables, wires, call systems, bell systems, door intercom and door opener systems

Table 2: Flat / lump sum rates (factors) for building technical installations[10]

PEnr in kWh/m²NFA (s)*a		kg CO2 eq./ m²NFA (s)*a		
A1–3, B4, C3/4	D1	A1–3, B4, C3/4	D1	BUILDING SCHEMES AND TYPES:
4.11	-2.06	1.23	-0.62	Office Hotel Education (kindergartens / schools) Department stores Consumer market Shopping centre Assembly buildings (libraries) Healthcare buildings type I Logistics Production
5.75	-2.83	1.72	-0.86	Healthcare buildings type II Assembly buildings (except libraries) Education (institutional buildings)
4.5	-1.45	1.2	-0.52	Residential

The indicators PEnr and GWP can be calculated by multiplying the relevant factors (from modules A1–3, B4, C3/4 and D1) with the Net Floor Area (standard case) of the building. For both methods (complete and PCM), the energy for building operation (module B6.1) must be determined according to the local building energy performance certificate (EPC), or alternatively, building energy performance simulation/calculation, and included in the calculation. To

[10] According to QNG accounting rules for residential/non-residential buildings, July 2024.

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evaluate the building environmental performance, the “reference building method” is used. This involves comparing the performance of the projected building with the reference building (“digital twin”). Requirements and details for the EPC, energy demand simulations/calculations are presented under Appendices 2, 4 and 5.

System boundaries of the life cycle assessment

Table 3 shows the system boundaries for the life cycle assessment and result declaration according to the above-mentioned European norms: EN 15643:2021 in conjunction with EN 15978:2025. There are two variants of the LCA calculation according to the modules taken into account:

- The first line, with the scope “Assessment”, incorporates the modules (coloured and marked with “x”) that are used for the LCA result assessment in accordance with the DGNB methodology and benchmarks for the individual building schemes, presented under the indicators 3.1.1 and 3.1.2.
- The second line, under the scope “Declaration”, also considers the whole LCA, incorporating the additional modules: A4, A5, B2, B3, B5, C1, C2, which are considered under Indicator 3.1.3.

According to EN 15978:2025, the modules – A4, A5, B6 etc. – are sub-divided; detailed descriptions of the individual modules and sub-modules are provided below.

Table 3: Modules for life cycle assessment EN 15643:2021 in conjunction with EN 15978:2025

	LIFE CYCLE PHASES																	
	A 1–3			A 4–5		B 1–7									C 1–4				D	
SCOPE	PRODUCTION PHASE			CONSTRUC-TION PHASE		USE PHASE									END-OF-LIFE PHASE				BENEFITS AND LOADS (OUTSIDE OF THE SYSTEM LIMITS)	
	RAW MATERIALS PROCUREMENT	TRANSPORT	PRODUCTION	TRANSPORT	ERECTION/INSTALLATION	USE 1	MAINTENANCE 2	REPAIR	REPLACEMENT 2	MODERNISATION	OPERATIONAL ENERGY USE (REGULATED ENERGY)	OPERATIONAL ENERGY USE (NON-REGULATED ENERGY)	OPERATIONAL ENERGY USE (USER RELATED ENERGY)	WATER CONSUMPTION DURING OPERATION	DISMANTLING/DEMOLITION	TRANSPORT	WASTE PROCESSING	DISPOSAL	POTENTIAL FOR REUSE, RECOVERY AND RECYCLING	EFFECTS OF EXPORTED ENERGY
	A1	A2	A3	A4[1]	A5[2]	B1[3]	B2	B3	B4[4]	B5	B6.1	B6.2	B6.3	B7[5]	C1	C2	C3	C4	D1	D2
Assessment	x	x	x			x			x		x						x	x	x	x
Declaration	x	x	x	x	x	x	x	x	x	x	x	x	x	(x)	x	x	x	x	x	x

1) Includes A4.1 and A4.2 sub-modules;

2) Includes A5.1, A5.2 and A5.3 sub-modules;

3) B1 – relevant global warming potential (GWP_{100}) of the refrigerants refers to Regulation (EU) 2024/573 on fluorinated greenhouse gases[11], and German Environment Agency: "Global Warming Potentials (GWP) of selected compounds and their mixtures")[12].
4) B4 for the scope "Assessment": Only includes the manufacture (modules A1–A3) and disposal (modules C3, C4) including recycling potential (module D1) of the replaced product, not the replacement process itself. B4 with the scope "Declaration": Also includes the construction processes presented under the A4, A5, C1 and C2 modules;
5) Operational water use is considered under the criterion ENV2.2;

Modules A1–A3: Production phase – relevant for assessment and declaration
The boundary for modules A1 to A3 covers the "cradle to gate" processes (raw materials extraction, processing of secondary material according to EN 15804+A2, transport to manufacturing facilities and manufacturing and fabrication processes), for all construction materials, products, components and services used in the construction of the building (referring to the rules for the building model), up to the final point of manufacture before transport to the construction site. Any intermediary fabrication or customisation processes taking place beyond the main product's factory gate, and prior to delivery to site, shall also be accounted for under A1 to A3.

Module A4: Transport of construction products, materials and equipment – relevant for declaration Module 4 is subdivided into the sub-modules A4.1 – Transport of construction products and materials and sub-module 4.2 – Transport of construction equipment. The boundary for module A4.1 shall include transport of construction products and materials from the factory gate to the building's site and the boundary for module A4.2 shall include transport of construction equipment (cranes, scaffolding, etc.) to and from the site.

Module A5: Construction installation process – relevant for declaration
Module 5 is sub-divided into the sub-modules A5.1 – Pre-construction deconstruction, which covers the site clearing-/preparation works. Note: The deconstruction of the previous building is not included in the assessment, as it is accountted for in module C of the previous building. Sub-module A5.2 – Construction activities include preliminary site preparation activities, such as site clearance (e.g. removal of trees and other natural features, decontamination of the site), processing of reused or remanufactured products, if not already included in modules A1–A3, temporary works, including temporary works located on- and off-site as necessary for the construction installation process, ground works, excavations, levelling, connection to utilities within the building site, on-site storage of construction products and materials, including the provision of heating, cooling, humidity, etc., on-site production and/or processing and/-or assembly of materials, energy and water use for construction processes and activities, provision of heating, cooling, ventilation, humidity control, etc. to site facilities during the construction process (for more details see EN 15978:2025). Sub-module A5.3 Waste and waste management, includes production, transport to the construction site, waste treatment at site and disposal of products and materials wasted during the construction and installation process as well as storage including their transport from the construction site.
Note: Sub-module A5.4: Transport of construction workers is not included in the declaration scope.

Module B1: Scenario building use – fluorinated greenhouse gases – relevant for assessment and declaration
A special calculation rule for the "fluorinated gases", regulates inclusion of module B1 (use) in case of use of the non-natural / non-halogen free refrigerants in HVAC systems. The result of the calculation, i.e. effects of module B1, must be included in the LCA results and the same applies to any other relevant module. For this purpose, a simplified calculation method is used for module B1 to calculate emission values in kg CO_2 equiv. units. The calculation is based on leakage losses and losses during removal (disposal) when dismantling the system.

[11] Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on fluorinated greenhouse gases: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202400573
[12] Global Warming Potentials (GWP100) of HFCs, HCFCs and PFCs, as well as other perfluorinated compounds, German environmental agency, May 2025.

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For simplicity, this special calculation rule does not take into account the life cycle assessment of the production, waste treatment and disposal of the refrigerants themselves. The systems / components are included in the building LCA as standard.

The resulting global warming potential is determined in the following steps:

- Identification of the refrigerants used in the system (list of refrigerants referring to the regulation (EU) 2024/-573 on fluorinated greenhouse gases and their natural / non-halogenated alternatives[13]);
- Filling quantity (kg) in the system;
- Determination of the installed system technology, where leakage rate and disposal losses through the whole life cycle of the building (50 years) are determined as follows:

Table 4: Allocation of system type, leakage rate and disposal losses

System type	Leakage rate (Lr) [%]	Disposal rate (Dr) [%]	Exchange cycle (Ec)
Split system	5	49	4
Multi-split	5.6	31.5	3
VRF (Variable Refrigerant Flow)	6.58	31.5	3
Refrigerating machines Turbo compressors	3.76	21.6	2
Chiller	3.76	21.6	3
Heat pumps	2.5	35.2	2
All other types of system	2.5	25	2

Note: DGNB will provide an Excel supplement to the “DGNB LCA-Form” to make calculation easier.

The environmental impact potential (EIP), specifically GWP in kg CO2 equiv. is determined as follows:

$$\mathbf{EIP_{UF\text{-}GAS} = [(Lr/100 * t_d) + (Dr / 100 * Ec)] * Fq * GWPr / t_d \quad (1)}$$

Where:

$EIP_{UF\text{-}GAS}$ Environmental impact potential in use stage from fluorinated greenhouse gases
Lr Leakage rate
Dr Disposal rate
Ec Exchange cycle
Fq Filling quantity
GWPr Global Warming Potential of the refrigerant
t_d period [a]

Table 5: Global Warming Potentials (GWP_{100}) of common HVAC Refrigerants

Industrial designation	Chemical name	Chemical formula	GWP (kg eq.)	Natural refrigerants
R 22	Chlorodifluoromethane	$CHClF_2$	1810	No
R 32	Difluoromethane	CH_2F_2	675	No
R 134a	1,1,1,2-tetrafluoroethane	CH_2FCF_3	1430	No
R 404A	HFC Blend	44% R-125, 4% R-134a, and 52% R-143a	3922	No
R 407C	HFC Blend	23% R-32, 25% R-125, 52% R-134a	1774	No
R 410A	HFC Blend	50% R-32 and 50% R-125	2088	No

[13] List of most commonly used refrigerants and alternatives to fluorinated greenhouse gases: https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/climate-friendly-alternatives-hfcs_en

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R 1234yf	2,3,3,3-Tetrafluoroprop-1-ene	$CF_3CF = CH_2$	4	No
R 1234ze	trans-1,3,3,3-Tetrafluoroprop-1-ene	$CHF = CHCF_3$	7	No
R 290	Propane	$CH_3CH_2CH_3$	3	Yes
R 600a	Isobutane	$CH(CH_3)_2CH_3$	3	Yes
R 717	Ammonia	NH_3	0	Yes
R 718	Water	H_2O	0	Yes
R 723	Dimethylether/Ammonia - Blend	60% R-717, 40% R-E170	1	Yes
R 744	Carbon dioxide	CO_2	1	Yes
R 1270	Propene (Propylene)	$CH_2=CH-CH_3$	2	Yes

Module B2: Maintenance and Module B3: Repair – relevant for declaration
According to EN 15978:2025, modules B2 and B3 may be combined to make it easier to conduct the assessment at building level and recognise difficulties in separating facets of maintenance and repair. The boundary of maintenance (module B2 whether planned or unplanned) and repair (module B3) shall include: the production and transportation of the construction products and materials, components and ancillary products used for maintenance (module B2) and/or repair (module B3), cleaning processes needed for the technical and functional performance of the interior and exterior of the building (e.g. cleaning of windows, floors, gutters), (module B2), all processes for maintaining the functional and technical performance of the building fabric and building-integrated technical systems, as well as aesthetic qualities of the building's interior and exterior components, (module B2), the process of installing/repairing the parts, relevant components and ancillary products, waste management of the removed parts, components and ancillary products, and any packaging, including their end-of-life treatment.

Module B4: Scenario for replacement – relevant for assessment and declaration
Expected service life of components can be found in Appendix 1, which corresponds to the Level(s) Indicator 2.1 "Bill of Quantities, materials and lifespans", Table 3. "Typical service lives for the minimum scope of building parts and elements". Alternatively, material / product-specific information for the reference service life from Environmental Product Declarations (EPD) type III in accordance with EN 15804+A2:2019 may be used.

Calculations for replacement must be carried out for all materials and components or surfaces with a duration of use shorter than the reference period $\mathbf{t_d}$. The frequency of replacement of components/products after their expected duration of use is determined assuming like-for-like replacement of the original component/product. For this calculation, only complete (integer) replacement is permitted (no partial replacements). The frequency of replacement is determined by dividing the reference period by the expected duration of use of the component/product. In the event of a calculated partial replacement (non-integer values), the resulting value must be rounded up. For this process, it is important to ensure that the technical framework conditions of the replacement are calculated as realistically as possible. This primarily applies to the accessibility of components that may require additional layers to be removed and replaced.

The frequency of replacement is determined as follows:

$\mathbf{n_{Replacement} = rounded\ up\ (t_d/t_D) - 1}$ **[-]**

where:

$n_{Replacement}$: Frequency of replacement; if the result is a decimal (partial replacement), the result must be rounded up to the next whole number

$\mathbf{t_d}$: Reference period [a]

$\mathbf{t_D}$: Duration of use of a component in [a]

The recovery and disposal of the replaced components/products must be calculated in a suitable quantity using the appropriate "end-of-life datasets" and recorded in the overall assessment (see Calculation method for end-of-life phase scenario). Transportation to the construction site and to recovery and disposal facilities is to be ignored. The plausibility of the approaches must be demonstrated. The assumptions used here must be consistent with those made for the calculation of the irregular maintenance costs for life cycle costs.

Please note: If determination of quantities is calculated using the partial calculation method, the indicator results for the scenario for maintenance and replacement must be multiplied by a **factor of 1.4**. If comprehensive passive measures are considered and recognised in criterion TEC1.4, Indicator 1, the factor of 1.4 for the partial calculation method can be reduced to a factor of 1.3 for passive buildings.

Module B5: Planned refurbishment – relevant for declaration
Module B5 covers any major changes planned at the start of a project (e.g. extension, refurbishment/ retrofit/up-grade), as required by the client's brief, legislation, national or regional regulations and standards, etc. that are to be carried out through a concerted programme across a significant part of or an entire building. Such changes can affect the building's layout, fabric, components and technical systems, typically as a result of a change or adjustment to the intended use or function or to improve the building's performance.

Boundary for energy use (module B6) – relevant for assessment and declaration
Module B6 includes impacts and aspects of operational energy use and is divided into the following 3 sub-modules:

- Sub-module B6.1 – The energy use of building integrated systems (services) that are regulated, i.e. energy declared under the building's EPC (see Appendix 2);
- Sub-module B6.2 – The energy use of building integrated systems (services) that are not regulated, e.g. energy demand for lifts.
- Sub-module B6.3 – Other energy use related to building user activities (e.g. plug-in appliances, computers, washing machines, refrigerators, plug-in lighting, production or process-related equipment used in the building).

Sub-module B6.1: Scenario for energy use in operation
The values for the final energy demand of the various/individual energy sources for operation of the building can be found in the EPC. Country-specific statutory buildings energy performance requirements will be taken into the consideration if there is sufficient compliance with the standards described in Appendix 2[14]. The final and primary energy values must be incorporated into the calculation here. Alternatively, results from a building energy performance simulation/calculation can be used for the actual building. When doing so, a calculation in accordance with specified standard parameters is required. These are described in Appendices 2, 4 and 5.

For the life cycle assessment of module B6.1 – operational energy, a country- and energy-specific dataset must be used. For these purposes, DGNB will provide a number of country specific datasets (in the ISUCO Dataset) which should be used as a basis for the life cycle assessment values for the estimated electricity demand. The use of any other country-specific dataset for the specific electricity mix or any other specific datasets for energy, must be agreed with the DGNB. The purchase of green electricity cannot be assessed in the new building schemes. The proportions of green electricity in the average electricity mix for individual countries have already been considered under ISUCO datasets for the electricity grid mix. The increasing share of renewables in the future scenarios is also defined in the relevant datasets for the electricity grid mix 2040 and/or 2050, which can be used for the climate action plan.

[14] A country-specific energy performance certificate (statutory regulation) must be provided and agreed with DGNB.

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In case of onsite or nearby energy generation[15], energy may be fed into the grid or used internally; in both cases the following is to be considered:
Building energy generation, e.g. electricity generation via PV systems, may already be considered in the EPC (e.g. reducing final energy demand through electricity generation from the local installations). In this case, the building's energy demand would be incorrectly reduced (double accounting). If the electricity production for internal use from a cogeneration unit is being taken into account, all life cycle assessment indicators must be corrected accordingly.
In all cases, it is necessary to state whether or not the energy production in the building systems has been included in the calculation of the energy demand and to include this accordingly in the life cycle assessment. Where extensive electricity production reduces internal electricity demand and feeds excess electricity into the grid, the net value of the electricity balance and the total values of the associated GWP (in CO_2-eq. units) may become negative. This corresponds to an energy-positive building in terms of operational energy. These results are valid only for the building being considered. The extrapolation of these results across the market is not covered by the methodological framework of the life cycle assessment (in particular, the attributional life cycle assessment).

A clear list of the estimated gains must be attached to the calculations as an appendix.
The life cycle assessment values for additional energy sources, e.g. for covering the **heating demand**, are to be determined as follows: The method of heat generation must be specified and the corresponding LCA dataset must be used. Use datasets, e.g. ISUCO, already partially include losses from combustion efficiency rates (Q_G). These efficiency rates/losses are documented accordingly in the dataset.

The following approach applies to the use of **district heating** if no situation-specific district heating life cycle assessment dataset is available:
If the energy supplier can demonstrate a proportion of renewable energy in district heating (but not the primary energy factor), this is estimated using the dataset for secondary fuel combustion (if this is not available, a dataset for industrial-scale wood combustion is used). The non-renewable proportion of district heating is linked to the corresponding LCA dataset, e.g. ISUCO; district heating datasets represent the mix of non-renewable district heating. The size of the renewable proportion of the district heating provided by the supplier must be demonstrated via a corresponding certificate or statement from the supplier. Regenerative sources of district heating include biomass, biogas, sewage gas, landfill gas and solar thermal energy. The same rule applies for **district cooling**, where the energy supplier can demonstrate a proportion of renewable and non-renewable energy sources.

When using **geothermal energy, PV systems, solar collectors or cogeneration units**, the following applies:
The auxiliary energy shown in the energy certificate normally contains the electricity demand for the operation of a heat pump. In this case, the renewable energy in the form of geothermal energy must also be considered as renewable primary energy. If the energy certificate does not show the electricity demand of the heat pump, a suitable heat pump dataset must be used – this must contain both the electricity demand and the renewable energy in the form of geothermal energy.
Process for assessing an electrical heat pump: The electricity demand of the heat pump (final energy) specified in the EPC and the electricity mix life cycle assessment dataset can be used to determine the environmental impact potentials from operation of the heat pump as a first step. As a second step, the generated renewable energy (PEr) is determined by multiplying the electricity demand of the heat pump (final energy) specified in the energy certificate by the pump's Seasonal Performance Factor (SPF). It is permissible to use life cycle assessment datasets for electrical brine water heat pumps for calculating deep geothermal energy. For photovoltaic systems and solar collectors, only the generated renewable energy can be additionally credited in the operational assessment. It is permissible to use life cycle assessment datasets for gas condensing boilers to calculate the heat production of cogeneration units.

[15] According to the Energy Performance of Buildings Directive (EU) 2024/1275, Zero Emission Buildings (Articles 7 and 11)

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In order to adequately take a small cogeneration unit, including electricity supply, into account, specific calculation of the cogeneration unit is recommended; the impact of the electricity production in the cogeneration unit must always be taken into account. The allocation of the impacts must be carried out in accordance with the energy content of the products (to ensure consistency with LCA datasets).

If the energy production cannot be represented directly using LCA datasets, a project-specific calculation must be carried out, or, if this is not possible, a suitable conservative estimation with a comparable available dataset must be made. The selected method must be justified and documented. Alternatively, as a preferred variant, an Environmental Product Declaration (EPD) type III in accordance with EN ISO 14025 and DIN EN 15804+A2:2019 for the specific method of energy production can be used.

The use of **waste heat from industrial processes** can be incorporated into the calculation separately, i.e. without including emissions and resource expenditure, if it can be proven that this waste heat is not used for any other purpose. The use of waste heat from industrial-scale waste incineration plants is an exception to this rule and must be considered in accordance with the rules for district heating (see above).

Sub-module B6.2: Unregulated energy use of building integrated systems (services)
When considering unregulated energy demand, installed lifts and centralised services must be considered as a minimum; these are not included in the EPC of the building. The energy consumption for lifts must be determined according to the type and number of lifts actually planned using Table 6, which provides information on the usage category and the values for energy consumption, usage time and efficiency classes.

Table 6: Determination of annual electricity consumption [in kWh/a] of lifts depending on usage time and efficiency classes[16]

Energy efficiency classes	Nominal load kg	Speed m/s	Usage time (h/day) and relevant electricity consumption (kWh/a)				
			0.2 h	0.5 h	1.5 h	3 h	6 h
A	630	1.0	527	661	1106	1774	3110
		1.6	583	800	1523	2608	4779
B	630	1.0	1008	1205	1864	2853	4829
		1.6	1091	1414	2490	4104	7333
C	630	1.0	1946	2237	3207	4662	7572
		1.6	2071	2550	4146	6540	11327
D	630	1.0	3788	4213	5632	7760	12015
		1.6	3975	4683	7040	10576	17648
A	1600	1.0	670	1018	2177	3915	7393
		1.6	811	1371	3236	6035	11631
B	1600	1.0	1222	1741	3470	6065	11253
		1.6	1434	2271	5060	9243	17611
C	1600	1.0	2267	3040	5616	9480	17208
		1.6	2585	3835	8000	14248	26745
D	1600	1.0	4270	5418	9245	14987	26469
		1.6	4746	6610	12821	22139	40774

For central services, regardless of the specific situation, the average value according to Table 7 is to be used.

[16] Information based on guidelines published by the Association of German Engineers (VDI) regarding the energy efficiency of lifts (VDI 4707)

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Table 7: Parameters for annual electricity demand for central services[17]

Other central services	Average value	Unit
Per low-voltage system: Buildings > 1,000 m² NFA Buildings ≤ 1,000 m² NFA	 0.70 0.95	kWh final-energy /m²NFA
Video surveillance system based on the m² of monitored area (MA)	0.60	kWh final-energy /m²MA

The final energy demand of the lifts and the determined annual electricity demand for central services for the entire building must be added together and used for the LCA indicator calculations for module B6.2, which is relevant for Indicator 3.1.3 and/or bonuses.

Sub-module B6.3: User energy demand

This module covers the energy use related to building user activities (e.g. plug-in appliances, computers, washing machines, refrigerators, audio visual equipment, plug-in lighting, and production or process-related equipment used in the building) and is relevant for Indicator 3.1.3 and/or bonuses. For the final energy determination, default user energy values according to Table 8 are available. These values are also included in the DGNB "Framework for carbon neutral buildings and sites" calculation tool[18]. National / project-specific adaptation of the user energy values is possible, provided that the boundary conditions of the use phase reflect the reality as accurately as possible, and that any adaptation is agreed with the DGNB in the system adaptation process.

Table 8: User and user-related annual electricity demand by zone[19]

	Space type	Plug-loads		Space type	Plug-loads
		kWh/(m²a)			kWh/(m²a)
1	Single office	10.5	24	Commercial halls (rough work)	70.0
2	Group office	10.5	25	Commercial halls (precision work)	70.0
3	Open-plan office	15.0	26	Audience area	0.0
4	Meeting rooms	2.0	27	Theatre foyer	0.0
5	Main hall / lobby	6.0	28	Stage	0.0
6	Retail / food store (without refrigerators)	7.2	29	Fair/congress	1.8
7	Retail / food store (with refrigerators)	25.5	30	Exhibition rooms and museums	0.0
8	Classroom (schools)	4.0	31	Library – reading hall	0.0
9	Lecture halls/ auditorium	3.6	32	Library – open-access sections	0.0
10	Ward / dorm	8.8	33	Library – storage and stock	0.0
11	Hotel room	16.1	34	Sports hall	0.0
12	Canteen (eating area)	2.5	35	Car park/underground car park (private use)	0.0
13	Restaurant (eating area)	4.2	36	Car park/underground car park (public)	0.0
14	Catering kitchen (cooking with electricity)	540.0	37	Sauna area	182.5
15	Catering kitchen (preparation and storage)	54.0	38	Gym	8.8
16	Toilet and bathroom	0.0	39	Laboratory	27.0
17	Other regularly occupied spaces	2.0	40	Examination/treatment room	8.8
18	Auxiliary space (non-regularly occupied)	0.0	41	Special medical care areas	83.2
19	Corridor / transition spaces	0.0	42	Corridors (medical care sector)	0.0

[17] Typical values for the electrical energy consumption of central low-voltage systems according to SIA 380/4 and VDI 3807-4
[18] DGNB provides you with a CO_2 calculator to help you calculate your carbon footprint. This tool also helps you to present your building-specific climate action roadmap.
[19] Partial energy values (final energy) / TEK-Tool Version TEK 5.6 Institut Wohnen und Umwelt (IWU), Darmstadt

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20	Corridor / transition spaces (without daylight)	1.0	43	Medical practices	6.3
21	Storage	0.0	44	Warehouse	0.0
22	Storage with reading space	1.0	45	Residential (single-family house)	24.5
23	Server room in data canters	657.0	46	Residential (apartment building)	36.8

Calculation method for end-of-life phase

Module C1: Deconstruction – relevant for declaration

This module includes all the processes associated with the deconstruction or dismantling of the building, including initial on-site sorting of the outputs of the deconstruction process.

Note: Recovery processes occurring on-site for the products to be reused in-situ are covered in module C3.

Module C2: Transport – relevant for declaration

This module includes all transportation of outputs of the deconstruction process until their end-of-waste state is reached or until they are taken to the final disposal site as waste, including transport to and from any intermediate storage/processing locations.

Modules C3, C4 and D1: Processing/recovery and disposal with benefits and loads beyond the system boundary – relevant for assessment and declaration

Recovery and disposal of all materials/construction materials listed in the production phase must be included in the calculation. To simplify this process, the calculation can also be carried out for groups of materials with the same EoL (end-of-life) scenario. For evaluation, materials must be divided into the following minimum scope of material groups:

(1) Materials for recycling (e.g. metals, glass, mineral materials, plastics, etc.)
(2) Materials for thermal recovery (with a calorific value, e.g. wood, plastics, etc.)
(3) Materials that can only be deposited at a landfill
(4) HVAC systems[20]

For (1), the following applies: The disposal/recycling path "Recycling/recovery" must be selected. The relevant data-sets, e.g. "metal recycling potential", that contain modules C3 and D1 must be selected. Precise allocation must be ensured. If a clearly suitable dataset is not available, a similar dataset must be selected. It should be noted that only the proportion of metals produced via primary manufacturing can be credited with recycling potential corresponding to such proportions (this is usually found in EoL datasets calculated in accordance with EN 15804+A2:2019). If a product consists entirely of recycled material, no further recycling potential can be assessed (e.g. reinforcing steel). For mineral materials, "Construction rubble reprocessing" (part of module C3) must be selected for materials that are demonstrably recoverable (e.g. concrete used for backfilling in road or landfill construction). This must be linked to a negative dataset for a corresponding quantity of gravel under the module D1, represented with the sub-modules D1.1: reuse and sub-module D1.2: recycling.

For (2), the following applies: The disposal option "Thermal recovery" must be selected. The datasets can be summarysed by material groups (e.g. wood, wooden materials, plastics) and must be matched to the corresponding datasets for thermal recovery. This is documented under module C3 and sub-module D1.3: energy recovery with energy generation, which can be applied in accordance with the definition of the dataset. The sub-module D1.4 is also applicable for waste incineration.

For (3), the following applies: The recycling path "Disposal at landfill" must be selected if no other recovery option aside from depositing at a landfill is typically used for the materials. This may apply, for instance, for some glass materials, exposed mineral wool, bitumen sheeting, plasterboard, etc. Suitable datasets or mixed material datasets must be selected for this. The results are part of module C4.

[20] Not included in the PCM

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For (4), the following applies: The dataset that corresponds to the production must be assessed. Here, it is important to ensure the correct scaling of the quantities and the correct unit of reference for the life cycle assessment datasets is used (as with the statements listed under "Construction"). Where the building service installations are considered in detail in the life cycle assessment, suitable EoL scenarios must be provided. Here, it is recommended to separate the material mix of building service installations to enable the use of available EoL scenarios and datasets.

Note 1: If EoL scenarios are taken from EPDs for specific construction products, it must be ensured that multiple alternative scenarios can be specified in EPDs. Generally, a standard scenario is defined representing the typical recycling pathway. This standard scenario can be used even if it deviates from the specifications given above for the EoL scenario to be applied. However, this requires that the specific installation location of the product supports the scenario. (For example, a standard scenario of an EPD assumes that the product is installed such that it can be removed, e.g. that it is screwed in place. However, if the product is glued in place in the specific project in question, it may no longer be available for the standard EoL scenario. In this case, a suitable EoL scenario must be used.)

Note 2: The available EoL datasets are generally less detailed than manufacturing datasets for construction materials (this also applies to generic datasets). As recovery of construction materials using up-to-date methods is rarely carried out on a product-specific basis but is instead often carried out by separating the demolition material into product groups, it is appropriate and sufficiently precise to represent the EoL with a small number of average datasets. For product-specific recovery methods, e.g. due to an established recovery system, it is possible to refer to corresponding EPDs including data for the EoL.

Module D2: Loads and benefits of the exported energy – relevant for assessment and declaration
This module includes the environmental benefits and loads that occur beyond the building system boundary, resulting from utilities such as power and heat, generated on site and exported during building operation. The environmental impacts and aspects related to the exported portion of generated thermal energy and/or electricity are assessed based on the allocation of resource use corresponding to each energy carrier and its respective share of the total export, i.e. scenarios for module D2 shall describe substitution of resources that result from exported utilities (e.g. electrical energy, thermal energy) based on the chosen national approach for the energy grid.

Data requirements for the building life cycle assessment
In principle, material-specific and verified life cycle assessment data (e.g. EPD) should be preferred over general, generic life cycle assessment data. An exception to this is country-specific energy-relevant datasets, for which DGNB provides a default LCA database: “International Sustainable Construction Database – ISUCO”, (a compilation of upgraded databases of ESUCO and CHISUCO), which include generic material and country-specific energy datasets. These databases are suitable for the scope and purpose of the LCA calculations. They are consistent in their methodology and provide the required results for each indicator. The methodological consistency, conformity and completeness of specific data from other sources must be verified by independent external experts. These requirements are met by EPD type III declarations according to ISO 14025 and EN 15804+A2:2019.

The use of manufacturer-specific datasets for products that are not used in the building is only permitted in justified exceptional cases and only if a safety margin of at least 10% is added to the DGNB life cycle assessment indicator results in order to consider possible deviations in the datasets used. As a general rule, preference should be given to datasets which most precisely reflect the item in question (materials, end-of-life scenario, energy supply, etc.) in terms of technical relevance and assessment date, e.g. generic datasets for design phase assessment, product-specific EPD for final documentation.
Please note: This safety margin is not to be confused with the 40% margin (factor of 1.4) for building construction that must be applied when using the calculation rules for the partial calculation method (PCM) – see above.

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The following applies as a general rule for selecting datasets: The dataset selected must be the one that most accurately represents (in terms of materials, end-of-life scenario, energy supply, etc.) the subject of the assessment (material or component), with reference to conformity to technical specifications and time of assessment (e.g. general data for the concept analysis, company-specific EPDs for final documentation). Project-specific life cycle assessment data that has not been subject to any external verification in accordance with EN 15804+A2:2019 can only be used due to certain conditions and must be agreed with the DGNB (see also "Documentation").

Data quality and requirements regarding completeness of life cycle assessment data
It is possible to select both aggregate data for assembled components or entire systems such as walls, roof systems, etc. and product-specific or material-specific data for components. In all cases, the data must be representative, regardless of whether it consists of general life cycle assessment data, average values or manufacturer-specific life cycle assessment data. LCA data other than that provided in the ISUCO database must match the methodological standards, quality and completeness set by EN 15804+A2:2019 standard and this must be documented comprehensively for verification. If EPDs are used, these must be type III declarations in accordance with EN 15804+A2:2019 and must be valid at the time the product is used (or at the time of the decision to purchase the product). Datasets with expired validity can only be used in justified exceptional cases.

Please note: EPDs in accordance with EN 15804+A2:2019 have a validity period of five years, but in individual cases the validity can be extended if necessary. When using data or EPDs not in accordance with EN 15804+A2:2019, it must be ensured that the data or EPDs comply with the same methodological specifications as the ISUCO database in terms of quality and completeness. The cut-off criteria for life cycle assessment datasets must comply with the requirements of EN 15804+A2:2019.
Note: DGNB Auditors and Consultants should consult with DGNB if no adequate LCA datasets are locally available.

Report and presentation of the results
A short project report must be created (see "Documentation") and information to ensure transparency in the creation of the building model must be provided. The life cycle assessment results must be presented in accordance with the documentation specifications. When doing so, the indicators and parameters listed in the descriptions of the criteria must be evaluated.

The life cycle assessment results must be presented with reference to a period of one year and one m^2 NFAs. This must be implemented consistently across all criteria of the life cycle assessment. Exception: The following applies to industrial (**Logistics** **Production**) and **Assembly buildings**: For buildings with ≤ 12 m clear room height, an approach using the area in m^2 NFAs must be used. For buildings with > 12 m clear room height, the assessment must be carried out with reference to gross volume GV in m^3 (see “Evaluation and structure of the DGNB system”).

The evaluation includes optimisation of the emissions for construction and operation at the same time throughout the entire life cycle. The determined values are specified as an indicator result relating to the net volume NV: Indicator result in [kg environmental impact equivalent/(m^2NFAs*a)][21]. They are calculated as an average annual value for the building and compared to reference values for assessment. Lower values for the emissions equivalents correspond to lower potential environmental impacts. The calculation method described below is applicable for each environmental impact indicator.

[21] The total primary energy demand and non-renewable primary energy demand indicators are specified in [kWh/(m^2_{NFAs}*a)] and the water demand indicator is specified in [m^3 world eq.].

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Life cycle assessment results for the actual building

The environmental impacts of the constructed building are summarised as a combined parameter in the form of an environmental impact potential (EIP) as an average annual value across the reference period considered for assessment of the indicators:

$$\mathbf{EIP_T = EIP_C + EIP_U} \qquad \mathbf{(2)}$$

Where:

EIP_T Total resulting environmental impact potential for construction (C) and use (U) of the building in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

EIP_C Resulting environmental impact potential during construction, replacement, recovery and disposal of the building including the technical facilities used as an annual average value over the reference period considered for the certification t_d in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

EIP_U Predicted annual environmental impact potential for **operation** of the implemented building, derived from the final energy demand in accordance with EPC (or standardised energy simulation) plus the environmental impact potential for the user equipment (only for selected schemes and/or bonus) during building operation, derived from the final energy demand of the defined facilities (insofar as required under "Usage-specific description of the method") in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

The average annual value for the **construction EIP_C** is determined as follows:

$$\mathbf{EIP_C = (P + D + M) / t_d} \qquad \mathbf{(3)}$$

Where:

P Predicted value for the environmental impact potential resulting from **production** (building construction and technical facilities) for the implemented building in [kg environmental impact equivalent/(m^2_{NFAs})]

D Predicted value for the environmental impact potential resulting from **recovery and disposal** (building construction and technical facilities) for the implemented building in [kg environmental impact equivalent/(m^2_{NFAs})]

M Predicted value for the environmental impact potential resulting from **replacement** (building construction and technical facilities) for the implemented building in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

t_d **Reference period** considered for the certification in [a].

The average annual value for the **use EIP_U** is determined as follows:

$$\mathbf{EIP_U = EIP_{UE} + EIP_{UH} + EIP_{UF} + EIP_{UF\text{-}GAS}} \qquad \mathbf{(4)}$$

Where:

EIP_{UE} Environmental impact potential of the **electricity demand during use**, calculated in accordance with the EPC (or standardised energy simulation), multiplied by the EIP factor of the electricity mix from the relevant LCA dataset in [kg environmental impact equivalent/-(m^2_{NFAs}*a)]

EIP_{UH} Environmental impact potential of the **heating and, where applicable, cooling demand during use**, calculated in accordance with the EPC (or standardised energy simulation), multiplied by the EIP factor of the selected energy source from the relevant LCA dataset in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

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EIP_{UF} Only for selected schemes: Predicted annual environmental impact potential for the **user equipment during building operation**, derived from the final energy demand of the defined facilities in [kg environmental impact equivalent/-(m^2_{NFAs}*a)]

EIP_{UF-GAS} Environmental impact potential in use stage from **fluorinated greenhouse gases** [kg CO_2 equiv. impact /(m^2_{NFAs}*a)]

Reference values for the building life cycle assessment

The reference values (40 points) for the environmental indicators (EIP_{Gref}) are generally derived from a fixed proportion for the construction-related value of the environmental impacts of emissions for construction, maintenance and recovery/disposal, as well as a variable proportion for the use-related value of the environmental impacts of emissions at the level of the reference building used as a basis in the EPC (or standardised energy simulation). The variable proportion is calculated from the electricity and heating demand (final energy) determined in accordance with the EPC (or standardised energy simulation), multiplied by defined factors (values of the environmental profiles for the electricity mix and a representative thermal energy mix).

$$\mathbf{R_{EIP} = EIP_{Gref} = EIP_{Cref} + EIP_{Uref}} \quad \textbf{(5)}$$

Where:

EIP_{Cref} Reference value for the annual average value of the environmental impact potential for **construction, replacement, recovery and disposal** of the building including the technical facilities used across the reference period considered $t_{d,}$ in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

EIP_{Uref} Reference value for the annual environmental impact potential resulting from the **operation** of the building, derived from the final energy demand of the reference building in accordance with the EPC (or standardised energy simulation) or – for selected schemes – reference value for the annual environmental impact potential resulting from the **user equipment** during the building operation, derived from the final energy demand of the defined facilities in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

The reference values for the **construction EIP_{Cref}** are determined as follows:

$$\mathbf{EIP_{Cref} = constant} \quad \textbf{(6)}$$

The EIP_{Cref} values are determined using parameters derived from statistical studies.

The reference values for the **use EIP_{Uref}** are determined as follows:

$$\mathbf{EIP_{Uref} = EIP_{UEref} + EIP_{UHref} + EIP_{UFref}} \quad \textbf{(7)}$$

Where:

EIP_{UEref} Environmental impact potential of the annual **electricity demand (final energy) of the reference building** in accordance with the EPC (or standardised energy simulation) in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

EIP_{UHref} Environmental impact potential of the annual **heating and, where applicable, cooling demand (final energy) of the reference building** in accordance with the EPC (or standardised energy simulation) in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

EIP_{UFref} only for selected schemes: Reference value for the annual environmental impact potential of the **user equipment during building operation**, derived from the final energy demand of the defined facilities in [kg environmental impact equivalent/(m^2_{NFAs}*a)]

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The calculation of the final energy demand is based on either the building's EPC (for regulated building services) or a standardised energy simulation/calculation with calculational boundaries as described in Appendix 2.

The following influencing parameters have already been considered in the conversion table (reference):
For the construction-related value of the environmental impacts of emissions and resource demands:

(1) Relevant statistical research for manufacture, maintenance, and end-of-life phases.
(2) Results of the DGNB certifications
(3) Long-term objective of the DGNB for the environmental indicators

For the use-related value of the environmental impacts of emissions:

(4) Current factors for country-specific electricity environmental profile and representative mix for thermal energy

Life cycle assessment results for the actual building and reference values
Reference values for results of life cycle assessment, kg CO2 equiv. (total) and Primary Energy non-renewable, for different building types.

Table 9: Reference values for construction, maintenance and recovery/disposal (construction) as well as use (operation): GWPtot and PEnr

	GWP_{TOT} (MODULES A1–A3, B4, C3, C4, D)		PE_{NR} (MODULES A1–A3, B4, C3, C4, D)	
Units	[kg CO_2 equiv./(m^2_{NFAs}*a)]	[kg CO_2 equiv./(m^3_{GV}*a)]	[kWh/(m^2_{NFAs}*a)]	[kWh/(m^3_{GV}*a)]
Construction (materials and products)				
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department store**	GWP_{Cref} = 9.5		$PE_{nr,Cref}$ = 30.5	
Assembly buildings Type I and II **Healthcare buildings** Type I	GWP_{Cref} = 10		$PE_{nr,Cref}$ = 32.8	
Healthcare buildings Type II	GWP_{Cref} = 11		$PE_{nr,Cref}$ = 34.8	
Logistics **Production**	GWP_{Cref} = 7.5		$PE_{nr,Cref}$ = 22.7	
Logistics **Production**		GWP_{Cref} = 0.75		$PE_{nr,Cref}$ = 2.3
Assembly buildings Type II		GWP_{Cref} = 1.0		$PE_{nr,Cref}$ = 3.3
Use (operational energy)				
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Assembly buildings** Type I and II **Healthcare buildings** Type I and II	GWP_{Uref} = GWP_{UEref} + GWP_{UHref} + GWP_{UFref}		$PE_{nr,Uref}$ = $PE_{nr,UEref}$ + $PE_{nr,UHref}$ + $PE_{nr,UFref}$	
Where:	GWP_{UEref} = GWP factor el.mix * E_{ref} GWP_{UHref} = GWP factor heat * H_{ref} GWP_{UFref} = 0		$PE_{nr,UEref}$ = factor $PE_{nr,E}$ * E_{ref} $PE_{nr,UHref}$ = factor $PE_{nr,H}$ * H_{ref} $PE_{nr,UFref}$ = 0	

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Consumer markets **Shopping centre** **Department stores**	$GWP_{Uref} = GWP_{UEref} + GWP_{UHref} + GWP_{UFref}$	$PE_{nr,Uref} = PE_{nr,UEref} + PE_{nr,UHref} + PE_{nr,UFref}$
Where:	GWP_{UEref} = GWP factor el.mix * E_{ref} GWP_{UHref} = GWP factor heat * H_{ref} GWP_{UFref} = GWP factor el.mix * E_{UFref}	$PE_{nr,UEref}$ = factor $PE_{nr,E}$ * E_{ref} $PE_{nr,UHref}$ = factor $PE_{nr,H}$ * H_{ref} $PE_{nr,UFref}$ = factor $PE_{nr,E}$* E_{UFref}

Where:

E_{ref} Electricity demand (final energy) of the reference building in accordance with the EPC (or standardised energy simulation) in [kWh/(m^2_{NFAs} *a)]

H_{ref} Heating demand (final energy) of the reference building in accordance with the EPC (or standardised energy simulation) in [kWh/(m^2_{NFAs} *a)]

E_{UFref} Electricity demand of the user equipment in [kWh/(m^2_{NFAs} *a)]

Factors for the electricity mix and heat should come from the LCA datasets like ISUCO, or alternatively from any other LCA dataset which complies with the ISO 14025 and DIN EN 15804+A2:2019, as described above. The external (individual) datasets must be agreed with the DGNB during the system adaptation process.

Limit value and target value calculation

Limit values G and target values Z, which are also required for evaluation of the criterion, are generally defined as a factor applied to the reference values for the environmental impact potentials, expressed mathematically as follows:

$$G_{EIP} = X_{EIP} * R_{EIP}$$
$$Z_{EIP} = Y_{EIP} * R_{EIP}$$

The associated variables X and Y must be formulated for the various environmental indicators as shown in Table 10.

Table 10: Target and limit values of the various environmental indicators

LIMIT AND TARGET VALUE	GWP_{TOT}	PE_{NR}
X	1.4	1.4
Y	0.7	0.7
Y+ (over fulfilment)	0.55	0.55

Note: environmental indicators other than GWP and PEnr have no reference values and the quantified information from the Indicator 3.1.2 will be used to form the future reference, target and limit values.

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Table 11: Conversion table and sub-points for the environmental indicators, GWP and PEnr

SUB-POINTS (SP)	GWP_{TOT}	PE_{NR}
0	$GWP \geq 1.4 * GWP_{tot,ref}$	$PE_{nr} \geq 1.4 * PE_{nr,ref}$
40	$GWP = GWP_{tot,ref}$	$PE_{nr} = PE_{nr,ref}$
80	$GWP < 0.70 * GWP_{tot,ref}$	$PE_{nr} < 0.70 * PE_{nr,ref}$
90 (over fulfilment)	$GWP < 0.55 * GWP_{tot,ref}$	$PE_{nr} < 0.55 * PE_{nr,ref}$

Weighting of the indicators for assessing the LCA results

To evaluate the LCA results, the sub-points (SP) target, reference and limit values from Table 9 must be assessed separately for GWP and PEnr. The sub-points must then be weighted using the weighting key from Table 12. The sum of the weighted sub-points is the total of the possible points in the indicator. The target value (Y) amounts to 80 points in the indicator, and an overfulfillment of the target value (Y+) can be awarded up to 90 points. Fulfilment of the reference value amounts to 40 points.

Table 12: Weighting key for the environmental indicators (W)

W_{GWP}	W_{PENR}
70%	30%

Points for Indicator 3.1.1 = $SP*W_{GWP} + SP_{PEnr}*W_{PEnr}$ (8)

Indicator 3.2: Climate action plan

For buildings that are not operated on a GHG-neutral basis at the time of completion, i.e. the result of the LCA (CO_2 equiv. total) for the building operational energy (module B6.1) is above 0 kg, possible measures must be drawn up and submitted, specifying the year of national greenhouse gas neutrality as the latest target year. For this indicator, the default target year is 2050 (according to the EU goals) where the aim is to be a climate-neutral economy with net-zero greenhouse gas emissions by 2050. The objective of the climate action plan is to demonstrate (calculate) CO_2 equiv. emissions from the building operation (module B6.1) by the year 2050 and draft the possible measures to achieve operational climate neutrality. The DGNB provides an Excel-based simplified CO_2 calculator (not the same tool as for "Framework for carbon neutral buildings and sites") to demonstrate the status quo of the project by the year 2050, including step-by-step predefined measures for future improvements. The results of these measures are to be communicated with the building owner/investor. The calculation of the GWP tot should take into account the energy datasets with the future scenarios, e.g. the electricity grid mix 2050 (of the relevant country/region). The DGNB database "ISUCO" provides several datasets with future scenarios, which will be incorporated into the Excel tool. The datasets of the future energy mixes, e.g. "Electricity grid mix (2050)" must always be used. In accordance with Directive (EU) 2023/1791 on energy efficiency and amending Regulation (EU) 2023/955, Article 26 "Heating and cooling supply", from 1 January 2050 (for EU member states), a system using only renewable energy, only waste heat, or only a combination of renewable energy and waste heat shall be used, i.e. for the impact calculation of the heating/cooling demand the respective datasets must be used. For countries or regions subject to different regulatory frameworks (for the target year 2050), the applicable renewable and non-renewable energy proportions shall be applied.

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Renewable energy generated on-site or nearby is to be reported with the GWP = 0 kg CO_2 equiv. Renewable energy produced on-site should be considered in relation to Article 2(54) which defines “on-site" as “in or on a particular building or on the land on which that building is located”. Article 2(55) defines energy from renewable sources produced nearby as “energy from renewable sources, produced within a local or district-level perimeter of a particular building under the following conditions:

(a) it can be distributed and used only within that local and district-level perimeter through a dedicated distribution network (does not enter the public electricity grid);
(b) it allows for the calculation of a specific primary energy factor valid only for the energy from renewable sources produced within that local or district-level perimeter;
(c) it can be used on-site through a dedicated connection to the energy production source, where that dedicated connection requires specific equipment for the safe supply and metering of energy for self-use”

The definitions of renewable energy produced “on-site” and “nearby” are also aligned with the EN ISO 52000-1 standard.

Additionally, the following assumption is made for (on-site) renewable energy generation from solar photovoltaic modules: the efficiency of the solar cell modules will increase by at least 50% by 2050[22]. This assumption means that the current total energy output from PV-systems (which can be calculated with the PVGIS 5.3 from Joint Research Centre (JRC) EU [23]), may be increased by 50% for calculational purposes. In general, surplus energy can be exported to the grid and can be defined as “exported electricity” and the displacement effect can be credited as “electricity mix” using the greenhouse gas emission factors of the country specific future scenarios in the overall calculation. The surplus energy can be calculated by deducting the monthly energy requirements for heating, hot water, ventilation, cooling and auxiliary energy in accordance with the EPC (based on monthly calculation/simulation method) from the monthly PV electricity gains.

If the building operation (module B6.1) cannot be converted to climate-neutral by the year 2050, despite the implemented or planned measures (due to increased user requirements, typically for buildings such as production buildings, hospitals) the remaining share of the energy demand may also be covered by renewable energy from the grid. In any case, on-site carbon emissions from fossil fuels[24] must be eliminated and the purchase of renewable energy documented with power purchase agreements (such as those referred to in Directive (EU) 2018/2001 or equivalent instruments). Information about this circumstance must also be provided to the building owner/investor. Since the purchase of renewable energy from the grid is considered the last possible option, it is only applicable if the following restrictive boundary conditions at the site are present:

- Legal restrictions (e.g. monument protection, building regulations)
- Economic restrictions (proven by a DGNB-compliant life cycle cost calculation that does not show economic viability over 20 years)
- Technical restrictions or if – due to the nature of the building – it is not feasible to fully comply with the requirements (e.g. solar-usable envelope area is already fully utilised, extraordinary and unchangeable shading of the building)
- Lack of access to renewable energy communities or renewable energy from district heating and cooling systems or waste heat (where the date of decarbonisation of the district or local heating network to which the building is connected is unknown).

[22] Photovoltaics Report – Prepared by Fraunhofer Institute for Solar Energy Systems, ISE Freiburg, 17 May 2024: https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/Photovoltaics-Report.pdf
[23] Web interface to produce calculations of solar radiation and photovoltaic (PV) system energy production (PVGIS 5.3) from the Joint Research Centre (JRC) EU Science Hub 2024: https://re.jrc.ec.europa.eu/pvg_tools/en/#TMY
[24] Fossil fuel is a generic term for non-renewable energy sources such as coal, coal products, natural gas, derived gas, crude oil, petroleum products and non-renewable wastes.

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The submission of the climate action plan is a minimum requirement for the certifiability of any buildings that are not operated in a net greenhouse gas-neutral manner at the time of certification. As an alternative to a climate action plan, the following two options can be provided to demonstrate fulfilment of the minimum requirement:

- Utilisation of the Zero Emission Buildings (ZEB) standard formulated in the European Energy Performance of Buildings Directive (EPBD) of 2024[25].
- Climate action plan based on the DGNB framework for climate-neutral buildings and sites - revised version (2025).

Indicator 4: Agenda 2030 bonus – climate protection goals

The objective is to encourage solutions that implement long-term climate protection targets today. This bonus indicator evaluates whether scenario calculations can be used to demonstrate that climate neutrality has been achieved as a minimum.

For the **Indicators 4.1.1** and **4.1.2**:
Buildings classified as category 1: Climate-neutral buildings and/or Category 2: Buildings prepared for climate-neutrality, will be assessed positively. The classification of climate action categories is aligned with the EPBD and defined under the DGNB **"**Framework for carbon neutral buildings and sites" 2025 version. For categories 1 and 2, the energy efficiency requirements according to the Zero Emission Buildings (ZEB) definition must be met. According to the EPBD, a distinction can be made between new and existing buildings and depending on national definitions. The minimum requirement for new buildings is to be 10% below the total energy efficiency of the nearly zero-energy building standard (based on total primary energy). Additionally, with regard to the energy efficiency aspect, the following characteristics are used to differentiate between buildings in categories 1 and 2:

- Applied assessment scope
- Energy efficiency
- Renewable energy supply
- Contribution to the energy transition
- Carbon footprint of operation and use
- Carbon footprint of construction measures
- Transparency and review

These seven differentiating features can be used to clearly define milestones that contribute to the carbon neutrality objectives, see Table 3 and 4 with the characteristics of climate action categories 1 and 2, according to the DGNB Framework for carbon neutral buildings and sites. For points to be awarded, Table 12: "Key metrics and data points for communicating the results of the status assessment" (of the same document) with all mandatory information must also be submitted in accordance with the requirements.

Indicator 4.2.1: "CO_2-reduced building materials" bonus points can be claimed if the calculated value of the CO_2-eq. emissions for the projected building, i.e. the GWPtot $_{C.Proj}$ (embodied carbon) as calculated under Indicator 3.1.1 (excluding the photovoltaic system) fall below the scheme-relevant reference value for the construction (GWPtot $_{C.ref}$) by at least 50%. This target can be achieved by selecting the appropriate construction materials, e.g. products made from renewable raw materials, climate-neutral concrete, and precise consideration of the EoL (end-of-life) scenarios, such as the possibility of reusing components.
Note: The purchase of CO_2 compensation certificates or comparable mechanisms cannot be credited in the CO_2 assessment for 4.1.1 or 4.1.2.

[25] Energy Performance of Buildings Directive: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401275
https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en

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Indicator 4.3.1: "Climate action through dimensional sufficiency"
Significant greenhouse gas reductions are achieved through clearly defined and measurable eco-sufficiency measures. Quantitative data for measures such as increased density of use and quantified data on the dimensional reductions achieved are available. Dimensional sufficiency in building construction and design refers to the adequate sizing of spaces, elements, and components to ensure the functionality, comfort, and safety of a structure. It involves considering the dimensions of rooms, corridors, doorways, staircases, and other parts of a building, ensuring that they meet both aesthetic and functional requirements. Since the building dimensional requirements are highly heterogenic depending on a building type, location, cultural and other prerequisites, it is not feasible to draw certain quantitative universal benchmarks on an international level. Nonetheless, it is a prerequisite for this bonus that the following key factors of dimensional sufficiency have been considered and implemented:

- Functionality and efficiency: Each space must be of a sufficient size to accommodate its intended use, e.g. a living room should be spacious enough to allow for furniture arrangement and movement, while a commercial kitchen needs to have enough room for equipment and staff to operate efficiently. Dimensions should be optimized for efficient use of space. This means providing enough space to meet functional needs while avoiding wasted or underused areas.
- Dimensions and comfort: Space design should account for average human dimensions (e.g., headroom, clearance for movement) to ensure comfort and accessibility. This can involve standardizing ceiling heights, doorway widths, and clearances for circulation.
- Safety and code compliance: Building codes often specify minimum dimensions to ensure safety. This includes the widths of exit paths, stair tread depth, ramp slopes, and other structural elements that influence safe movement and evacuation. Adequate dimensions also concern the load-bearing components of a structure, such as beams, columns, and foundations. The size of these elements must be sufficient to support the weight of the building and withstand various forces.
- Accessibility: The design should also ensure that spaces are accessible to everyone, including people with disabilities. This means taking into account sufficient clearances for wheelchair access, accessible bathroom dimensions, and other requirements for inclusivity.

Dimensional sufficiency is a balance between practical use of space, aesthetic design, safety standards, and compliance with regulations. Each element must be carefully calculated and designed to ensure that it supports the function and comfort of the building's occupants. A prerequisite for the bonus is that the effects cannot be represented or cannot be sufficiently represented by other indicators in the criterion, as they use alternative needs-based reference variables, e.g. the number of users, beds, workplaces. Building plans, area calculations with variant considerations in the planning phase, increased occupancy density, etc. can be provided as proof of this. Building eco-sufficiency is ultimately about achieving a balance: providing the right amount of material resources needed for a building's functionality and longevity, without excess or scarcity.

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IV. Usage-specific description

Consumer markets
Shopping centre
Department stores
The reference values must be determined in accordance with the "General description of the evaluation method".
The reference values must be determined in accordance with the "General description of the method". For the reference building in accordance with EPC, the following maintained illuminance values should be included in the calculations:

Low illuminance: 500 lux, corresponding to approx. 13 W/m² (*)
(Retail sectors: General, foodstuffs, bakery, furniture, household goods, etc.)
Medium illuminance: 750 lux, corresponding to approx. 20 W/m² (*)
(Retail sectors: Mall, textiles, cleaning, perfumery, leather goods, etc.)
High illuminance: 1000 lux, corresponding to approx. 26 W/m² (*)
(Retail sectors: Jewellery, lighting, radio and television, etc.)
Very high illuminance: 1500 lux, corresponding to approx. 39 W/m² (*)
(Tenant fit out)

(*) "Compact fluorescent lamps with external electronic ballast" are used as a basis (directly) as an average value from high-efficiency T5/T8 lighting and less efficient spotlights.

The reference specifications for electricity consumption for refrigeration facilities for users can be found in Appendix 3 and onwards.

Assembly buildings
Assembly buildings, according to the building volume, to be assigned to one of the following building types:

Type I: Buildings predominantly without “hall character” (e.g. congress centres, libraries)
Type II: Buildings largely with “hall character” (such as exhibition halls, town halls)

Healthcare buildings
Healthcare buildings, according to the building function, to be assigned to one of the following building types:

Type I: Buildings predominantly without Operating Rooms (OR) and/or intensive care unit (ICU) (e.g. Rehabilitation clinics, psychosomatic clinics, policlinic etc.)
Type II: Buildings with Operating Rooms (OR) and intensive care unit (ICU) like Hospitals, university Hospitals etc.

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APPENDIX 1: System boundaries for the life cycle assessment in the DGNB system*

Legend:

x = taken into account

= not taken into account

Tier 1	Tier 2	Tier 3	Tier 4	Expected lifespan	Module A			Module B			Module C		Module D
					PRODUCTION PHASE			USE PHASE			END OF THE LIFE CYCLE		BENEFITS AND LIABILITIES OUTSIDE OF THE SYSTEM LIMITS
					RAW MATERIALS PROCUREMENT	TRANSPORT	PRODUCTION	USE	REPLACEMENT	ENERGY CONSUMPTION DURING OPERATION	WASTE RECYCLING	DISPOSAL	POTENTIAL FOR REUSE, RECOVERY, RECYCLING AND EXPORTED ENERGY
System boundaries of building parts				years	A1	A2	A3	B1	B4	B6	C3	C4	D (D1 & D2)
Excavation			Excavation work, Support work, Dewatering, Excavation, other items										
Shell	Foundations (substructure)	Piles	(i) Permanent piles and caisson; (ii) Pile caps	**60**	x	x	x				x	x	x
		Basements	(i) Concrete blinding; (ii) Raft footings; (ii) Column bases; (iv) Wall footings; (v) Strap beams; (vi) Tie Beams; (vii) Substructure walls; (viii) Substructure columns; (ix) Lowest floor slabs (Considering ground floor slab); (x) Lowest floor beams (Considering ground floor slab); (xi) Lift pit wall; (xii) Lift pit slab; (xiii) Vertical waterproof tanking; (xiv) Drainage blanket; (xv) Sleeves	**60**	x	x	x				x	x	x

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	Retaining walls	(i) Vertical waterproof tanking; (ii) Drainage blanket; (ii) Drains and skin wall; (iv) Skin wall; (v) Retaining wall; (vi) Retaining wall foundation; (vii) Fireproofing to steel structure; (viii) Sleeves	**60**	x	x	x			x	x	x
Loadbearing structural frame	Frame (beams, columns and slabs)	(i) Structural internal walls; (ii) Columns; (ii) Upper Floor Beams; (iv) Staircases	**60**	x	x	x			x	x	x
	Upper floors	(i) Slabs	**60**	x	x	x			x	x	x
	External walls	(i) Structural external walls	**60**	x	x	x			x	x	x
	Balconies	(i) Balconies beams; (ii) Balconies slab	**60**	x	x	x			x	x	x
	Ground floor slab	(i) Slab blinding; (ii) Bottom slab	**60**	x	x	x			x	x	x
Non-load bearing elements	Ground floor slab	(i) Slab blinding; (ii) Bottom slab	**60**	x	x	x			x	x	x
	Internal walls, partitions and doors	(i) Non-structural internal walls; (ii) Non-structural internal partitions; (iii) Acoustic insulation; (iv) Shop fronts; (v) Toilet cubicles; (vi) Moveable partitions; (vii) Cold rooms; (vii) Internal doors; (ix) Internal windows; (x) Roller shutters; (xi) Fire shutters; (xii) Sundry concrete work	**30**	x	x	x	x[1]		x	x	x
	Stairs and ramps	(i) Balustrades; (ii) Railings; (iii) Handrails; (iv) Staircases not forming part of the structure; (v) Catwalk not forming part of the structure, cat ladders	**30**	x	x	x	x[1]		x	x	x
Facades	External wall systems	(i) Non-structural external walls and features; (ii)	**60**	x	x	x	x[1]		x	x	x
		Acoustic insulation; (iii) Thermal insulation;	**50**								
		(iv) Curtain walls.	**35**								
		(v) Gondolas	**30**								
	Cladding and shading devices	(i) Facade cladding; (ii) Roller shutters	**30**	x	x	x	x[1]		x	x	x

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Core		Façade openings (including windows and external doors)	(i) Facade cladding; (ii) Roller shutters; (iii) External windows (v) External shop fronts; (vi) Fire shutters;	**30**	x	x	x	x[1]	x	x	x
			(iv) External doors;	**20**							
		External paints, coatings and renders	(i) External wall finishes except cladding	**10** paint **30** render	x	x	x	x[1]	x	x	x
	Roof	Structure	(i) Roof beams; (ii) Roof slabs	**60**	x	x	x		x	x	x
		Weatherproofing	(i) Roof finishes; (vi) Roof hard landscaping.	**60**	x	x	x	x[1]	x	x	x
			(ii) Acoustic insulation; (iii) Thermal insulation; (iv)	**50**							
			Waterproofing element; (v) Skylights; (vii) Roof soft landscaping	**30**							
	Fittings	Sanitary fittings	(i) Sanitary appliances;	**20**	x	x	x	x[1]	x	x	x
		Ceilings	(i) External false ceilings; (ii) Internal false ceilings	**25**	x	x	x	x[1]	x	x	x
		Wall and ceiling finishes	(i) Internal wall finishes; (iii) Internal ceiling finishes; (iv) External ceiling finishes	**10**	x	x	x	x[1]	x	x	x
			(ii) Internal wall cladding;	**20**							
		Floor finishes, coverings and coatings	(i) External floor finishes (under cover); (ii) Internal floor finishes	**10** paint **30** render	x	x	x	x[1]	x	x	x
	In-built lighting system	Light fittings	(i) Lighting devices	**15**	x	x	x	x[1]	x	x	x
		Control systems and sensors	(i) Light control devices; (ii) Light sensor devices	**15**	x	x	x	x[1]	x	x	x
	Energy system	Heating plant and distribution	(i) Seawater system; (ii) Heating water system; (iii) Steam and condensate system; (iv) Fuel oil system; (v) Unitary air-conditioning system; (vi) Water treatment; (vii) Window air conditioners;	**20**	x	x	x	x[1]	x	x	x

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		(viii) Split-type air conditioners; (ix) Air-curtains; (x) Electric underfloor heating; (xi) Local electrical heating units							
	Cooling plant and distribution	(i) Seawater system; (ii) Chilled water system; (iii) Cooling water system; (iv) Water treatment; (v) Condensate drain system; (vi) Unitary air-conditioning system; (vii) Window air conditioners; (viii) Split-type air conditioners; (ix) Air-curtains; (x) Fans	**20**	x	x	x	x[1]	x	x	x
	Electricity generation	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system	**30**	x	x	x	x[1]	x	x	x
	Electricity distribution	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system	**30**	x	x	x	x[1]	x	x	x
Ventilation system	Air handling units	(i) Air handling units (AHU)	**20**	x	x	x	x[1]	x	x	x
	Ductwork and distribution	(i) Kitchen ventilation system; (ii) Fume and smoke extraction system.	**40**	x	x	x	x[1]	x	x	x
		(iii) Distribution system	**15**							
Sanitary systems	Cold water distribution	(i) Cold water supply; (ii) Irrigation water supply; (iii) Cleansing water supply; (iv) Flushing water supply; (v) Water treatment equipment	**25**	x	x	x	x[1]	x	x	x
	Hot water distribution	(i) Hot water supply	**25**	x	x	x	x[1]	x	x	x
	Water treatment systems	(i) Wastewater treatment equipment; (ii) Grey water supply	**25**	x	x	x	x[1]	x	x	x
	Drainage system	(i) Rainwater disposal; (ii) Soil and waste disposal; (iii) Planter drainage disposal; (iv) Kitchen drainage disposal; (v) Sump pits; (vi) Surface water drainage; (vii) Storm water drainage; (viii) Foul and wastewater drainage; (ix) Filtration plant	**25**	x	x	x	x[1]	x	x	x

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Other systems	Lifts and escalators	(i) Lifts / elevators; (ii) Platform lifts; (iii) Escalators; (iv) Travellators | moving walkways; (v) Conveyors	**20**	x	x	x	x[1]	x	x	x
	Firefighting installations	(i) Fire hydrant and hose reel system; (ii) Wet risers; (iii) Sprinkler system; (iv) Deluge system; (v) Gaseous extinguishing system; (vi) Foam extinguishing system; (vii) Audio/visual advisory system; (viii) Automatic fire alarm and detection system	**30**	x	x	x	x[1]	x	x	x
	Communication and security installations	(i) Security and alarm; (ii) Close circuit television; (iii) Communal aerial broadcast distribution and the like; (iv) Telecoms and data installations	**15**	x	x	x	x[1]	x	x	x
	Building automation[5]	(i) Distributors; (ii) Cables and lines (iii) Monitoring and control systems	**15**	x	x	x	x[1]	x	x	x
External works[6]		(i) Roads and paving; (ii) Hard landscaping	**30**	x[6]	x[6]	x[6]		x[6]	x[6]	x[6]
		(i) Non-structural external walls and features; (ii) External wall finishes except cladding; (iv) Site enclosures and divisions	**20**							
		(iii) Permanent retaining structures;	**60**							
System boundaries in the use phase										
Supply		Water					x[2]			X[2]
		Oil					x			
		Gas					x			
		Solid fuels					x			
		District heating					x			x[4]
		District cooling					x			x[4]
		Electricity					x			x[4]

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Maintenance	Refrigerants in HVAC system		x[3]	x[3]	

*) **Note**: This table is not relevant for the partial calculation method (PCM) – see method Indicator 3, see also **cut off rules** (1%) under the method. Considered modules relevant for Indicator 3.1.1 and 3.1.2 only.
1) Only when Expected lifespan <50 years and only includes the production and disposal of the replaced product, not the replacement process itself (same as for construction process).
2) Water consumption of the building (use phase) is represented in the criterion ENV2.2
3) When used non-natural refrigerants in HVAC system
4) In case of on-site generated renewable energy export (Module D2)
5) Unless included in other positions (Costs of automation across building systems including the associated distributors, cables and lines.) – corresponds to the standard BoQ of Level(s) Indicator 2.1: Tier 2 building aspect:" Other systems" → Tier 3 building aspect:" Telecoms and data installations";
6) Only relevant for EU Taxonomy / ESG verification / reporting. (https://ec.europa.eu/sustainable-finance-taxonomy/taxonomy-compass)

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APPENDIX 2

Building energy demand during operation (Module B6.1)

As an alternative to the default standard DIN V 18599 (German standard for calculation of the net, final and primary energy demand for heating, cooling, ventilation, domestic hot water and lighting), the final energy demand can be determined via country specific building EPC or building dynamic energy performance simulation. DGNB refers to the several calculation and simulation standards to specify a general framework for the assessment of overall energy use of a building and the calculation of energy performance assessments in terms of primary energy or other energy related metrics. The following boundary conditions for EPC calculation and building energy performance simulation standards have to be considered when doing so. Table 13 below shows the graphical demonstration of optional pathways towards a building energy demand calculation (option 1) and simulation (option 2).

Table 13: options for energy simulation or calculation

Option 1		Option 2	
National Energy Performance Certificate (EPC)		**Building dynamic energy performance simulation****	
a	b	a	b
DIN 18599*	**The local Standard**	**EN ISO 52000**	**ASHRAE 90.1**
Detailed description in Appendix 2.2		Detailed description in Appendix 2.1	

*Instead of the DIN 18599 standard other compatible calculation methods are allowed to be used, e.g. PHPP – Passive House Planning Package.
**PHPP – Passive House Planning Package is ASHRAE 140 conform, thus it can be used as a substitute for various simulation programs. PHPP offers a sophisticated Excel based tool for the building energy demand calculation together with the large worldwide climate data:
https://passipedia.org/planning/calculating_energy_efficiency/phpp_-_the_passive_house_planning_package

Appendix 2.1: Basic principles and relevant standards for the dynamic building simulation

For simulation purposes, DGNB refers to the overarching energy efficiency of buildings (EPB), EN ISO 52000: 2017 family standards (for details see also the following table 22 under the boundary conditions and Appendix 4 for the default choices) that offers choices to tailor the assessment to any national situation, worldwide. In general, the holistic approach must be used in order to calculate the energy demand of the building. Holistic approach means that the energy performance is assessed as the total energy used for heating, cooling, lighting, ventilation, domestic hot water and in some cases, appliances. It ensures that all technologies are treated equally and balanced. Simulation standards have to contain specifications for the assessment of thermal zones in the building or in the part of a building. The calculations are performed per thermal zone. In the calculations, the thermal zones can be assumed to be thermally coupled or not. As an alternative to the EN ISO 52000 family standards, ASHRAE Energy Standard 90.1-2013 (or latest) can be applied. The simulation program shall be tested according to ASHRAE 140: 2011 (or latest) Standard. Assessment have to be performed using the microclimate of the building site location (e.g. "urban heat island" for inner city locations), using typical meteorological climate data in hourly values for the location (test reference year), adopted to the local climate known from the past 30 years.

Boundary conditions
The overarching EPB standard EN ISO 52000 has a modular structure (described in EN ISO 52000-1: 2017) which contains the following four main areas:
M1 Overarching standards

M2 Building (as such)
M3 - M11 Technical Building Systems under EPB
M12 - M13 Other systems or appliances (non-EPB)

Table 14: modular structure of the EN ISO 52000-1

Overarching		Building (such as)		Technical Building Systems										
	Descriptions		Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic Hot water	Lighting	Building automation & Control	Electricity production
Sub1	**M1**	Sub1	**M2**	Sub1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**

Table 14 shows the relative position of this document within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1.
Note 1. In ISO/TR 52000-2 the same table can be found, with, for each module, the numbers of the relevant EPB standards and accompanying technical reports that are published or in preparation.
Note 2. The modules represent EPB standards, although one EPB standard could cover more than one module and one module could be covered by more than one EPB standard, for instance, a simplified and a detailed method respectively.

Modules **M3** to **M11** together with the overarching descriptions from **M1** and **M2**, must be considered as the boundary conditions which have to be taken into a consideration for the comprehensive and holistic building energy performance simulation, using dynamic weather data from the local (national) Meteorological Office. More information regarding the validation of calculation procedures given in the standard are provided in the Technical Report accompanying overarching main document ISO/TR 52000-2. Appendix 4 provides information about the default standards, informative default choices and references to other EPB standards.

Calculation boundary
The calculation boundary for operating conditions data for measured energy performance are determined according to modules:
M3-10 for heating;
M4-10 for domestic hot water;
M4-10 for cooling;
M5-10 for ventilation;
M9-10 for lighting;
M10-10 for building automation and control;
M11-10 for electricity production.

Considering overarching definitions and regulations from EN ISO 52000-1: 2017 (e.g. Measurement intervals and measurement period, Zoning, etc.). The simulation program shall be capable of performing design load calculations to determine required HVAC equipment capacities and air and water flow rates in accordance with generally accepted engineering standards (e.g. standards listed in Appendix 4) and handbooks (e.g. ASHRAE Handbook-Fundamentals) for both, the proposed design and baseline building design.

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Appendix 2.2: country specific EPC

In general, building energy performance simulation is necessary when no national regulation is available. In case the local standard is used in context of national or regional legal requirements, it can be accepted from DGNB as a valid document for building energy performance calculation. In any case the national/regional standard must be communicated with the DGNB office for eventual validation. Even if it is expected that national/regional standards are not corresponddng fully with the default values, choices and references of EPB standards (EN ISO 52000 standard family) listed in Appendix 4 or ASHRAE 90.1 followed due to national regulations, policy or traditions, etc. the following boundary conditions must be taken in account:

- The holistic approach must be used in order to calculate the energy demand of the building;
- The calculations are performed per thermal zone;
- Assessment has to be performed using the microclimate of the building site location;
- Energy performance calculation must be based at least on monthly calculations;

Calculation boundary

To verify the country specific national/regional EPC of the building, the following set of services must be considered while calculating the overall building energy performance:

a) The (sensible) energy need for heating and cooling;
b) The latent energy need for (de-)humidification;
c) The energy need for lighting (incl. lighting controls)
d) The energy need of ventilation and air conditioning systems
e) The energy need for domestic hot water
f) The energy need for building automation and control[26]
g) Auxiliary energy requirement
h) Energy production - renewable energy sources (on site)

The calculation methods can be used for residential or non-residential buildings, or a part of it, referred to as "the building" or the "assessed object". However, if the iterative calculation method is essentially replaced by a thermal building simulation (mentioned above) using dynamic weather data, this will mean that the same calculation methodology will be used for evaluation of criterion "ENV 1.1 – Life cycle assessment" as for criterion "SOC 1.1 – Thermal comfort". With regard to the electricity demand, the calculation is also linked to criterion "SOC 1.4 – Visual comfort".

Reference building implementation

In general, the whole LCA calculation is based on the comparative performance of the baseline (reference) building, which complies with local building regulations, and the actual (designed) building. The actual building performance and baseline building performance must be calculated using the following:
the same simulation program
the same weather data
the same geometrical and area properties
the same occupancy and use profile

there are two design options (the default values) for the reference building:
Baseline building design characteristics in accordance with the national regulation[27]
Baseline building design characteristics in accordance with the Appendix 5 or characteristics specified in Section G3 of the ASHRAE 90.1 – 2013 (or latest) standard.

[26] If considered by the national standard.
[27] National standard for reference building to be communicated with DGNB during adaptation process.

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Simulation environment

The program used for creating the verification documentation and a summary of the key information entered into the simulation for the actual building and the reference building must be included in the documentation for the thermal building simulation.

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APPENDIX 3

Appendix 3.1: User profile for food department with refrigerated products and commercial refrigeration

Table 15: User profile for food department with refrigerated products and commercial refrigeration

Use periods		**From**	**To**	Basis: Profile no. 7
Daily use period	Time	08:00	20:00	
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	
Room conditions (if conditioning is available)				
Room target temperature for heating	°C	21		
Room target temperature for cooling	°C	24		
Minimum temperature for heating design	°C	20		
Maximum temperature for cooling design	°C	26		
Temperature decrease with reduced operation	K	4		
Requirements for humidity		with tolerance		
Minimum outside air flow V_E				
By number of persons	m³ / h * persons	20		
By area	m³ / h * m²			
Mechanical fresh air flow rate (in practice)		**From**	**To**	
Air exchange rate h^{-1}				
Air exchange rate, air only h^{-1}				
Lighting				
Maintained illuminance value E_m	lx	500	Low illuminance (foodstuffs), note: A value of 500 lx is averaged across the usable space, and corresponds to approx. 1000 lx in the shelves	
Height of the working plane h_{wp}	m	0.8		
Reduction factor k_A		0.93		
Relative absence C_A		0		
Room index k		2.5		
Reduction factor for the building operating period F_1		1		

Occupancy		**Low**	**Medium**	**High**
Maximum occupancy rate	m³ / person	6	5	4

Internal heat sources	**Hours in full use (h/d)**	**Max. specific output (W/m²)**		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18

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Work aids [a]	17	-12	-10	-8
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	-132	-86	-28

[a] Refrigerated cabinets are heat sinks if the thermal load is dissipated outside of the room (e.g. central commercial cooling system); otherwise, the standard value for the specific output of 5 W/m² applies (instead of -10 W/m²). Refrigerated cabinets have a lower full operating period at the weekend, which is taken into account with 300 days of use, each with full operating periods of 17 h/d.

Appendix 3.2: User profile for food department with refrigerated products without commercial refrigeration

Table 16: User profile for food department with refrigerated products without commercial refrigeration

Use periods		**From**	**To**	Basis: Profile no. 7
Daily use period	Time	08:00	20:00	
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	
Room conditions (if conditioning is available)				
Room target temperature for heating	°C	21		
Room target temperature for cooling	°C	24		
Minimum temperature for heating design	°C	20		
Maximum temperature for cooling design	°C	26		
Temperature decrease with reduced operation	K	4		
Requirements for humidity		with tolerance		
Minimum outside air flow V_E				
By number of persons	m³ / h * persons	20		
By area	m³ / h * m²			
Mechanical fresh air flow rate (in practice)		**From**	**To**	
Air exchange rate h^{-1}				
Air exchange rate, air only h^{-1}				
Lighting				
Maintained illuminance value E_m	lx	500	Low illuminance (foodstuffs), note: A value of 500 lx is averaged across the usable space, and corresponds to approx. 1000 lx in the shelves	
Height of the working plane h_{wp}	m	0.8		
Reduction factor k_A		0.93		
Relative absence C_A		0		
Room index k		2.5		
Reduction factor for the building operating period F_1		1		

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Occupancy		Low	Medium	High
Maximum occupancy rate	m³ / person	6	5	4

Internal heat sources	Hours in full use (h/d)	Max. specific output (W/m²)		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18
Work aids [a]	17	-12	5	-8
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	-132	169	-28

[a] Refrigerated cabinets are heat sinks if the thermal load is dissipated outside of the room (e.g. central commercial cooling system); otherwise, the standard value for the specific output of 5 W/m² applies (instead of -10 W/m²). Refrigerated cabinets have a lower full operating period at the weekend, which is taken into account with 300 days of use, each with full operating periods of 17 h/d.

Appendix 3.3: 500 lux user profile

Table 17: 500 lux user profile

Use periods		From	To	
Daily use period	Time	08:00	20:00	Basis: Profile no. 6
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	

Room conditions (if conditioning is available)			
Room target temperature for heating	°C	21	
Room target temperature for cooling	°C	24	
Minimum temperature for heating design	°C	20	
Maximum temperature for cooling design	°C	26	
Temperature decrease with reduced operation	K	4	
Requirements for humidity		with tolerance	

Minimum outside air flow V_E			
By number of persons	m³ / h * persons	20	
By area	m³ / h * m²		

Mechanical fresh air flow rate (in practice)	From	To	
Air exchange rate h^{-1}			
Air exchange rate, air only h^{-1}			

Lighting			
Maintained illuminance value E_m	lx	500	Low illuminance
Height of the working plane h_{wp}	m	0.8	(general, foodstuffs,
Reduction factor k_A		0.93	bakery, furniture,

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Relative absence C_A		0	household goods, etc.)	
Room index k		2.5		
Reduction factor for the building operating period F_1		1		
Occupancy		**Low**	**Medium**	**High**
Maximum occupancy rate	m³ / person	6	5	4
Internal heat sources	**Hours in full use (h/d)**	**Max. specific output (W/m²)**		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18
Work aids	12	1	2	3
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	84	108	144

Appendix 3.4: 750 lux user profile

Table 188: 750 lux user profile

Use periods		**From**	**To**	Basis: Profile no. 6
Daily use period	Time	08:00	20:00	
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	
Room conditions (if conditioning is available)				
Room target temperature for heating	°C	21		
Room target temperature for cooling	°C	24		
Minimum temperature for heating design	°C	20		
Maximum temperature for cooling design	°C	26		
Temperature decrease with reduced operation	K	4		
Requirements for humidity		with tolerance		
Minimum outside air flow V_E				
By number of persons	m³ / h * persons	20		
By area	m³ / h * m²			
Mechanical fresh air flow rate (in practice)		**From**	**To**	
Air exchange rate h^{-1}				
Air exchange rate, air only h^{-1}				
Lighting				
Maintained illuminance value E_m	lx	750	Medium illuminance	
Height of the working plane h_{wp}	m	0.8	(mall, textiles,	

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Reduction factor k_A		0.93	cleaning, perfumery, leather goods, etc.)	
Relative absence C_A		0		
Room index k		2.5		
Reduction factor for the building operating period F_1		1		
Occupancy		**Low**	**Medium**	**High**
Maximum occupancy rate	m³ / person	6	5	4
Internal heat sources	**Hours in full use (h/d)**	**Max. specific output (W/m²)**		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18
Work aids	12	1	2	3
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	84	108	144

Appendix 3.5: 1000 lux user profile

Table 19: 1000 lux user profile

Use periods		**From**	**To**	Basis: Profile no. 6
Daily use period	Time	08:00	20:00	
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	
Room conditions (if conditioning is available)				
Room target temperature for heating	°C	21		
Room target temperature for cooling	°C	24		
Minimum temperature for heating design	°C	20		
Maximum temperature for cooling design	°C	26		
Temperature decrease with reduced operation	K	4		
Requirements for humidity		with tolerance		
Minimum outside air flow V_E				
By number of persons	m³ / h * persons	20		
By area	m³ / h * m²			
Mechanical fresh air flow rate (in practice)		**From**	**To**	
Air exchange rate h^{-1}				
Air exchange rate, air only h^{-1}				

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Lighting				
Maintained illuminance value E_m	lx	1000	High illuminance (jewellery, lighting, radio and television, etc.)	
Height of the working plane h_{wp}	m	0.8		
Reduction factor k_A		0.93		
Relative absence C_A		0		
Room index k		2.5		
Reduction factor for the building operating period F_1		1		

Occupancy		**Low**	**Medium**	**High**
Maximum occupancy rate	m³ / person	6	5	4

Internal heat sources	**Hours in full use (h/d)**	**Max. specific output (W/m²)**		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18
Work aids	12	1	2	3
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	84	108	144

Appendix 3.6: 1500 lux user profile

Table 20: 1500 lux user profile

Use periods		**From**	**To**	Basis: Profile no. 6
Daily use period	Time	08:00	20:00	
Annual days of use $d_{use,a}$	d/a	300		
Annual hours of use during the day t_{day}	h/a	2999		
Annual hours of use during the night t_{night}	h/a	601		
Daily operating period for indoor air ventilation (HVAC) and cooling systems	Time	06:00	20:00	
Annual days of operation for indoor air ventilation (HVAC), cooling and heating systems respectively $d_{op,a}$	d/a	300		
Daily operating period for heating systems	Time	06:00	20:00	

Room conditions (if conditioning is available)		
Room target temperature for heating	°C	21
Room target temperature for cooling	°C	24
Minimum temperature for heating design	°C	20
Maximum temperature for cooling design	°C	26
Temperature decrease with reduced operation	K	4
Requirements for humidity		with tolerance

Minimum outside air flow V_E		
By number of persons	m³ / h * persons	20
By area	m³ / h * m²	

Mechanical fresh air flow rate (in practice)		**From**	**To**	
Air exchange rate h^{-1}				
Air exchange rate, air only h^{-1}				

Lighting			
Maintained illuminance value E_m	lx	1500	Very high illuminance (tenant fit out, shopping centre)
Height of the working plane h_{wp}	m	0.8	
Reduction factor k_A		0.93	
Relative absence C_A		0	
Room index k		2.5	
Reduction factor for the building operating period F_1		1	

Occupancy		**Low**	**Medium**	**High**
Maximum occupancy rate	m³ / person	6	5	4

Internal heat sources	**Hours in full use (h/d)**	**Max. specific output (W/m²)**		
		Low	Medium	High
Persons (70 W per person)	6	12	14	18
Work aids	12	1	2	3
Heat supply per day ($q_{l,p}$+$q_{l,fac}$)	Wh/(m².d)	84	108	144

Appendix 3.7: Reference specifications for user electricity for refrigeration facilities

Consumer markets and shopping centres feature a very high electricity consumption for refrigeration facilities for users. As the refrigeration facilities interact directly with the indoor climate concept and energy concept of the building, they are incorporated into the life cycle assessment and into the life cycle cost assessment. The electricity consumption for refrigeration facilities for users is therefore integrated into the LCC, but the envisaged manufacturing costs and maintenance costs are not, as there is no validated data currently available for them.

Table 21: Reference specifications for user electricity for refrigerated counters

	UNIT	TOTAL
Electricity consumption per linear metre	kWh/(a * linear metre)	3000 **
Operating hours/year	h/a	8760

** in accordance with German Federal Environment Agency (*Umweltbundesamt – UBA*) report (average total of normal refrigeration+deep freezing)

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APPENDIX 4: Reference standards

Table 22: The reference standards, identified by the module code number

Reference	Reference document	
	Number	Title
M1-4	EN ISO 52003-1	Energy performance of Buildings – Indicators, requirements and certification – Part 1: General aspects and application to the overall energy performance
	EN W16798-1 or EN 15251	Energy performance of Buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of Buildings addressing indoor air quality, thermal environment, lighting and acoustics – Module M1-6; (revision of EN 15251)
M1-13	EN ISO 52010-1	Energy performance of Buildings – Overarching Assessment Procedures. External environment conditions – Part 1: Calculation Procedures
M1-14	EN 15459-1	Economic evaluation procedure for energy systems in Buildings
M2-2	EN ISO 52016-1 EN ISO 13790	Energy performance of Buildings – Building and Building Elements – Calculation of Sensible and Latent Thermal Energy Needs in a Building or Building Zone – Part 1: Calculation Procedures
M2-3	EN ISO 52017-1	Energy performance of Buildings – Building and Building Elements – Calculation of the Dynamic Thermal Balance in a Building or Building Zone – Part 1: Detailed procedures
M2-4	EN ISO 52018-1	Energy performance of Buildings – Building and building elements – Ways to Express Energy Performance and Energy Performance Requirements – Part 1: Expressions and Procedures
M2-5	EN ISO 13789 EN ISO 13790	Thermal performance of Buildings – Transmission and ventilation heat transfer coefficients – Calculation method
	EN ISO 13370	Thermal performance of Buildings – Heat transfer via the ground – Calculation methods
	EN ISO 6946	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method
	EN ISO 10211	Thermal bridges in building construction – Heat flows and surface temperatures – Detailed calculations

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	EN ISO 14683	Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values
	EN ISO 10077-1	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General
	EN ISO 10077-2	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
	EN ISO 12631	Thermal performance of curtain walling – Calculation of thermal transmittance
M2-9	EN ISO 13786	Thermal performance of building components – Dynamic thermal characteristics – Calculation methods
M2-8	EN ISO 52022-3	Energy performance of Buildings – Building and Building Elements – Solar and Visual Characteristics – Detailed calculation method
	EN ISO 52022-1	Energy performance of Buildings – Building and Building Elements – Solar and Visual Characteristics – Simplified calculation method
M3-1	EN 15316-1	Energy performance of Buildings — Modules M3-1, M8-1— Heating and DHW systems in Buildings – Part 1: General and Energy performance expression
M3-3	EN 12831-1	Heating systems in Buildings — Method for calculation of the design heat load
M3-5	EN 15316-2	Energy performance of Buildings, modules M3-5, M4-5 – Space emission systems (heating and cooling)
M3-6	EN 15316-3	Energy performance of Buildings, Modules M3-6, M4-6, M8-6 –Distribution systems (DHW, heating and cooling)
M3-7	EN 15316-5	Energy Performance of Buildings – Modules M3-7; M8-7 – Part 5-1: Storage systems for heating and domestic hot water
M3-8	EN 15316-4-1	Energy performance of Buildings, modules M3-8-1, M8-8-1 – Heating and DHW generation systems, combustion systems (boilers, biomass)
	EN 15316-4-2	Energy performance of Buildings – Module M3-8:1 - Heating systems – Part 4.2:1: Generation and control – Heat pumps systems

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	EN 15316-4-3	Energy performance of Buildings, modules 3-8-3, 8-8-3, 11-8-3 – Heat generation systems, thermal solar and photovoltaic systems
	EN 15316-4-4	Energy performance of Buildings – Modules M3-8-4, M8-8-4, M11-8-4 – Heat generation systems, building integrated cogenerations systems
	EN 15316-4-5	Energy performance of Buildings, Modules M3-8-5; M4-8-5; M8-8-5; M11-8-5 – District heating and cooling
	EN 15316-4-8	Energy performance of Buildings – Heating systems and water based cooling systems in Buildings - Module M3-8-8 – Space heating generation, air heating and overhead radiant heating systems, stoves (local)
M3-10	EN 15378-3	Energy performance of Buildings – Module M3-10 and M8-10 – Heating and domestic hot water measured energy performance
M3-11	EN 15378-1	Energy performance of Buildings – Heating systems in Buildings – Inspection of heating and domestic hot water systems
M4-1	EN 16798-9	Energy performance of Buildings – Part 9: Ventilation for Buildings – Module M4- 1 – Calculation methods for energy requirements of cooling systems – General
M4-3	EN 16798-11	Energy performance of Buildings – Part 11: Module M4-3 – Calculation of the design cooling load
M4-7	EN 16798 – 15	Energy performance of Buildings — Part 15: Module M4-7 – Calculation of cooling systems – Storage – General
M4-8	EN 16798-13	Energy performance of Buildings – Part 13: Module M4-8 – Calculation of cooling systems – Generation
M4-11	EN 16798-17	Energy performance of Buildings — Part 17: Ventilation for Buildings – Module M4-11, M5-11, M6-11, M7-11 – Guidelines for inspection of ventilation and air conditioning systems;
M5-1	EN 16798-3	Energy performance of Buildings – Part 3: Ventilation for non-residential Buildings – Performance requirements for ventilation and room-conditioning systems
M5-5	EN 16798-7 EN 15241 EN 15242	Energy performance of Buildings – Module M5-5 – Ventilation for Buildings – Calculation methods for energy requirements of ventilation and air conditioning systems – Part 7: Emission (determination of air flow rates)

M5-6	EN 16798-5	Energy performance of Buildings – Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7- 8 – Ventilation for Buildings – Calculation methods for energy requirements of ventilation and air conditioning systems – Part 5-1: Distribution and generation– Method 1
M8-2	EN 12831-3	Domestic hot water systems heat load and characterization of needs
M9-1	EN 15193-1	Energy performance of Buildings – Module M9 – Energy requirements for lighting – Part 1: Specifications
M10-1	EN 15232	Energy performance of Buildings – Contribution of Building Automation, Controls and Building Management
M10-11		Energy Performance of Buildings – Inspection for Building Automation and Control
M10-12		Energy Performance of Buildings – Building Management System

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APPENDIX 5

Reference Building

This appendix provides the factors to be considered for developing the global reference building in case local values are not available.

Appendix 5.1: Use and Operation

*D = daylight sensor
*M = manual (lighting switched on/off considering user behaviour)
*P = presence / motion sensor

		USE AND OPERATION									OPERATION									
													COOLING: REQUIRED TEMPERATURE			VENTILATION		LIGHTING		
	SPACE TYPE	START OF USE	END OF USE	DAILY HOURS OF USE [HOURS/DAY]	YEARLY HOURS OF USE (MONDAY TO FRIDAY, MINUS HOLIDAY) [HOURS/A]	DAILY OPERATION HOURS HVAC	YEARLY OPERATION HOURS HVAC	MEDIUM OCCUPANCY NUMBERS [M3/P]	THERMAL DISCHARGE BY PERSON (SENSITIVE) [WH/M2 DAY]	THERMAL DISCHARGE BY EQUIPMENT AND MACHINERY [WH/M2 DAY]	HEATING : REQUIRED TEMPERATURE [°C]		[°C]	OFF-TIME [°C]	PRIMARY ENERGY [%]	MINIMUM FRESH AIR EXCHANGE RATE [M3/M2H]	MINIMUM HUMIDITY DEMAND	ILLUMINATION [LUX]	FACTOR LIGHTING	LIGHTING CONTROL
1	SINGLE / CLUSTER OFFICE	07:00	18:00	11	2750	13	3250	14	30	42	21	17	24	no demand	50	4	none	500	0.7	D*
2	OPEN SPACE OFFICE	07:00	18:00	11	2750	13	3250	10	42	60	21	17	24	no demand	50	6	none	500	1	D*
3	CONFEREN	07:00	18:00	11	2750	13	3250	3	96	8	21	17	24	no demand	-	15	none	500	1	P*

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	CE, MEETING, SEMINAR																		
4	COUNTER HALL	07:00	18:00	11	2750	13	3250	12	36	24	21	17	24	no demand	-	2	none	200	1	M*
5	CANTEEN	08:00	15:00	7	1750	9	2250	1.2	177	10	21	17	24	no demand	-	18	none	200	1	M*
6	RESTAURANT	10:00	00:00	14	4200	16	4800	1.2	236	14	21	17	24	no demand	-	18	none	200	1	M*
7	KITCHEN	10:00	23:00	13	3250	15	4500	10	56	1800	21	17	24	no demand	-	90	none	500	1	M*
8	KITCHEN – PREPARATION, STORAGE	10:00	23:00	13	3250	15	4500	10	56	180	21	17	24	no demand	-	15	none	300	1	P*
9	LAVATORY, BATHROOMS	07:00	18:00	11	2750	13	3250	-	0	0	21	17	24	no demand	50	15	none	200	1	P*
10	ADJACENT AREAS (WITHOUT RECREATION AREAS)	07:00	18:00	11	2750	13	3250	-	0	0	21	17	24	no demand	50	0.15	none	100	1	P*
11	CIRCULATION SPACES	07:00	18:00	11	2750	13	3250	-	0	0	21	17	24	no demand	50	0	none	100	1	P*
12	STORAGE, SERVICE ROOM	07:00	18:00	11	2750	13	3250	-	0	0	21	17	24	no demand	50	0.15	none	100	1	M*
13	SERVER ROOM	00:00	00:00	24	8760	24	8760	30	15	1800	21	17	24	no demand	-	1.3	none	500	0.5	P*

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14	PARKING GARAGE (OFFICE AND PRIVATE USE)	07:00	18:00	11	2750	13	3250	-	0	0	-	-	-	no demand	-	8	none	75	1	M*
15	PARKING GARAGE (PUBLIC USE)	09:00	00:00	15	5475	17	6205	-	0	0	-	-	-	no demand	-	16	none	75	1	M*

Appendix 5.2: Building Envelope

NO.	BUILDING ELEMENT	PROPERTIES	VALUES FOR REFERENCE BUILDING
1.1	OUTSIDE WALL, FLOOR SLAP EXPOSED TO AIR	Coefficient of heat transmission	U_W = 0.28 W/(m² K)
1.2	CURTAIN FAÇADE (SEE ALSO NO. 1.14)	Coefficient of heat transmission	U_W = 1.40 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.48
		Luminous transmission index of glazing	T_{D65} = 0.72
1.3	WALL EXPOSED TO SOIL, BASE PLATE, WALLS AND CEILINGS CONNECTED TO NON-HEATED ROOMS (BESIDES BUILDING ELEMENTS ACCORDING TO NO. 1.4)	Coefficient of heat transmission	U_W = 0.35 W/(m² K)
1.4	ROOF (AS FAR AS NOT CONSIDERED IN NO. 1.5), TOP FLOOR SLAP, WALLS IN DIRECTION OF NAVE AISLE	Coefficient of heat transmission	U_W = 0.20 W/(m² K)
1.5	GLASS ROOF	Coefficient of heat transmission	U_W = 2.70 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.63

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		Luminous transmission index of glazing	T_{D65} = 0.76
1.6	LIGHTING ROW	Coefficient of heat transmission	U_W = 2.40 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.55
		Luminous transmission index of glazing	T_{D65} = 0.48
1.7	LIGHT CUPOLA	Coefficient of heat transmission	U_W = 2.70 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.64
		Luminous transmission index of glazing	T_{D65} = 0.59
1.8	WINDOWS, GLAZED DOORS (SEE ALSO NO. 1.14)	Coefficient of heat transmission	U_W = 1.30 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.60
		Luminous transmission index of glazing	T_{D65} = 0.78
1.9	ROOF LIGHT, SKY LIGHT (SEE ALSO NO. 1.14)	Coefficient of heat transmission	U_W = 1.40 W/(m² K)
		Coefficient of thermal conductivity for glazing	g = 0.60
		Luminous transmission index of glazing	T_{D65} = 0.78
1.10	OUTSIDE DOOR	Coefficient of heat transmission	U_W = 1.80 W/(m² K)
1.11	BUILDING ELEMENTS FROM NO. 1.1 AND 1.3 TO 1.10	Thermal bridge adjustment	ΔU_W = 0.05 W/(m² K)
1.12	LEAK TIGHTNESS OF BUILDING	Related value n_{50}	with ventilation: n_{50} = 1.0 h^{-1} without ventilation: n_{50} = 1.5 h^{-1}
1.13	DAYLIGHT SUPPLY BY SUN SHADING AND/OR GLARE SHIELD	Daylight supply factor $C_{TL,Vers,SA}$	No sun shading or glare shield provided: 0.70 Glare shield provided: 0.15
1.14	SUN SHADING DEVICE	Sun shading devices of the constructed building need to be taken into account for calculating the reference building. This refers to the insulation from heat during summer days according to criterion TEC1.3, Indicator 6 “Solar Heat Protection”.	

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		If solar glass is used to fulfil this Indicator, the following values need to be taken into account for the used solar glass:
		▪ Instead of NO. 1.2
		  ▪ Coefficient of thermal conductivity for glazing: g = 0.35
		  ▪ Luminous transmission index of glazing: T_{D65} = 0.58
		▪ Instead of values of NO. 1.8 and 1.9:
		  ▪ Coefficient of thermal conductivity for glazing: g = 0.35
		  ▪ Luminous transmission index of glazing: T_{D65} = 0.62

Appendix 5.3: Heating, Ventilation, Air-Conditioning, Lighting

NO.	SYSTEM	VALUES FOR REFERENCE BUILDING
2.1	LIGTHING TECHNIQUE	Direct / Indirect, each with electronic ballast and fluorescent tube
2.2	LIGHTING CONTROL	See Table of Appendix 5.1, column “Lighting control”
3.1	HEATING (CEILING HEIGHT ≤ 4 M) – HEAT GENERATORS	Considering boiler, forced-air burner, domestic fuel oil, placed outside of the thermal envelope, water content > 0.15 l/kW
3.2	HEATING (CEILING HEIGHT ≤ 4 M) – HEAT DISTRIBUTION	▪ <u>In case of radiator heating and hot-air heating (decentralised re-heater of the ventilation system):</u> Double-pipe network, external distribution pipes in unheated areas, internal ascending pipes, internal supply lines, system-temperature 55/45 °C, hydraulic aligned, Δp constant, pump designed by its demand, pump with intermittent operation, no overflow valves, calculating the length of the reference building, 70% of the standard length as well the ambient temperature can be chosen according to DIN V 18599-5. ▪ <u>In case of central ventilation system:</u> Double-pipe network, system-temperature 70/55 °C, hydraulic aligned, Δp constant, pump designed by its demand, for calculating the reference building the lengths and position of pipes must be assumed the same as for the actual building.
3.3	HEATING (CEILING HEIGHT ≤ 4 M) – HEAT TRANSFER	▪ <u>In case of radiator heating:</u> Free heating surfaces fixed to outside walls with glass surfaces and radiation protection, P-controller (1K), no auxiliary energy.

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		▪ <u>In case of hot-air heating (decentralised re-heater of the ventilation system):</u> Room temperature as controlled variable, high control quality.
3.4	HEATING (CEILING HEIGHT > 4 M)	<u>Heating system:</u> Hot-air heating with standard induction outlet, air outlet sideways, P-controller (1K) according to DIN V 18599-5.
4.1	DOMESTIC HOT WATER – CENTRAL SYSTEM	▪ <u>Heat generator:</u> Solar collector according to DIN V 18599-8, Section 6.4.1, including ▪ flat-plate collector: $A_C = 0.09 \cdot (1.5 \cdot NFA_s^*)^{0.8}$ ▪ volume of beneath solar part of storage system: $V_{S,SOL} = 2 \cdot (1.5 \cdot NFA_s^*)^{0.9}$ ▪ in case of $NFA_s^* > 500$ m² “large scale solar plant” Remaining demand is supplied by heat generator of heating system. Note: is the net floor area of zones supplied by central system ▪ <u>Heat storage:</u> Indirect heated storage system (upright), placed outside of the thermal envelope. ▪ Heat distribution: Including circulation, Δp constant, pump designed by its demand, for calculating the reference building the lengths and position of pipes must be assumed the same as for the actual building.
4.2	HOT WATER – DECENTRAL WATER SYSTEM	Electrical instantaneous water heater, one tap and 6 meters of pipe per unit.
5.1	HVAC SYSTEMS – EXHAUST AIR SYSTEM	Specific fan power: $P_{SFP} = 1.0$ kW/(m³/s)
5.2	HVAC SYSTEMS – SUPPLY AND EXHAUST AIR SYSTEM WITHOUT RE-HEAT AND COOLING FUNCTION	Specific fan power: ▪ supply-air fan: $P_{SFP} = 1.5$ kW/(m³/s) ▪ exhaust-air fan: $P_{SFP} = 1.0$ kW/(m³/s) Extra adjustments according to DIN EN 13799, Section 6.5.2 can only be taken into account if the following components are available: HEPA-filter, gas filter or heat recovery systems class H1 or H2.

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		▪ Heat recovery via heat plate exchangers (cross-counter flow) with: ▪ recovered heat coefficient: $\eta_t = 0.6$ ▪ pressure ratio: $f_P = 0.4$ ▪ air duct routing inside the building
5.3	HVAC SYSTEMS – SUPPLY AND EXHAUST AIR SYSTEM WITH CONTROLLED AIR CONDITIONING	Specific fan power: ▪ supply-air fan: $P_{SFP} = 1.5$ kW/(m³/s) ▪ exhaust-air fan: $P_{SFP} = 1.0$ kW/(m³/s) Extra adjustments according to DIN EN 13799, Section 6.5.2 can only be taken into account if the following components are available: HEPA-filter, gas filter, or heat recovery systems class H1 or H2. ▪ Heat recovery via heat plate exchangers (cross-counter flow) with: ▪ recovered heat coefficient: $\eta_t = 0.6$ ▪ pressure ratio: $f_P = 0.4$ ▪ supply-air temperature: 18 °C ▪ air duct routing inside the building
5.4	HVAC SYSTEMS – AIR HUMIDIFYING SYSTEM	For calculating the reference building the humidifying unit must be assumed in the same way as for the actual building.
5.5	HVAC SYSTEMS – PURE AIR CONDITIONING	In case of installation of a variable air volume system: ▪ pressure ratio: $f_P = 0.4$ ▪ air duct routing inside the building
6	ROOM COOLING	▪ <u>Cooling system:</u> ▪ Chilled water fan-coil, parapet unit ▪ Cold water temperature: 14/18 °C ▪ <u>Chilled water circuit room cooling:</u> ▪ Overflow: 10% ▪ Specific electric power of distribution: $P_{d,spec} = 30\ W_{el}/kW_{cooling}$ ▪ Hydraulic aligned, controlled pump, pump hydraulic decoupled, seasonal and night/weekend switch off

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7	COOLING GENERATING SYSTEM	▪ <u>Generator:</u> Piston/scroll compressor multi-level shiftable, R134a, air cooled ▪ <u>Chilled water temperature:</u> ▪ If NFAs cooled via room cooling > 5,000 m2 system temperature for this area: 14/18 °C ▪ Otherwise: 6/12 °C ▪ <u>Chilled water circuit generator inclusive HVAC cooling:</u> ▪ Overflow: 30% ▪ Specific electric power of distribution: $P_{d,spez}$ = 20 $W_{el}/kW_{cooling}$ ▪ Hydraulic aligned, uncontrolled pump, pump hydraulic decoupled, seasonal and night/weekend switch off ▪ Distribution outside the conditioned zone

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APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation submitted must comprehensively and clearly demonstrate compliance with the requirements of the individual indicators.

Indicator 1: Life cycle assessment in the planning process

Confirmation by the auditor and by other specialist planners involved in the planning process that life cycle assessments were used in the planning process, via the documentation from the early life cycle calculations and/or project specific assumptions and/or early assessments, with clear reference to the projected building. Short description of the methodology used and the scope of the analysis, covering at least aspects of energy efficiency and construction (embodied carbon – materials and design) e.g. through PCM for the preliminary LCA assessments at the early service phases (2, 3). The following documents maybe used to provide as evidence:

- Building energy efficiency design concepts, preliminary assessments/calculations, concepts and/or measures to achieve high performance building standards e.g. Nearly Zero Energy (NZEB), Zero Emission Buildings (ZEB) or comparable (e.g. through national norm), through different variations of the following aspects like: highly efficient building fabric, variation in shapes and/or forms, possible passive and active measures, etc.
- On site energy generation plans and preliminary assessments/calculations, e.g. site-specific simulation of photovoltaic generation.
- Concept of building model (simplified, reasonable for service phase 2-3) with consideration of the embodied carbon in major (e.g. heaviest) materials/products.
- Confirmation by the auditor and other specialist planners involved in the planning that life-cycle assessments were used in the planning, also possible: excerpts from life-cycle assessment comparisons with clear reference to the building.
- Confirmation by the auditor that life-cycle assessments have been determined for relevant decisions
- Presentation of the considered aspects / alternatives.

Indicator 2: Life cycle assessment detailed design

All positions/documents mentioned above (under the indicator 1), considered in more detailed level, reflecting higher detailing grade of the advanced project service phases 3 – 5. Confirmation by the auditor that life cycle assessments were evaluated for important decisions, description of the alternatives considered. Clear demonstration of the relationship between the preliminary assessments (from Ind. 1) and the advanced design of the project in the service phases (3 - 5). Confirmation of the participation of the planning team and of communication of the life cycle assessment results (e.g. via planning logs)

Indicator 3: Comparative values of life cycle assessment (as built)

Documentation of the building life cycle assessment results**:**

- General information about the building: building address, building type, duration of use etc.;
- Description of the building model including origin of the primary data for site plan, urban design concept, building design (the structure, layout, floor count, façade, wall-window ratio etc.) and technical (energy systems, HVAC systems etc) description incl. photo documentation;
- Components and material quantities (in relevant units: volumes, masses, areas) according to the table in the appendix 1 of this criterion (similar to the Level(s) Indicator 2.1 – “Bill of Quantities (BoQ) materials and lifespans”), that do not fall under the cut-off criteria (<1% Mass), including estimated durations of use (according to the table or if components are grouped together, this must be clearly disclosed),

- Building areas and volumes (net floor area, energy related area, gross volume, etc.) according to the mentioned standards and norms;
- Specification of HVAC system incl. documentation of the refrigerants which are used in the system as well as energy sources. For district heating (or cooling), the proportion of renewable energy used must be proven via a corresponding certificate;
- Final energy demand (electricity, heating, cooling): detailed documentation for projected and reference buildings, according to the local legal regulation – valid EPC (Energy Performance Certificate) or alternatively, energy calculations/simulations, which complies with the requirements described under the Appendix 2 of this document;
- Documentation of the renewable energy generation on site incl. (if applicable) use of waste heat, and how it is provided in the case of use of waste heat.
- Information/documentation about the data basis used for the LCA. If a country specific dataset has been used, this data basis or the corresponding part of it must be disclosed for the conformity check (compliance with the EN15804+A2). If product-specific EPDs have been used, confirmation by the expert regarding their use must be provided (recognised experts include, for instance, experts who work in verifying EPD programmes compliant with DIN EN 15804+A2:2019 or data providers who provide data that is verifiably compliant with DIN EN 15804+A2:2019 or similar);
- Plausible documentation of results of the life-cycle assessment – Data export (in traceable format e.g. csv table form) of the LCA results from the software/tool. If third-party tool is used, compliance with the DGNB LCA methodology must be provided e.g. in form of DGNB LCA tool recognition or disclosure of technical description of the tool (compliance with the methodology of the indicator 3 and all mentioned standards like ISO14040, 14044, EN 15643 etc. system boundaries, rules for building modelling containing all life cycle phases that are to be considered etc.);
- Presentation of the results in form of the DGNB summary LCA table (Excel) including operational impacts from the refrigerants (B1) in relevant units;
- Documentation for the carbon neutral future operation, in form of filled up DGNB Excel tool for the “climate action plan 2050”, including confirmation that the results have been communicated with an investor/owner or filled up CO2 accounting tool according to the DGNB Framework for carbon neutral buildings and sites 2025;

Indicator 4: Agenda 2030 bonus – climate protection goals

Demonstration of climate neutrality (calculations for CO_2 equivalents) for scenarios of the energy demand, user energy and/or construction according to the DGNB "Framework for carbon neutral buildings and sites".

- Carbon-neutral operation by 2045: filled DGNB Excel based tool “Framework for carbon neutral buildings and sites", where the building operation (energy) related CO_2 equivalents are set to zero or below;
- Carbon-neutral operation including user energy demand (according to the table 8) by 2050: filled DGNB Excel based tool “Framework for carbon neutral buildings and sites", where the building operation (energy) + user energy related CO_2 equivalents are set to zero or below;
- Presentation of results of embodied carbon (CO_2 equivalents) building materials: documented results from the building LCA.
- Climate neutrality in accordance with the "Framework for carbon neutral buildings and sites" accounting scope "operation and construction”, CO_2 equivalents are set to zero or below;
- Mobility concept where the greenhouse gas reductions are plausibly documented.
- Climate action through dimensional sufficiency: results of calculation/estimates for alternative variants where argumentation and presentation of the greenhouse gas reductions achieved.

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DGNB Framework for carbon neutral buildings and sites, DGNB German Sustainable Building Council, publication: August 2025: https://www.dgnb.de/en/sustainable-building/climate-action/framework-for-carbon-neutral-buildings-and-sites/revised-version
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework, Technical Committee: ISO/TC 207/SC 5, published July 2006;
- ISO 14044:2006-10 Environmental management – Life cycle assessment – Requirements and guidelines, Technical Committee: ISO/TC 207/SC 5, published July 2006;
- DIN V 18599:2018 Energy efficiency of buildings – Calculation of the energy needs, delivered energy and primary energy for heating, cooling, ventilation, domestic hot water and lighting. Berlin: Beuth publisher. September 2018;
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, Technical Committee CEN/TC 350, published October 2019; EN 15643:2021 Sustainability of construction works - Framework for assessment of buildings and civil engineering works: from Technical committee CEN/TC 350.
- 15978:2025- Sustainability of construction works - Assessment of environmental performance of buildings – Calculation method: from technical committee CEN/TC 350
- DIN 277-1:2016 Areas and volumes of buildings - Part 1: Building construction, DIN German Institute for Standardization, published January 2016;
- ISO 9836:2017 Performance standards in building — Definition and calculation of area and space indicators, Technical Committee : ISO/TC 59/SC 15, published September 2017;
- Regulation (EU) 2024/573 on fluorinated greenhouse gases, European Parliament and of the Council, published February 2024; and the German interpretation: Global Warming Potentials (GWP) of selected compounds and their mixtures, Umweltbundesamt (German Environment Agency), published march 2024;
- Directive (EU) 2024/1275 on the energy performance of buildings of the European Parliament and of the Council, published April 2024;
- Defining Zero-Emission Buildings, Technical report by the Joint Research Centre (JRC), Publications Office of the European Union, 2023;
- Photovoltaics-Report, Fraunhofer Institute for Solar Energy Systems, Freiburg, published, May 2024;
- Commission recommendation EU) 2016/1318, on guidelines for the promotion of nearly zero-energy buildings and best practices, published July 2016;
- Level(s) indicator 2.1: Bill of Quantities, materials and lifespans, European Commission Joint Research Centre August 2024;
- Web interface to produce calculations of solar radiation and photovoltaic (PV) system energy production (PVGIS 5.3) from e Joint Research Centre (JRC) EU Science Hub 2024: https://re.jrc.ec.europa.eu/pvg_tools/en/#TMY

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- Partial energy values (final energy) / TEK-Tool Version TEK 5.6 Institut Wohnen und Umwelt (IWU), Darmstadt May 2014;
- ASHRAE 140: 2011 - Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs, ASHRAE Standards Committee published on June 2014;
- ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings, ASHRAE Standards Committee 2013;
- EN ISO 52000-1: 2017 Energy performance of buildings — Overarching EPB assessment, Technical Committee : ISO/TC 163, June 2017;
- EN ISO/TR 52000-2: 2017 Energy performance of buildings — Overarching EPB assessment Explanation and justification, Technical Committee : ISO/TC 163, June 2017;
- QNG accounting rules for residential/non-residential buildings, German Federal Ministry for Housing, Urban Development and Construction, July 19, 2024 https://www.qng.info/wp-content/uploads/2024/07/QNG_-Handbuch_Anlage-3_Anhang-3211_LCA_Bilanzregeln-NW_v1-4-1.pdf

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ENV1.2

Local environmental impact

Objective

Our objective is to reduce, avoid or substitute all hazardous or harmful materials, (construction) products, substances and mixtures that can adversely affect or cause short, medium or long-term damage to people, flora and fauna.

Benefits

The use of particularly environmentally friendly materials not only makes an important contribution to improving indoor air quality but also helps limit the contamination risks during the building renovations. Only a building elements catalogue that is complete in terms of the environmental qualities of materials can provide building owners with extensive information about construction products used in various parts of the building. This information is of key importance for quality assurance in building construction, for clarifying deficiencies and finding appropriate ways of eliminating them, while optimising maintenance costs. This is crucial in helping buildings retain their value.

Contribution to overarching sustainability goals



Outlook

The handling and use of environmentally harmful materials are increasingly subject to regulatory requirements. The classifications will therefore change in the future. In addition, an overarching basic requirement has been developed for this version, which serves as the minimum requirement for this criterion (quality level (QL0)).

Share of total score

	SHARE	WEIGHTING FACTOR
Office Education Department stores Assembly buildings Healthcare buildings	4.7%	5
Residential Hotel Consumer market Shopping centre	4.5%	5
Logistics Production	4.3%	5

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EVALUATION

The Quality Levels (QL) named in the evaluation build upon each other, i.e. QL0 is a premise of QL1, etc. The quality level achieved is derived from the individual aspect that needs to be given the lowest evaluation. The requirements of a higher quality level in each case incorporate all requirements specified for the lower levels. A maximum of 100 regular points and 115 points with bonuses can be awarded for this criterion.

NO.	INDICATOR	POINTS
1	**Environmentally friendly materials**	**Max. 100**
1.1	**Office** **Education** **Hotel** **Consumer market** **Logistics** **Production** **Assembly buildings** **Healthcare buildings**	
	■ Fulfilment of the overarching basic requirement (see method) QL0	10
	Fulfilment of all requirements in the criteria matrix:	
	■ QL 1	30
	■ QL 2	50
	■ QL 3	75
	■ QL 4	100
	Residential **Department stores**	
	Evaluation of the communal areas, building envelope and the living spaces/rental spaces is carried out via 1.1 and 1.2. If the fit-out standard achieved for the living spaces/rental spaces deviates from the standardised fit-out description, this must be evaluated separately via Indicator 1.2 (for more information, see IV. Usage-specific description).	
	■ Fulfilment of the overarching basic requirement (see method) QL0	5
	Fulfilment of all requirements in the criteria matrix:	
	■ QL 1	15
	■ QL 2	25
	■ QL 3	35
	■ QL 4	50
	Shopping centre	
	Evaluation of the communal areas and the building envelope.	
	■ Fulfilment of the overarching basic requirement (see method) QL0	5
	Fulfilment of all requirements in the criteria matrix:	
	■ QL 1	15
	■ QL 2	25
	■ QL 3	40
	■ QL 4	60
1.2	**Residential** **Department stores**	
	Evaluation of at least 50% of the rental spaces (apartments)	
	■ Fulfilment of the overarching basic requirement (see method) QL0	5
	Fulfilment of all requirements in the criteria matrix:	
	■ QL 1	15
	■ QL 2	25
	■ QL 3	40
	■ QL 4	50

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NO.	INDICATOR	POINTS
	Shopping centre	
	Evaluation of at least 50% of the rental spaces	
	■ Fulfilment of the overarching basic requirement (see method) QL0	5
	Fulfilment of all requirements in the criteria matrix:	
	■ QL 1	15
	■ QL 2	25
	■ QL 3	35
	■ QL 4	40
1.3	**Office** **Education** **Hotel** **Shopping centre** **Consumer market** **Logistics** **Production** **Residential** **Department stores** **Assembly buildings** **Healthcare buildings**	
	Additional points:	
	Cooling is provided without halogenated/partially halogenated refrigerants	+10
2	**AGENDA 2030 BONUS**	**Max. 15**
	■ **Bonus 1:** Avoidance of exception (ignored line in the criteria matrix) upon achievement of QL3	**5**
	■ **Bonus 2:** Avoidance of exception (ignored line in the criteria matrix) upon achievement of QL4	**10**
	■ **Bonus 3:** For all lines of the criteria matrix, only products with SVHC ≤ 0.1% were used	**+ 5**

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SUSTAINABILITY REPORTING

Appropriate key performance indicators (KPIs) include, in the case of a positive evaluation for Indicator 2, no use of certain refrigerants or communication of selected relevant emission parameters for construction products used.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	No use of halogenated and partially halogenated refrigerants that are persistent by themselves or have persistent degradation products	[yes]
KPI 2	Emission profiles for construction products used, stating carcinogenic, mutagenic and toxic volatile organic compounds, formaldehyde and volatile organic compounds VOCs (tested in accordance with CEN/TS 16516); corresponds to Level(s) indicator 4.1.2 and Regulation (EU) 2020/852 (Taxonomy) on Pollution prevention and control – Do no significant harm (‘DNSH’) criterion.	[µg/m³], [-]
KPI 3	Only products with SVHC ≤ 0.1 % used	[yes/no]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Certain substances, construction products and preparations are dangerous to the soil, air, groundwater and surface water and to people, flora and fauna. This applies to their entire life cycle – from manufacturing to processing on the construction site and use in the existing building through to their disposal (dismantling, recycling, disposal in landfill). The local risks are evaluated on the basis of substances and products, as the toxicological impact categories for the environment and humans have not yet been recorded in the life cycle assessment due to a lack of recording and evaluation processes.

II. Additional explanation

In the DGNB certification system, high-risk material and substance groups are investigated and evaluated individually and on the basis of products. The following material groups, among others, are currently considered (as products or as ingredients in compositions):

- Halogenated and partially halogenated refrigerants
- Halogenated and partially halogenated propellants
- Heavy metals
- Substances that fall under the Biocidal Products Directive (528/2012/EC)[1]
- Substances that fall under the Persistent Organic Pollutants (POPs) Regulation[2]
- Hazardous substances in accordance with the CLP Regulation (1272/2008/EC)[3]
- Organic solvents and plasticisers
- Substances of very high concern (SVHC in accordance with the European Chemicals Regulation (REACH) (1907/2006/EC))[4]

Chemicals/substances that are particularly dangerous in terms of the following toxic end points are classified as being of very high concern:

- Carcinogenic, mutagenic and toxic to reproduction (CMR)
- Persistent, bioaccumulating and toxic (PBT)[5]
- Very persistent and very bioaccumulating (vPvB)
- or of similar concern (e.g. endocrine disruptors).

In accordance with the European Chemicals Regulation (REACH), suppliers must inform their customers if a product (e.g. an insulation tube for building technology) contains a substance listed in the candidate list in a concentration of more than 0.1% (w/w). This obligation is described in Article 33 of the European Chemicals Regulation (REACH) and applies once a substance is included in the candidate list[6]

The substances and components that must be considered are specified and explained in the criteria matrix (Appendix 1).

[1] Information on biocides: https://echa.europa.eu/information-on-chemicals/biocidal-active-substances
[2] Regulation (EU) 2019/1021 on POPs: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R1021&from=EN; for the non-EU area, internationally ratified Stockholm Convention http://www.pops.int/TheConvention/Overview/TextoftheConvention/tabid/2232/-Default.aspx
[3] Guidance on labelling and packaging in accordance with Regulation: https://echa.europa.eu/documents/10162/23036412/clp_labelling_-en.pdf/89628d94-573a-4024-86cc-0b4052a74d65
[4] Candidate List of substances of very high concern: https://echa.europa.eu/candidate-list-table
[5] Persistence, bioaccumulation and toxicity assessment: https://echa.europa.eu/pbt

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With regard to the requirement for limiting emissions of volatile organic compounds from products or their risk potentials during use, there are overlaps between the VOC content of the product and the resulting release of VOCs by the product. In criterion ENV 1.2 "Local environmental impact", the VOC content of the product is evaluated primarily, and the release of VOCs is only evaluated where there are no industry regulations regarding the VOC content (e.g. sealants). The quantitative emissions of volatile substances into the interior are considered in criterion SOC1.2 "Indoor air quality".

The **CE** marking symbolises that a product complies with the applicable requirements placed on the manufacturer by the European Community. By using the CE marking, the responsible person/organisation declares that the product complies with all applicable EU regulations and that a corresponding conformity assessment procedure has been carried out.

Planning procedure:
From the early planning phases, certain materials and components must be considered in terms of critical substances (see Appendix 1) and, where appropriate, suitable alternative designs must be assessed. By making informed choices when selecting construction materials, it is largely possible to avoid using the hazardous substances and products specified in the criteria matrix without restricting the creative and functional planning process.

III. Method

Criterion ENV1.2 contains specific requirements for a wide range of construction materials. For all materials and products listed under Appendix 1, the fulfilment of the basic requirements is a mandatory minimum overarching rule for this criterion, i.e. without meeting the basic requirements listed below, a positive assessment for this criterion is not possible.

Basic requirements of QL0 – no use of materials and products containing:

- Substances listed in Annexes I or II of Regulation (EU) 2019/1021[7] – POPs Regulation, except in the case of substances present as an unintentional trace contaminant;
- Mercury and mercury compounds, as defined in Article 2 of Regulation (EU) 2017/852[8]
- Substances listed in Annexes I or II to Regulation (EC) No 1005/2009 – Ozone depletion substances (ODS)[9]
- Substances listed in Annex XVII to Regulation (EC) 1907/2006 – List of substances restricted under REACH, except where there is full compliance with the conditions specified in that Annex;
- Substances listed in Annex II to Directive 2011/65/EU – RoHS Directive[10] except where there is full compliance with Article 4(1) of that Directive (Annex III);

Note: (additionally, if applicable) Fulfilment of all country-specific statutory requirements are always a prerequisite for any building project claiming compliance with this document.

Basic requirements (all abovementioned directives) refer to the "Harmonised Standards" – A harmonised standard is a European standard developed by a recognised European Standards Organisation: CEN, CENELEC, or ETSI.

[7] Similar International version of the directive (for non-EU states): Stockholm Convention on persistent pollutants
[8] Regulation (EU) 2017/852 of the European Parliament and of the Council of 17 May 2017 on mercury.
[9] Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 Sep. 2009 on substances that deplete the ozone layer.
[10] Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

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The **CE marking** is a part of the EU's harmonisation legislation; by affixing the CE marking to a product, a manufacturer declares that the product meets all the legal requirements for CE marking and can be sold throughout the EEA (European Economic Area). This also applies to products made in other countries that are sold in the EEA. Required documentation regarding the fulfilment of the **basic requirements** are outlined in the Appendix B. Beyond the basic requirements, specific requirements are also listed in the Appendix 1 table. The complete layer structure of all components must be specified on the basis of a building elements catalogue (see implementation example, Appendix 2). Auxiliary materials such as adhesive, primers, etc. must also be included. Verifiable proof must be produced in accordance with the criteria matrix for all requirements that are to be verified at the desired quality level (see Appendix 1, column: Type of documentation; requirement for verification of the individual aspects).

As a result of this, the following surfaces must be considered:

- Ground structures including foundations
- External wall structures
- Internal wall structures
- Floor and ceiling structures
- Roof structures
- Underground garages (considered separately)
- EU-Taxonomy relevant areas

The following requirements of this criterion shall be considered, verified and complied with for materials/products-/materials listed below that are delivered ready for use to the construction site:

- Factory coatings of components according to the criteria matrix (Appendix 1): Either products are used in the coating process that comply with the VOC requirements of the criteria matrix, or the facility where the product is manufactured/coated operates in accordance with the EU directive 2010/75/EU - Industrial Emissions Directive (IED), formerly 1999/13/EU, or similar, for small manufacturing companies.

The DGNB has learned over many years of experience that the material qualities required to fulfil **quality level 3** or **4** can only be successfully ensured if the relevant materials are tested and approved on the construction site prior to their use. **Quality level 3** or **4** can therefore only be achieved if the corresponding **material monitoring logs** are presented. Material inspection and creation of the logs can be delegated to qualified third parties (auditors, construction ecologists).

Material inspections on the construction site

An approval list must be regularly updated by the qualified institution responsible for review and approval and must be made available to the construction managers/property monitoring specialists for material inspection on the construction site. The construction managers/property monitoring specialists must monitor the correctness of the materials used by the companies involved in the construction by means of regular target/achieved comparisons and keep a record of the results. An appropriate and regular frequency is considered to be one that ensures

- that the work of all contractors involved in all parts of the construction process involving relevant materials is checked soon after it begins (i.e. before 5% of the work that is critical for meeting objectives is completed), and
- that the intervals between inspections are reduced once fit-out work is started.

Information regarding dealing with incorrect use is provided in Appendix 5.
Construction site inspections are not required to achieve **quality level 0, 1** or **2**.

Agenda 2030 Bonus:
The aim is to promote solutions that reduce the input of pollutants into the environment in particular and that support the circularity of building products.

Bonus 1 or **2** “Avoidance of deletion criterion" is intended to positively evaluate the use of products that consistently minimise pollution. The bonus cannot be credited with another bonus.

Bonus 3 "Products with SVHC <= 0.1%" can only be awarded if all installed products within the scope of the criteria matrix demonstrably comply with the requirement SVHC <= 0.1%.

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IV. Usage-specific description

Information regarding indicator 1.1:
In the following schemes, rental spaces can be assessed separately via Indicator 1.2. This corresponds to the methodology for Indicator 1.1, which is to be used to evaluate the building envelope and any existing communal areas.

Residential **Department stores**:
The rental spaces can be evaluated separately via Indicator 1.2. This corresponds to the methodology for Indicator 1.1, which is to be used to evaluate the building envelope and communal areas. If the fit-out standard that has been implemented for the rental/living spaces deviates from the standardised fit-out description, these must be considered via Indicator 1.2. Declarations of obligation and binding fit-out descriptions from tenants and confirmations of implementation of the quality level in accordance with the DGNB criteria matrix must be verified.

For department stores with a tenant, separate evaluation is not required. If no separate analysis is carried out, the points for Indicators 1.1 and 1.2 can be awarded accordingly. In this case, a separate list is not required. The quality level of the rental spaces can, in principle, only be assessed as higher than the quality level that has been achieved for the communal areas if documentation for the rental/living spaces, in accordance with the requirements specified for verification in the criterion and Appendix 2, is available and has been implemented successfully.

Shopping centre
Communal spaces and building envelopes are evaluated via Indicator 1.1, while rental spaces are evaluated via Indicator 1.2.

Communal areas and building envelope:
Communal areas include all non-rental spaces. These include spaces such as escape routes, parking areas, communal WC areas, office spaces and communal social areas. All non-retail spaces, such as storage spaces that are fitted out by the landlord, must be included in the communal spaces. The building envelope is also included.

Information regarding Indicator 1.2:
Rental spaces:
A positive evaluation is given if it is proven that, in at least 50% of the rental space, the respective tenants have committed themselves to implementing the quality levels of the criteria matrix. This can be done, for example, by means of an obligation on the part of the tenants in the rental agreement. The quality level of the rental areas can in principle only be rated higher than the quality level achieved for the general areas if the documentation for the rental/living areas are available in accordance with the verification requirements specified in the criterion and they have been implemented.

Information regarding Indicator 1.3:
In order to provide an additional market incentive, implementation of cooling without halogenated/partially halogenated refrigerants is rewarded with additional checklist points. If no refrigerants are used, no additional checklist points can be awarded. This objective is intended, in particular, to prevent the use of halogenated refrigerants or propellants, unless it has been proven that they and their degradation products do not accumulate in the environment and do not themselves have persistent degradation products that can pollute (accumulate in) natural basins or have harmful effects there.

Assembly buildings
In the case of individual/separate responsibilities between the parties, e.g. owner: common areas and building envelope / tenant: rental areas, the evaluation of the criterion for the scheme **Assembly buildings** can be done similarly to the scheme **Shopping centre**, where the "General areas and building envelope" are assessed in accordance with Indicator 1.1 and the "rental areas" are assessed in accordance with Indicator 1.2.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Documentation submitted must comprehensively and clearly demonstrate compliance with the requirements for the target evaluation of the individual indicators. The components/construction materials and areas listed in the criteria matrix (Appendix 1) must be considered:

- Complete declaration and verification of relevant components/construction materials applied in points or lines (e.g. sealant) using the documentation required in the criteria matrix. In principle, the verification process should deal with all consecutive numbers in the criteria matrix. Irrelevant aspects of the criteria matrix should be explicitly identified as irrelevant, and technical exceptions should be explicitly marked as exceptions and justified.
- Declaration and verification of relevant components/construction materials applied across surfaces in the form of a building elements catalogue that includes the environmental qualities of materials in accordance with Appendix 2 is obligatory in all quality levels (QL). Verification can also be submitted in a different form, as long as this clearly demonstrates the installation site (location/component/layer structure) of all materials considered in "Appendix 1 – Criteria matrix" to an equivalent extent as a building elements catalogue (in accordance with Appendix 2) and covers all components in the life cycle assessment with identical component designation and area assignment (due to traceability via the conformity check).
- The materials, products and elements listed in the documentation of criterion ENV1.2 must contain the following information as a minimum:
- Construction product
- Manufacturer
- Area information (for materials applied across surfaces)
- Description of the individual layers (see implementation example in Appendix 2: Building elements catalogue)
- Tenant fit out obligations (if required in the scheme)
- Construction site logs for the material inspections (obligatory for quality level 3 and 4)
- Target/achieved comparison in addition to the approval list (obligatory for quality level 3 and 4)
- Notification of defects/notification that the building is free from defects in accordance with Appendix 5 (in the event of incorrect use)

Alternatively, fulfilment of the **Basic requirements** can be documented as follows:
Construction projects situated beyond EU member states:

- List of the companies involved in construction with details of the service areas (e.g. façade, roof, etc.);
- Contract extracts and/or quality assurance agreements, where use of only compliant building products and/or materials (in reference to the Basic requirements) is permitted;
- Company declarations and/or extracts from handover protocols signed by the DGNB Auditor, where the compliance with the basic requirements is documented;

For the projects in the EU member states, no extra documentation is required, i.e. legal framework covers the requirements.

Exceptions for the verification process:

- **Quality levels 0 and 1:**
  No exceptions available in the **QL0** and **QL1,** i.e., all requirements listed in the matrix for these quality levels must be fulfilled.

- **Quality level 2:**
  For verification of quality level 2, two of the criteria (row of the criteria matrix) can be ignored without impacting the maximum evaluation points. Any further exception of the criteria (row of the criteria matrix) will lead to subtraction of five points (-5 points). The ignored criterion in the criteria matrix must fulfil the requirements of the **QL1** as a minimum.

- **Quality level 3:**
  For verification of quality level 3, three of the criteria (row of the criteria matrix) can be ignored without impacting the maximum evaluation points. Any further exception of the criteria (row of the criteria matrix) will lead to subtraction of five points (-5 points). The ignored criterion in the criteria matrix must fulfil the requirements of the **QL1** as a minimum.

- **Quality level 4:**
  For verification of quality level 4, a total of three of the criteria (rows of the criteria matrix) can be ignored without impacting the maximum evaluation points. Any further exception of the criteria (row of the criteria matrix) will lead to subtraction of five points (-5 points). The ignored criteria in the criteria matrix must each fulfil the requirements of the **QL1** as a minimum.

- **Cut-off criteria:**
  The verification can be ignored for max. 5% of the GFA(S) in accordance with [T&D_04], **but only if explicitly mentioned** under the relevant raw of the Appendix 1**;** This applies regardless of which building areas the product/material is used on (see criteria matrix Appendix 1: "Scope of application and verification").

- **Example of the process:**
  - Building with a GFA(S) of 50,000 m² (incl. areas below the ground floor, such as underground garages)
  - Example result:
    5% GFA(S) = 2500 m²
  - Application: The verification of the criteria marked in the criteria matrix with this exception may exclude up to 2,500 m² area from the documentation. The location (walls, ceilings, floors, etc.) of the materials/products is not relevant here.

- **Technical and functional exceptions[11]:**
  If one of the specified product requirements cannot be implemented for technical or functional reasons (i.e. due to the absence of a functionally equivalent product or a construction alternative that meets the requirements), exceptions from the requirements are permitted. Any deviation from the requirements must be documented and justified, specifying the product, the technical application and the quantity used. Product exceptions for purely aesthetic reasons are not covered by the exemption. Possible forms of documenttation include, for example, a current confirmation from at least three market-relevant manufacturers that no product that is suitable for the intended quality level is available (see Appendix 3), or proof that use of a suitable product was not technically possible for reasons attributable to "force majeure" (weather conditions, natural circumstances such as water under pressure in the construction site subsoil). Verification for a technical exception can only pertain to a single quality level and does not constitute an exemption from the requirements that may apply in the quality levels below it. If the requirement of a lower quality level cannot be met for technical reasons, this must be consistently justified on the basis of the three manufacturer confirmations presented for the technical exception.

[11] Not technical exception for QL 0 is possible

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- **Data basis:**

  In principle, the following can be used as a data basis:

  - Technical information
  - Safety data sheets (SDS)
  - Environmental Product Declarations of types I and III and manufacturer declarations regarding ingredients and recipe components
  - Manufacturer declaration
  - SVHC declaration by manufacturers of products (cf. Appendix 4)

  The most suitable sources for the material qualities that are to be queried within the scope of criterion ENV1.2 are normally:

  - VOC content of paints/lacquers: Technical information, safety data sheets, labels (declaration of the VOC content in accordance with Directive 2004/42/EC); specified in g/l
  - VOC content of other products: Manufacturer declaration
  - SVHC in preparations: Safety data sheet
  - SVHC in products: Technical information, manufacturer data sheets (obligation on the part of the manufacturer)
  - Individual substances (heavy metals, etc.): Manufacturer declaration (see criteria matrix in Appendix 1; column: "Type of documentation/requirement for verification of individual aspects")

- **Validity of the data basis for verification:**

  The following information is required for verification:

  - EC safety data sheets in accordance with EC 1907/2006.
  - Declarations of SVHC in products in accordance with Annex XIV EC 1907/2006 in the most recent applicable version at the publication date of this DGNB version.
  - Declarations of substances in the SVHC candidate list in products in accordance with the most recent applicable version at the publication date of this DGNB version.

  This means that the documentation that is produced must be created on the basis of the data basis or substance lists (e.g. SVHC) available at the time of publication of this version. This is only ensured if currently valid safety data sheets, technical data sheets and manufacturer declarations that comply with legislation regarding chemicals are used. Documentation published at a later date can be used for verification.

- **Evidence of construction site control monitoring:**

  Regular site inspections to be carried out at reasonable intervals. An inspection could, for example, take place as a trade begins to be implemented. At least the following trades are to be checked: **Formwork oil, painting work, waterproofing work on roof and perimeter, tiling work, flooring work.** Accordingly, several site reports shall also be submitted, but at least one report on the aforementioned works. A log of the material inspection contains the following information:

  - Release list must be confirmed and signed by the trades/subcontractors.
  - Date of the inspection with signature of the person who carried out the inspection
  - Designation of the time of the inspection (e.g. execution of trade xyz).
  - Name all products that have been tested, stating the product name, production company, place of use, trade (= spot check). Note: Not all installed products are expected to be tested.
  - Result of the inspection: "compliant product" or "non-compliant product"
  - Explanation, in case of a "non-conforming product": e.g. handling of misapplications (Annex 5 of the criterion)

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

Fundamental sources chosen from the available lists of substances and material data:

- CLP Regulation 1272/2008/EC including alignment regulations*
- European Chemicals Regulation (REACH) (EC 1907/2006) *
- Biocidal Products Directive 98/8/EC *
- Independently verified declarations, such as Environmental Product Declarations (EPD)
- Certifications developed within industries
- EC (2010): Consolidated list of substances that are no longer allowed to be sold, published and continuously updated by the European Commission
- SVHC – Substances of Very High Concern, also known as the REACH candidate list: (http://echa.europa.eu/web/guest/candidate-list-table)
- Sustainable Development Goals icons, United Nations/globalgoals.org
- REGULATION (EC) No 850/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2004
- Guidance on labelling and packaging in accordance with Regulation (EC) No 1272/2008
- ECHA - Persistence, bioaccumulation and toxicity assessment: https://echa.europa.eu/pbt
- Implementation and review of DIRECTIVE 2004/42/EC, final report, 10 Nov. 2009
- Cadmium in general and copper based paints, ECHA report, 19 Nov. 2012
- ISO 12944 an international standard on corrosion protection of steel structures by protective paint systems, 2018
- Blue Angel – the German eco label, basic award criteria, edition Feb. 2011
- Annex XVII to REACH on: Lead and its compounds in articles, ECHA, Entry 63 (paragraphs 7 to 10)
- The EU-GHS Hazard statements, REACH Compliance GmbH
- Stockholm Convention on Persistent Organic Pollutants (POPs) - Secretariat of the Stockholm Convention (SSC), May 2023.

*For all statutory lists and material information, the currently valid version at the time the building application is submitted must be referred to. For statutory provisions, the transitional periods for placing on the market and use apply in each case.

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APPENDIX 1 – Criteria matrix

#	CATEGORY	SCOPE (Components/products considered / Delimitation rules)	SUBSTANCES/ ASPECTS CONSIDERED	REFERENCE STANDARD	QUALITY LEVEL 1	QUALITY LEVEL 2	QUALITY LEVEL 3	QUALITY LEVEL 4	TYPE OF DOCUMENTATION	SCOPE OF APPLICATION AND VERIFICATION	NOTES REGARDING DEFINITIONS/ EXPLANATIONS/ FOOTNOTES
1	Coatings	**Decorative paints and glazes applied on site (interior and exterior):** coatings and primers on non-mineral substrates (metals, wood, plastics). **Excluding (not relevant):** - Effect coatings (e.g. metallic paints) and anti-corrosion coatings on non-load-bearing metal components (see line 19) - Parquet varnishes (see line 21)	VOCs/ Emissions or content	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 Emissions according to EN ISO 16000-9/ EN 16516	VOC < 300 g/l – (category D in accordance with Directive 2004/42/EC)	VOC < 130 g/l – (category D in accordance with Directive 2004/42/EC)	VOC < 100 g/l	For products intended for **indoor** use: Proof of low emission or products for **outdoor** use: VOC ≤ 100 g/l	Technical data sheet and/or SDS and/or manufacturer declaration and/or Documentation of emissions or reference product labels, see table 1	All relevant components and construction products	Please note: Coatings applied at the factory
2	Coatings	**Interior paints:** on predominantly mineral substrates in interior spaces, e.g. on wallpaper, fleece, plasterboard, floor coatings with no special resistance requirements, etc.: - Paints - Glazes - Primers **Excluding (not relevant):** floor areas with special resistance requirements (surface protection systems) and traffic routes such as underground garages	VOC/SVOC/ / Biocidal Products	VOC definition in accordance with Directive 2004/42/EC VOC/plasticiser content: ISO 11890-2 Biocidal product definition: VdL-RL01	water-borne (WB) products (In accordance with the Directive 2004/42/EC - Appendix II)	VOC < 30 g/l	- Solvent-free (≤ 1 g/l) and - plasticiser-free (≤ 1 g/l)	- Solvent-free (≤ 1 g/l) and - plasticiser-free (≤ 1 g/l) and - biocidal product free	Technical data sheet and/or SDS and/or manufacturer declaration and/or test certificate and/or reference product labels, see table 1	All relevant components and construction products. For > 5% of the GFA(S).	Notre: product labelled with H phrase: H317 or EUH208 must never be declared as "biocide-free/preservative-free"
3	Coatings	**Coatings applied on site (primer) on mineral substrates (interior):** - Dust-binding coatings - Base coatings such as concrete contact and flame-retardant coatings **Excluding (not relevant):** floor areas with special resistance requirements (surface protection systems) and traffic routes such as underground car parks, access roads and visible and decorative screeds.	VOCs	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 or ISO 17895	VOC < 30 g/l	VOC < 30 g/l	VOC < 10 g/l	VOC < 5 g/l	Technical data sheet and/or SDS and/or manufacturer declaration and/or test certificate	All relevant components and construction products. For > 5% of the GFA(S).	
5	Coatings	**Facade paints (exterior):** facade paints for predominantly mineral surfaces in exterior areas, such as concrete, masonry, mineral mortar and filler, plaster, ETICS, facade wallpaper, etc.	VOCs	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 or ISO 17895 Biocidal Products according 528/2012/EC	VOC < 40 g/l	VOC < 40 g/l	VOC < 40 g/l and biocidal products only in accordance with 528/2012/EC	VOC < 40 g/l and biocidal products only in accordance with 528/2012/EC	Technical data sheet and/or SDS and/or manufacturer declaration and/or test certificate	All relevant components and construction products	
6	Floor coverings	**Textile floor coverings**	VVOC/VOC/ hazardous substances	VOCs and SVHC from the REACH candidate list as well as Biocidal Products according 528/2012/EC	Proof of low emission and SVHC ≤ 0.1% and biocidal products only in accordance with 528/2012/EC or label for flooring	Proof of low emission and SVHC ≤ 0.1% and biocidal products only in accordance with 528/2012/EC or label for flooring	Proof of low emission and SVHC ≤ 0.1% and biocidal products only in accordance with 528/2012/EC or label for flooring	Proof of low emission and SVHC ≤ 0.1% and biocidal products only in accordance with 528/2012/EC or label for flooring	Reference product labels, see table 1 or Technical / safety data sheet, CE marking, Emission certificate or measurement according to ISO16000-28	All floor coverings	Emission certificate / label and SVHC ≤ 0.1% and CE marking for compliance to the biocidal products only in accordance with 528/2012/EC
7	Floor coverings	**Resilient floor coverings:** such as homogeneous or heterogeneous floor coverings made of PVC, linoleum, cork, rubber/caoutchouc, etc.	VVOC/VOC/ hazardous substances	REACH, SVHC / Chlorinated paraffins (incl. long chain CPs) Emissions according to EN ISO 16000-9/ EN 16516	Proof of reference emission	Proof of reference emission and ≤ 0.1% chlorinated paraffins (CPs)	Proof of reference emission and CPs ≤ 0.1% and SVHC ≤ 0.1%	Proof of low emission and CPs ≤ 0.1% and SVHC ≤ 0.1% or label for flooring	Technical / safety data sheet, and/or manufacturer declarations, Documentation of emissions or reference product labels, see table 1	All floor coverings	Documentation of emissions Chlorinated paraffins
8	Auxiliary materials for Installations // Adhesives, sealants, assembly foams	**Installation materials without special resistance requirements (interior):** the following installation materials under wall and floor coverings (e.g. tiles, carpets, parquet, elastic floor coverings): - Primers - Undercoats - Levelling compounds/levelling fillers/levelling compounds - Adhesives **Excluding (not relevant):** adhesives and primers for wallpaper and non-woven fabrics.	VVOC/VOC/ hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 °C Emissions according to EN ISO 16000-9/ EN 16516	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%)	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%) and Proof of low emission	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%) and Proof of very low emission	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%) and Proof of very low emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products	GISCODE D1, ZP1, CP1, CP2, CP3, RU 0,5, RU 1, RE05, RE10, RE20, RE30, RE90 or RS10

9	Auxiliary materials for Installations // Adhesives, sealants, assembly foams	**Installation materials with special resistance requirements (interior):** - Barrier coatings - Screed resins - Waterproofing under tiles	VVOC/VOC/ hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 °C Emissions according to EN ISO 16000-9/ EN 16516	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%)	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%)	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%) and Proof of low emission	Solvent free products (solvent content ≤ 0.5%) Exception: Epoxy resin products (solvent content ≤ 5%) and Proof of low emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products. For > 5% of the GFA(S)	GISCODE D1, ZP1, RE05, RE10, RE20, RE30 oder RE90, RU 0,5 or RU 1
11	Adhesives, sealants and assembly foams	**Sealants and adhesives (interior):** sealants and adhesives (acrylate sealants/ adhesives, silicone sealants, PU adhesives and silane-modified polymers (SMP)) for point and line bonding of components in interior spaces for: - Mechanically stressed joints - Skirting boards - Door rails - Double or hollow floors (support adhesives) - Ventilation duct joints **Excluding (not relevant):** glass construction, facades and fire protection.	VVOC/ VOC / hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 ° Emissions according to EN ISO 16000-9/ EN 16516	Solvent content ≤ 1%	Solvent content ≤ 1%	Solvent content ≤ 1% and Proof of low emission	Solvent content ≤ 1% and Proof of very low emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products	GISCODE PU10, PU20, RS10, DA20, DSE20, DSA20, DSO20, DH20 or DSC20
13	Adhesives, sealants and assembly foams	**Adhesives and sealants on the façade for creating airtightness (building envelope):** adhesives (e.g. PU, PU hybrid, MS polymer, SMP, acrylate, silicone) for creating airtightness in: - External windows - External doors - Bonding of airtightness films (except for self-adhesive films).	CPs / VOCs	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 or ISO 17895 Chlorinated paraffins (incl. long chain CPs)/ Solvent: Boiling point (b.p.) ≤ 250 ° Emissions according to EN ISO16000-9/ EN 16516			- CPs < 0,1 % and Proof of low emission or - VOC < 1 %	- CPs < 0,1 % and Proof of very low emission or - VOC < 1 %	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products	Chlorinated paraffins
14	Concrete release agents	**Mould oils and release agents for concreting**	VOCs	Solvent: Boiling point (b.p.) ≤ 250 °	Solvent free products (Solvent content ≤ 5%)	Solvent free products (Solvent content ≤ 3%)	Solvent free products (Solvent content ≤ 1%) Inherently Biodegradable products (degradation 20-60% under 28 days)	Solvent free products (Solvent content ≤ 1%) Readily Biodegradable products (degradation 60-100% under 28 days) e.g. vegetable oil-based fluids	Technical data sheet and/or SDS and/or manufacturer declaration	All relevant components and construction products	
15	Fire protection coatings	**Fire protection coatings applied on site (interior):** - Load-bearing metal components > 50 m² of coated surface - Fire protection upgrades to adjacent areas in the connection area of load-bearing metal components > 5 m² of coated surface - Electrical cables, cable ducts and ventilation ducts in the area of fire bulkheads > 5 m² of coated surface - Exposed wooden surfaces in solid wood construction, if fire protection is not dimensioned for combustion > 50 m² of coated surface	VOCs, emissions, and halogens	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 Emissions according to EN ISO 16000-9/ EN 16516	VOC < 50 g/l	VOC < 25 g/l and no halogenated flame retardants	Proof of reference emission and VOC < 25 g/l and no halogenated flame retardants	Proof of reference emission and VOC < 5 g/l and no halogenated flame retardants	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1		
19	Coatings	**Corrosion protection and effect coatings applied on site for non-load-bearing metal components (interior):** for > 10 m² of coated component surface area e.g.: - Metal stair railings and metal stringers - Metal frames - Metal substructures - Heat and cold transfer surfaces/pipes - Steel doors	VOC	VOC definition in accordance with Directive 2004/42/EC VOC content: ISO 11890-2 Emissions according to EN ISO 16000-9/ EN 16516	VOC < 300 g/l or Proof of reference emission	VOC < 300 g/l or Proof of reference emission	VOC < 140 g/l (Exception: For metallic effect paints VOC < 300 g/l) or Proof of reference emission	VOC < 140 g/l or Proof of reference emission	Technical data sheet and/or SDS or emission certificate or Reference product labels, see table 1	construction site for >10 m² coated area	
20	Coatings	**Polyurethane (PU) - Reaction resins (interior):** reactive polyurethane products for coating mineral surfaces in interior spaces without special requirements - floor, ceiling and wall surfaces – including in system structures **Excluding (not relevant):** special surface protection systems for car parks, etc. (see line 24).	VVOC/VOC, hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 ° Emissions according to EN ISO 16000-9/ EN 16516	Solvent free PU products	Solvent free PU products	Solvent free PU products and Proof of reference emission	Solvent free PU products and Proof of reference emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products. For > 5% of the GFA(S)	GISCODE PU10 Documentation of emissions as an individual product or in the system AgBB test certificate
21	Coatings	**Coatings wooden surfaces (interior):** for > 10 m² of coated surface area on: - Parquet and other wooden floors - Wooden stairs - Panelling	VVOC/VOC hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 ° Emissions according to EN ISO 16000-9/ EN 16516	Water-borne, oil or wax wood floor coating, solvent content: ≤ 15%	Water-borne, oil or wax wood floor coating, solvent content: ≤ 15%	Water-borne, oil or wax wood floor coating, solvent content: ≤ 5% and Proof of low emission	Water-borne, oil or wax wood floor coating, solvent content: ≤ 5% and Proof of very low emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products	

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22	Sealings // Coatings	**Polymethyl methacrylate (PMMA) - Reaction resins (interior and exterior):** PMMA and PMMA/epoxy resin coatings and liquid plastics for floor and wall surfaces (e.g. plinths) with special requirements for > 10 m² of coated component surface area in: - Industrial floors - Parking areas and underground car parks - Waterproofing in kitchens. - Waterproofing of rising components - Waterproofing of penetrations in the building envelope **Excluding (not relevant):** markings in underground car parks and on parking areas.	VOC	Solvent: Boiling point (b.p.) ≤ 250 °			Solvent free products (solvent content ≤ 0.5%)	Solvent free products (solvent content ≤ 0.5%)	Technical data sheet and/or SDS and/or manufacturer declaration	All relevant components and construction products	
23	Coatings	**Epoxy resin (EP) – Reaction resins (interior, without special protection systems):** Reactive epoxy resin products for coating mineral surfaces without special requirements – also in system structures. **Excluding (not relevant):** surface protection systems for multi-storey car parks, etc. (see line 24).	VOC, hazardous substances	Solvent: Boiling point (b.p.) ≤ 250 ° CLP Regulation (1272/2008/EC) Emissions according to EN ISO16000-9/ EN 16516	EP products, solvent content: ≤5%	EP products, solvent content: ≤5%	EP products, solvent content: ≤5% and Proof of reference emission	EP products, solvent content: ≤5% and Proof of reference emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products For > 5% of the GFA(S)	Documentation of emissions as an individual product or in the system AgBB test certificate
24	Coatings	**Special protection systems based on epoxy resin (EP) or polyurethane (PU) (interior):** The following surface protection systems such as protection systems 8, 10, 11, etc.: - EP and/or PU primers (also under mastic asphalt screed) - EP and/or PU coatings for floor and wall surfaces (e.g. plinths) with special requirements, e.g. industrial floors, parking areas and underground car parks **Excluding (not relevant):** markings in underground car parks and on parking areas.	Solvents	Solvent: Boiling point (b.p.) ≤ 250 °	EP/PU products, solvent content ≤5%	EP/PU products, solvent content: ≤5%	EP/PU products, solvent content: ≤5%	EP/PU products, solvent content: ≤5%	Technical data sheet and/or SDS and/or manufacturer declaration	All relevant components and construction products	GISCODE PU10
25	Sealings	**Cold-applied bitumen products (exterior):** The following cold-applied bitumen products: - Coatings (e.g. primers, thick bitumen coatings) for roof waterproofing and building waterproofing against soil - Auxiliary materials for covering (e.g. adhesives, sealants) for installing insulation materials **Excluding (not relevant):** bituminous composite waterproofing for inverted roofs.	Bitumen / Tar	Solvent: Boiling point ≤ 250 °C	Bitumen products, solvent content: ≤ 25%	Bitumen products, solvent content: ≤ 25%	Bitumen emulsions, organic solvents: ≤ 3%	Bitumen emulsions, organic solvents: ≤ 3%	Technical data sheet and/or SDS and/or manufacturer declaration and/or test certificate	All relevant components and construction products	
29	Biocides	**External load-bearing timber components (use classes 3 and 4*):** chemical wood preservative for external load-bearing timber components in service classes 3-4 in accordance with DIN 68800-3.	Wood preservative (product type 8 in accordance with 528/2012/EC)	528/2012/EC (Biocide regulation)	Use Class* 2–4: biocidal products in accordance with 528/2012/EC	Use Class* 2: Wood protection only constructively in accordance with national “Building inspection approval” Use Class* 3 and 4: biocidal products in accordance with 528/2012/EC	Use Class* 2: Wood protection only constructively in accordance with national “Building inspection approval” Use Class* 3 and 4: biocidal products in accordance with 528/2012/EC	Wood protection only constructively in accordance with national “Build-ing inspection ap-proval” or natural durability in accord-ance to DIN 68800-1	Planning and/or technical data sheet and/or SDS and/or manufacturer declaration and/or test certificate CE-Marking	All relevant components and construction products	Wood preservative in accordance with 68800-2 or natural durability
30a	Biocides	**Chemical impregnation of non-structural wooden components (exterior):** wooden doors and windows	Wood preservative (product type 8 in accordance with 528/2012/EC)	528/2012/EC (Biocide regulation)	biocidal products in accordance with 528/2012/EC	biocidal products in accordance with 528/2012/EC	biocidal products in accordance with 528/2012/EC	biocidal products in accordance with 528/2012/EC	Technical data sheet and/or SDS and/or manufacturer declaration, CE-Marking	All relevant components	
30b	Biocides	**Wood protection, non-load-bearing/non-dimensionally stable (exterior):** chemical wood protection for non-load-bearing, non-dimensionally stable wooden components in: - Facades covering > 5% of the building envelope area - Terraces covering > 5% of the gross floor area - Substructures for parapets and skylights covering > 5% of the gross floor area	Wood preservative (product type 8 in accordance with 528/2012/EC)	528/2012/EC (Biocide regulation)	only with marketable biocidal products in accordance with 528/2012/EC	only with marketable biocidal products in accordance with 528/2012/EC	only with marketable biocidal products in accordance with 528/2012/EC	Wood protection only constructively in accordance with national “Build-ing inspection approval” or natural durability in accordance to DIN 68800-1	Technical data sheet and/or SDS and/or manufacturer declaration, CE-Marking	External: All relevant components and construction products. For > 5% of the GFA(S)	
31	Coatings // Biocides	**UV-protected wood coatings (interior):** Film-preserved wood glazes and varnishes.	Biocides (product type 7 and 9 in accordance with 528/2012/EC: Preservatives for construction materials) e.g. algicides, fungicides, moth repellents	528/2012/EC (Biocide regulation)	Internal: No chemical wood preservative Exception: Can preservation and/or Windows only with marketable biocidal products in accordance with 528/2012/EC	Internal: No chemical wood preservative Exception: Can preservation and/or Windows only with marketable biocidal products in accordance with 528/2012/EC	Internal: No chemical wood preservative Exception: Can preservation and/or Windows only with marketable biocidal products in accordance with 528/2012/EC	Internal: No chemical wood preservative Exception: Can preservation and/or Windows only with marketable biocidal products in accordance with 528/2012/EC	Manufacturer declaration CE-Marking	All relevant components and construction products	Approved substance in accordance with 528/2012/EC Biocidal Products Directive
33	Coatings	**Primers and final coatings (interior and exterior):** Coatings, e.g. paints, lacquers, powder coatings for metal components: - Façade elements - Doors / Windows / Frames - Radiators / Heating/cooling ceilings. **Excluding (not relevant):**	Lead, cadmium and chromium (VI)		No use of lead, cadmium and chromium (VI) compounds	No use of lead, cadmium and chromium (VI) compounds	No use of lead, cadmium and chromium (VI) compounds	No use of lead, cadmium and chromium (VI) compounds	Technical data sheet and/or SDS and/or manufacturer declaration	Components with coating applied at the factory with a coated area > 100 m² per component type (e.g. steel door) in the building	

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		Hot-dip galvanising is not considered to be a coating for the purposes of this criterion.									
37	Refrigerants	**Refrigerants used in building systems:** Building HVAC systems like cooling systems, heat pumps, split systems etc.	Halogenated refrigerants	Regulation (EU) 2024/573	Additional evaluation point: Does not contain halogenated/ partially halogenated refriger-ants	Additional evaluation point: Does not contain halogenated/ partially halogenated refrigerants	Additional evaluation point: Does not contain halogenated/ partially halogenated refrigerants	Additional evaluation point: Does not contain halogenated/ partially halogenated refriger-ants	Building technology planning and/or manufacturer declaration	All relevant components and construction products	
38	Adhesives, sealants and assembly foams // Fire protection	**Assembly foams (interior and building envelope):** On-site and assembly foams in the following applica-tions: - Installation of exterior doors - Installation of exterior windows - Bonding of perimeter insulation - Bonding of basement ceiling insulation - Bonding of flat roof insulation - Indoor use in an insulating function - For installation in interior construction, e.g. door frames **Excluding (not relevant):** - Bonding of insulation materials in ETICS (see line 39) - Installation foams that must meet the requirements for 'flame retardancy' classes B and C (EN 13501-1)	Halogenated and other propellants, solvents, plasti-cisers and flame retardants,	REACH, SVHC / VOC Emissions according to EN ISO 16000-9/ EN 16516	Proof of low emission and - no use of halogenated propellants, chlorinated paraffins and TCEP	Proof of low emission and - no use of halogenated propellants, chlorinated paraffins and TCEP	Proof of low emission and - no use of halogenated propellants, chlorinated paraffins, and TCEP And halogenated flame retardants <0,1%	Proof of very low emission and - no use of halogenated propellants, chlorinated paraffins, TCEP, plasticisers and halogenated flame retardants <0,1%	EMICODE EC1 or Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All relevant components and construction products	Propellants REACH candidate list
39	Adhesives, sealants and assembly foams	**Assembly foams for attaching ETICS (exterior)** perimeter insulation, cellar ceiling insulation and flat roof insulation	Halogenated and other propellants	REACH, SVHC	No use of assembly foams Exception: Assembly foams without halogenated agents may only be used in the joints of ETICS insulation boards	No use of assembly foams Exception: Assembly foams without halogenated agents may only be used in the joints of ETICS insulation boards	No use of assembly foams Exception: Assembly foams without halogenated agents may only be used in the joints of ETICS insulation boards	No use of assembly foams Exception: Assembly foams without halogenated agents may only be used in the joints of ETICS insulation boards	Documentation of the mineral adhesive, joint foam with no halogenated propellants (technical data sheet and/or SDS)	All relevant components and construction products	
40	Installation materials	**Synthetic insulating boards for buildings (interior and exterior):** PUR, PIR/XPS/EPS Melamine resin foam, on walls, ceilings, floors (screed), and roofs in interior applications and XPS and phenolic resin foam insulation boards (resol board) on the building envelope) **Excluding (not relevant):** Insulation for building services	Halogenated Propellants/emis-sions/SVHC	POP/REACH Emissions according to EN ISO 16000-9/ EN 16516	for XPS, PU and Resol boards: No use of halogen-ated propellants	for XPS, PU and Resol boards: No use of halogen-ated propellants	for XPS, PU and Resol boards: No use of halogen-ated propellants and for PU (PUR and PIR boards): TCEP ≤ 0.1% and Proof of reference emission	for XPS, PU and Resol boards: No use of halogen-ated propellants and for PU (PUR and PIR boards): TCEP ≤ 0.1% and Proof of reference emission	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1	All components and con-struction products rele-vant for the building ther-mal envelope and the main parts of the build-ing technical installations	AgBB test certificate
40b	Installation materials	**Insulating boards and mats made of artificial mineral fibres (AMF) (interior):** All insulation materials made of AMF for interior use **Excluding (not relevant):** Insulation for building services	VOC, hazardous sub-stances	REGULATION (EC) No 1272/2008 Emissions according to EN ISO 16000-9/ EN 16516	No use of Artificial mineral fi-bers ≤ 3 µm and length-to-diameter ratio greater than 3:1	No use of Artificial mineral fi-bers ≤ 3 µm and length-to-diameter ratio greater than 3:1	No use of Artificial mineral fi-bers ≤ 3 µm and length-to-diameter ratio greater than 3:1 and Proof of reference emission	No use of Artificial mineral fi-bers ≤ 3 µm and length-to-diameter ratio greater than 3:1 and Proof of low emission Or Label for insulation	Technical data sheet and/or SDS and/or manufacturer declaration and emission certificate or Reference product labels, see table 1		
43b	Fire protection	**Construction products equipped with flame retardant (interior):** the following flame-retardant construction products: - Non-expanding assembly adhesives - Fire protection foams - Fire protection bricks and fire protection cushions - Fire protection fillers - Fire protection fabrics - Fire protection silicones - synthetic foam insulation materials for building services (water pipes, heating pipes, cooling pipes and ventilation ducts) without sleeves and clamps	Chlorinated paraf-fins (cf. defini-tion), polybromin-ated biphenyls (PBB) and diphenyl ethers (PBDE) and SVHC	Stockholm POP Conven-tion and SVHC from the REACH candidate list as well as long-chain chlorin-ated paraffins			CPs < 0.1% PBB < 0.1%, PBDE < 0.1%, and SVHC ≤ 0.1% Exemption: For construction material class B1(EN 13501-1), insulating materials with long-chain CP (LCCP) are tolerated	CPs ≤ 0.1% PBB < 0.1%, PBDE < 0.1%, and SVHC ≤ 0.1%	Technical data sheet and/or manufacturer declaration "No chlorinated paraffins, no polybrominated biphenyls, no polybrominated biphenyl ethers and no SVHC> 0.1%"	All relevant components and construction products	Chlorinated paraffins POP Regulation REACH candidate list
44	Products made of PVC	**Building products made of PVC (interior and building envelope):** Wall and ceiling coverings, skylights, windows and doors plastic profiles, electrical cables, Plastic films **Excluding (not relevant):** PVC floor coverings (see line #7)	SVHC phthalates (plasticisers) / hazardous sub-stances	SVHC in the REACH can-didate list (all); partially included in REACH Annex XIV			SVHC ≤ 0.1%	SVHC ≤ 0.1%	Technical data sheet and/or manufacturer declaration "No SVHC > 0.1%"	All relevant components and construction products	REACH candidate list
45	Insulation materials made from for build-ings (excluding build-ing services)	**Insulating materials made of renewable materials (in-terior):** wood fibres, wood wool and cellulose for insulating - walls, - ceilings, - floors and roofs **Excluding (not relevant):** Insulation for building services	Boron com-pounds as recipe components	SVHC in the REACH can-didate list (all); partially included in REACH Annex XIV Emissions according to EN ISO 16000-9/ EN 16516			Boron compounds ≤ 0.1% and Proof of reference emission	Boron compounds ≤ 0.1% and Proof of reference emission	Technical data sheet and/or manufacturer declaration "No boron compounds > 0.1%" and emission certificate or Reference product labels, see table 1	All relevant components and construction products	

46	Adhesives, sealants and assembly foams	**PU system adhesives used on site (interior):** Structural PU adhesives for: - Dry screeds - Hollow floors - Drywall panels	VVOC/VOC Solvents	REACH Emissions according to EN ISO 16000-9/ EN 16516		Solvent-free (solvent content ≤ 0.5%) or Proof of reference emission	Solvent-free (solvent content ≤ 0.5%) or Proof of reference emission	Solvent-free (solvent content ≤ 0.5%) or Proof of reference emission	Technical data sheet and SDS or emission certificate or Reference product labels, see table 1	All relevant components and construction products	
47c	Floor coverings	**Parquet, laminate flooring, MMF and WPC floor coverings (interior):** - Multi-layer parquet - Laminate flooring - Veneered floor coverings - MMF flooring - WPC floor coverings	VVOC/VOC, hazardous substances	Emissions according to EN ISO 16000-9/ EN 16516	Proof of reference emission	Proof of reference emission	Proof of reference emission	Proof of reference emission and additionally, for MMF floors without the use of PVC as a constituent component	Emission certificate or Reference product labels, see table 1	All relevant components and construction products	
47d	Wood-based materials	**Products made from wood-based materials (interior):** - Ceiling cladding - Wall cladding (panels) - Interior doors - Room-in-room systems - Structural wood-based panels for double and hollow floors - Toilet partitions **Excluding (not relevant):** wood-based floor coverings (see line #47c).	VVOC/VOC	Emissions according to EN ISO 16000-9/ EN 16516	Proof of reference emission	Proof of reference emission	Proof of reference emission	Proof of reference emission	Emission certificate **or** Reference product labels, see table 1	All relevant components and construction products	
48	Wood-based materials	**Wood-based panels (interior):** chipboard, veneer panels, fibreboard in structural timber construction	Formaldehyde	emission values according to EN 16516 or EN 717-1(with a factor of 2) or ISO16000-3			Formaldehyde ≤ 0.10 ppm (corresponds to 0.120 mg / m³)	Formaldehyde ≤ 0.06 ppm (corresponds to 0.072 mg / m³)	Emission certificate or Reference product labels, see table 1	All relevant components and construction products	

Note: the blue colored rows are referring to Regulation (EU) 2020/852 (EU Taxonomy) on Pollution prevention and control - Do no significant harm ('DNSH') criterion: "Building components and materials used in the construction that may come into contact with occupiers emit less than 0,06 mg of formaldehyde per m³ of material or component upon testing in accordance with the conditions specified in Annex XVII to Regulation (EC) No 1907/2006 and less than 0,001 mg of other categories 1A and 1B carcinogenic volatile organic compounds per m³ of material or component, upon testing in accordance with CEN/EN 16516 or ISO 16000-3:2011 or other equivalent standardized test conditions and determination methods.

* Use Classes:

0. Internally installed wood, constantly dry, approach not possible due to wood-damaging insects or wood cross-section controllable (at least visible on three sides)
1. Internally installed wood, constantly dry, approach possible by insects that damage wood;
2. Timber that is not exposed to earth contact or direct weathering or leaching, temporary humidification possible
3. Wood not under roof, but without constant earth and / or water contact, accumulation of water in the wood - even spatially limited - to be expected
4. Wood exposed to continuous earth contact or constant humidification

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Various Eco- and environmental labels concentrate on the emission of volatile organic compounds (VOCs) together with the restrictions or bans imposed on certain hazardous substances e.g. carcinogenic VOCs as defined in EU Taxonomy regulation (Regulation (EU) 2020/852). The table below compares the VOC limit values and other evaluation parameters, in the absence of specific threshold requirements, the following labels or certifications may be considered sufficient.

Table 1: Numerical Thresholds Established by Selected Environmental Labels and Certificates

Certificates / Labels	TVOC µg/m³	Formaldehyde µg/m³	Carcinogens (EU Kat. 1A & 1B) µg/m³	Very low emission ≤ 60 µg/m³	Low emission ≤ 300 µg/m³	Reference emission ≤ 1000 µg/m³	EU Taxonomy Conformity (emissions)
EMICODE EC1 Plus	60	10	1	•	•	•	•
EMICODE EC1	100	10	1		•	•	•
EMICODE EC2	300	10	1		•	•	•
Blue Angel RAL UZ 12a	300	20	1		•	•	•
Blue Angel RAL UZ 113	60	60	1	•	•	•	•
Blue Angel RAL UZ 120 (floorings)	300	60	1		•	•	•
Blue Angel RAL UZ 123	300	60	1		•	•	•
Blue Angel RAL UZ 128 (floorings)	100	25	1		•	•	•
Blue Angel RAL UZ 132 (insulation)	100	60	1		•	•	•
Blue Angel RAL-UZ 176 (floorings)	300	60	1		•	•	•
GUT (floorings)	100	4	1		•	•	•
Finland M1 — general	200	50	1 µg/m²h		•	•	With extra conformity
Finland M1 — Sealants	20	10	1	•	•	•	•
Indoor Air Comfort GOLD	60	10	1	•	•	•	•
Indoor Air Comfort	1000	60	1			•	•
eco-INSTITUT-Label (coatings)	300	24	1		•	•	•
eco-INSTITUT-Label (floorings)	300	36	1		•	•	•
France: Class A+	1000	10	1 (4 C compounds according to 2 Franch decrees)			•	With extra conformity
Belgium	1000	100	1			•	•
Note: For all the above-mentioned test certificates / labels the testing results after 28 days. detailed assessment, it is necessary to take the respective testing conditions into account							
Furthermore, the DGNB recognized labels: https://www.dgnb.de/en/certification/path-to-dgnb-certification/dgnb-recognised-product-labels							
EU Taxonomy Compass: https://ec.europa.eu/sustainable-finance-taxonomy/taxonomy-compass							

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Explanations and information regarding APPENDIX 1 (criteria matrix):

Legally valid proof (see General information: 1): Legally valid proof is considered to include a document signed ppa. or a clear statement in the manufacturer declaration that this was legally issued by a person with knowledge of the recipe.

Chlorinated paraffins:
The term "chlorinated paraffins" refers to substance mixtures that contain chlorinated alkanes with a chain lengths of 10-30 carbon atoms and a chlorination degree of 10% to 70% by mass (= SCCP (short-chain CP), MCCP (medium-chain CP) and LCCP (long-chain CP)).

POP Regulation and REACH candidate list:
Both the POP Regulation and the REACH candidate list currently regulate short-chain chlorinated paraffins. As a precaution, however, medium-chain and long-chain chlorinated paraffins are also relevant for consideration.

Approved substance in accordance with 528/2012/EC:
For products manufactured in the EU, it can be assumed that this requirement has been complied with due to the statutory regulations in place (no additional documentation is required here apart of prove of EU manufacturing or CE Maring).

Biocidal Products Directive:
More information regarding the substances permitted within the Biocidal Products Directive can be found at:
http://www.reach-clp-biozid-helpdesk.de/de/Biozide/Wirkstoffe/Genehmigte-Wirkstoffe/Genehmigte-Wirkstoffe.html

Documentation of emissions:
Certification (no more than 5 years old) by a laboratory accredited in accordance with ISO 17025 that the product or system complies with the AgBB criteria (except for sensory characteristics) on the basis of emissions testing in accordance with ISO 16000-9, prEN 16516 or EN 16402.

Hydrocarbon plasticiser (HC):
Hydrocarbon plasticisers are aliphatic hydrocarbons within a boiling point range of 200–400 degrees Celsius.

Note – coatings applied at the factory:
The VOC requirements in row 1 in the highest quality level (QL) can be fulfilled in the factory with coating materials of QL3 (<100 g VOC/l).

Note – use of recycled materials:
For products made from recycled plastics, proof that they do not contain organolead, organocadmium or organostannic compounds must be provided via a manufacturer declaration.

Information, explanations and footnotes for "Focus of impact of the substances/aspects considered over the individual stages in the life of a building":

- * "Halogenated refrigerants or propellants" in rows 37, 38 and 39:

  Prevention of halogenated refrigerants or propellants, unless it has been proven that they and their degradation products do not accumulate in the environment or have persistent degradation products that can pollute (accumulate in) natural basins or have harmful effects there.

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APPENDIX 2

(Example table in Excel format)

Criterion ENV1.2 - Local environmental impact

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Project number:
Project name:
Auditor:

						Requirements		Submitted data sheets						
Building Component	Optional: Nr.	Product description and / or product type and / or function with, if necessary, (layer) assignment in the component	Product name	Manufacturer	Mounting place	Requirement according to criterion (the line number according to criteria matrix)	Achieved quality level DGNB	Proven attributes according to data sheets	Technical Data Sheet	Safety Data Sheet	Manufacturer' declaration /	Link / Reference to submitted data sheets	If required: remark / strike criterion / techn. Exception	If necessary: area shares / mass shares (plausible information actual building)
Example: Flooring	1	elastic floor covering	Linoleum Marboleum	Forbo	Ceiling covering 1st floor	7	4	SVHC ≤ 0.1%	x					
Example: Flooring	2	Adhesive for bonding (1)	L249DD	Thomsit	Ceiling covering 1st floor	8	4	VOC < 0.5%	x	x	x			250
Example: Flooring	3	Dust-binding primer on screed	R766	Thomsit	Ceiling covering 1st floor	8	4	EMICODE EC-1 plus	x	x	x			250
Example: Flooring	4	Screed cracking resin			Ceiling covering 1st floor	9	4	EMICODE EC-1 plus	x	x				

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APPENDIX 3

Example letter "Confirmation by manufacturing companies"

"Dear Sir or Madam,

For the project:
The following coating materials/coating systems are planned to be used:

NO.	PRODUCT	DFT µM	VOC G/L	VOC MASS%	VOC G/M²
1					
2					
3					
Total					

Please supplement the VOC data in the units g/l, mass% and g/m² of coated surface with the specified dry film thickness (DFT) on the basis of the theoretical yield.

Thank you, and
kind regards

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APPENDIX 4

Example letter "SVHC enquiry"

Regulation (EC) No. 1907/2006 (REACH Regulation), obligation to provide information in accordance with Art. 33

Dear Sir or Madam,

The European Chemicals Agency (ECHA) has published a list of substances of very high concern that meet the criteria of Art. 57 of the REACH Regulation mentioned above and that have been determined in accordance with the process described in Art. 59 of the regulation on its website (http://echa.europa.eu/chem_data/candidate_list_table_en.asp).

I request that you inform me/us, with reference to Art. 33(2) of the regulation mentioned above, of whether the product "XXXX" sold by you contains any of these substances of very high concern in proportions of more than 0.1%, and that you provide me/us with the information required for safe use of the product "XXXX".

In accordance with Art. 33 of the regulation mentioned above, you, as a supplier of "XXXX", are obliged to provide me, as a user, with this information within 45 days.

Thank you, and
kind regards

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APPENDIX 5

Dealing with incorrect use (during material inspections on the construction site)

If, as part of these construction site inspections, it is determined that individual materials have been installed that are not in conformity with the intended quality level 3 or 4, their use must be prohibited in writing by the construction managers/-property monitoring specialists. This notification of defects specifies the material, the affected component, the work that has been carried out, the reason for deviation and the areas constructed using the material that is not in conformity. These deviations must be documented as follows in order to ensure that they do not prevent the achievement of objectives in accordance with quality level 3 or 4:

- Specification of the suitable material approved for use prior to commencement of the work in question (approval list with date),
- Written notification of defects by the construction managers/property monitoring specialists and notification that the work is free from defects by the company responsible for carrying out construction,
- Specification of the area where work was carried out using the material that is not in conformity; here, it must be proven that this amounts to < 5% of the area of the component (example: Flat roof as a warm roof, incorrect use of undercoat, area < 5% of the warm roof area) for which the material type in question is intended in the trade involved in carrying out the work (proof via building elements catalogue),
- The building owner is not subject to any penalties arising from harmful substances that permanently remain within the material such as heavy metals, plasticisers or solvents that form deposits on absorbent substrates (solvent seal on parquet) – proof via technical data and safety data sheet or SVHC documentation or manufacturer declaration, e.g. plasticisers
- The incorrect use does not prevent the achievement of objectives intended for the project in accordance with SOC1.2 indicator 1, Indoor air quality (degassing behaviour, ventilation programme for compensation, etc.)
- Logs of properly executed and regular material inspections (see above) on the construction site (cf. PRO2.1) are presented
- Construction managers/property monitoring specialists or, alternatively, the company responsible for carrying out construction provide legally valid confirmation (ppa.) that – with the exception of the single instance of incorrect use – work has been carried out exclusively with approved materials in accordance with the target quality level of this criterion

Please note: The DGNB expressly states that the DGNB documentation must correspond to the building constructed. Any discrepancies between the technical documentation and the DGNB documentation with regards to the materials used may therefore result in pecuniary losses, even for future owners of the buildings years later. As such, the constructions are tested for harmful substances, e.g. for DGNB inventory certification or as part of DD reviews, in order to prevent pecuniary losses as a result of refurbishment costs.

It is therefore recommended that the construction managers/property monitoring specialists obtain legally valid confirmation of the exclusive use of approved materials by the companies responsible for carrying out construction (e.g. via signature of the approval list).

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ENV1.3

Responsible resource extraction

Objective

Our goal is to reduce the use of primary materials in the construction process whenever possible and to address human rights and environmental protection aspects in global supply chains for raw material extraction. Taking responsibility for this means that companies identify potential risks with suppliers and prioritise the use of products in the building and its outdoor facilities, which are optimised in terms of their environmental and social impacts across the entire value chain and whose raw material extraction and processing meet recognised environmental and social standards.

Benefits

Improved transparency helps to make those involved in the value chain aware of the responsible extraction of resources, and to further expand and share expertise about sustainable and socio-ecologically acceptable raw material extraction in order to address environmental and social grievances.

Contribution to overarching sustainability goals



Outlook

The evaluation is designed to allow the DGNB to expand the scope of consideration even further and to enable the evaluation of the quality levels to adapt to developments in the industry.

Share of total score

	SHARE	WEIGHTING FACTOR
Office Education Department stores Assembly buildings Healthcare buildings	1.9%	2
Residential Hotel Consumer market Shopping centre	1.8%	2
Logistics Production	1.7%	2

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EVALUATION

If responsible use of resources is addressed during the design and implementation phases, up to 10 points can be awarded in Indicators 1 and 2. The use of products made from responsibly sourced raw materials and/or significant incorporation of secondary raw materials – utilised in building structures, technical installations, or outdoor facilities – is regarded positively. The greater the proportion of raw materials in the building that are responsibly sourced or replaced with secondary materials, the higher the score on this indicator. In this criterion, a maximum of 100 points can be awarded based on one or more indicators.

NO.	INDICATOR	POINTS
1	**Responsible use of resources in the planning process**	**Max. 5**
1.1	**Responsible selection of construction materials**	**5**
	For sustainable resource planning and material selection, at least the following three aspects have been considered and form part of the planning process: ■ Measures are taken to minimise the use of primary raw materials in the construction through the use of secondary raw materials (reused or recycled). ■ Avoidance of resources and materials is also considered. ■ Availability of local resources and materials is considered and integrated into the design process	5
2	**Responsible use of resources in implementation and documentation**	**Max. 5**
2.1	**Documentation of construction materials during the construction stages (BoQ)**	**5**
	During construction, the use of new and/or secondary materials is explicitly addressed, controlled and documented. For this purpose, a building component catalogue / bill of quantities (or comparable data compilation from BIM) is compiled and handed over to the building owner in digital form. This includes documentation of the material type, quantities, qualities, origin of the products (plus further information, e.g. installation location, if required), components and building systems.	5
3	**Responsible resource management and assessment (as built)**	**Max. 100**
3.1	**Corporate responsibility for resource management (quality level 1)**	**Max. 10**
	Products that meet the requirements of quality level 1 are permanently installed in the building or associated outside areas and are not allocated to Indicator 3.2	
	■ For each product, from different manufacturers or different products from the same manufacturer.	+2
3.2	**Use of responsibly sourced primary or secondary raw materials in the building**	**Max. 100**
	The first three heaviest material categories: The three heaviest material categories used in building construction, measured by mass in kilogrammes, meet the target total amounts of certified primary raw materials and/**or** secondary raw materials (reused or recycled) (see method).	
	■ Heaviest material category, from 0% to material specific target	+ 0–50
	■ Second heaviest material category, from 0% to material specific target	+ 0–50
	■ Third heaviest material category, from 0% to material specific target	+ 0–50
	All other material categories (except the three heaviest material categories): For each material category used in a building construction, measured by mass in kilogrammes, the target total amounts of certified primary raw material used and/or secondary raw materials (reused or recycled) are met (see method).	

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■ Fourth heaviest material category, from 0% to material specific target	+ 0–20
■ Fifth heaviest material category, from 0% to material specific target	+ 0–20
■ Sixth heaviest material category, from 0% to material specific target	+ 0–20
■ Seventh heaviest material category, from 0% to material specific target	+ 0–20

Note: points to be interpolated based on the mass ratios and the quality levels of the labels – see method.

to 3 INNOVATION AREA

If sustainably extracted raw materials or secondary raw materials cannot be mapped according to the criterion 3.2 and there is a proof that all defined requirements have been achieved, these can alternatively be credited in accordance with the evaluation logic of Indicator 3 in consultation with the DGNB.

such as 3

SUSTAINABILITY REPORTING

The following information can be used as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Supply chain corporate obligations observed by companies with more than 100 employees involved in planning and construction	[Yes/No]
KPI 2	Number of permanently installed products with evidence of compliance with quality level 1 (corporate responsibility for resource management)	[Number]
KPI 3	Mass share of certified primary products permanently installed in the building	[mass %]
KPI 4	Mass share of certified or non-certified (with declaration) secondary products permanently installed in the building	[mass %]
KPI 5	Mass share of bio-based materials e.g. woods, wood products, wood-based materials in the total mass of all installed woods, wood products and/or materials	[mass %]
KPI 6	Mass share of concrete, natural or agglomerated stone	[mass %]
KPI 7	Mass share of the combined total of brick, tile, ceramic	[mass %]
KPI 8	Mass share of the combined total of glass, mineral insulation	[mass %]
KPI 9	Mass share of non-biobased plastic	[mass %]
KPI 10	Mass share of metals	[mass %]
KPI 11	Mass share of gypsum	[mass %]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Defining different quality levels is intended to raise market awareness and promote the implementation of sustainable raw material management. The accompanying required documentation along the value creation process contributes to increased transparency. This enables the identification of measures to improve ecological and social standards, forming a basis for improving resource efficiency.

The aim is to promote transparency and the traceability of the origin, cultivation and harvesting or mining conditions of raw and secondary raw materials, as well as their further processing along the value chain, by establishing binding standards and to assist consumers with the decision-making process.

II. Additional explanation

Standards support the communication of "invisible attributes" of raw materials and provide clear guideline for companies involved in resource extraction. These "invisible attributes" can include, for example, social or environmental impacts that are not discernible in the building material itself, such as compliance with human rights during raw material extraction or risks to groundwater from chemicals used during extraction. Standards can credibly convey complex information about the building material to the foreman/end user and provide reassurance. They also help harmonise and enforce clear regulations and requirements in the international market.

Products used in the construction sector differ greatly in terms of their origin, and the extraction and further processing methods used. Currently, few standards ensure comprehensive transparency and the enforcement of environmental and social standards. Many companies operate their production facilities according to environmental management standards, adhere to minimum social requirements or report on key sustainability aspects of production in CSR reports.

When selecting building materials and products, planners should consider the origin and degradation conditions of the raw materials used in the building products at an early stage and actively discuss this with their clients.

III. Method

Indicator 1: Responsible use of resources in the planning process

Indicator 1.1: Responsible selection of construction materials

As part of the planning process, measures are taken to ensure the responsible use of resources for the building. The following aspects must be considered as a minimum:

Avoidance of the use of resources or using secondary materials (reused or recycled) to minimise the use of primary raw materials is regularly integrated into the design process via appropriate procedures. In addition, the availability of local resources and materials is considered and integrated into the design process via appropriate procedures. Using local materials and products generally shortens supply chains and reduces the related negative effects. As a result, carbon footprints and expensive transportation costs are reduced, and local materials can provide higher accessibility and reduce supply chain delays. Local products and materials can also support local building culture and be the better aesthetic fit.

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These materials are suited to the local climate and often involve better, more sustainable sourcing. As evidence that primary raw materials are selected responsibly for the building project, the use of secondary materials and/or availability of the local resources and materials are considered and integrated into the design process via appropriate procedures, such as project objectives, variants and concepts, excerpts from performance specifications or similar.

Indicator 2: Responsible use of resources in implementation and documentation

Indicator 2.1: Documentation of construction materials during the construction stages (BoQ)

During construction, the origin and quantity of the materials and use of secondary materials are explicitly addressed, controlled and documented. For this purpose, a building components catalogue is prepared and handed over to the client/building owner in digital form (various electronic tools can be used). This documents the material type, quantities, qualities, origin, installation location, and, if necessary, further information on the products, components and building systems, which are classified as relevant according to Indicator 3. Information can be used for future maintenance, recovery, and reuse, for example using EN ISO 22057:2022 to provide Environmental Product Declarations.

Indicator 3: Responsible resource management and assessment (as built)

This indicator evaluates the extent to which responsibly sourced primary raw materials and products, as well as secondary materials (reused, recycled), are used in the building and its outdoor facilities. The evaluation is based on three key factors:

- Firstly, the assessment is based on the material's mass relative to the overall building, with the three heaviest material groups receiving higher weighting.
- Secondly, the mass/ratio of responsibly sourced primary raw and/or secondary materials in the whole material group (e.g. mass share of the certified wood/wood products in the total mass of all installed bio-based materials).
- Thirdly, the quality of evidence is demonstrated through self-declarations or certificates for materials/products (recognised labels[1]), categorised into the following quality levels:
  Quality Level 1 (**QL1**): Products supported by self-declarations, indicating corporate responsibility.
  Quality Level 2 (**QL2**): Certified materials or products where the certificate or label meets only some of the criteria required for full recognition, or secondary raw materials supported by self-declarations.
  Quality Level 4 (**QL4**): Certified primary materials or products where the certificate or label fully satisfies all necessary criteria, or secondary raw materials accompanied by relevant certificates.

In principle, all components permanently installed in the building structure, technical installations (for details, see Appendix 1 to the criterion ENV1.1 or ECO1.1) and also its outside facilities can be evaluated.

Indicator 3.1: Corporate responsibility for resource management (quality level 1)

The aim is for the manufacturing companies to be aware of the origin, extraction and processing of the raw materials and materials used in products and to increase transparency regarding environmental and social aspects along value-creation processes and to improve environmental and social standards for extraction and production through active influence by market participants.

For products with quality level 1, which are permanently installed in the building and/or its outdoor facilities, points are awarded on a flat-rate basis: 2 points per product, with a maximum of 5 products eligible for assessment.

[1] Product labels recognised by DGNB: https://www.dgnb.de/en/certification/path-to-dgnb-certification/dgnb-recognised-product-labels

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Indicator 3.2: Use of responsibly sourced primary or secondary raw materials in the building

There are seven material groups, each with specific target quotas (expressed as a percentage by mass) for both primary raw materials and secondary materials (such as reused or recycled content):

- for the combined total of concrete, natural stone, and agglomerated stone, 70% of the materials come from certified (responsibly sourced) primary raw materials and/or 30% consist of secondary materials (recycled or reused);
- for the combined total of brick, tile, ceramic, 70% of the materials come from certified (responsibly sourced) primary raw materials and/or 30% consist of secondary materials (recycled or reused);
- for bio-based materials, 80% of the materials come from certified (responsibly sourced) primary raw materials and/or 20% consist of secondary materials (recycled or reused);
- for the combined total of glass, mineral insulation, 70% of the materials come from certified (responsibly sourced) primary raw materials and/or 30% consist of secondary materials (recycled or reused);
- for non-biobased plastic, 50% of the materials come from certified (responsibly sourced) primary raw materials and/or 50% consist of secondary materials (recycled or reused);
- for metals, 30% of the materials come from certified (responsibly sourced) primary raw materials and/or 70% consist of secondary materials (recycled or reused);
- for gypsum, 65% of the materials come from certified (responsibly sourced) primary raw materials and/or 35% consist of secondary materials (recycled or reused);

For each of the three heaviest material groups, qualitative products or materials labelled with the Quality Level 4 certificates (**QL4**), can earn up to **50** points per group if they meet the group-specific target quota(s) – whether through primary raw materials/products, secondary (reused or recycled) materials/products, or a combination of both. Similarly, for qualitative products or materials for the same three heaviest material groups, with **QL2** labels/certificates, up to **40** points per group can be awarded if the group-specific target quotas are reached (for the new and/or secondary materials/products). Up to **20** points can be awarded for the remaining four material groups with **QL4** certificates if they reach the group specific target quota(s), either for the new and/or secondary materials; up **to 10** points can be awarded for materials/products with **QL2** certificates.

Points should be calculated proportionally based on the mass/ratio of certified to non-certified materials or products within the material group. Points are cumulative within each material group, and contributions from primary and secondary materials can be combined to reach the target quota.[2]

Understanding labels and certifications: quality levels explained

Minimum requirements

Compliance with minimum requirements must be a prerequisite when evaluating products in the building or its outside facilities. In general, construction products can only be positively assessed if all (100% mass share) primary and secondary raw materials were extracted, mined or produced, and the following can be ruled out:

- use of child or forced labour (reference conventions: ILO 138,182, 29, and 105);
- illegal raw material extraction/production (extraction of raw materials in nature conservation areas, as well as UNESCO World Heritage Sites).

The mass fraction can be reduced to 95% if it can be established that the product does not contain the raw materials tin, tantalum, gold and tungsten from conflict or high-risk areas and that these raw materials do not contain recycled materials.

[2] DGNB offers an Excel-based tool featuring visualisations designed to facilitate the calculation process and the systematic documentation of results.

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Further guidance is provided by the EU Regulation “laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas”, which entered into force from June 2017[3].

The minimum requirements do not need to be demonstrated for construction products whose primary raw materials were extracted and whose secondary raw materials were processed in EU member states, as this is considered to be sufficiently regulated by European legislation. As proof of this, a corresponding assurance from the manufacturer that the minimum requirements have been met is necessary for quality level 1. For quality levels 2 and 4, full compliance with the minimum requirements shall be ensured by the standard-setting organisation within the scope of product certification. For secondary raw materials (quality levels 2 and 4), proof of compliance with the minimum requirements must be provided seamlessly from the last post-use by means of a manufacturer’s declaration or a certificate.

Old and new quality levels[4]
The following correspondences of former quality levels in previous system version: 1.1, 1.2, 1.3, 2.1 and 2.2 apply (also in the DGNB Navigator and the label recognition forms and tools):

- Quality level 1.1 corresponds to QL1
- Quality levels 1.2 and 2.1 correspond to QL2
- Quality levels 1.3 and 2.2 correspond to QL4

Corporate responsibility for resource management, quality level 1 (formerly level 1.1)
For products rated at quality level 1, compliance with the minimum requirements is mandatory. In addition, there is evidence that the manufacturing companies assume responsibility for transparent and responsible resource extraction and processing of the product and its ingredients at the corporate level and document and communicate this appropriately, for example via CSR reports outlining responsibility for the supply chain.

Corporate responsibility is understood to mean that manufacturers take (co-)responsibility for compliance with environmental and social standards in the extraction and processing of the raw materials and materials they use and commit to undertaking corporate due diligence in accordance with the OECD Guidelines for Multinational Enterprises or other equivalent guidelines. The following principles and processes are enshrined as a minimum in the corporate mission statement of the manufacturers of the raw materials and materials used in building materials, products, and components:

- Preventing corruption and bribery;
- Preventing negative environmental and social impacts in the handling of raw materials, materials or secondary materials (e.g., conflict minerals) used by manufacturers in the production process;
- Preventing violations of human rights, labour standards regarding equality and workplace safety (Discrimination (Employment and Occupation) – ILO Convention 111 and Occupational Safety and Health Convention – ILO Convention 155);

Manufacturers must document the origin of the primary raw materials used in the products, name all processing steps and identify the locations (countries and regions) of the processing steps. A list of raw materials with guarantee of origin and a description of the processing steps with the locations in the form of a manufacturer’s declaration must be submitted as evidence.

[3] Regulation (EU) 2017/821 of the European parliament and of the council: https://eur-lex.europa.eu/eli/reg/2017/821/oj/eng
[4] DGNB recognised standards: https://www.dgnb.de/en/certification/path-to-dgnb-certification/dgnb-recognised-product-labels

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Use of responsibly sourced primary raw materials

Minimum requirements for quality levels 2 and 4 are mandatory. The differentiation between labels with quality level 2 and level 4 is the level of fulfilment of the following requirements:

- If the label allows only partial coverage of the value chain (e.g. only extraction but not further processing, or only processing of raw materials but not extraction) then the application is to be classified as "Certified responsible resource extraction of a part of the value chain" (quality level 2)

or

- If the label allows only the environmental or the social requirements (see Appendix 1) QL2 is awarded.

or

- If the standard allows a "mixture" of certified and non-certified raw materials, either a classification according to quality level 2 shall be made by the standard-setting organisation or a proportional evaluation according to the certified share in the product shall be made by the auditor. In case of doubt, the worst-case principle is to be applied.

The environmental and social requirements defined as essential across all key elements of the value chain can only be classified as "Certified responsible resource extraction" (quality level 4) if they are demonstrably applied.

Use of secondary raw materials

Recycling is one way to reduce the extraction of primary raw materials and its associated impacts. Therefore, the use of post-consumer secondary raw materials and pre-consumer secondary raw materials (which can be proven to originate from external sources; pre-consumer in-house recycling is not eligible for credit) in the building is also positively assessed. Materials used in the building that are demonstrably recycled can be included in the evaluation via two quality levels. Quality level 2 (formerly quality level 2.1) allows secondary raw materials used in the building or in its outside facilities to be credited where the share of such materials in the product is confirmed via self-declaration. Quality level 4 (formerly level 2.2) allows secondary raw materials used in the building or in its outside facilities to be credited where the share of such materials in the product is confirmed via a certificate (DGNB-recognised label).

Systemic and content requirements in terms of the DGNB label recognition

The standard-setting organisation has demonstrated that its certification system meets the systemic and content-related requirements for responsible resource recovery set out in the “Procedure for the Recognition of Standards under the DGNB System”, based on its awarding principles. Information on the recognition process, the requirements and the standards already recognised by the DGNB can be found on the DGNB website https://www.dgnb.de/en/-certification/path-to-dgnb-certification/dgnb-recognised-product-labels. Systemic and content requirements can be found under the chapter “Requirement types” and also under the attached Excel file.

If a standard is recognised by the DGNB and compliance with the systemic and content requirements (according to the separate document "Content and systemic requirements for labels in ENV1.3") is therefore demonstrated, the relevant certificate can be used for assessment under this criterion. If no recognised label/certificate exists, either the standard-setting organisation can apply to be recognised by the DGNB, or the individual project- or region-specific recognition process can be carried out via the innovation area with a maximum recognition level up to QL2; relevant requirements are documented under Appendix 1 to this document.

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APPENDIX 1

If a label/certificate is already recognised by the DGNB[1], the points for the assessment can be claimed in accordance with the methodology described above. If the label is not yet recognised, the country specific label recognition can be requested from the DGNB using the method stated below. Note: max. quality level 2 (**QL2**) can be recognized in this procedure.

Content requirements for label recognition:
For the recognition of the label, the following need to be fulfilled per label:

- Fulfilment of Quality level 1 and systematic requirements for labels **AND**
- All environmental requirements (if relevant) **OR**
- All social requirements (if relevant) **OR**
- All minimum obligations environmental and social requirements need to be fulfilled (minimum obligations for the environmental and social requirements are highlighted in grey in the checklist below for all relevant fields)

If fulfilment of the above-mentioned requirements is not possible, the reasons need to be communicated and approved by the DGNB during the country specific project adaptation process.

Methodology (Use table below):
STEP 1. **Identification of relevant fields - Relevant (R) or Not Relevant (NR)**: Identification of all steps in the entire process (raw material extraction and all processing steps) in which there are effects on the topics mentioned below (water, energy, etc.). If the topic is relevant, insert 'R' in the appropriate column below.

STEP 2. **Action fields**: Naming of the fields (from point 1) for which measures are taken for improvement.
If the field is identified as Relevant (R) (from point 1) and associated measures have been taken for improvement, then insert Action 'A' in the appropriate column below.
If the field is identified as Relevant (R) (from point 1) and not measures have been taken, provide explanation.
For Not Relevant (NR) fields (from point 1), no action is required

STEP 3. **Description of the implementation of the measure(s)** per action taken. For all actions fields where measure is taken, provide a description of the measure in the appropriate column.

1. **Environmental Requirements: Principles of Raw Material Extraction and Processing Processes**

In the extraction of raw materials and all subsequent processing processes, the avoidance of negative effects on the environment, flora and fauna as well as the minimization of resource use is applied in the form of possible strategies (such as: Circular economy*)*

	Topic	**STEP 1:** Relevant **(R)** / Not - Relevant **(NR)**	Note: *Minimum obligations for environmental requirements - If fields marked with * are identified as relevant (R), action needs to be taken for all rows marked in grey.*		
			Only to be entered when Relevant (R)		
			STEP 2: Action (A) / No Action (NA)	**STEP 3:** Description of implementation of the measure(s)	Reference in Relevant document

1.	**Natural spaces**				
1.1	Protection and preservation of natural areas				
	1.1.1 Compliance with a prohibition of deterioration of natural areas				
	1.1.2 Protection and preservation of biotopes				
2.	**Water***				
2.1	Water consumption reduction- Measures to reduce water consumption (e.g. reuse)				
2.2	Preservation and protection of water quality				
	2.2.1 Prevention of water pollution (e.g. by chemicals that are harmful to the environment, health and hazardous substances)				
	2.2.2 Polluted wastewater must not be allowed to enter groundwater or other natural waters				
2.3	Preservation and protection of natural water cycles				
	2.3.1 Avoidance of impacts on surface water and/or groundwater levels				
	2.3.2 Avoidance of large-scale sealing				
3.	**Energy**				
3.1	Energy reduction				
	3.1.1 Measures to reduce energy demand and consumption (e.g. machines with low energy consumption)				
	3.1.2 Avoidance / reduction of transports (e.g. by using local raw material sources)				
4.	**Soil***				
4.1	Preservation and protection of soil quality				

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	4.1.1 Avoidance of biological soil degradation (e.g. disruption of the humus cycle, e.g. due to imbalance of microorganisms, worms, fungi and insects)				
	4.1.2 Avoidance of chemical soil degradation (e.g. soil salinization, soil acidification, soil contamination e.g. by pesticides, fertilization)				
	4.1.3 Avoidance of physical soil degradation (e.g. soil compaction, soil erosion)				
5.	**Air / Atmosphere***				
5.1	Preservation and protection of air quality				
	5.1.1 Maintaining air quality by preventing the release of pollutants that are harmful to the environment and health, such as: smoke, soot, dust, exhaust gases, aerosols, vapours and odours *				
	5.1.2 Reduction of greenhouse gas emissions to curb climate change, (e.g. by avoiding CO2-intensive manufacturing processes, use of renewable energies, renunciation of the use of fossil fuels)				
6.	**Light**				
6.1	Reduction of light emission- Preservation of natural darkness at night to avoid the impairment of ecosystems (e.g. limited outdoor lighting times at night, reduction of unnecessary lighting, directional lighting, shielding or elimination of light sources)				
7.	**Sound**				
7.1	Reduction of vibrations and noise				
	7.1.1 Measures to prevent / reduce noise to avoid the impairment of ecosystems (e.g. through the use of low-noise machines or working techniques)				

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	7.1.2 Measures to prevent / reduce vibrations to avoid the impairment of ecosystems (e.g. through the use of vibration damping technologies, adaptation of operating practices, creation of buffer zones)				
8.	**Fire**				
8.1	Protection and conservation of ecosystems and biodiversity - Measures to prevent and control radiation exposure, especially in the case of radioactive materials				
9.	**Radiation**				
	Protection and conservation of ecosystems and biodiversity - Measures to prevent and control radiation exposure, especially in the case of radioactive materials				

For the Label recognition by DGNB, it should be ensured that there is continuous **Monitoring and control** for the implemented measures. The label should be **regularly modified and updated** to reflect new international and national regulations, ensuring ongoing compliance with the latest requirements.

2. Social Requirements:

The aim is to prevent negative social impacts through the extraction and processing of raw materials.

	Topic	**STEP 1:** Relevant **(R)** / Not - Relevant **(NR)**	Note: *Minimum obligations for social requirements - If fields marked with * are identified as relevant (R), action needs to be taken for all rows marked in grey.*		
			STEP 2: Action **(A)** / No Action **(NA)**	**STEP 3:** Description of implementation of the measure(s)	Reference in Relevant document
1.	**The standard covers the requirements of the following ILO core labour standards and occupational health and safety measures***				
	ILO Convention 87: Freedom of Association and Protection of the Right to Organise Convention				
	ILO Convention 98: Right to Organise and Collective Bargaining				

	ILO Convention 100: Equal Remuneration Convention				
	ILO Convention 187: Promotional Framework for Occupational Safety and Health				
	ILO Convention 170: Safety in the Use of Chemicals at Work				
	ILO Convention 148: Protection of Workers against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration				
2.	**Compliance with fair and equitable conditions in the workplace-** Regulations relating to employment relationships that protect the rights of employees (temporary, part-time, seasonal, home-based and subcontractors) and define the obligations of employers in at least the following areas *				
	Employment contracts- documented in writing, formulated in simple language that is understandable to the employee, and handed over to both parties				
	Working hours- Determination of reasonable working hours, breaks, overtime and holidays				
	Minimum wage- payment to satisfy basic needs (minimum wage), as well as equality of pay; in accordance with ILO Convention No. 131 on the Fixing of Minimum Wages, especially with regard to developing countries				
	Protection against dismissal- regulation of the admissibility of dismissal and protective measures against unfair dismissal; in accordance with ILO Convention No. 158 on the termination of the employment relationship by the employer				
3.	**Housing conditions for accommodation by employers (according to ILO Recommendation 115)-** If, for example, the company is located far from the usual residential centres and the nature of the work requires that the employee must be available on call, employees have appropriate living conditions for accommodation within easy reach of the place of work. The employee should only spend a reasonable part of his income on adequate accommodation.				

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	The following living conditions are observed:				
	Reasonable size of rooms and accommodation				
	Supply of clean water and drinking water in sufficient quantities				
	Functioning wastewater and waste disposal				
	Protection against weather, noise, fire and pests				
	Sufficient sanitary facilities, ventilation, washing and cooking facilities as well as lighting				
	Separation of living spaces and animal shelters				
	Separate bed per employee and separate accommodation according to gender				
	Rooms for dining, recreation and health care, if there are no facilities nearby				
4.	**Health and safety***				
	4.1 Elimination of violence and harassment in the world of work in accordance with ILO Convention 190				
	Health and safety training: Workers and their representatives are regularly and systematically trained on health and safety issues, in particular workplace hazards.				
	Employees are guaranteed access to local medical services as well as transport to external medical facilities.				
	Necessary first aid measures (e.g. first aid equipment or trained first aiders) are available for emergencies and accidents				
5.	**Social security benefits** Regulations on employees' entitlements to social benefits; accordingly				
	ILO Convention 102 Social Security (Minimum Standards)				
	ILO Convention 121 Employment Injury Benefits Convention				
6.	**Preservation of cultural values and respect for the rights of indigenous peoples or local populations through informed consent** (in accordance with the FPIC principle; or Convention 169 Convention on Indigenous and Tribal Peoples in Independent Countries; or Declaration *on the Rights of Indigenous Peoples* (UNDRIP)) *				

	Free, Prior and Informed Consent • Before starting projects in indigenous peoples' areas, their consent must be obtained. • Communities should be given sufficient time to examine agreements. • The decision-making processes must be transparent, free of coercion and fully informed, e.g. by ensuring independent legal advice.				
	Protection of land and resource rights: The rights of indigenous peoples to their ancestral lands and natural resources must be respected, even if they are not formally registered.				
	Preservation of culture and way of life: Projects must not endanger the cultural identity, way of life and social fabric of indigenous peoples.				
	Sustainable benefit-sharing: When coordinated measures are implemented, local companies and companies are strengthened in the long term, for example by prioritising the awarding of contracts to them.				
	Safeguarding the environment and livelihoods: When implementing measures, potential risks and resulting environmental impacts should be identified in order not to exacerbate environmental problems and to avoid new damage (precautionary principle).				
	Participation and representation: Indigenous communities must be actively involved in the planning, implementation and monitoring of projects.				
	Grievance mechanisms: Accessible and effective mechanisms for resolving conflicts and complaints should be put in place				
7.	**Implementation of "ethical management"**; in accordance with the *United Nations Convention against Corruption (UNCAC)*- Corruption must be prevented. Fair business practices must be implemented. The laws of the respective countries must be observed.				

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8.	**Avoidance of conflicts***				
	Avoidance of raw material mining / extraction in conflict-prone and conflict-prone regions: Raw material mining should take place in a conflict-free environment. In principle, all risks and any resulting effects in connection with the extraction of raw materials should be identified in order not to exacerbate existing conflicts (in conflict-prone and conflict-prone regions) or to avoid new conflicts (precautionary principle).				
	Avoidance of conflicts of use and the endangerment of the livelihoods of the local population due to possible negative effects of the extraction of raw materials, processing or production of products				

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APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents. In addition to the documents listed below, the requirements relating to the country specific label recognition by the DGNB, positions listed under the Appendix 1 must be considered and provided with the relevant proves.

Indicator 1: Responsible use of resources in the planning process

Indicator 1.1: Responsible selection of construction materials

- Definition of project objectives with regard to variants with optimised material quantities or recycled content, references to performance specifications, design variants and/or documented decisions based on variant comparison in regard of material sourcing.
- Document describing aavailability of local materials and/or the design variant(s) considering local materials. Consideration of supply chain aspects of local materials into the construction management process or similar.

Indicator 2: Responsible use of resources in implementation and documentation

Indicator 2.1: Documentation of construction materials during the construction stages (BoQ)

- Implementation details, tender texts, process descriptions or similar.
- Excerpt from the documentation, e.g. building components catalogue, any relevant digital files e.g. plausibly documented extracts from the BIM files using data templates EN ISO 22057:2022

Indicator 3: Responsible resource management and assessment (as built)

Indicator 3.1: Corporate responsibility for resource management (quality level 1):

- The following principles and processes are at least anchored in the manufacturer's corporate mission statement (e.g. the CSR report) for the raw materials used in the product: fulfilment of min. requirements, prevention of corruption and bribery, prevention of negative environmental and social impacts in the handling of raw materials, materials or secondary materials (e.g. conflict minerals) used by the manufacturer in the context of production, prevention of violations of human rights
- List of raw materials (with differentiation between primary and secondary raw materials) with guarantee of origin and a description of the processing steps with the locations (incl. country and region) in the form of a manufacturer's declaration
- If applicable proof of the manufacturer/processor of material procurement and/or production in Europe
- If the minimum requirements can be proven by means of a label, no separate proof is required.

Indicator 3.2: Use of responsibly sourced primary or secondary raw materials in the building

- Allocation of the all primary raw and/or secondary materials to mentioned seven material groups and their quantification by mass (ranked by mass % ratio to total building mass) e.g. by means of the LCA's component catalogue or on a trade-by-trade basis on the basis of the tenders, BIM model, BoQ etc.
- Proof that the materials/products used are certified with a DGNB-recognised standard (label) and the mass ratio of certified non-certified materials used in the same raw material group (e.g. certified woods, wood products and non-certified bio-based materials)

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- Delivery note(s) or invoice of the supplier (mentioning the CoC certification number as well as the name of the project to be certified). The certification status of the item to be verified must be noted on the delivery document, e.g., FSC/PEFC certified or CSC Silver/Gold.
- Drop shipping: If a trader is involved who merely forwards the original containers, the trader shall submit the delivery note/invoice of his supplier in which his chain of custody certification number, the certification status of the item to be verified as well as the name of the trader and the certified project are noted.
- Evidence for secondary raw materials Quality level 2 (former 2.1) - Proof that a self-declaration of manufacturer on the proportion of secondary raw materials is available for the products used.
- Declaration of the construction companies on the standard-compliant use of recycled concrete

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Recognition of product labels in the DGNB System, The procedure for the quality verification of the product labels in construction industry: https://www.dgnb.de/en/certification/path-to-dgnb-certification/dgnb-recognised-product-labels
- Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401760
- Sustainable Development Goals Icons, United Nations/globalgoals.org
- International Labour Organisation ILO, conventions (https://www.ilo.org/) :
- 29 - Forced Labour Convention, 1930 (No. 29)
- 98 - Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
- 105 - Abolition of Forced Labour Convention, 1957 (No. 105)
- 111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
- 138 - Minimum Age Convention, 1973 (No. 138)
- 155 - Occupational Safety and Health Convention, 1981 (No. 155)
- 182 - Worst Forms of Child Labour Convention, 1999 (No. 182)
- OECD Guidelines for Multinational Enterprises on Responsible Business Conduct: https://www.oecd.org/en/publications/oecd-guidelines-for-multinational-enterprises-on-responsible-business-conduct_81f92357-en.html
- Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0821
- UNESCO World Heritage List: https://whc.unesco.org/en/list/
- ISO standard 22057:2022, Sustainability in buildings and civil engineering works — Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM) (version of [adoption date]: https://www.iso.org/standard/72463.html
- Referenced to the supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council (also known as the EU Taxonomy Regulation): contributing substantially to the transition to a circular economy, C(2023) 3851 Annex 2, Brussels, 27.6.2023: https://eur-lex.europa.eu/resource.html?uri=cellar:41bc9b06-1515-11ee-806b-01aa75ed71a1.0001.02/DOC_3&format=PDF

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ENV2.2

Potable water demand and wastewater volume

Objective

Our goal is to preserve and strengthen natural water cycles. We want to contribute to securing the supply of potable water by reducing demand and by recycling rainwater and wastewater, as climate change will increase water shortages and heavy rainfall events.

Benefits

Buildings that actively support water cycles become more resilient to the changes caused by climate change and create suitable conditions for vegetation. Reducing the demand for potable water and wastewater also lowers running costs. In addition, a high level of wastewater recycling or the use of local resources such as rainwater helps to reduce infrastructure costs.

Contribution to overriding sustainability goals



Outlook

The issue of potable water will continue to increase in importance, particularly in an international context. The DGNB will monitor developments and update the criterion accordingly. A quality assessment can also be added in the long term, as contamination of potable water with nitrates will increase in relevance.

Share of total score

	SHARE	WEIGHTING FACTOR
Residential Hotel	2.7%	3
Office Education Department stores Assembly buildings Healthcare buildings	1.9%	2
Shopping centre Consumer market	1.8%	2
Logistics Production	1.7%	2

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EVALUATION

Evaluation is based on a quantitative water use value that represents the balance of potable water and wastewater. Maintenance of the natural water cycle and reduction of potable water demand by recycling wastewater and using local resources are also considered using the indicators "Watering and retention" and "Integration into the district infrastructure". There is also a Circular Economy bonus, which is integrated into Indicator 2. In this criterion, the maximum of 100 regular points can be achieved.

NO.	INDICATOR	POINTS
1	**Water design concept**	**Max. 10**
1.1	There is an overarching concept, in which water-saving potentials are examined. This concept is developed in the early planning phase and covers at least the following five aspects: ■ Flow rates of sanitary equipment (fittings) ■ Water scarcity (risk) consideration in the context of building location (WEI+ / BWS)[1] ■ Potential for rainwater harvesting and greywater reuse ■ Efficient irrigation (watering) of outdoor facilities ■ Potential metering plans	10
2	**Potable water demand and wastewater volume**	**Max. 80**
2.1	**Water use value (as built)**	**10 - 80**
	■ Dynamic limit value (adapted to local water stress) ≤ water use value	10
	■ Dynamic reference value (adapted to local water stress) = water use value	45
	■ Dynamic target value (adapted to local water stress) ≤ water use value	80
Re 2	**CIRCULAR ECONOMY** Explanation: The use of rainwater or greywater is incorporated into the assessment of the water use value. The potable water saved and the reduced wastewater are recorded in the assessment of the water parameter and are incorporated into the life cycle assessment evaluation. The contribution to the circular economy is thereby fully covered in the criterion.	
3	**External works**	**Max. 6**
3.1	**Watering and retention**	
	■ Watering the outdoor facilities with potable water is not foreseen, or only intermittent irrigation (based on choice of plant species)	+2
	■ The outdoor facilities include rainwater retention devices	+4
4	**Integration into the district infrastructure**	**Max. 4**
4.1	**Level of integration** The rainwater and wastewater disposal method is geared towards the existing infrastructure in the surrounding district and uses all available opportunities for separation, reduction, etc.	4

[1] Baseline Water Stress (BWS), for different regions worldwide, should be used for the water scarcity risk estimates. Alternatively, for the EU member states (e.g. for the Level(s) reporting), water risk can be assessed using the water exploitation index plus (WEI+): (https://www.eea.europa.eu/en/analysis/maps-and-charts/water-exploitation-index-for-river-2). For the water use value calculation (Indicator 2), the detailed, regional and river basin-based BWS will be used. The table of 3311 worldwide locations with the BWS factors from the World Resourses Institute (https://www.wri.org/aqueduct) will be included in the Excel-based ENV2.2 “water tool”.

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Water usage value m3 per occupant per year according to DGNB method	[m³/a]
KPI 2	Level(s) Indicator 3.1 "Use stage water consumption" incl. water exploitation index (WEI+)	[Index WEI+]
KPI 3	Baseline Water Stress (BWS) according to WRI Aqueduct 3.0 Country and Province Rankings	[score BWS]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Reduction of potable water demand reduces running costs. In addition, a high level of wastewater recycling and the use of local resources (wells, rainwater) helps achieve independence from price fluctuations and availability. All these and many other aspects may vary in severity depending on the geographical location. Country/region-specific benchmark adaptation is also considered according to the BWS factors provided by the World Resources Institute[2]. All 3311 regions considered for this version are included in the DGNB ENV2.2 Excel tool (the “water tool”).

II. Additional explanation

To ensure the supply of high-quality potable water, water is withdrawn from natural cycles on a daily basis, subjected to cost-intensive treatment and then used. The resulting wastewater must then be purified of harmful substances and contamination before it is returned to the natural water cycle. The objective of sustainable construction is therefore to reduce potable water demand and wastewater volume to ensure that the natural water cycle is disturbed as little as possible.

These requirements are tested and evaluated based on established assumptions regarding user behaviour and the planned use of greywater and rainwater. Equally important is the issue of how the water is drained and treated within the building. A holistic approach that also takes design aspects into account enables the establishment of conditions that are crucial for achieving the objectives specified in the DGNB criterion.

III. Method

The "water use value" (WUV) is calculated by adding together the determined potable water demand and wastewater volume. This represents a simple value for evaluating the use of water in the building. The water expended during construction is ignored. Established assumptions regarding user behaviour and determined parameters are incorporated into the evaluation.

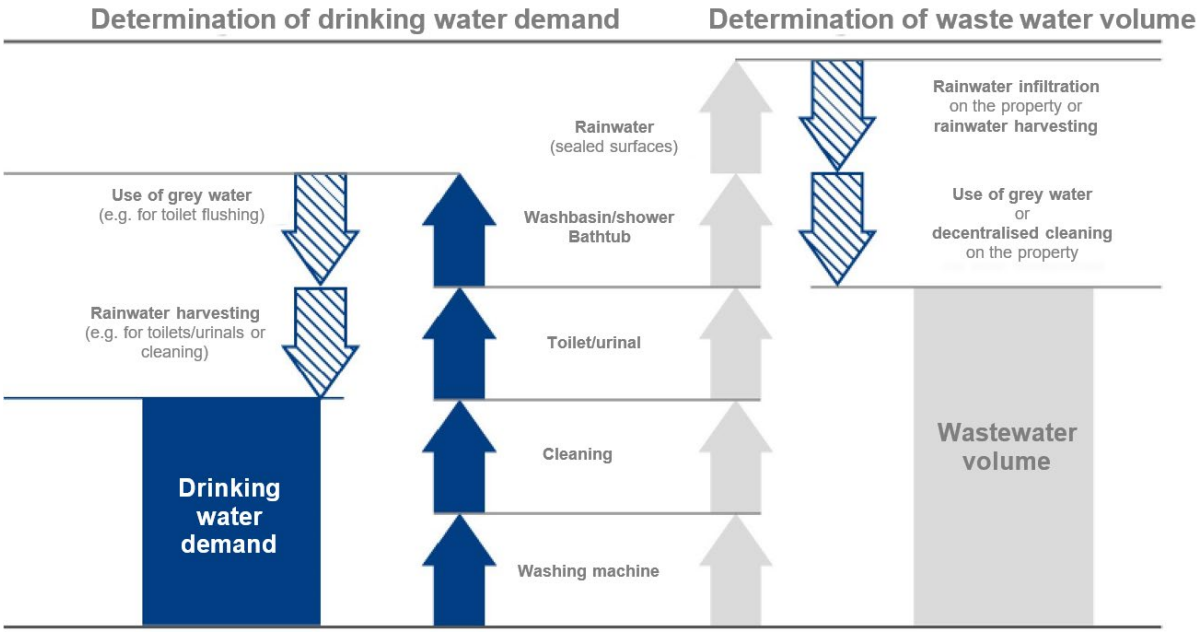
System limits

Measures that can be influenced by the designer are primarily considered in the evaluation of potable water demand and wastewater volume. This does not include demand for potable water for drinking or, where applicable, food preparation, for example. A selective analysis of individual criteria is not permitted, as this conflicts with a holistic evaluation. This means that elements such as decentralised wastewater treatment plants and planned use of rainwater, river water or wastewater may only be incorporated into the assessment if they are also taken into consideration in the other relevant criteria (particularly the building-related life cycle costs). In general, consumption by users is the deciding factor for the water demand, meaning that water-saving technology is particularly worthwhile for reducing water consumption. In contrast, cleaning has only a minor impact, while the impact of the total area used for plants and rainwater management must be evaluated differently depending on the local circumstances.

[2] World Resources Institute: https://www.wri.org/

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Figure 1: System limits of the water use value calculation



Benchmarks

Depending on the building's location, the number of users, roof surface area including green area and number of plants, a building's annual demand for potable water and the amount of wastewater produced can vary greatly. For this reason, a dynamic limit value is determined using the individual conditions of the building. Usage-specific limit values are determined according to the formulas in Indicator 2.

Indicator 2.1: Water use value

The water use value (WUV) is calculated as follows:

$$W_{UV} = (WD_U + WW_U) + (WW_{RW}) + (WD_{SPA} + WW_{SPA}) \quad (1)$$

where:

- W_{UV} Water use value in [m³/a]
- WD_U Employee water demand in [m³/a]
- WW_U Wastewater by users in [m³/a]
- WW_{RW} Portion of rainwater diverted to the drain system in [m³/a]
- WD_{SPA} Drinking water requirement for spa area in [m³/a]
- WW_{SPA} Wastewater for spa area in [m³/a]

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IV. Usage-specific description

Indicator 1: Water utilisation concept

In the earlier planning phase, different options were explored for reducing future water consumption. For this purpose, the service areas for various sanitary fittings and other fittings (e.g. flow rates of washbasin fitting and shower head in l/min, toilet flush volume in l/flush, etc.) are taken into account. If the following flow rates and flushing volumes are used (and also when determining the actual water value in accordance with Indicator 2), this must be confirmed separately:

- Taps for hand basins and kitchen sinks: max. flow rate 6 l/min;
- Showers: max. flow rate 8 l/min;
- Toilets: max. full flush volume of 6 l and max. average flush volume of 3.5 l;
- Urinals: max. flush volume of 2 l/urinal/h and flush water urinals have a maximum full flush volume of 1 l.

For the assessment of site-specific water risks, the data of the water risk indices BWS or WEI+ for surface waters in the catchment area (e.g. river catchment area) in which the building is located, is considered. Any average summer WEI+ or BWS value which shows a high or extremely high water stress percentage should be assessed as water scarcity; this shows that a clear problem exists so that measures to reduce water consumption are taken and implemented. In addition, the choice of plants should be selected according to the local climate so that irrigation can be reduced to a minimum. Furthermore, all options for rainwater and greywater utilisation have been investigated and the results communicated to the planning teams.

Healthcare buildings

Indicator 2.1: Water use value

For healthcare buildings, the topic of cleaning is far more relevant than for other usage profiles. Therefore, the potable water demand and wastewater volume from cleaning are also considered here. The water use value WUW for healthcare buildings is calculated as follows, deviating from the other usage profiles:

$$W_{UV} = (WD_{US} + WW_{US}) + (WW_{RW}) + (WD_{C} + WW_{C}) \quad (2)$$

where:

- W_{UV} Water use value in [m³/a]
- WD_{US} Potable water demand by user [m³/a]
- WW_{US} Wastewater by user in [m³/a]
- WW_{RW} Portion of rainwater diverted to the drain system [m³/a]
- WD_{C} Potable water needed for cleaning [m³/a]
- WW_{C} Wastewater from cleaning [m³/a]

Office **Education** **Logistics**
Residential (up to "Specifications for user behaviour" and “Presence days”)
Production (up to "Specifications for user behaviour")

Indicator 2.1: Potable water demand and wastewater volume – by users

The water demand of employees (WD_U) is determined from the total potable water demand of installations based on established assumptions regarding user behaviour.

The use of rainwater, river water or greywater that can replace potable water is subtracted from the water demand:

$$\mathbf{W_{DU} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(2)}$$

where:

- WD_U Water demand by users/residents/employees in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. to flush toilets, in [m³/a]
- N_{GW} Amount of greywater used, e.g. to flush toilets, in [m³/a]

The amount of rainwater, river water and greywater used can be taken from the profitability calculation for the use of rainwater, river water and greywater. The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on established assumptions regarding user behaviour and presence days:

$$\mathbf{wd_I = (n_U * f_I * cv_I * d/a) / 1000} \qquad \textbf{(3)}$$

where:

- wd_I Specific potable water demand of installations in the building in [m³/a]
- n_U Number of users
- f_I Installation-specific factor for water use in accordance with Table 1, in [seconds/day] or [flushes/day]
- cv_I Installation-specific consumption value in [litres/seconds] or [litres/flush]
- d Presence days (= 210 days)
- a Year

The wastewater produced by users (WW_U) is calculated as the total specific water demand of the installations, minus reused greywater and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{.WW_U = \sum_{i=1}^{n} wd_I - N_{GW} - R_{BW}} \qquad \textbf{(4)}$$

where:

- WW_U Wastewater by users in [m³/a]
- wd_I Specific potable water demand of installations in the building in [m³/a]
- N_{GW} Amount of greywater reused, e.g. to flush toilets, in [m³/a]
- R_{BW} Amount of wastewater purified on-site in [m³/a]

The amount of purified wastewater can be taken from the design of the decentralised (small) sewage treatment plant.

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Table 1: Specifications for user behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR F_I FOR WATER USE [SECONDS OR FLUSHES PER PERSON AND DAY]
Hand washbasin	45
Water-saving WC flush	1
WC	1
Urinal	1
Shower	6
Kitchen sink	20

The installation-specific factors are derived based on the following assumptions:

- Each user washes their hands three times a day, for 15 seconds each time
- The ratio of water-saving WC flush/urinal usage to normal WC flush usage is 2:1; this assumes an equal gender ratio (50% each)
- 2% of employees shower daily, for 5 minutes each time (if shower facilities are available)
- The kitchen sink is used to wash up, e.g., one cup per employee

Table 2: Specifications for the limit value of the installation-specific consumption value (cvI) in [litres/second] or [litres/flush]

INSTALLATION	CONSUMPTION VALUE (IN LITRES/SECOND OR LITRES/FLUSH)	CONSUMPTION VALUE FOR THE 'DNSH' OF TAXONOMY
Hand washbasin (litres/second)	0.15	0.1
Water-saving WC flush (litres/flush)	3	2.25 / 3*
WC (litres/flush)	6	6 / 4.5*
Urinal (litres/flush)	1.5	1
Shower (litres/second)	0.25	0.134
Kitchen sink (litres/second)	0.25	0.1

'Flow rates are recorded at the standard reference pressure 3 -0/+0.2 bar or 0.1 -0/+0.02 for products limited to low pressure.

*Calculation: For a toilet with a 6/4-litre dual flush, the average flush volume is calculated as follows: ((6 l x 1) + (4 l x 2)) / 3=4.67l

Residential

Indicator 2.1: Potable water demand and wastewater volume – by users

Presence days for the specific water requirements of existing installations wdi:

- dpresence days (=345 d)

Table 3: Specifications for user behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR F_I FOR WATER USE IN [SECONDS OR FLUSHES PER PERSON AND DAY]
Hand washbasin	195
Water-saving WC flush	4
WC	1
Shower	120
Dishwasher	0.5
Washing machine	0.25

Flats with bathtubs:
To save water, showering is clearly preferable to bathing. The shape of the bathtub should be chosen so that it can also be used for showering without compromising comfort. Saving water in the bathtub is directly related to the usable capacity. The smaller the tub, the more water can be saved. The type of draw-off fitting has no influence on the water requirement when the tub is filled. Savings are only possible with shower fittings. For flats with a bathtub, a full bath is assumed every 14 days and use of the shower on the remaining days.

Table 4: Specifications for the limit value of the installation-specific consumption value (cvI) in [litres/second] or [litres/flush]

INSTALLATION	CONSUMPTION VALUE (IN LITRES/SECOND OR LITRES/FLUSH)	CONSUMPTION VALUE FOR THE 'DNSH' OF TAXONOMY
Hand washbasin (litres/second)	0.15	n/a
Water-saving WC flush (litres/flush)	3	n/a
WC (litres/flush)	6	n/a
Shower (litres/second)	0.25	n/a
Bathtub (litres/full bathtub)	70 (Useful capacity)	n/a
Dishwasher (litres/wash cycle)	20	n/a
Washing machine (litres/wash cycle)	60	n/a

Production

Indicator 2.1: Potable water demand and wastewater volume – by users

Presence days for the specific water requirements of existing installations wdi:

- dpresence days (=260 d)

Table 5: Specifications for user behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR F_I FOR WATER USE [SECONDS OR FLUSHES PER PERSON AND DAY]
Hand washbasin	90
Water-saving WC flush	1
WC	1
Urinal	1
Shower	60
Kitchen sink	20

The installation-specific factors are derived based on the following assumptions:

- Each employee washes their hands three times a day, for 30 seconds each time
- The ratio of water-saving WC flush/urinal usage to normal WC flush usage is 2:1; this assumes an equal gender ratio (50% each)
- 20% of employees shower daily, for 5 minutes each time (if shower facilities are available)
- The kitchen sink is used to wash up, e.g., one cup per employee

Supermarket **Shopping centre** **Department store** **Assembly buildings**

Indicator 2.1: Potable water demand and wastewater volume – by users

Table 6: Specifications for the limit value of the installation-specific consumption value (cvl) in [litres/second] or [litres/flush]

INSTALLATION	CONSUMPTION VALUE (IN LITRES/SECOND OR LITRES/FLUSH)	CONSUMPTION VALUE FOR THE 'DNSH' OF TAXONOMY
Hand washbasin (litres/second)	0.15	0.1
Water-saving WC flush (litres/flush)	3	2.25 / 3
WC (litres/flush)	6	6 / 4.5
Urinal (litres/flush)	1.5	1
Shower (litres/second)	0.25	0.134
Kitchen sink (litres/second)	0.25	0.1

'Flow rates are recorded at the standard reference pressure 3 -0/+0.2 bar or 0.1 -0/+0.02 for products limited to low pressure.

The term "customers" is used in the following to refer to both customers (e.g. of sales outlets) and visitors/guests (e.g. of theatres or cinemas).

$$\mathbf{WD_U = WD_E + WD_{CU}} \qquad \mathbf{(2)}$$

where:

- WD_U Water demand by users in [m³/a]

- WD_E Water demand by employees in [m³/a]
- WD_{CU} Water demand by customers in [m³/a]

$$\mathbf{WW_U = WW_E + WW_{CU}} \qquad \mathbf{(3)}$$

where:

- WW_U Wastewater from users in [m³/a]
- WW_E Wastewater from employees in [m³/a]
- WW_{CU} Wastewater from customers in [m³/a]

Employees

The water demand of employees (WD_E) is determined from the total potable water demand of installations based on the established assumptions regarding user behaviour. Use of rainwater, river water or greywater that replaces the use of potable water is subtracted from the water demand:

$$\mathbf{WD_E = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \mathbf{(4)}$$

where:

- WD_E Water demand by employees in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. to flush toilets, in [m³/a]
- N_{GW} Amount of greywater used, e.g. to flush toilets, in [m³/a]

The amount of rainwater, river water and greywater used can be taken from the profitability calculation for the use of rainwater, river water and greywater.

The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on established assumptions regarding user behaviour and presence days:

$$\mathbf{wd_I = (n_E * f_I * cv_I * d/a) / 1000} \qquad \mathbf{(5)}$$

where:

- wd_I Specific potable water demand of installations in the building in [m³/a]
- n_E Number of employees
- f_I Installation-specific factor for water use in accordance with Table 1, in [seconds/day] or [flushes/day]
- cv_I Installation-specific consumption value in [litres/seconds] or [litres/flush]
- d Presence days according to Table 7
- a Year

The wastewater produced by employees (WW_E) is calculated as the total specific water demand of the installations, minus reused greywater and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{WW_E = \sum_{i=1}^{n} wd_I - N_{GW} - R_{BW}} \qquad \mathbf{(6)}$$

where:

- WW_E Wastewater from employees in [m³/a]
- wd_I Specific potable water demand of installations in the building in [m³/a]
- N_{GW} Amount of greywater reused, e.g. to flush toilets, in [m³/a]
- R_{BW} Amount of wastewater purified on-site in [m³/a]

The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Table 7: Specifications for days of attendance

BUILDING USE	PRESENCE DAYS IN YEAR
Consumer market, department store, shopping centre	312
Congress, trade fair, and municipal halls	150
Museums, exhibition halls	250
Theatre and concert halls	250
Libraries	300

The specification (presence days per use profile) in Table 7 is based on DIN V 18599-10: 2016-10 (Table 5 – Guide values for the boundary conditions for non-residential buildings).

Customers

The water demand of customers (WD_{CU}) is determined from the total potable water demand of installations based on established assumptions regarding user behaviour. Use of rainwater, river water or greywater that replaces the use of potable water is subtracted from the water demand:

$$\mathbf{WD_{CU} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(7)}$$

where:

- WD_{CU} Water demand by customers in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. to flush toilets, in [m³/a]
- N_{GW} Amount of greywater used, e.g. to flush toilets, in [m³/a]

The amount of rainwater, river water and greywater used can be taken from the profitability calculation for use of rainwater, river water and greywater.

The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on established assumptions regarding user behaviour and presence days:

$$\mathbf{wd_I = (n_{CU} * f_I * as_I * d/a) / 1000} \qquad \textbf{(8)}$$

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where:

- wd_I Specific potable water demand of installations in the building in [m³/a]
- n_{CU} Number of customers
- f_I Installation-specific factor for water use in accordance with Table 1, in [seconds/day] or [flushes/day]
- cv_I Installation-specific consumption value in [litres/seconds] or [litres/flush]
- d Presence days according to Table 7
- a Year

Consumer market **Department stores** **Shopping centre**

- It is assumed that 5% of customers use the sanitary facilities.

Assembly buildings

The maximum number of customers according to the seating plan of the largest event hall located in the building or assigned to the building. Alternatively, the maximum number of authorized visitors (customers) can be used. The number of customers determined in this way must be multiplied by the following factor in order to determine the average number of customers on annual usage:

- **0.5** for Assembly buildings that are designed for predominantly seated events (e.g. congress, theatre, cinema)
- **0.3** for Assembly buildings that are designed for both seated and standing events (such as exhibition halls, town halls). Alternatively, another basis can be used to determine the number of visitors if this is reasonably justified and corresponds to the building and the operating concept.

The wastewater produced by customers (WW_{CU}) is calculated as the total specific water demand of the installations, minus reused greywater and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{WW_{CU} = \sum_{i=1}^{n} wd_I - N_{GW} - R_{BW}} \qquad \textbf{(9)}$$

where:

- WW_{CU} Wastewater from customers in [m³/a]
- wd_I Specific potable water demand of installations in the building in [m³/a]
- N_{GW} Amount of greywater reused, e.g. to flush toilets, in [m³/a]
- R_{BW} Amount of wastewater purified on-site in [m³/a]

The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Table 8: Specifications for user behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR F_I FOR WATER USE [SECONDS OR FLUSHES PER PERSON AND DAY]	
	EMPLOYEES	CUSTOMERS
Hand washbasin	45	15
Water-saving WC flush	1	0.6
WC	1	1
Urinal	1	0.4

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Shower	6	-
Kitchen sink	20	-

The installation-specific factors are derived based on the following assumptions:

Employees

- Each employee washes their hands three times a day, for 15 seconds each time
- The ratio of water-saving WC flush/urinal usage to normal WC flush usage is 2:1; this assumes an equal gender ratio (50% each)
- 2% of employees shower daily, for 5 minutes each time (if shower facilities are available)
- The kitchen sink is used to wash up, e.g., one cup per employee.

Customers

- 5% of customers use the sanitary facilities
- The customers using the sanitary facilities are 60% female customers and 40% male customers
- Each user washes their hands for an average of 15 seconds
- Female customers use the water-saving WC flush and the normal WC flush in a 1:1 ratio, while male customers use the urinal/water-saving WC flush and the normal WC flush in a 1:1 ratio

Hotel

Indicator 2.1: Potable water demand and wastewater volume – from users

The water demand of guests (WD_U) is determined from the total potable water demand of installations based on established assumptions regarding user behaviour. The use of rainwater, river water or greywater that replaces the use of potable water is subtracted from the water demand:

$$\mathbf{WD_U} = \sum_{i=1}^{n} \mathbf{wd_I} - \mathbf{N_{RW}} - \mathbf{N_{GW}} \qquad \textbf{(2)}$$

where:

- WD_U Water demand by guests in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. to flush toilets, in [m³/a]
- N_{GW} Amount of greywater used, e.g. to flush toilets, in [m³/a]

The amount of rainwater, river water and greywater used can be taken from the profitability calculation for the use of rainwater, river water and greywater.

The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on established assumptions regarding user behaviour and presence days:

$$\mathbf{wd_I = (n_U * f_I * cv_I * d/a) / 1000} \qquad \textbf{(3)}$$

where

- wd_I Specific potable water demand of installations in the building in [m³/a]
- n_U Number of guests
- f_I Installation-specific factor for water use in accordance with Table 1, in

[seconds/day] or [flushes/day]

- cv_I Installation-specific consumption value in [litres/seconds] or [litres/flush]
- d Presence days (= 360 days)
- a Year

The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on the assumption of 360 days of occupancy, usage of 65% of the total capacity and an average occupancy for double rooms of 1.2 people:

$$\mathbf{n_U = (n_{SR} + (n_{DR} * 1.2)) * 0.65} \qquad \mathbf{(4)}$$

where:

- n_U Number of guests
- n_{SR} Number of single rooms
- n_{DR} Number of double rooms

The wastewater produced by guests (WW_U) is calculated as the total specific water demand of the installations, minus reused greywater and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{WW_U} = \sum_{i=1}^{n} \mathbf{wd_I} - \mathbf{N_{GW}} - \mathbf{R_{BW}} \qquad \mathbf{(5)}$$

where:

- WW_U Wastewater from guests in [m³/a]
- wd_I Specific potable water demand of installations in the building in [m³/a]
- N_{GW} Amount of greywater reused, e.g. to flush toilets, in [m³/a]
- R_{BW} Amount of wastewater purified on-site in [m³/a]

The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Table 9: Specifications for user behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR F_I FOR WATER USE [SECONDS OR FLUSHES PER PERSON AND DAY]
Hand washbasin	75
Water-saving WC flush	1
WC	1
Urinal	1
Hand washbasin in SPA	15
Water-saving WC flush in SPA	1
Shower in SPA	600

The installation-specific factors are derived based on the following assumptions:

- Each guest uses the hand washbasin once a day, for 75 seconds each time
- The water-saving WC flush or urinal is used twice per overnight stay, and the normal WC flush is used once per overnight stay
- The shower is used for 300 seconds per overnight stay
- In the spa area, the hand washbasin is used for 15 seconds per spa visitor, the shower is used for 600 seconds per spa visitor and the water-saving WC flush is used once per spa visitor
- Swimming pools are not taken into consideration

Table 10: Specifications for the limit value of the installation-specific consumption value (cvI) in [litres/second] or [litres/flush]

INSTALLATION	CONSUMPTION VALUE (IN LITRES/SECOND OR LITRES/FLUSH)	CONSUMPTION VALUE FOR THE 'DNSH' OF TAXONOMY
Hand washbasin (litres/second)	0.15	0.1
Water-saving WC flush (litres/flush)	3	2.25 / 3
WC (litres/flush)	6	6 / 4.5
Shower (litres/second)	0.25	0.134

'Flow rates are recorded at the standard reference pressure 3 -0/+0.2 bar or 0.1 -0/+0.02 for products limited to low pressure.

Healthcare buildings

Indicator 2.1: Potable water demand and wastewater volume – by user

$$WD_{US} = WD_{EMP} + WD_{PA} + WD_{VI} \quad (3)$$

where:

- WD_{US} Water demand of users in [m³/a]
- WD_{EMP} Water demand of employees in [m³/a]
- WD_{PA} Water demand of patients in [m³/a]
- WD_{VI} Water demand of visitors/day patients in [m³/a]

$$WW_{US} = WW_{EMP} + WW_{PA} + WW_{VI} \quad (4)$$

where:

- WW_{US} Wastewater volume produced by users in [m³/a]
- WW_{EMP} Wastewater volume produced by employees in [m³/a]
- WW_{PA} Wastewater volume produced by patients in [m³/a]
- WW_{VI} Wastewater volume produced by visitors/day patients in [m³/a]

Employees

The water demand of the employees WD_{EMP} is determined from the total potable water demand of existing installations based on the specified assumptions on usage behaviour.

Rainwater, river water or greywater use that can replace potable water is deducted from the water demand:

$$\mathbf{WD_{EMP} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(5)}$$

where:

- WD_{EMP} Water demand of employees in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. for toilet flushing in [m³/a]
- N_{GW} Amount of greywater used, e.g. for toilet flushing in [m³/a]

The amount of rainwater, river water or greywater used can be taken from the economic efficiency calculation for rainwater, river water or greywater use.

The specific water demand of existing installations wd_I is determined on the basis of the daily water demand, based on specified assumptions on usage behaviour and working days: In case of shift operation, the number of all employees n_{EMP} is to be applied, not just the employees in one shift (example: 150 EMP in shift 1, 150 EMP in shift 2, 90 EMP in shift 3, number of employees: 390 EMP/day):

$$\mathbf{wd_I = (n_{EMP} * f_I * cl_I * d/a) / 1000} \qquad \textbf{(6)}$$

with

- wd_I Specific water demand of installations in the building [m³/a]
- n_{EMP} Number of employees
- f_I Installation-specific factor for water use according to Table 11 in [sec/d] or [flushes/d]
- cl_I Installation-specific connected load according to Table 12 in [l/sec] or [l/flush]
- d Working days (= 365 d)
- a Year

The volume of wastewater generated by the employees WW_{EMP} is the total specific water demand of the existing installations, minus the greywater used and/or wastewater purified via decentralised treatment on-site:

$$\mathbf{WW_{EMP} = \sum_{i=1}^{n} wd_I - N_{GW} - C_{OW}} \qquad \textbf{(7)}$$

with

- WW_{EMP} Wastewater volume produced by employees in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{GW} Amount of greywater reused, e.g. for toilet flushing in [m³/a]
- C_{OW} Amount of wastewater purified on-site [m³/a]

The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Patients

The water demand of the patient WD_{PA} is determined from the total potable water demand of existing installations, based on the specified assumptions on usage behaviour.

Rainwater, river water or greywater use that can replace potable water is deducted from the water demand:

$$\mathbf{WD_{PA} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(8)}$$

with

- WD_{PA} Water demand of patients in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. for toilet flushing in [m³/a]
- N_{GW} Amount of greywater used, e.g. for toilet flushing in [m³/a]

The amount of rainwater, river water or greywater used can be taken from the economic efficiency calculation for rainwater, river water or greywater use.

The specific water demand of existing installations wd_I is determined on the basis of the daily water demand, based on specified assumptions on usage behaviour and working days:

$$\mathbf{wd_I = (n_{PA} * f_I * cl_I * d/a) / 1000} \qquad \textbf{(9)}$$

with

- wd_I Specific water demand of installations in the building [m³/a]
- n_{PA} Number of patients
- f_I Installation-specific factor for water use according to Table 11 in [sec/d] or [flushes/d]
- cl_I Installation-specific connected load according to Table 12 in [l/sec] or [l/flush]
- d Working days (= 365 d)
- a Year

The number of patients is based on an 80% occupancy of the available beds:

$$\mathbf{N_{PA} = 0.8 * n_B} \qquad \textbf{(9)}$$

with

n_B Number of beds

The volume of wastewater generated by the WW_{PA} users is the total specific water demand of the existing installations, minus the greywater used and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{WW_{PA} = \sum_{i=1}^{n} wd_I - N_{GW} - C_{OW}} \qquad \textbf{(10)}$$

with

- WW_{PA} Wastewater volume generated by patients in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{GW} Amount of greywater reused, e.g. for toilet flushing in [m³/a]
- C_{OW} Amount of wastewater purified on-site [m³/a]

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The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Visitors and day patients

The water demand of the visitors and day patients WD_{VI} is determined from the total potable water demand of existing installations, based on the specified assumptions on usage behaviour. Day patients are patients who are accommodated in another building, for example, or who are treated as outpatients. Rainwater, river water or greywater use that can replace potable water is deducted from the water demand:

$$\mathbf{WD_{VI} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(11)}$$

with

- WD_{VI} Water demand of visitors/day patients in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{RW} Amount of rainwater or river water used, e.g. for toilet flushing in [m³/a]
- N_{GW} Amount of greywater used, e.g. for toilet flushing in [m³/a]

The amount of rainwater, river water or greywater used can be taken from the economic efficiency calculation for rainwater, river water or greywater use.

The specific water demand of existing installations wd_I is determined on the basis of the daily water demand, based on specified assumptions on usage behaviour and working days:

$$\mathbf{wd_I = ((n_{VI} + n_{DP}) * f_I * cl_I * d/a) / 1000} \qquad \textbf{(12)}$$

with

- wd_I Specific water demand of installations in the building [m³/a]
- n_{VI} Number of visitors
- n_{DP} Number of day patients
- f_I Installation-specific factor for water use according to Table 11 in [sec/d] or [flushes/d]
- cl_I Installation-specific connected load according to Table 12 in [l/sec] or [l/flush]
- d Working days according to table (= 365 d)
- a Year

The number of visitors is based on one visitor for 50% of the patients:

$$\mathbf{N_{VI} = 0.5 * 0.8 * n_B} \qquad \textbf{(13)}$$

with

n_B Number of beds

The volume of wastewater generated by the visitors/day patients WW_{PA} is the total specific water demand of the existing installations, minus the greywater used and/or wastewater purified via decentralised on-site treatment:

$$\mathbf{WW_{VI} = \sum_{i=1}^{n} wd_I - N_{GW} - C_{OW}} \qquad \textbf{(14)}$$

with

- WW_{VI} Wastewater volume generated by visitors/day patients in [m³/a]
- wd_I Specific water demand of installations in the building [m³/a]
- N_{GW} Amount of greywater reused, e.g. for toilet flushing in [m³/a]
- C_{OW} Amount of wastewater purified on-site [m³/a]

The treated volume of wastewater can be taken from the design of the decentralised (small-scale) purification plant.

Table 11: Specifications on usage behaviour

INSTALLATION	INSTALLATION-SPECIFIC FACTOR FI FOR WATER USE [SEC. OR FLUSHES PER PERSON PER DAY]		
	EMPLOYEES	PATIENTS	VISITORS/DAY PATIENTS
Hand washbasin	45	135	15
Water-saving WC flush	1	2	0.5
WC	1	1	0.5
Urinal	1	-	0.5
Shower	60	90	-
Kitchen sink	20	-	-

The installation-specific factors are based on the following assumptions:

Employees

- Every employee washes their hands for 15 seconds three times a day
- The water-saving WC flush or urinal use to toilet use ratio is 2: 1; a balanced gender ratio (50% each) is assumed
- 20% of employees shower for 5 minutes a day (if shower facilities are available)
- For example, one cup per employee is washed up in the kitchen sink.

Patients

- Each patient washes their hands for 15 seconds three times a day and uses the washbasin for 90 seconds each time for personal hygiene
- The water-saving WC flush use to WC use ratio is 2: 1; a balanced gender ratio (50% each) is assumed
- 30% of patients shower for 5 minutes a day (if showering facilities are available).

Visitors/day patients

- Each patient washes their hands once a day for 15 seconds
- The water-saving WC flush or urinal use to toilet use ratio is 2: 1; a balanced gender ratio (50% each) is assumed.

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Table 12: Specifications for the limit value of the installation-specific connected load cIl in [l/sec] or [l/flush]

INSTALLATION	CONNECTED LOAD (IN L/SEC OR L/FLUSH)	CONSUMPTION VALUE FOR THE 'DNSH' OF TAXONOMY
Hand washbasin (l/sec)	0.15	0.1
Water-saving WC flush (l/flush)	3	2.25 / 3
WC (l/flush)	6	6 / 4.5
Urinal (l/flush)	1.5	1
Shower (l/sec)	0.25	0.134
Kitchen sink (l/sec)	0.25	

Indicator 2.1: Potable water demand and wastewater volume – wastewater due to rainwater diverted to the drain system

The portion of rainwater diverted to the drain system (WW_{RW}) is determined as follows:

$$\mathbf{WW_{RW} = N_P - P_{RW} - N_{RW}} \qquad \mathbf{(6)}$$

where:

- WW_{RW} Wastewater due to rainwater diverted to the drain system
- N_P Amount of precipitation in [m³/a]
- P_{RW} Amount of rainwater infiltrating into soil or diverted into rivers or canals in [m³/a]
- N_{RW} Amount of rainwater used, e.g. to flush toilets, in [m³/a]

Suitable documentation of the amount of rainwater infiltrating into the soil must be provided. The amount of precipitation to be taken into consideration N_P is determined as follows:

$$\mathbf{N_P = (A_R * e_R + A_S * e_S) * S_{RW} / 1000} \qquad \mathbf{(7)}$$

where:

- A_R Roof surface area
- A_S Sealed surface area [m²]
- e_R Yield coefficient of roof surface
- e_S Yield coefficient of sealed ground surface
- S_{RW} Site-specific annual precipitation

Table 13: Specifications for the limit value for the drainage of rainwater

Yield coefficient of roof surface	0.8
Yield coefficient of ground	0.8

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Outdoor green spaces with natural infiltration have a yield coefficient of 0.0.
The plot area that must be taken into account is the plot area, not including the building floor area.

Table 14: Yield coefficients[3]

CONDITION	YIELD COEFFICIENT % E
Sloped hard roof (deviations depending on the absorbency and roughness)	0.8
Flat roof, not gravelled	0.8
Flat roof, gravelled	0.6
Green roof, intensive	0.3
Green roof, extensive	0.5
Paved area/interlocking paved area	0.5
Asphalt surface	0.8

Hotel

Indicator 2.1: Potable water demand and wastewater volume – by the spa area

The water demand of the spa area (WD_{SPA}) is determined from the total potable water demand of installations, based on the established assumptions regarding user behaviour:

$$\mathbf{WD_{SPA} = \sum_{i=1}^{n} wd_I - N_{RW} - N_{GW}} \qquad \textbf{(8)}$$

where

- WD_{SPA} Water demand by spa visitors in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{RW} Amount of rainwater used, e.g. to flush toilets, in [m³/a]
- N_{GW} Amount of greywater used, e.g. to flush toilets, in [m³/a]

The specific water demand of installations (wd_I) is determined on the basis of the daily water demand, based on the assumption of the spa area being open for 360 days and usage by 25% of the average total guests staying overnight:

$$\mathbf{n_{SPA} = n_U * 0.25} \qquad \textbf{(9)}$$

where

- n_{SPA} Number of spa visitors
- n_U Number of guests

$$\mathbf{wd_I = (n_{SPA} * f_I * cv_I * 360\ d/a) / 1000} \qquad \textbf{(10)}$$

where

- wd_I Specific water demand of installations in the building in [m³/a]
- n_{SPA} Number of spa visitors

[3] In accordance with the DIN 1989

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- f_I Installation-specific factor for water use in accordance with Table 1, in [seconds/day] or [flushes/day]
- cv_I Installation-specific consumption value in accordance with Table 9 in [litres/second] or [litres/flush]

The wastewater produced by spa guests (WW_{SPA}) is calculated as the total specific water demand of the installations, minus reused wastewater or wastewater purified via decentralised on-site treatment plus the amount of rainwater used for flushing toilets:

$$\mathbf{WW_{SPA} = \sum_{i=1}^{n} wd_I - N_{GW} - R_{BW} - N_{RW}} \qquad \textbf{(11)}$$

where

- WW_{SPA} Wastewater for spa visitors in [m³/a]
- wd_I Specific water demand of installations in the building in [m³/a]
- N_{GW} Amount of greywater reused, e.g. to flush toilets, in [m³/a]
- R_{BW} Amount of wastewater purified on-site in [m³/a]
- N_{RW} Amount of rainwater used, e.g. to flush toilets, in [m³/a]

The amount of wastewater used can be taken from the profitability calculation for use of wastewater, while the amount of purified wastewater can be taken from the design of the decentralised (small) sewage treatment plant.

Healthcare buildings

Indicator 2.1: Potable water demand and wastewater volume – by cleaning

The potable water demand for cleaning WD_C as well as the wastewater volume WW_C is determined based on the total potable water demand for cleaning wipeable floors and the window surfaces.

$$\mathbf{WD_C} = \sum_{i=1}^{n} \mathbf{wd_C} \qquad \textbf{(15)}$$

$$\mathbf{WW_C = WD_C} \qquad \textbf{(16)}$$

where:

WD_C Potable water needed for cleaning [m³/a]
WW_C Wastewater from cleaning [m³/a]
wd_C Potable water demand for a specific surface to be cleaned [m³/a]

The potable water demand wdC for cleaning wipeable floors and the window surfaces is determined on the basis of the area, the cleaning interval and the specific potable water demand. Areas with significantly different requirements must be distinguished:

$$\mathbf{wd_C = (A_C * wd_{C/A}) / 1000} \qquad \textbf{(17)}$$

where:

wd_C Potable water demand for a specific surface to be cleaned [m³/a]
A_C Specific surface to be cleaned (washable flooring and window surfaces, each differentiated according to cleaning interval) [m²]
$wd_{C/A}$ Area-related water demand for cleaning (for the specific cleaning area according to cleaning interval) according to Table 15 in [l/(m²a)]

Table 15: Water demand for cleaning

	INTERVAL	WATER CONSUMPTION CLEANING [L/M²A]	BREAKDOWN OF THE NET FLOOR AREA (EXCLUDING PARKING AREAS)
Wipeable floors	1 x per month	1.5	Technical functional areas
	1 x per week	6.25	(Secondary) circulation areas such as emergency staircases
	3 x per week	18.75	Secondary usable floor areas
	5 x per week 6 x per week 7 x per week	31.25 37.5 43.75	Main usable floor areas and main circulation areas
Glass surfaces	4 x per year	1.2	Exterior glass outside
	12 x per year	3.6	Exterior glass inside

Results of the study “Ökologische Referenzwerte der Gebäudereinigung” (Ecological reference values of building cleaning); on-site cleaning of twelve buildings was examined.

Parking areas and their associated circulation areas are not included in the calculation. Wipeable floor coverings include, for example, artificial stone, natural stone, screed, resilient floors, wooden floors or laminate. Parquet and other wooden floors use very little water when cleaned as they are cleaned less frequently with water and are then simply wiped with a damp cloth. When using these floors, one third of the water consumption values for cleaning that are provided in Table 15 can be assumed.

Portions of floor space in relation to the net floor area for cleaning areas to be considered

Table 16: Specifications for the limit value

CLEANING SURFACES	M³ /M² NFA	AVERAGE CLEANING INTERVAL
Wipeable floor covering	0.031	5 x per week
Glass surface	0.008	Mixed calculation of portions of floor space and cleaning frequency

Indicator 2.1: Calculation of the limit value (benchmarks)

The limit value (L) is determined according to the formulas in Table 18. Greywater, rainwater, river water use, as well as decentralised wastewater treatment, are not considered. The limit value is also influenced by the building location, based on the relevant baseline water stress (BWS) score and category (see Appendix 1 for details).

All limit values (L) from Table 17 must be adapted to the local conditions. The limit value for local conditions (L_{LC}) is determined according to the following equation:

$$L_{LC}\ (m^3/a) = L\ (m^3/a) * (1 - (S_{BWS} * C_{BWS} / 100)) \qquad (18)$$

where:
S_{BWS}: Overall water risk score according to Aqueduct 3.0 data (WRI)
C_{BWS}: Risk categories according to Aqueduct 3.0 data (WRI)

Table 17: Conversions to risk categories

RAW VALUE	RISK CATEGORY	RISK CATEGORY WEIGHT (C_{BWS})	SCORE (S_{BWS})
< 10%	Low	0	0–1
10 – 20%	Low–medium	1	1–2
20 – 40%	Medium–high	2	2–3
40 – 80%	High	3	3–4
> 80%	Extremely high	4	4–5

Dynamic limit values specific to the building type (scheme) are calculated according to the following equations:

Table 18: Dynamic limit value formulas

Office Education Logistics	
Building without shower	$L\ (m^3/a) = (n_U * 9.35\ m^3/a_U) + (A_R * 0.8 + A_S * 0.8) * S_{RW}/1000$
Building with shower	$L\ (m^3/a) = (n_U * 9.98\ m^3/a_U) + (A_R * 0.8 + A_S * 0.8) * S_{RW}/1000$
Residential	
Building without bathtub	$L\ (m^3/a) = (n_U * 70.6\ m^3/a) + (A_R * 0.8 + A_S * 0.8) * S_{RW}/1000$
Building with bathtub	$L\ (m^3/a) = (n_U * 72.6\ m^3/a) + (A_R * 0.8 + A_S * 0.8) * S_{RW}/1000$

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Consumer market Department stores Shopping centre	
Building without shower	L (m^3/a) = (n_E*13.9 m^3/a_E) + (0.05*n_{CU}*5.5 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_E*14.82 m^3/a_E) + (0.05*n_{CU}*5.5 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Production	
Building without shower	L (m^3/a) = (n_U *15.1 m^3/a) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_U*22.89 m^3/a) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Hotel	
Building without spa	L (m^3/a) = (n_U *69.7 m^3/a) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with spa	L (m^3/a) = (n_U*69.7 m^3/a) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000 + (n_{SPA} *111,78m^3/a)
Assembly buildings Congress, trade fair, and municipal halls	
Building without shower	L (m^3/a) = (n_E*6.68 m^3/a_E) + (0.05*0.3*n_{CU}*3.195 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_E*7.13m^3/a_E) + (0.05*0.3*n_{CU}*3.195 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Assembly buildings Museums, exhibition halls	
Building without shower	L (m^3/a) = (n_E*11.13m^3/a_E) + (0.05*0.3*n_{CU}*5.325m^3/a_{CU}) + (A_R*0,8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_E*11.88m^3/a_E) + (0.05*0.3*n_{CU}*5.325m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Assembly buildings Theatre and concert halls	
Building without shower	L (m^3/a) = (n_E*11.13m^3/a_E) + (0.05*0.5*n_{CU}*5.325m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_E*11.88m^3/a_E) + (0.05*0.5*n_{CU}*5.325m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000

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Assembly buildings

Libraries

Building without shower	L (m^3/a) = (n_E*13.35 m^3/a_E) + (0.05*0.5*n_{CU}*6,39 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000
Building with shower	L (m^3/a) = (n_E*14.25 m^3/a_E) + (0.05*0.5*n_{CU}*6,39 m^3/a_{CU}) + (A_R*0.8 + A_S*0.8)* S_{RW}/1000

Healthcare buildings

Building without shower options	LV (m^3/a) = (n_{EMP}*16.3 m^3/a_{EMP}) + (0.8*n_{VI}*23.5 m^3/a_{PA}) + ((0.8*0.5*n_{VI}+n_{DP})*5.5 m^3/a_{VI}) + [(A_{NFA}* 0.031 (m^3/m^2a))] + [(A_{NFA} *0.008 (m^3/m^2a))] + (A_D*0.8 + A_V*0.8)* S_{RW}/1000
Building with shower options	LV (m^3/a) = (n_{EMP}*27.2 m^3/a_{MA}) + (0.8*n_{VI}*40 m^3/a_{PA}) + ((0.8*0.5*n_{VI}+n_{DP})*5.5 m^3/a_{VI}) + [(A_{NFA}* 0.031 (m^3/m^2a))] + [(A_{NFA} *0.008 (m^3/m^2a))] + (A_D*0.8 + A_V*0.8)* S_{RW}/1000

Office **Education** **Hotel** **Consumer market** **Department stores** **Logistics** **Production** **Shopping centre** **Assembly buildings** **Healthcare buildings**

The reference (R) and target value (T) are derived from discount factors:

R = X * G

T = Y * G

The associated values of X and Y are set as follows:

X = 0.66

Y = 0.33

Residential

The associated values of X and Y are set as follows:

X = 0.68

Y = 0.46

Indicator 3: Outdoor facilities

The evaluation is based on two qualitative questions. First, it is asked whether irrigation of outside facilities without drinking water is planned. Second, it is asked whether the outside facilities contain equipment for flow control, retention and storage of rainwater.

Indicator 4: Integration into the district infrastructure

The degree of integration into the district infrastructure is assessed based on a qualitative question. If the building's rainwater and wastewater disposal system is fully aligned with the existing infrastructure in the surrounding district and makes use of all available options for separation, reduction, etc., this can be positively included in the evaluation.

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APPENDIX 1: country specific water stress indicator

The table[4] and map below refer to the working paper WRI (World Recourses Institute) a weighted aggregation methodology that brings Aqueduct's (3.0 data 2019) granular sub-basin level information up to the country and river basin scale, generating global rankings of water-quantity-related risks for all users, as well as sector-specific rankings for agricultural, municipal, and industrial water users.

Baseline Water Stress (definition):
Baseline water stress measures the ratio of total water demand to available renewable surface and groundwater supplies. Water demand includes domestic, industrial, irrigation, and livestock uses. Available renewable water supplies include the impact of upstream consumptive water users and large dams on downstream water availability. Higher values indicate more competition among users.

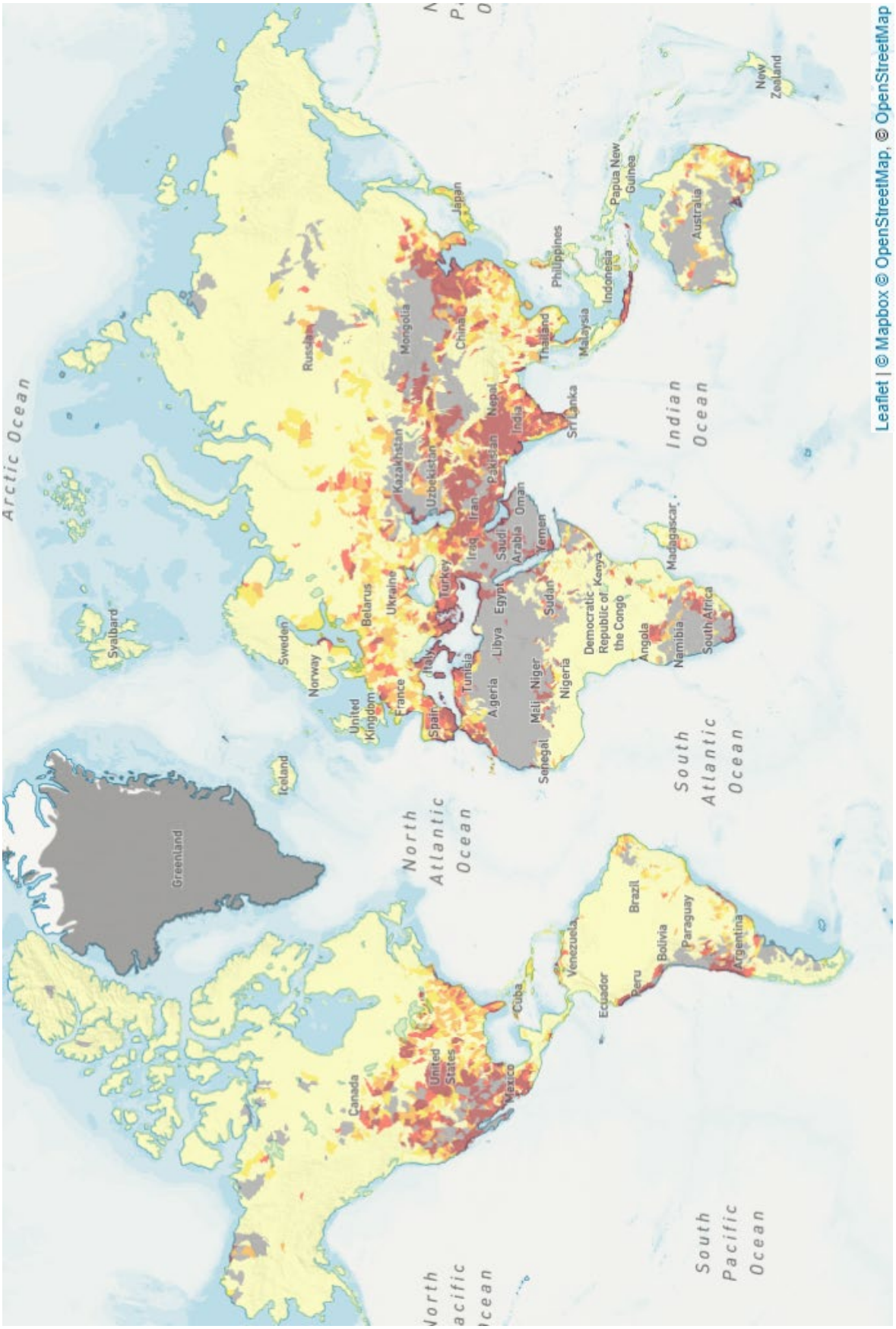
Table 19: exemplary list of regions/countries from the WRI Aqueduct 3.0 Country/Region Rankings

REGION	CODE	COUNTY NAME	SCORE	CATEGORY
Badghis	AFG	Afghanistan	5,00	4
Gaborone	BWA	Botswana	5,00	4
Jwaneng	BWA	Botswana	5,00	4
Djibouti	DJI	Djibouti	5,00	4
Galápagos	ECU	Ecuador	5,00	4
-	-	-	-	-
Azad Kashmir	PAK	Pakistan	3,99	3
Batken	KGZ	Kyrgyzstan	3,99	3
Boucle du Mouhoun	BFA	Burkina Faso	3,98	3
Sidi Bou Zid	TUN	Tunisia	3,97	3
Famagusta	CYP	Cyprus	3,97	3
-	-	-	-	-
Babil	IRQ	Iraq	2,99	2
Ma'rib	YEM	Yemen	2,99	2
Guárico	VEN	Venezuela	2,99	2
Dadra and Nagar Haveli	IND	India	2,98	2
Comunidad Foral de Navarra	ESP	Spain	2,98	2
-	-	-	-	-
Hîncesti	MDA	Moldova	2,00	1
Cuscatlán	SLV	El Salvador	2,00	1
Leova	MDA	Moldova	1,99	1
Ahuachapán	SLV	El Salvador	1,99	1
Briceni	MDA	Moldova	1,99	1
-	-	-	-	-
Mauren	LIE	Liechtenstein	0,99	0
Valduz	LIE	Liechtenstein	0,99	0
Appenzell Ausserrhoden	CHE	Switzerland	0,99	0
Appenzell Innerrhoden	CHE	Switzerland	0,99	0
Thurgau	CHE	Switzerland	0,99	0

[4] Full table of regions is available under the DGNB ENV2.2 Excel tool ("water tool").

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Figure 1: Baseline water stress (BWS) global atlas: https://www.wri.org/aqueduct/data



APPENDIX B – DOCUMENTATION

I. Required documentation

A range of different forms of documentation is listed below. The documentation submitted must comprehensively and clearly demonstrate compliance with the requirements for the target evaluation of the individual indicators.

Indicator 1: Water utilisation concept

- Documents on the flow rate classes of the sanitary equipment
- Documentation/detection of the local water use index (WEI+ and/or BWS), concepts and variant studies considering rainwater harvesting, greywater reuse possibilities, efficiency of irrigation etc.

Indicator 2: Potable water and wastewater volume

Indicator 2.1: Water use value

- Calculation of the water use value (WUV)
  Clear calculation of the water use value for the constructed building and the limit value, reference value and target value throughout the calculation process for the criterion. All results and interim results of the calculation must be clearly presented via DGNB Excel tool for this criterion.

Note: Country specific adaptation: of the limit, reference and target values, is integrated into the DGNB Excel tool.

- If river water is used, the following points must be noted:
  (1) Extraction of river water:
  River water can be used within the building as an alternative to greywater or rainwater for flushing toilets, etc., if the building is in the immediate vicinity of such a body of water. If rainwater is discharged into the body of water at the same time, this would form a cycle of discharge and extraction.
  (2) Discharge of non-hazardous rainwater into surface waters (rivers/canals/streams)
  Requirement: Permission for discharge into a surface body of water in accordance with local regulations and an exemption from compulsory connection and usage.

- Potable water demand and wastewater volume by users
  - Number of employees
  - Flow rate values for fittings from data sheets
  - Additional information on manufacturer's specifications for toilets: When specifying the installation-specific factor of e.g. 5-9 l, the average value does not apply, but the low key metric corresponds to “toilet economy button", the higher value is to be entered for “toilet".
  - Amount of rainwater or river water used
  - Amount of greywater used
  - Amount of wastewater purified via decentralised treatment, e.g. as a result of the design of the sewage treatment plant

- Wastewater due to rainwater diverted to the drain system
  - Plausible determination of the annual rainfall at the site
  - Plausible determination of river water discharge
  - Plausible calculation of sealed areas and green spaces
  - Plausible determination of the yield coefficients of the sealed areas according to the table 13
- Calculation of the rainwater used for watering or flushing toilets

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Indicator 3: External works

Indicator 3.1: Watering and rainwater retention

- Documents in the form of plans, photos, etc. with statements on the throttling/retention of rainwater

Indicator 4: Integration into district infrastructure

Indicator 4.1: Level of integration

- Documents on rainwater and wastewater disposal of the building and the surrounding district, if applicable pictures of the implemented measures (and location on overall plan)

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN EN 246. Sanitary tapware – General specifications for flow rate regulators. Berlin: Beuth publisher. November 2003
- DIN 1989-1. Rainwater harvesting systems – Part 1: Planning, installation, operation and maintenance. Berlin: Beuth publisher. April 2002
- DIN 1988/3. Drinking water supply systems; pipe sizing (DVGW code of practice). Berlin: Beuth publisher. December 1988
- DIN EN 12056-1. Gravity drainage systems inside buildings – Part 1: General and performance requirements. Berlin: Beuth publisher. January 2001
- VDI 3818. Public sanitary facilities. Düsseldorf: Verein Deutscher Ingenieure. February 2008
- VDI 6024 sheet 1, Table 10: Saving of water in drinking-water installations – Requirements for planning, installation, operation, and maintenance. Düsseldorf: Verein Deutscher Ingenieure. September 2008
- Feurich. Sanitärtechnik [Sanitary engineering], 9th edition, Düsseldorf 2005; pages 12-29 (specifies the water consumption for administrative and office buildings as 20 to 25 litres per working day and employee)
- Sustainable Development Goals icons, United Nations/globalgoals.org
- Aqueduct 3.0: Updated Decision-Relevant Global Water Risk Indicators - “Baseline water stress Aqueduct Indicators Based on Hydrological Model Output” DC: World Resources Institute 2019 https://www.wri.org/-aqueduct/data
- Water exploitation index plus (WEI+) for river basin districts (1990-2015): https://www.eea.europa.eu/en/-analysis/maps-and-charts/water-exploitation-index-for-river-2#:~:text=The%20WEI%2B%20has%20been%-20estimated,under%20the%20Water%20Framework%20Directive.

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ENV2.3

Land use

Objective

Our objective is to reduce the excess use of land for building purposes and limit soil sealing in undeveloped areas.

Benefits

Using land and soil sparingly and in a way that minimises environmental impact is necessary not only from an ecological standpoint; with infrastructure costs rising, financial aspects must also be considered. At a local level, efficient land use can help to reduce development and wastewater charges and improve the microclimate.

Contribution to overarching sustainability goals



Outlook

Reducing land use is an important national sustainability goal and the EU is aiming to move towards ‘no net land take’ by 2050. For this reason, the criterion will remain in later versions and will be even more heavily oriented towards the achievement of higher-level goals.

Share of total score

	SHARE	WEIGHTING FACTOR
Office Education Department stores Assembly buildings Healthcare buildings	1.9%	2
Residential Hotel Consumer market Shopping centre	1.8%	
Logistics Production	2.6%	3

EVALUATION

In order to achieve the objective of reducing the excess use of land for building purposes, the extent of land reuse is assessed by determining the previous use of the land on which the building is being built. In order to limit soil sealing on undeveloped land, achieving a low soil sealing factor and implementing compensatory measures is assessed positively in the evaluation. Circular economy bonuses can be achieved if contaminated sites are cleaned of pollutants through in-situ renovation measures using natural and sustainable degradation processes (e.g. chemical/biological) or if the soil is not changed at all. 100 points can be obtained for this criterion; with the bonus, a maximum of 110 points can be awarded.

NO.	INDICATOR	POINTS
1	**Land use**	**Max. 70**
1.1	**Extent of rededication**	**70**
	Outer development area – undeveloped	10
	The land used for building purposes has already been allocated to the settlement and traffic area under the legally valid land-use plan. This land has not yet been developed. (“Outer zone” in accordance with the local zoning codes, e.g. “zoning ordinances” or “land use ordinances”) and these areas are **not** assigned to any of the following categories: ■ Arable and cultivated land with moderate to highly fertile soil[1] ■ Greenfield sites with recognised high biodiversity value and areas that serve as habitats for endangered species (flora and fauna)[2] ■ Areas defined as forests and used in the national greenhouse gas inventory[3] If areas used have a recognised high biodiversity value (nature conservation areas as well as UNESCO World Heritage Sites), an appropriate evaluation has been carried out and necessary mitigation measures[4] implemented that will not have a significant impact on the objectives of the (nature conservation) areas.	
	Inner development area – undeveloped	40
	The land used for building purposes is within an existing settlement structure ("Inner area" in accordance with the local zoning codes, e.g. “zoning ordinances” or “land use ordinances”).	
	Brownfield	70
	Brownfield land used for building purposes within an existing settlement structure ("Inner area" in accordance with the local zoning codes, e.g. “zoning ordinances” or “land use ordinances”).	
2	**Soil sealing**	**Max. 20**
2.1	**Soil sealing factor and/or compensatory measures**	**0–20**
	Soil sealing factor	
	■ The soil sealing factor of the total developed and undeveloped area is more than 80%	0
	■ The soil sealing factor of the total developed and undeveloped area is no more than 50%	20
	Implementation of compensatory measures	
	■ Compensatory measures have been implemented that go beyond the measures required by construction law in both scope and quality and contribute to the urban and microclimate and biodiversity.	+10

[1] As defined in the EU LUCAS survey: https://esdac.jrc.ec.europa.eu/projects/lucas
[2] Endangered species according to the European Red List: https://environment.ec.europa.eu/topics/nature-and-biodiversity/european-red-list-threatened-species_en and or the IUCN global Red List: https://www.iucnredlist.org/
[3] Or, if not available, according to the FAO definition of "forest"
[4] In accordance with Directive 2009/147/EC and 92/43/EEC

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2.2	**CIRCULAR ECONOMY BONUS – Unsealing** Areas sealed prior to the development will be unsealed to the relevant extent (> 30%) and landscaped or designed to be open to infiltration.	**Max. 10** 10
3	**Soil quality improvement**	**Max. 10**
3.1	**Soil remediation** Professional material recovery or disposal of large areas of contaminants and/or ammunition (e.g. WWII battlefields) are classified for recycling or disposal in accordance with the applicable legal regulations. The site has been investigated for potential contaminants, for example using standard ISO 18400[5] or the soil categorisation using either national (local) contaminant classification or classification described in Appendix B. ■ Examination of the property and, if applicable, existing building for pollutants ■ Investigation and improvement in the case of weaker contamination in relation to the building project (building stock/soil can be recycled/recovered fully in the best case, but at least partially in the current building project) and possible disposal of heavily contaminated building fabric ■ Investigation and improvement in the case of stronger contamination in relation to the building project (building stock/soil must be removed) and possible disposal of heavily contaminated building fabric	**10** 2 5 10
3.2	**CIRCULAR ECONOMY BONUS – Soil quality improvement and protection** Significant improvement of soil quality is achieved through in-situ (on-site) soil remediation measures using natural and sustainable degradation processes (e.g. chemical/biological). The soil is not removed or replaced. By elevating the structure or not building a basement, the existing soil is not changed or is changed only slightly to the extent necessary for construction. The mobile pollutant pool is secured, and the transfer of pollutants is prevented by suitable structural measures (e.g. sealing, encapsulation). Remediation of groundwater damage, e.g. by: ■ Physical treatment methods by means of ongoing plant technology ■ Active in-situ processes leading to long-term chemical or biological degradation. ■ In-situ processes that lead to long-term chemical and biological degradation, “treatment train" remediation approaches.	**Max. 10** +5 +5 +5

[5] ISO 18400 series on Soil quality

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Type of land used (outside of development area, area for inner city development – previously undeveloped, brownfield)	[Type]
KPI 2	Soil sealing factor of the total developed and undeveloped area	[%]
KPI 3	Investigation of potentially contaminated sites according to ISO 18400:2018 corresponds to EU Taxonomy indicator “Pollution prevention and control”	[yes/no]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Space is not "consumed“ but used for different purposes. This is usually reflected in changes to the type and degree of ground cover. The criterion assesses whether and to what extent the type of land use changes as a result of the construction project. A positive evaluation can be achieved through good site selection and through the reuse of land in the sense of a circular land economy, as well as through re-densification, the closure of gaps between buildings and other measures for internal development.

II. Additional explanation

-

III. Method

This criterion relates to the completed building. The amount of land used for a project can generally only be influenced at the project development and design phase. Once the planning application has been submitted and approved, there are no further opportunities to make changes.

Indicator 1: Land use

Indicator 1.1: Extent of rededication

Only the (building) plot is considered here. The type, extent and direction of the actual change in use of the area are recorded. The development of near-natural areas is assessed negatively and soil remediation of polluted areas is assessed positively. Internal development measures are rated positively compared to external development. Land used for extracting raw materials (e.g. quarries) or for buildings for producing building materials and products is not taken into consideration. To assess the plot of land, its previous use must be determined via the land register or cadastral records.

Outer development area – undeveloped

Undeveloped areas are areas for which **outdoor development measures** that have been designated for circulation and settlement via land-use planning and for which building rights exist under a legally binding land-use plan, but which were previously undeveloped. The areas are not assigned to any of the following categories:

- Arable and cultivated land with moderately to highly fertile soil
- Greenfield sites with recognised high biodiversity value and areas that serve as habitats for endangered species (flora and fauna)
- Areas defined as forests and used in the national greenhouse gas inventory

If areas with a recognised high biodiversity value (Key Biodiversity Areas, other nature conservation areas as well as UNESCO World Heritage Sites) are used, an appropriate evaluation would have been carried out and necessary mitigation measures[6] implemented that will not have a significant impact on the objectives of the (nature conservation) areas.

[6] In accordance with Directive 2009/147/EC and 92/43/EEC or especially for the non-EU member states similar regulation in regard to the conservation of natural habitats and of wild fauna and flora

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Inner (city) development area – previously undeveloped
Undeveloped areas are areas in **inner development zones** within an existing settlement structure (“inner area" according to national/local cadastre/building code), but which were also previously undeveloped. This includes gaps between buildings and “re-densification” zones.

Brownfield
Built-up areas are areas within an existing settlement structure (“inner area" according to the national/local cadastre /building code) that are already assigned to the category "building area", “operational area" or “circulation area" or have already been predominantly used as a building, industrial and commercial or circulation area, including brown-fields. Measures to develop brownfield sites, as opposed to developing greenfield sites, will be reflected positively in the assessment.

Indicator 2: Soil sealing

Indicator 2.1: Soil sealing factor and compensatory measures
The soil sealing factor of the undeveloped land must be determined. The soil sealing factor is calculated based on the amount of impervious/sealed, developed and undeveloped land as a proportion of the total land area.

Soil sealing factor = (sealed developed and undeveloped land area / total land area) * 100 [%]

The indicator is evaluated based on of the available documentation on calculating the soil sealing factor for the developed and undeveloped land. Soil sealing is the artificial separation of the soil from the atmosphere by covering the surface of the soil with materials that are virtually impenetrable to rainwater, particularly by building roads, paths and buildings on this land. Sealing can be divided into the following types:

- Full sealing, e.g. with tarmac or concrete
- Partial sealing, e.g. with flagstones, grass pavers and paving slabs
- Underground sealing, e.g. by means of underground garages, etc.

The soil sealing factor indicates the proportion of the total land area under consideration that is sealed. For partially sealed areas, the following calculations apply:

- Water-bound cover (paths and roads, squares and other large open plots, driveways, etc.) 80%,
- Spaced paving with grass jointing and similar ground coverings, drain paving 70%,
- Grass pavers 50%,
- Gravel/stone chippings 40%,
- Lawn on gravel 30%.

Exemption for sealing:

- If an expert report demonstrates that it is necessary to seal certain areas for ecological reasons (e.g. highly contaminated soil would contaminate the groundwater), these sub-areas can be disregarded.

Recognition of compensatory measures:

- Compensatory measures implemented on the plot of land or in the immediate vicinity can be credited in the evaluation. These include all measures normally recognised under building and planning law. They encompass certain rainwater management and infiltration measures, green roofs and walls, and land-scaping.

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Indicator 2.2: Circular economy bonus – Unsealing
Bonus points can be awarded if areas are unsealed to a relevant extent (> 30%) and greened or designed to be open to infiltration.

Indicator 3: Soil quality improvement

Indicator 3.1: Soil remediation:
Brownfield redevelopment is often implemented by making contaminated land suitable for (re)use by means of measures to dispose of contaminated soil and improve the soil categories. Land with a national (local) contaminant classification (if applicable) or there is a suspicion of contamination, either because there is/has been an activity considered to be potentially polluting, or because an accident or spill has occurred, and/or land containing munitions is classed as contaminated. If significant contamination is identified in the inherited building fabric on the land and if this needs to be disposed of, this can also be taken into consideration when evaluating the indicator. Classification as either "Significant improvement of land with low-level/weaker contamination as a result of the project" or "Significant improvement of land with significant/stronger contamination as a result of the project" depends on the level of contamination (contaminant classification) of the soil or building fabric in the project in question, and on the proportion of land with contaminated areas in relation to the scope of the project as a whole. The soil and contaminant survey must be used as a basis for this classification, and documentary evidence for the disposal must be provided.

Indicator 3.2: Circular economy bonus – in-situ soil remediation/protection:
Soil remediation in-situ (on-site) by means of natural and sustainable degradation processes (e.g. chemical/ biological) is positively evaluated. The soil is not removed or replaced.

Bonus points can also be awarded if, by elevating the structure or not building a basement, the existing soil is not altered or is only slightly altered. Expert reports must show that the soil left in place does not pose a risk to protected assets (e.g. humans, groundwater, air).

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APPENDIX B – DOCUMENTATION

I. Required documentation

A range of different forms of documentation is listed below. The documentation submitted must comprehensively and clearly demonstrate compliance with the requirements for the target evaluation of the individual indicators.

Indicator 1.1: Extent of rededication

- Relevant excerpts from land registry records or the cadastre as evidence of the previous use of the land for building purposes.
- Environmental impact assessment/strategic environmental assessment or environmental report
- Documentation by environmental, nature conservation and monument protection authorities

Indicator 2.1: Soil sealing factor and/or compensatory measures

- Calculation of the soil sealing factor of the undeveloped land
- Site plan with information on the land and land cover types
- Documentation of the compensatory measures, e.g. in the form of:
  approval from the relevant authority for the measures implemented as compensation areas/compensatory measures in accordance with the Habitats Directive (more formally known as Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora).
- Relevant excerpt from the urban land-use plan that demonstrates that approved compensatory measures are in place for the property to be assessed and lists the applicable requirements
- Excerpt from the written text and drawings defining the compensatory measures and used to implement the requirements
- Plans of the compensation areas

Indicator 3: Soil remediation

- There must be official monitoring and written documentation of proper implementation and that the condition has been achieved (reduction of contamination).
- Documentation of previous contamination of the plot, e.g. in the form of excerpts from the soil survey, contaminant cadastre or a contaminant survey that specifies the level of contamination, waste categories and geographical location (mapping) of the contaminants*, as well as a professional assessment of the contaminated area as a proportion of the project as a whole so that it can be categorised as "low-level" or "significant" contamination. The list of polluting activities varies among countries, depending on their industrial past and the national legislation. Generally, the concept of polluting activities refers to certain installations[7] and industrial activities[8] that are damaging the capacity of soil to continue to perform in full its broad variety of crucial functions.

* contaminant classification can be defined as follows (if no national soil contamination classification can be applied):

- 0 Natural soil, unrestricted reuse
- 1 Restricted open installation (certain use restrictions, the decisive factor for determining the values is usually the protective material groundwater)
- 2 Restricted re-use with defined technical protection measures for groundwater
- 3 Residential waste, landfill class I

[7] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), p.23.
[8] Annex II of the proposal Directive of the European Parliament and of The Council establishing a framework for the protection of soil and amending Directive 2004/35/EC.

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- 4 Residential waste, landfill class II
- 5 Waste, hazardous waste landfill

Parameters	Waste, hazardous waste landfill	Residential waste, landfill class II	Residential waste, landfill class I
Loss on ignition of the dry residue of the original substance	≤ 10 Mass-%	≤ 5 Mass-%	≤ 3 Mass-%
Extractable lipophilic substances of the original substance	≤ 4 Mass-%	≤ 0.8 Mass-%	≤ 0.4 Mass-%
Conductivity	≤ 100,000 µ S/cm	≤ 50,000 µ S/cm	≤ 10,000 µ S/cm
TOC	≤ 200 mg/l	≤ 100 mg/l	≤ 20 mg/l
Phenols	≤ 100 mg/l	≤ 50 mg/l	≤ 0.2 mg/l
Lead	≤ 5 mg/l	≤ 1 mg/l	≤ 0.2 mg/l
Cadmium	≤ 0.5 mg/l	≤ 0.1 mg/l	≤ 0.05 mg/l
Zinc	≤ 10 mg/l	≤ 5 mg/l	≤ 2 mg/l
Cyanide, easily released	≤ 1 mg/l	≤ 0.5 mg/l	≤ 0.1 mg/l
AOX	≤ 3 mg/l	≤ 1.5 mg/l	≤ 0.3 mg/l
Water-soluble fraction	≤ 10 Mass-%	≤ 6 Mass-%	≤ 3 Mass-%

The table lists some selected allocation values, which clearly show the grading of the different landfill classes. https://www.gesetze-im-internet.de/depv_2009/anhang_3.html

Alternatively, Investigation of potentially contaminated sites can be done according to ISO 18400-203:2018 Soil quality-sampling.

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals icons, United Nations/globalgoals.org
- The Habitats Directive. http://ec.europa.eu/environment/nature/legislation/habitatsdirective/
- Status of local soil contamination in Europe, A report by the JRC in collaboration with the European Information and Observation Network (Eionet) national reference centres for soil, 2018
- The need for soil protection, legislation at EU level Position paper of the German Environment Agency, October 2018
- Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, December 2018
- Soil hazard categorisation and management, EPA (environmental protection agency US). June 2009
- Federal Soil Conservation Act (Bundes Bodenschutzgesetz) https://www.umweltbundesamt.de/en-/topics/soil-agriculture/site-contamination
- Ordinance on landfills and long-term storage “Verordnung über Deponien und Langzeitlager (Deponie-verordnung - DepV)”, Federal Government and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. https://www.gesetze-im-internet.de/depv_2009/anhang_3.html
- Soil Contamination: Impacts on Human Health, Science for Environment Policy, published by European Commission Issue 5, September 2013
- ISO 18400-203:2018 Soil quality — Sampling — Part 203: Investigation of potentially contaminated sites, October 2018

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ENV2.4

Biodiversity at the site

Objective

Our objective is to maintain biodiversity in the local environment. The built environment has a significant influence on the diversity of ecosystems (ecological communities, habitats and landscapes), the diversity of the species there and their genetic diversity. We want to encourage positive steps towards creating, maintaining and increasing biodiversity both on buildings themselves and in their environs.

Benefits

Biodiversity and intact ecosystems are the basis of life for humans. The fewer species there are, the more vulnerable ecosystems are to disturbance and change. As a result, the habitats and livelihoods of human-beings are also becoming less resilient. The evaporation function of plants leads to an improved microclimate and higher thermal comfort, especially considering the continuing increase in heat problems, and a positive effect on climate change is achieved via the CO_2-binding capacity of plants and soils. Furthermore, plants in, on and around buildings and respect for the local fauna create a positive image of the buildings. This increases the value of the property. Choosing plants that are suitable for the site can also reduce subsequent costs as these are often hardier, less susceptible to disease etc., and require less care.

Contribution to overarching sustainability goals



Outlook

Adapted from the DGNB scheme for districts, this criterion was applied to buildings for the first time in the 2018 German version and is now being further enhanced with the 2023 German and 2025 international versions. The considerable importance of biodiversity has required a pragmatic approach. The short-term objective is to re-examine the methodology and increase acceptance of this issue. In the medium term further, relevant indicators are to be added to the methodology to support the achievement of this goal.

Share of total score

	SHARE	WEIGHTING FACTOR
Office Education Department stores Assembly buildings Healthcare buildings	2.8%	3
Residential Hotel	2.7%	3
Logistics Production	3.5%	4
Shopping centre Consumer market	3.6%	4

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EVALUATION

The biodiversity strategy, as described by Indicator 1, sets out a pathway for preserving diverse ecosystems and creating new habitats. It shows how the relevant area can have a positive impact on environmental diversity. Indicator 2 addresses the creation and maintenance of diverse and structurally rich habitats. Only by ensuring the diversity of habitats and semi-natural and site-appropriate plant selection, as described in Indicator 3, can animals be provided with suitable habitats. This has an indirect effect on species richness. If ecosystems are interconnected or animal movement patterns are supported, this can be addressed in Indicator 4. Indicator 5 identifies potential hazards for animals posed by construction work and aims to encourage their avoidance or reduction. In order to ensure the long-term preservation of ecological areas, professional maintenance is necessary. This long-term commitment is rewarded by Indicator 6 “Maintenance and monitoring". From a total of 150 points, a maximum of 100 regular points can be awarded for the criterion, or a maximum of 110 points including bonuses.

NO.	INDICATOR		POINTS
1	**Biodiversity strategy**		**Max.20**
1.1	**Development and implementation of a biodiversity strategy**		
	Preparation and implementation of a comprehensive and long-term biodiversity strategy for the building and its immediate surroundings that goes beyond the measures prescribed in the land-use plan or building approval and considers future site development.		20
2	**Habitat**		**Max. 54**
2.1	**Biodiversity-promoting area**		**15–20**
	The outside facilities are implemented in a way that promotes biodiversity, or which prepares them accordingly. Points can be interpolated on a linear basis.		
	■ 40%		15
	■ 100%		20
2.2	**Green roof**		**5-7**
	To support habitat structures and utilise positive climatic effects (points can be interpolated on a linear basis)		
	■ at least 50% of the suitable roof areas are green.		5
	■ at least 70% of the suitable roof areas are green.		7
2.3	**Biodiversity index (BDI)**		**0–20**
	The points are interpolated between 0 and the respective target BDI (see method)		
	■ Object-related biodiversity index (BDI) 0 ≤ BDI = 0.6 (target BDI = 0.6)	**Residential**	0–20
	■ Object-related biodiversity index 0 ≤ BDI = 0.4 (target BDI = 0.4)	**Education, healthcare buildings** **Hotel**	0–20
	■ Object-related biodiversity index 0 ≤ BDI = 0.3 (target BDI = 0.3)	**Office, Logistics, Production,** **Department stores, Consumer market,** **Shopping centre,** **Assembly buildings**	0–20

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2.4	**AGENDA 2030 BONUS – Green Building**	**Max. 5**
	Green building: 1 bonus point for each 0.05 increase over and above the object-related target biodiversity index (max. 5 bonus points)	+1
2.5	**Wide range of structure types**	**Max. 7**
	Various structures form habitats for flora and fauna and can thus provide different functional areas for animals.	
	■ The habitat structure types are integrated into a biodiversity-promoting concept as part of a new installation.	+5
	■ Two types of habitat structure are present.	+2
3	**Vegetation**	**Max. 27**
3.1	**No use of invasive plant species**	
	No invasive plant species will be planted on the property as part of the implementation. For already existing invasive species, a plan of action for control and professional disposal is drawn up.	7
3.2	**Use of diverse, native and site-appropriate plant species**	**Max. 20**
	■ The plant selection is based on a biodiversity-promoting concept.	8
	■ The seedlings, perennials, woody plants and trees present on the biodiversity-promoting areas are predominantly native, species-rich and adapted to the existing site.	+1–20
3.3	**AGENDA 2030 BONUS – Preservation of vegetation with high environmental value**	**5**
	Much of the existing vegetation with a high environmental value will be preserved during the construction project and beyond	5
4	**Environmental reference**	**Max. 7**
4.1	**Measures for habitat connectivity**	
	An evaluation of the construction project is available in terms of disturbance or favouring of connectivity of surrounding biotopes or movements of animals. In the event of anticipated disturbances caused by the construction project, mitigation or connectivity measures have been implemented.	
	■ A concept for integrating the open spaces into the overarching biotope networks and habitat structures is available and the measures identified from this have been implemented or prepared for implementation. Permeability to adjacent open spaces and properties is present and existing internal networking potentials on the property have been exhausted.	7
5	**Reduction of negative influences**	**Max. 19**
5.1	**Lighting suitable for wildlife conservation**	**Max. 9**
	■ There is a lighting concept (for open spaces, building lighting and advertising) that explicitly addresses the issue of light pollution and how to avoid it: according to the principle of "only where necessary, as much as necessary and overall as little as possible".	+3
	■ All light sources in the outdoor area are designed with regard to orientation such that they are harmless to wildlife conservation: no light scattering upwards and to the side (upward light ratio ULR: 0%).	+3

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	■ The colour of lamps used outdoors is designed such that they are harmless to wildlife conservation: portion of the blue light spectrum in a light source and lamps with a surface temperature > 60 °C, are avoided.	+3
	■ There are no undesirable glare effects from any of the light sources.	+3
5.2	**Avoidance of animal traps** An evaluation of the construction project is available in terms of existing hazard potentials for animals. If potential hazards are identified, measures to avoid or reduce them are implemented.	5
5.3	**Construction site planning** Construction site planning that takes environmental protection and biodiversity concerns into account has been implemented, e.g. in soil and water protection measures, flora and fauna protection measures.	5
6	**Maintenance and monitoring**	**Max. 23**
6.1	**Maintenance and monitoring agreement** After project completion, the relevant open spaces are maintained to preserve the quality and functionality of the biodiversity-promoting areas within the maintenance agreement/contract.	
	■ Maintenance and monitoring agreement is available	13
6.2	**No use of substrates containing peat**	
	No substrate containing peat is used for the creation and maintenance of the outside facilities.	4
6.3	**No use of pesticides**	**Max. 4**
	■ No use of herbicides (weed and weed killer) throughout the site	+2
	■ No use of biocides (pesticides) on the areas promoting biodiversity (see Indicator 2.1)	+2
6.4	**No use of chemical fertilisers on the site**	
	■ No use of chemical fertilisers throughout the site	2
to 1–6	**INNOVATION AREA – Alternative verification procedure** If a biodiversity award is available for the project, 100 points can be credited in the alternative procedure in consultation with the DGNB.	**100**

SUSTAINABILITY REPORTING AND SYNERGIES

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Biodiversity strategy used as a basis for implementation	[yes/no]
KPI 2*	Proportion of the implemented biodiversity-promoting area to the total outdoor areas	[% area]
KPI 3	Proportion of green roof areas classified as suitable	[% area]
KPI 4*	Object-related biodiversity index	[-]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

A decline in biodiversity can be observed the world over. This puts the very foundation of human existence at risk because this loss is irreversible (*cf. BMU 2007*). To counteract this, for example, at the 1992 UN summit in Rio de Janeiro, international objectives for maintaining and increasing biodiversity were agreed, and these objectives are now to be implemented at local level (cf. UN 1992). At the COP15 Biodiversity Conference in 2022, this goal was strengthened, and it was agreed that "by 2030, biodiversity loss [should] be halted and the trend reversed" (BMUV website, retrieved from https://www.bmuv.de/cbd-cop15).

The careful treatment of nature by considering biodiversity on building site creates a positive external and internal perception with customers, visitors and employees. Well-being is demonstrably increased by spending time in a healthy and natural environment, which ultimately has positive effects on health.

Even in an urban context, biodiversity can be maintained or nurtured through appropriate measures, sometimes even achieving higher levels of biodiversity than, for example, in mono-structural landscapes or rural areas with very little arable land that could be useful for this purpose. A strategic, environmentally friendly urbanisation concept can be used to integrate landscaping and architecture, for example through green roofs, façade greening systems, realistic water features and small-scale urban farming, combining contemporary design, functional use and the development and protection of biotopes.

II. Additional explanation

-

III. Method

Indicators are evaluated on a partly qualitative and partly quantitative basis. The biodiversity strategy is assessed as an overarching concept. Habitats are examined via biodiversity-promoting areas, the biodiversity index and the presence of various habitat structures. Indicators for biodiversity-promoting vegetation are then defined, extending the assessment beyond the system boundary and establishing an environmental reference. It is also important to reduce negative impacts on fauna and flora caused by development. In order to maintain the environmental value of the site, biodiversity-promoting maintenance is essential.

Biodiversity strategy and concept
Indicator 1.1: Development and implementation of a biodiversity strategy
Preparation and implementation of a comprehensive and long-term biodiversity strategy for the building and its immediate surroundings that goes beyond the measures prescribed in the land-use plan or building approval and considers future site development. A preliminary wildlife conservation study (habitat potential analysis) is to be carried out. Evidence must be provided of an examination of the topics listed below. If an environmental report or comparable documents exist within the scope of the valid land-use plan procedure, they can be used as evidence.

The strategy must include a clear definition of the desirable goal(s), including annual reviews/descriptions of the development progress towards this goal.
Examination of the following topics is to be provided as evidence:

- Existing buildings – What is the condition of the site / structure and what should be preserved?
- Future climate – What are the future climatic conditions of the site?

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- Habitat structures – Which structures are worth preserving? Which structures can be created and linked to existing ones? Which habitat functions exist, and which can be created?
- Animals – Which animal species from the natural area are suitable for the site? What are the environmenttal requirements for these species? Which plants do these species need?
- Vegetation – Which plants suit the site and are native? Can the vegetation be selected so that it does not require irrigation or fertilisation? If irrigation is needed, how can it be done in a (fresh) watersaving way.
- Environmental reference – How can the biotopes be networked and permeability created? What higher-level plans are in place and how does the site fit into them?
- Reduction of negative influences – What barriers and disruptive factors are created by the construction work? What measures can be taken to reduce or avoid them?
- Care instructions – How should biodiversity-promoting maintenance be carried out?

Habitat

Indicator 2.1: Biodiversity-promoting area

At least 40% of the outside facilities are implemented in a way that promotes biodiversity, or which prepares them accordingly. All areas according to Table 1 are considered to be the biodiversity-promoting areas. All outdoor surfaces such as façades, roofs and outdoor facilities can be counted.

The proportion of biodiversity-promoting area can be calculated as follows:

$$Proportion\ of\ biodiversity\ promoting\ area = \frac{\sum biodiversity\ promoting\ areas}{Outside\ facilities} * 100$$

The allocation of the areas using Table 1 must be verified / plausibly explained, e.g. by an expert. All of the areas listed below can also be implemented on the façade and/or roof surfaces, with an average substrate layer of 10 cm. The area can only be credited if it exceeds the minimum size.

Table 1: Biodiversity-promoting areas

NO.	DESIGNATION
1.	**Biodiversity-promoting areas**
1.1	Semi-natural, species-rich and site-appropriate tree groups Evaluation: predominantly native and species-rich (see Indicator 2.3 Use of diverse, native and site-appropriate plant species) Assessment: estimated canopy width or degree of cover in the current state Note: If trees (groups of trees, avenues, etc.) are located in semi-natural green spaces, they are not assessed separately. The overlapping area then counts as seedlings, woody plants or perennials and not as category 1.1 Tree groups (relevant for tool -> Linking minimum area for woody plants, perennials and seedlings) Minimum area: none
1.2	Semi-natural, species-rich and site-appropriate shrubs Evaluation: predominantly native and species-rich (see Indicator 2.3 Use of diverse, native and site-appropriate plant species, Table 5 – Requirements for native and species-rich vegetation) Minimum area: 6 m²

1.3	Semi-natural, species-rich and site-appropriate perennial planting Evaluation: predominantly native and species-rich (see Indicator 2.3 Use of diverse, native and site-appropriate plant species, Table 5 – Requirements for native and species-rich vegetation) Minimum area: 10 m²
1.4	Semi-natural, species-rich and site-appropriate seedlings Assessment: native and species-rich seed, indigenous if possible (see Indicator 2.3 Use of diverse, native and site-appropriate plant species, Table 5 – Requirements for native and species-rich vegetation) Examples: lean, dry, rich and wet meadows (flowering meadows) as well as herbaceous margins Minimum area: 30 m²
1.5	Ruderal areas, fallow land, sparsely vegetated areas Minimum area: 5 m²
1.6	Semi-natural water areas/bodies of water Evaluation: soft slopes and edges covered with semi-natural vegetation present Minimum area: 10 m²
1.7	Semi-natural façade greening Evaluation: according to category 1.2 semi-natural shrubs and 1.3 semi-natural perennials Assessment of soil-bound vertical greening: max. crediting height 10 m. This corresponds approximately to the area that will be overgrown with climbing plants within 10 years. In the case of greenery with a trellis, the area covered by the trellis is considered, up to a maximum height of 10 m. Assessment of wall-bound vertical greenery: up to a height of 20 m, a maximum of 10 m can be credited proportionally. Minimum area: none
1.8	Other biodiversity-promoting areas that are not mentioned can be credited if they are suitably justified by an expert
Note:	Semi-natural green roof No separate area category. All previously mentioned areas can also be verified on roof surfaces with an average of at least 10 cm substrate layer.

Indicator 2.2: Green roof

To support habitat structures and use positive climatic effects

- the potential green roof area is to be determined
- at least 50% of the roof areas (which are classified as suitable) are green.

The potential green roof area and thus the suitability of a roof to be green is to be determined according to the roof pitch:

- 0°–5° Roof pitch very well suited
- 6°–10° Roof pitch well suited
- > 10° Roof pitch not relevant for the evaluation of the green roof potential

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Note on identifying suitable roof surfaces:
When identifying suitable roof surfaces, only the roof pitch is decisive. The green roof areas are calculated up to the inner edge of the parapet. Technical superstructures are not deducted but included in the green roof surface potential. Glass surfaces may be deducted.

The sum of the roof surfaces with a very good or good suitability results in the green roof surface potential. Either 50% or 70% of this area is to be used for green roofs. Green roofs in this sense are considered to be green roofs if site-appropriate seeds are used in accordance with the Guidelines for the Design, Construction and Maintenance of Green Roofs 2018 (FLL Green Roof Guidelines) and the substrate height of the green roof averages at least 10 cm or, if combined with a photovoltaic system, at least 6 cm.

Proof must be provided of the green roof surface potential using sections and roof elevations, photo documentation of the completed areas and detailed green roof design drawings, including information on the average substrate construction heights and the area calculations for all green roofs implemented.

Indicator 2.3: Biodiversity index
Sealed and partially sealed soils can no longer perform soil functions such as storing and filtering water and are no longer suitable as a habitat for animals and/or a breeding ground for vegetation or can be only to a very limited extent. The aim is to use the biodiversity index to positively evaluate those areas that are able to fulfil these functions.

The biodiversity index is calculated according to the Berlin biodiversity index method. For this purpose, a factor is assigned to each sub-area according to its degree of sealing or substructure (Tables 2.1–2.4). For example, a completely asphalted area has a factor of 0, while a vegetated area connected to soil below has a factor of 1.0. Vertical greening and green roofs are also considered in the evaluation.

The biodiversity index defines the ratio of the sum of partial areas within the project area, multiplied by the respective specific crediting factors, to the plot area. Benchmarks are defined using target key values (target BDIs).

If a qualified person can demonstrate that the environmental quality of an area exceeds the classification in Tables 2.1–2.4: Biodiversity index, a new factor can be set for the area. This may be the case, for example, if highly endangered species are present in an area. The points for the indicator can be determined using the following equation:

$$\underset{biodiversity\ index}{object-related}\ (\mathrm{BDI}) = \frac{\sum(Partial\mathrm{areas} * specificcrediting\ factor)}{Total\mathrm{area}}$$

Depending on the type of use, the degree of overdevelopment of the plot varies. For this reason, different target biodiversity indices are given for different building types.

Table 2.1: Biodiversity index: Paths and circulation areas and their specific factors

NO.	DESIGNATION	FACTOR
1.	**Paths and circulation areas** Areas with different types and degrees of sealing	
1.1	Sealed paved surfaces Completely sealed surfaces with air- and/or water-impermeable surfaces; without vegetation. Example: concrete, asphalt, terrazzo, ceramics, slabs/paving (with substructure or grouting), water-impermeable synthetic coverings	0.0

1.2	Partially sealed paved surfaces Proportionate air- and water-permeable materials without planned vegetation. Example: large and small paving stones, clinker bricks, wooden paving stones, concrete composite stones and slabs, water-bound coverings, open compacted soil, permeable synthetic coverings Greened pavements with high use intensities (N2, N3)	0.1
1.3	Permeable pavement surfaces Especially air- and water-permeable materials without planned vegetation. Example: lattice paving with highly coarse joint materials, seepage paving stones, drainage stones, paving stones with very high seepage capacity, sand surfaces, gravel.	0.2
1.4	Greened paved areas Air- and water-permeable materials with planned and permanently established vegetation and low intensities of use according to international/national guidelines for the design, construction and maintenance of “greenable” surface paving[1]. Example: clinker bricks, lawn gravel, wooden paving with a high proportion of joints, lattice stones, lawn grids, grass pavers	0.4

Table 2.2: Biodiversity index: Areas of vegetation and their specific factors

NO.	DESIGNATION	FACTOR
2.	**Areas of vegetation** Areas with and without connection to existing soil	
2.1	Area of vegetation with connection to soil Area of vegetation with a high degree of cover; completely air- and water-permeable surface with connection to the existing body of soil Example: all areas of vegetation without restriction of root space	1
2.2	Supported area of vegetation with very high substrate thickness (≥ 151 cm) Area of vegetation without connection to soil with more than 150 cm substrate layer for the establishment of very high vegetation volumes Example: areas of vegetation on basement ceilings or underground garages, permanent planters. Establishment of vegetation structures including very tall trees	0.9
2.3	Supported area of vegetation with high substrate thickness (81–150 cm) Area of vegetation without connection to soil with 81 to 150 cm substrate layer for the establishment of high vegetation volumes Example: areas of vegetation on basement ceilings or underground garages, permanent planters. Establishment of vegetation structures including medium to tall trees	0.7

[1] e.g. Guidelines from The World Bank/International Bank for Reconstruction and Development, The FLL "Green Roof Guidelines – Guidelines for the Planning, Construction and Maintenance of Green Roofs", etc.

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2.4	Supported area of vegetation with medium substrate thickness (41–80 cm) Area of vegetation without connection to soil with 41 to 80 cm substrate layer for the establishment of medium vegetation volumes. Example: areas of vegetation on basement ceilings or underground garages, permanent planters. Establishment of vegetation structures including hedges and large shrubs	0.6
2.5	Supported area of vegetation with low substrate thickness (12–40 cm) Vegetation area without connection to soil with up to 40 cm substrate layer for the establishment of low vegetation volumes. Example: vegetation areas on basement ceilings or underground garages. Establishment of lawns, small shrubs and perennials	0.5

Table 2.3: Biodiversity index: Blue areas and their specific factors

NO.	DESIGNATION	FACTOR
3.	**Blue areas** Areas for rainwater management	
3.1	**Semi-natural/natural water area** Rainwater-fed water area that is designed in a semi-natural way and has a connection to soil Example: semi-natural ponds and streams	1
	Water area Rainwater-fed water area Example: rainwater-fed ponds, artificial lakes, artificial bogs, artificial wetlands	0.5
3.2	Infiltration area Near-surface infiltration of precipitation from external surfaces (e.g. roof surfaces) onto areas of vegetation For example, in the case of non-greened roofs, the projection area is credited insofar as the rainwater accumulating on these surfaces is infiltrated over a wide area via vegetation on the property or district open spaces. Example: surface infiltration, trough infiltration. No exclusively underground infiltration measures	0.2

Table 2.4: Biodiversity index: Building greening and its specific factors

NO.	DESIGNATION	FACTOR
3.	**Building greening** Roof and vertical greening	

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3.1	Intensive green roof Green roof with high substrate thickness (> 50 cm); high plant diversity and complex vegetation structure. Example: Green roofs with medium-high to high perennials and woody plants	0.8
3.2	Simple intensive green roof Green roof with medium substrate thickness (12–50 cm). Example: green roofs with herbs, grasses, perennials and small woody plants; biodiversity roofs	0.7
3.3	Extensive green roof Green roof with low substrate thickness (< 12 cm). Example: green roofs with moss, sedum, herb, grass vegetation	0.5
3.4	Wall-bound vertical greening Vegetation without direct connection to soil, vertical vegetation areas or permanent horizontal vegetation areas, usually with artificial irrigation. Up to a height of 20 m, a maximum of 10 m can be credited proportionally. Example: living walls; large-scale permanent planters	0.7
3.5	Soil-bound vertical greening Direct connection of vertically climbing plants to the soil, supply of nutrients and water usually directly via the root space in the soil. Maximum credit amount: 10 m. This corresponds approximately to the area that will be overgrown by climbing plants within 10 years. In the case of greenery with a trellis, the area covered by the trellis is taken into account, up to a maximum height of 10 m. Example: Facade greening of various plants (e.g. ivy or wild vine) with or without climbing aid.	0.5

Indicator 2.4: AGENDA 2030 BONUS – Green Building

Bonus points are awarded if the biodiversity index achieves a result above the maximum possible score. For each increase of 0.05, 1 bonus point can be credited (a maximum of 5 bonus points can be credited).

Indicator 2.5: Wide range of structure types

Various structures form habitats for flora and fauna and can thus provide different functional areas for living organisms. For example, the provision of plant and animal food, retreat and hibernation facilities and breeding sites. The following list of structure types (Table 3: Habitat structure types) includes a range of different habitat structures. High-quality habitats can only be created through the interplay of different types of structure.

Habitats often already exist on properties. The aim is to identify and preserve these habitats and to create new ones where necessary. This allows plants and animal species to be preserved while providing escape routes for animal species from areas where construction is taking place. To identify such potentials, habitat structure types are incorporated into a biodiversity-promoting concept covering the following topics:

- Preservation of valuable habitat structures
- Creation of habitat structures corresponding to the local natural environment
- Provision of different functional areas for animals (feeding, resting and retreat, hibernation, breeding, etc.)
- Connectivity with the surroundings

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It must be demonstrated that the habitat structures are based on a biodiversity-promoting concept, which may also form part of the biodiversity strategy. It must also be demonstrated which habitat structure types from the list in Table 3: Habitat structure types are present or prepared for implementation, including photo documentation and location.

Table 3: Habitat structure types

NO.	DESIGNATION
2.	**Habitat structure types**
2.1	Open and sandy soil, e.g. integrated into dry meadows
2.2	Stone or dry structures, e.g. cairns, dry stone walls
2.3	Deadwood, e.g. deadwood piles, standing deadwood, Benjes hedges
2.4	Watering holes and puddle-forming measures, e.g. stone water feature, clay puddle
2.5	Single tree, groups of trees
2.6	Nesting aids, e.g. integrated into buildings
2.7	Other biodiversity-promoting structure types not mentioned may be credited if justified by an expert.

Vegetation

Indicator 3.1: Invasive plant species

The presence of invasive plant species in the district may have a continuous negative influence on environmental quality. "The intentional importation and unintentional introduction of invasive species are regarded throughout the world as the second largest cause of danger to biological diversity after the destruction of habitats" (*cf. BMU 11/2010*).

Evidence must be provided to show that the planning area/plot of land does not contain any invasive plant species included in the list of the main invasive and potentially invasive plant species that are used as ornamental plants or shrubs (see below and together with Regulation (EU) No 1143/2014 of the European Parliament of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species). The list was taken from the biodiversity criterion of the German BNB system for the evaluation of outdoor facilities *[BNB-System zur Bewertung von Außenanlagen,]* (*cf. BMUB 2010*). If invasive species are localised, a plan of action for combating them must be formulated, or proof must be provided to show that combating them has no prospect of success.

Note: The list of invasive plant species in Table 4 is useful for the central European region and must be adapted to the local conditions and climate

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Table 4: Recommended courses of action regarding invasive plant species

ENGLISH NAME (BOTANICAL NAME)	RECOMMENDED COURSE OF ACTION
Box elder (Acer negundo)	Do not plant near bodies of water or pastureland. Plant at least 2 km away from bodies of water.
Tree of heaven (Ailanthus altissima)	Do not grow on open land. In residential areas, use must be justified by on-site conditions, e.g. drought resistance for highly urban sites where water is likely to be in scarce supply; evidence must be provided that measures have been taken to prevent their propagation (by means of vegetative reproduction or seeds).
Bastard indigo (Amorpha fruticosa)	Do not grow on open land. Plant at least 2 km away from bodies of water in residential areas.
Butterfly bush (Buddleja davidii)	Do not grow on open land.
Turkish warty-cabbage (Bunias orientalis)	Do not use as a herb (Bunias orientalis has no value as an ornamental plant).
New Zealand pygmyweed (Crassula helmsii)	Do not use.
Glandular globe thistle (Echinops sphaerocephalus)	Do not grow on open land.
Canadian pondweed (Elodea canadensis)	Use only in fenced-off water gardens/ponds. Plant at least 2 km away from bodies of water; planting any closer must be justified.
Nuttall's waterweed (Elodea nuttallii)	Use only in fenced-off water gardens/ponds. Plant at least 2 km away from bodies of water; planting any closer must be justified.
Common Japanese knotweed (Fallopia japonica)	Do not use.
Giant knotweed (Fallopia sachalinensis)	Do not use.
Bohemian knotweed (Fallopia x bohemica)	Do not use.
Red ash (Fraxinus pennsylvanica)	Do not grow on open land.

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Jerusalem artichoke (Helianthus tuberosus)	Do not use if it is not possible to plant at least 2 km away from bodies of water.
Giant hogweed (Heracleum mantegazzianum)	Do not use.
Floating pennywort (Hydrocotyle ranunculoides)	Do not use.
Himalayan balsam (Impatiens glandulifera)	Do not use.
Small balsam (Impatiens parviflora)	Do not use.
Garden lupin (Lupinus polyphyllus)	Do not sow on open land or on the outskirts of residential areas (alternatively, sterile varieties can be used).
Goji berry plant (Lycium barbarum)	Do not grow on open land.
Yellow skunk cabbage (Lysichiton americanus)	Do not use.
Black pine (Pinus nigra)	Do not grow on open land. Do not grow on or in the area around calcareous grassland.
Weymouth pine (Pinus strobus)	Do not grow on open land. Do not grow within a 300 m radius of rocky areas that require preservation.
Carolina poplar (Populus x canadensis)	Do not grow on open land. Do not grow near naturally occurring black poplar trees.
Black cherry (Prunus serotina)	Do not grow on open land. Do not grow in the area around open land biotopes.
Common Douglas fir (Pseudotsuga menziesii)	Do not grow on open land. Plant at least 2 km away from shallow, nutrient-poor rocky ridges or ‘blockfields’ (e.g. colourful sandstone from the Black Forest and the Odenwald), silver birch and common oak tree forests, sessile oak tree forests and dry, acidic silicate sites.

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Red oak (Quercus rubra)	Do not grow on open land. Plant at least 2 km away from rocky biotopes.
Stag's horn sumac (Rhus hirta)	Do not grow on open land or on the outskirts of residential areas.
False acacia (Robinia pseudoacacia)	Do not grow on open land. Plant at least 500 m away from xeric grassland communities that need to be preserved.
Japanese rose (Rosa rugosa)	Do not grow on open land. Do not plant near the coast (even in residential areas).
Armenian blackberry (Rubus armeniacus)	Do not grow on open land. Plant at least 500 m away from oligotrophic grassland and semi-xeric grassland communities that need to be preserved.
Narrow-leaved ragwort (Senecio inaequidens)	Do not use.
Canadian goldenrod (Solidago canadensis)	Do not use.
Late goldenrod (Solidago gigantea)	Do not use.
Common snowberry (Symphoricarpos albus)	Do not grow on open land, near rough pasture or as roadside greenery.
American blueberry hybrid (Vaccinium angustifolium x corymbosum)	Do not grow on open land. Plant at least 3 km away from moorland.

Indicator 3.2: Use of diverse, native and site-appropriate plant species

As plants and animals have adapted over millions of years, animals have become dependent on certain plant species. If native plant species and habitats disappear, the animals that rely on them will no longer be able to find food, and breeding sites or hibernation sites and will also disappear. To preserve habitats for animals and give them a chance to adapt, it is important to promote native plant species.

It is recommended to select native plants based on the specific site and soil conditions. It is also recommended to use plants that are functionally appropriate and robust, with good drought tolerance and low susceptibility to diseases and pests. It should be noted that the plants are to be provided with sufficiently large planting beds with adequate root space. Initial guidance on local native species can be found in planting lists available from the relevant district offices.

For the design, it must be demonstrated that the plant selection is based on a biodiversity-promoting concept in which the different habitat functions of the vegetation are described. This concept can also be part of the biodiversity strategy.

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For implementation, the percentage of native (all plant species established before 1492) individual plants in the plant list and the species richness in relation to a species target value must be demonstrated. The evaluation is carried out according to the conditions in “Table 5: Requirements for native and species-rich vegetation” and is considered separately for seedlings, perennials, shrubs and trees. Minimum areas apply for each of these categories to be included in the evaluation. These areas can be located in the outdoor facility area as well as on the roof or façade surface (see Table 1: Biodiversity-promoting areas). If the minimum area is not reached for a category, it will be excluded from the evaluation and the full score can still be achieved. However, at least three of the categories will be used.

The total number of individual plants and number of native plants, as well as the number of different species are to be entered in the tool. Only the vegetation that is located in the biodiversity-promoting areas according to Indicator 2.1 and “Table 1: Biodiversity-promoting areas” is relevant for evaluation.

Table 5: Requirements for native and species-rich vegetation

NO.	VEGETATION TYPE
1	Seeding Minimum area: 30 m² Native seeding ■ 100% native (if available: indigenous) Species-rich seeding ■ Use of seeding mixtures
2	Perennials Minimum area: 10 m² Native perennials ■ Minimum requirement: 60% of the individual plants are native. Species-rich perennials ■ Minimum requirement: 60% of the target number of species has been reached.
3	Shrubs Minimum area: 6 m² Native shrubs ■ Minimum requirement: 80% of the individual plants are native. Species-rich shrubs ■ Minimum requirement: 60% of the target number of species has been reached.
4	Trees Minimum number: ■ Outside facilities area ≤ 100 m²: 1 individual ■ Outside facilities area 101–500 m²: 3 individuals ■ Outside facilities area > 500 m²: 5 individuals

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Native trees

- Minimum requirement: 80% of the individuals are native (from 4 individual plants, with 1 and 2 individual plants 100% native, with 3 individual plants 60% native).

Species-rich trees

- Minimum requirement: 60% of the target number of species has been reached.

Calculation methodology of the target species value (calculation is carried out in the tool)
Different plant species provide different functions for animals. Diversity in height, density and species is essential to create species-rich outside facilities. The target species number is always a natural number (round up from 0.5). The closer the number of different species (shrubs, woody plants, trees) from the planting list comes to the calculated specific target species number, the better the evaluation.

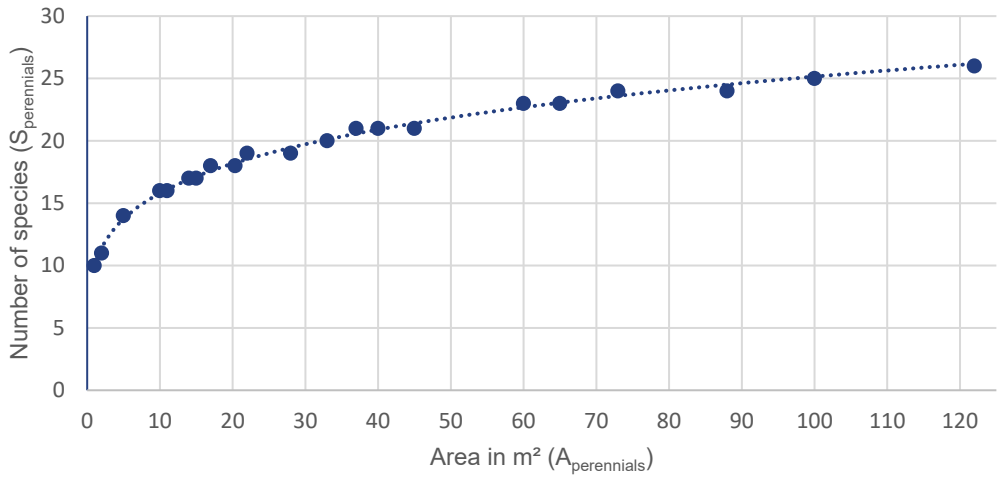
Seeding
Seeding mixtures are used for seeding. No mixing ratio is defined.

Perennials
According to Dengler, a graduate biologist with a research focus on the number of species to area ratio, the majority of ecologists agree that species numbers increase as the area size increases. However, how this increase in area size can be described mathematically is still the subject of scientific discourse. (cf. Dengler 2012: p. 15) In research, the power function is considered the "best general approach for describing the number of species to area ratio" (Dengler 2012: p. 32). According to Hobohm, this power function can be described as follows, averaged over all woody plant communities from Central Europe:

$$S_{Perennials} = 10.0 * \left(\frac{A_{Perennial}}{m^2}\right)^{0.20}$$

Where S is the target number of species and A is the area in m². Here, $A_{perennials}$ refers to the area of semi-natural, species-rich and site-appropriate perennial planting from Indicator 2.1 Biodiversity-promoting area.

Chart 1 Perennials: Target number of species as a function of the area



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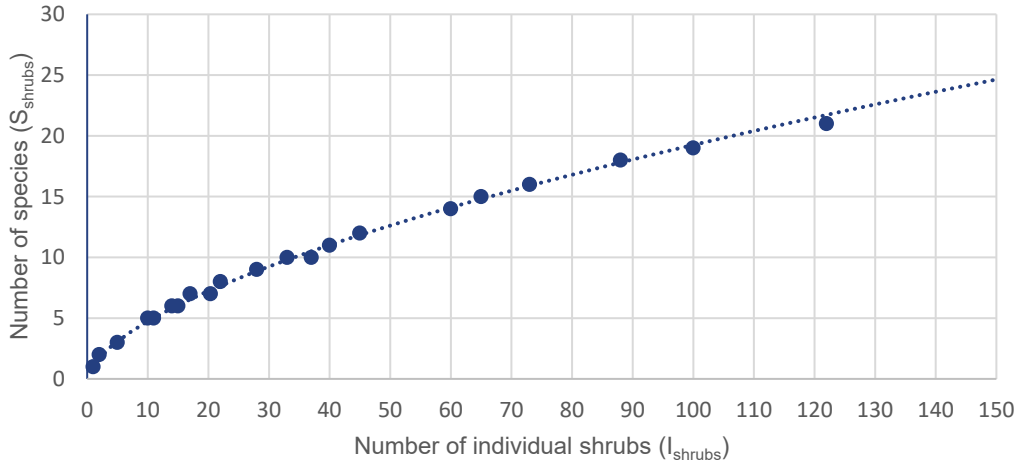
Shrubs

The target species function for shrub species is based on an extrapolation of empirical values from experts. As with perennials, a power function is assumed that can be described as follows:

$$S_{Shrubs} = 1.2 * (I_{Shrubs})^{0.6}$$

Where S_{shrubs} corresponds to the target species number and I_{shrubs} to the total number of individual shrubs.

Chart 2 Shrubs: Target number of species as a function of the number of individual shrubs



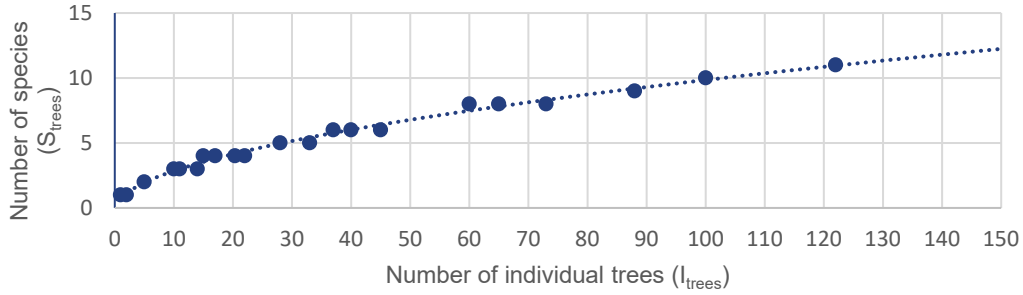
Trees

The target species function for tree species is based on an extrapolation of empirical values from experts. As with perennials, a power function is assumed that can be described as follows:

$$S_{Trees} = 0.8 * (I_{Trees})^{0.55}$$

Where S_{trees} corresponds to the target species number and I_{trees} to the total number of individual trees.

Chart 3 – Trees: Target number of species as a function of the number of individual trees



Indicator 3.3: AGENDA 2030 BONUS – Preservation of vegetation with high environmental value

Much of the existing vegetation with a high environmental value will be preserved during the construction project and beyond.

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It is recommended to carry out an inventory of the already existing vegetation and its plant communities on the site, the existing building, if any, and the immediate surroundings. With regard to vegetation, the extent to which the existing vegetation has ecological value and whether invasive plant species are present must be investigated. For example, a diverse native vegetation, an old tree population or areas where rare species occur have a high ecological value.

It must be demonstrated that inventory with a high ecological value is present and that the majority (over 50%) of it is conserved. A short description with photo documentation of the existing situation and its ecological value is available and is determined in relation to the situation after the construction work.

Environmental reference

Indicator 4.1: Habitat connectivity

A combination of soil sealing and urban expansion has shrunk and fragmented the habitats of many species of plants and animals. The few remaining habitats that play host to wild flora and fauna are becoming isolated, preventing genetic exchange between populations. To counter this, biotopes must be interlinked. The assessment will evaluate whether the land features sufficiently effective biotope interlinking elements. The size and distribution of these elements must be defined using a biotope land-use plan with a biotope function map.

Definitions of interlinking:

- An area is regarded as being "interlinked" if it is connected by a sufficiently wide interlinking corridor to another open space. (Areas can also be considered interlinked if evidence is provided that what are referred to as "stepping-stone biotopes" are sufficient for the migration and travel of animals and for the exchange of species between areas.)
  If there is no interlinking for certain species (for example due to a busy road), measures (green bridge, frog tunnel, etc.) must be demonstrated that link the existing species inside the project area with those outside in order to include these areas in the evaluation. The usefulness of these measures must be confirmed by a qualified expert (this may also take place as part of the EIA). This applies to roads if they are wider than 3.5 metres.

Reduction of negative influences

Indicator 5.1: Lighting suitable for wildlife conservation

The evaluation of light pollution at the site is carried out by means of a qualitative evaluation. The **lighting installations in the outdoor area** are considered here. The aim is to **avoid light scattering upwards and to the side.** It is recommended that an appropriate lighting concept be drawn up with a focus on wildlife conservation, which, in addition to the type of lamps, their colour and adaptability, also considers the area of application of the street lighting in order to avoid the use of unnecessary lighting installations. In addition, the area lighting and, for example, the orientation of the motion detectors should be included so that unnecessary activation is avoided. For this reason, an upward light ratio of 0% must be ensured for luminaires. In addition, the light sources should have light colours that are harmless to wildlife. According to current knowledge, light sources with a low proportion of UV and blue light, such as amber to warm white LEDs (orientation colour temperature: 1600–2400 Kelvin, max. 3000 Kelvin), are recommended. The housing of the lights should be closed and have a surface temperature of less than 60°C. Likewise, the illuminance should be adjusted to the actual lighting conditions. For example, it is unnecessary for lamps to shine with full luminosity during twilight hours[2].

Lamps that do not scatter light upwards and sideways, have an insect-friendly colour temperature, do not heat up too much and can automatically adjust their luminosity to the ambient conditions, are therefore classified as good.

[2] References: (cf. Roth (2021) Vermeidung von Lichtimmissionen, website: NABU: Ökologische Stadtbeleuchtung, Schweizerische Vogelwarte (2022): “Bird-friendly building with glass and light”- Swiss Ornithological Institute 2023

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To achieve sufficient illumination, some light interference is unavoidable. Various measures can help meet these comfort values. For example, avoiding direct visibility of the light source through the right choice of location, the optimum height of the luminaire, the appropriate angle of inclination of the luminaires or shielding measures. In addition, the light emission can be reduced using time switching, by using multiple smaller luminaires rather than one large one or by dimming measures.

Indicator 5.2: Avoidance of animal traps

An evaluation of the construction project has been carried out to identify existing potential hazards for animals. A survey of the site and the proposed or existing building for potential animal traps, barriers and disturbance factors has been carried out. It is recommended to pay attention to the following points during the examination; at least the glass façade (if present) must be assessed. At least the following must be examined:

- Glass façades in relation to bird strike
  Guidance on the subject of bird strikes on glass façades is provided by the online action guides[3]:
  "Bird-friendly building with glass and light":
  https://vogelglas.vogelwarte.ch/assets/files/broschueren/Glasbroschuere_2023_E.pdf

Inspection of the following is recommended:

- open manholes and bodies of water for exit opportunities
- buildings and factory halls for containment hazards

Where potential hazards are identified, the measures implemented to avoid or reduce them are shown. If no hazards are present, a short statement and justification is sufficient to achieve the score.

Indicator 5.3: Construction site planning

A construction site plan that takes environmental protection and biodiversity concerns into account has been developed and implemented. Early and comprehensive planning of the site has a direct influence on the smooth running of the construction project as well as on all environmental aspects. The plan for the protection and preservation of biodiversity and species conservation during the construction project should include:

- assessment of the construction site prior to construction
- demonstration and assessment of the planned interventions
- demonstration of the planned protective measures and any compensatory measures

Maintenance and monitoring

Indicator 6.1: Maintenance and monitoring agreement

The outdoor area is maintained to preserve and further develop the functional and biodiversity-promoting qualities as part of ongoing maintenance and care. A contractually agreed check is conducted annually. Maintenance and servicing must be carried out by landscaping and gardening professionals with proven expertise in vegetation technology, or similar.

Biodiversity-promoting plants can only maintain their ecological diversity in the long term through proper maintenance. Without natural or human disturbance, areas would develop into forests in the long term. In the natural world, this "natural maintenance" is carried out by animals that gradually graze the areas or cause disturbances by wallowing, digging and gnawing.

Where such approaches are adopted, it is recommended that the following aspects in the development and maintenance contract be addressed:

- Machines: Can biodiversity-friendly machines be used? How often are they used? (Avoid using robotic mowers, rotary mowers, leaf blowers)

[3] "Bird-friendly building with glass and light" - Swiss Ornithological Institute 2023 https://vogelglas.vogelwarte.ch/assets/files/-broschueren/Glasbroschuere_2023_E.pdf

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- Seeds: Can seeds and plants of native wild origin be used?
- Mowing: Can mowing be done in sections? Can the frequency of mowing be reduced? Can the cutting height be more than 8 cm? Can different areas (wild corners, common areas) be defined?
- Foliage: Can leaves be left on certain areas or collected in one place?
- Pruning: Are the protection and breeding periods respected? Can heavy pruning (e.g. cutting back to a few shoots) be carried out at intervals of several years?
- Perennial beds: Is partial pruning only possible in spring? (Hibernation options for insects as well as sources of seeds for birds)
- Pesticides: Can herbicides and biocides be avoided?
- Fertilisation: Can chemical fertilisation be avoided and only carried out organically and responsibly?
- Long-term safety and security: Can long-term maintenance contracts be concluded to build knowledge of and responsibility for the areas?

It is important to monitor, maintain and adapt the appropriate measures. An assessment is made of whether a maintenance contract has been drawn up with a qualified specialist company (e.g. master gardening company or a company with appropriate expertise in biodiversity-promoting vegetation technology), which defines both the nature of the maintenance measures and the frequency of maintenance visits.

Indicator 6.2: No use of substrates containing peat

Peat is obtained by extraction from raised bogs. Peatlands are a natural carbon store. When they are drained in the course of peat extraction, not only does this destroy a sensitive habitat and its function, but it also releases large amounts of CO_2. In order to avoid further environmental destruction, only peat-free substrates are used for the creation and maintenance of the outside facilities. This is to be demonstrated, e.g. by means of a contractually signed agreement.

Indicator 6.3: No use of pesticides on the premises

The use of synthetic chemical pesticides, along with habitat loss, is one of the main causes of insect mortality worldwide. Herbicides not only destroy plants and thus the food sources and nesting sites of insects and other creatures, but they also have negative effects on the beneficial insects themselves (cf. BUND https://www.bund.net/umwelt-gifte/pestizide/insektenfreundlicher-garten/). For this reason, avoiding the use of herbicides throughout the plot is an important prerequisite for a biodiversity-promoting facility. The use of biocides (pest control), on the other hand, is only permitted in the areas that promote biodiversity (according to Indicator 2.1: Biodiversity-promoting areas). For certification, proof must be provided of a contractual obligation on the part of the creator and caretaker of the facility to refrain from using herbicides throughout the site and biocides in the semi-natural areas.

Indicator 6.4: Use of fertilisers on the site

Chemical fertilisers are very resource-intensive in their production and, if used regularly, have a negative effect on soil structure and soil life. Contamination of the groundwater cannot be ruled out either. For this reason, no chemical fertilisers are used throughout the site. Site-appropriate design variants can create opportunities to permanently manage a site without fertilisation. Organic fertilisers should be used responsibly. Mulch mowing is not a responsible use of organic fertilisers. For certification, proof must be provided of a contractual obligation on the part of the operator and caretaker of the facility to refrain from using chemical fertilisers throughout the site.

INNOVATION AREA – Alternative verification procedure

If a biodiversity award is available for the project, 100 points can be credited in the alternative procedure in consultation with the DGNB.

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APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

Biodiversity strategy and concept

Indicator 1.1: Development and implementation of a biodiversity strategy

- Excerpt from the prepared and completed biodiversity strategy according to the thematic areas in the indicator
- Brief explanation as well as pictures of the implemented measures and, if applicable, assignment to an overall plan

Habitat

Indicator 2.1: Biodiversity-promoting area

- Allocation of the biodiversity-promoting areas on a site plan or similar
- Calculation of the share of executed areas in the total area (using the Excel tool provided by DGNB)
- If applicable, photo documentation of the realised areas

Indicator 2.2: Green roof

- Analysis of green roof suitability with assessment of the suitability of all roof surfaces for green roofs and area calculation of the potential green roof area
- Implementation planning (floor plans, roof plans, outdoor facilities planning, sections, views, detailed drawings of roof structures)
- Calculations of the areas of executed green roofs (using the Excel tool provided by DGNB)
- Photo documentation of the realised areas of green roofs

Indicator 2.3: Biodiversity index

- Categorisation of the areas in the project area and their allocation on an overall plan
- Calculation of the biodiversity index using the Excel tool provided (plausible memorandums of understanding are required for areas where there is no open space plan yet and for the façade areas)
- Site plan, aerial photograph

Indicator 2.4: AGENDA 2030 BONUS – Green Building

- Analogous to Indicator 2.3: Biodiversity index

Indicator 2.5: Wide range of structure types

- Allocation of habitat structure types on an overall plan (site plan, aerial photograph, etc.) including a brief explanation and pictures of the implemented measures

Vegetation

Indicator 3.1: Avoidance of invasive plant species

- Statement by a qualified person that there are no invasive species on the site as defined in local Regulation e.g. species in accordance with Table 4 and/or (EU) No. 1143/2014 of the European parliament and of the council of 22 OCTOBER 2014 ON THE PREVENTION AND MANAGEMENT OF THE INTRODUCTION AND SPREAD OF INVASIVE ALIEN SPECIES. If it does, a necessary plan of action must be taken to combat it

- Planting list with declaration that no invasive or potentially invasive plants are present

Indicator 3.2: Use of diverse, native and site-appropriate plant species

- Calculation of the percentage of native and species-rich plant species in the tool
- Planting list, divided into native and non-native species

Indicator 3.3: Agenda 2030 Bonus – Preservation of vegetation with high environmental value

- Brief description of the existing situation and of the high environmental value with photo documentation and location on a site plan
- Ratio before and after the conversion measure

Environmental reference

Indicator 4.1: Habitat connectivity

- Site plan, urban design and aerial photograph
- Brief explanation as well as pictures of the implemented measures and, if applicable, assignment to an overall plan
- Opinion from a qualified person on how connectivity between environmentally relevant open spaces is to be achieved for specific species

Avoidance of negative influences

Indicator 5.1: Lighting suitable for wildlife conservation

- Proof of lighting concept
- Proof of all realised lighting installations by means of data sheets

Indicator 5.2: Avoidance of animal traps

- Opinion of a qualified person regarding the potential hazards for animals present on the property
- If applicable, Photo documentation of the implemented measures

Maintenance and monitoring

Indicator 6.1: Maintenance and Monitoring agreement

- Extract from concluded and signed development and maintenance contract with a qualified specialist company

Indicator 6.2: No use of substrates containing peat

- Extract from concluded and signed development and maintenance contract

Indicator 6.3: No use of pesticides on the premises

- Extract from concluded and signed development and maintenance contract

Indicator 6.4: Use of fertilisers on the site

- Extract from concluded and signed development and maintenance contract

Innovation area

Indicator 1-6: Innovation area

- Submission of the biodiversity award after consultation with the DGNB

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Bundesamt für Naturschutz [German Federal Agency for Nature Conservation]. Informationsblatt über den Handel mit Holz geschützter Arten innerhalb der Europäischen Union (EU) [Information sheet on trading protected wood species within the European Union (EU)]
- Bundesamt für Naturschutz [German Federal Agency for Nature Conservation]. Information from the Bundesamt für Naturschutz. Liste der im WA und der VO(EG) Nr. 338/97 geschützten Holzarten [List of wood species protected by the CITES and Council Regulation (EC) No. 338/97]. February 2012
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- Kaule, Giselher: Umweltplanung, Eugen Ulmer publisher, Stuttgart, 2002
- Law on the implementation of Regulation (EU) No. 1143/2014 on the prevention and management of the introduction and spread of invasive alien species
- Sustainable Development Goals icons, United Nations/globalgoals.org
- Vogelfreundliches Bauen mit Glas und Licht [Bird-friendly building with glass and light], Schmid, H., W. Doppler, D. Heynen & M. Rössler (2012): Vogelfreundliches Bauen mit Glas und Licht. 2nd, revised edition, Schweizerische Vogelwarte Sempach [Swiss Ornithological Institute in Sempach], ISBN no.: 978-3-9523864-0-8
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- Baur, Bruno (2021): Naturschutzbiologie. Haupt Verlag, Bern
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- UFZ – Helmholtz Zentrum für Umweltforschung (2019): Sumpfpflanzendächer

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- WISIA – Artenschutzdatenbank des Bundesamt für Naturschutz [Species protection database maintained by the German Federal Agency for Nature Conservation] (URL: www.wisia.de, 16.02.2011)
- Wettbewerb Bundeshauptstadt im Naturschutz [German national nature conservation capital competition] (URL: www.duh.de/uploads/tx_duhdownloads/Dokumentation_Naturschutzkommune.pdf, 27.01.2011)
- http://naturschutzbund.at/files/projekte_aktionen/vielfaltleben/downloads/EU-Liste_Beschreibungen_-Auswirkungen.pdf
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- http://naturschutzbund.at/files/projekte_aktionen/vielfaltleben/downloads/EU-Liste_Beschreibungen_-Auswirkungen.pdf, 04/02/2019
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Economic quality

The four economic quality criteria are used to assess **long-term economic viability** (life cycle costs) and **economic development**.

ECO1.1 Life cycle cost
ECO2.1 Flexibility and adaptability
ECO2.2 Commercial viability
ECO2.6 Climate resilience

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ECO1.1

Life cycle cost



Objective

Our objective is to ensure the sensible and conscious use of economic resources throughout the entire life cycle of a building. There is significant potential for optimising the long-term economic management of a building during the conception and planning phases. The parties involved in the planning process should regularly focus on possible life cycle costs associated with their design and implementation decisions from an early planning stage.

Benefits

The economic viability of buildings essentially depends on construction costs, utilisation, income, and cost-efficient operation. Life cycle costing is a method of obtaining a medium- to long-term cost analysis of a building. The earlier life cycle costing is introduced into the design process, and the more regularly it is carried out and communicated to those involved in the planning process, the more likely it is that economically optimal solutions will be achieved in the long term. Based on this method, a transparent comparative cost calculation of buildings of similar use and functionality can also be carried out, providing an indication of the relative performance. For this step, life cycle costing is carried out according to predefined parameters, in accordance with defined conventions, and followed by an evaluation comparison with defined benchmarks.

Contribution to overriding sustainability goals



Outlook

The current version of the criterion emphasises the importance of the continuous monitoring of life cycle costs and assessment of variants at various points during the planning process to achieve cost-efficient buildings. Comparative life cycle cost calculation remains an essential tool for providing guidance to the project team on how well their project compares to other projects.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Assembly buildings** **Healthcare buildings** **Production**	**10.0%**	**4**

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EVALUATION

Life cycle costs are considered from the early planning phase and rewarded in Indicator 1. The development of the life cycle cost sub-variants during the detailed design phase and regular reviews (at each planning stage) are evaluated in Indicator 2. If the life cycle costs are determined in accordance with a fixed method and compared to a benchmark, depending on the level of deviation from the benchmark, evaluation points will be awarded in Indicator 3; a maximum of 90 points can be achieved. A circular economy bonus can be included in the evaluation with a maximum of 10 points (5 points per implemented solution). Without a bonus, a maximum of 100 regular points can be achieved, or a maximum of 110 points including bonuses.

NO.	INDICATOR	POINTS
1	**Calculations of the life cycle costs in the planning process**	**Max. 10**
1.1	**Integration of the life cycle costing into the conceptual design phase**	**10**
1.1.1	A life cycle costs system/model is drawn up for the project in the early planning phase. The building variants are compared with regard to their production costs and relevant subsequent costs, including the expected energy costs. At least two integral variants are developed and demonstrated. The aim is to show how production costs relate to the various costs in the use phase of the building.	
	■ The life cycle costs are determined during the early planning process and are communicated within the planning team. Relevant building-related and subsequent costs are included in the calculations. The link between initial investment and operational (energy, maintenance) costs is discussed with the client as part of the decision-making process.	+5
	■ In addition, to establish the link between life cycle cost and environmental impact, another variant is presented where the building energy-related CO_2 tax and other aspects – e.g. reused building components, increase in energy standard, preparation for net greenhouse gas neutral operation, extension of the reference period – are considered.	+5
2	**Life cycle cost optimisation detailed design**	**Max. 10**
2.1	**Life cycle cost optimisation**	**10**
2.1.1	The life cycle costs are calculated regularly during the design phase (adjusted to the respective planning status) and communicated within the planning team.	+5
	■ All relevant building-related subsequent costs are fully integrated into the calculations from planning phase 4 (planning approval) at the latest. Production and operation costs are determined and documented separately.	
	Alternatively: the impact of key decisions on the expected life cycle costs is determined regularly for the building in the form of a partial assessment for the most relevant building components and subsequent (operational) costs.	
	■ Furthermore, for the climate action plan (see ENV1.1, Indicator(s) 3.2 and/or 4), a corresponding financial plan for implementing the identified measures is created as part of the decision-making process.	+5
	INNOVATION AREA	**as 2.1**
Re 2.1	Explanation: Alternative approaches for optimising life cycle costs can also be selected and credited.	

2.2 CIRCULAR ECONOMY BONUSES — Max. 10

2.2.1 CIRCULAR ECONOMY BONUS – Reuse

If a significant portion of the relevant components is demonstrably reused in or on the building through business models aligned with circular/sharing economy principles and that ensure or significantly support recyclability, the bonus can be awarded (e.g. performance contracting models with recovery or reuse strategies). For each circular economy solution implemented, 5 bonus points can be awarded. — 5

2.2.2 CIRCULAR ECONOMY BONUS – End-of-life costs

The LCC model also considers the end-of-life costs over the entire life cycle. — 5

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3 Building-related life cycle costs (as built) — Max. 100

3.1 Assessment and comparison of the building-related life cycle costs: all Schemes — 10–80
Consumer Market — + (1–10)

Costs are given as a **net value** per square meter of gross floor area for the standard case EUR/m²GFA$_S$ (if not marked separately) over a reference period of 50 years for:

- selected structural and technical components according to Appendix 1
- selected occupancy and operational costs, including operational reference energy (**RE**)[1], supply and disposal, cleaning, maintenance, repair and replacement (see Appendices 2 and 3).

Office	**Office buildings – medium standard**	**Office buildings – buildings with increased representativeness requirements**		**10–80**
	≤ 4675 + 1.4*RE	≤ 5095 + 1.4*RE		10
	= 3879 + RE	= 4446 + RE		40
	≤ 3718 + 0.4*RE	≤ 4285 + 0.4*RE		80
Education	**Day care facilities/kindergartens**	**Schools**	**Institutional buildings**	**10–80**
	≤ 4569 + 1.4*RE	≤ 4189 + 1.4*RE	≤ 6307 + 1.4*RE	10
	= 3955 + RE	= 3622 + RE	= 5547 + RE	40
	≤ 3690 + 0.4*RE	≤ 3397 + 0.4*RE	≤ 5323 + 0.4*RE	80
Residential	**Residential buildings (at least 6 residential units)**			**10–80**
	≤ 3824 + 1.4*RE			10
	= 3223 + RE			40
	≤ 2987 + 0.4*RE			80
Consumer market	**Retail/ supermarket**			**10–80**
	≤ 2467 + 1.4*RE			10
	= 2186 + RE			40
	≤ 2035 + 0.4*RE			80
	Additional points that can be awarded when using refrigerated counters: Annual energy consumption per linear metre of refrigerated counter			**+ (1–10)**
	≤ 3000 kWh/linear metre			1
	≤ 1200 kWh/linear metre			10

[1] Electricity and heat demand (final energy) of the reference building in accordance with the EPC – (see Appendix 5)

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Shopping centre	**Shopping centre**			**10–80**
	≤ 3839 + 1.4*RE			10
	= 3432 + RE			40
	≤ 3283 + 0.4*RE			80
Department stores	**Retail parks**	**Department stores**		**10–80**
	≤ 3146 + 1.4*RE	≤ 4175 + 1.4*RE		10
	= 2782 + RE	= 3737 + RE		40
	≤ 2676 + 0.4*RE	≤ 3611 + 0.4*RE		80
Logistics Production	**Warehouses/logistics/-production facilities with low requirements**	**Production facilities with increased requirements**		**10–80**
	≤ 2607 + 1.4*RE	≤ 3341 + 1.4*RE		10
	= 2063 + RE	= 2452 + RE		40
	≤ 2000 + 0.4*RE	≤ 2340 + 0.4*RE		80
Alternatively:				
	Warehouses/logistics/ production facilities with low requirements in €/m²GV (Gross volume)	**Production facilities with increased requirements in €/m²GV (Gross volume)**		
	≤ 218 + 1.4*RE	≤ 278 + 1.4*RE		10
	= 172 + RE	= 204 + RE		40
	≤ 167 + 0.4*RE	≤ 195 + 0.4*RE		80
Hotel	**Hotel – standard (0–3 stars)**	**Hotel – upscale (4 or more stars)**		**10–80**
	≤ 4675 + 1.4*RE	≤ 5126 + 1.4*RE		10
	= 3912 + RE	= 4310 + RE		40
	≤ 3329 + 0.4*RE	≤ 4074 + 0.4*RE		80
Assembly buildings	Assembly buildings			**10–80**
	≤ 4884 + 1.4*RE			10
	= 4254 + RE			40
	≤ 3811 + 0.4*RE			80
Healthcare buildings	**Healthcare buildings Type I**		**Healthcare buildings Type II**	**10–80**
	≤ 5126 + 1.4*RE		≤ dynamic **limit** value + 1.4*RE	10
	= 4472 + RE		= dynamic **reference** value + RE	40
	≤ 4237 + 0.4*RE		≤ dynamic **target** value + 0.4*RE (see method)	80

3.2	**Building energy-related CO_2 tax (Over-fulfilment)**		**10**
3.2.1	**All schemes**	Additional points that can be awarded when the life cycle cost results, including building operational **CO_2 costs**, fall below the target values.	10

SUSTAINABILITY REPORTING

The life cycle cost value in accordance with the DGNB method can be communicated as key performance indicators (KPIs). The LCC results and calculation basis can also be used for reporting in accordance with the "Level(s) Indicator 6.1: Life cycle costs"[2]

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Building-related life cycle costs in accordance with the DGNB method (total)	[€/m²GFAs*a]
KPI 2	Structural building components (shell and fittings) construction costs	[€/m² GFAs]
KPI 3	Technical building components (core) construction costs	[€/m² GFAs]
KPI 4	Building use stage costs: energy, water, maintenance, repair/replacement	[€/m²GFAs*a]
KPI 5	End of life stage – Deconstruction and demolition	[€/m² GFAs]

[2] A discount rate of 4% should be applied in order to align with the Level(s) "Cost model setup steps", however, this does not exclude country-specific adaptation or DGNB default rates for the Level(s) reporting: "where construction costs indices having escalated at a significantly different rate to inflation, a different rate may be applied to these costs."

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

In addition to returns from manufacturing and operational costs, the economic viability of a building depends on cost-efficient operation. To this end, the life cycle cost calculation enables the medium- to long-term costs of a building to be considered. These figures can be used as a basis for a transparent cost comparison for buildings with similar usage and functionality in order to carry out further analyses and optimisation. The calculation is carried out in accordance with fixed parameters and provides a comparative assessment based on benchmarks.

II. Additional explanation

Life cycle cost planning carried out alongside the planning process can be used to identify cost drivers as well as win-win solutions (e.g. measures that are beneficial for both environmental reasons and economic reasons). Life cycle cost calculation can thus support a balanced analysis of measures across various topics in the DGNB certification system. Options and alternatives are examined with regard to their short-term, medium-term and long-term cost-efficiency and thereby potentially help to support the economic viability of the building.

The life cycle costs usually include all costs that arise throughout the lifetime of a building:

- Construction or (initial) investment costs: costs incurred in the production phase (planning and implementation costs).
- Subsequent costs or selected operational costs: property management, operation and repair costs.
- Recovery costs: costs for demolition, dismantling, recycling and disposal (due to the net present value method, these costs currently represent an insignificant portion of the life cycle costs and are therefore not considered in the comparison costs method (Indicator 3)).

The life cycle costs are organised by cost types, as this is the only way to enable replacement cycles for components and maintenance to be considered.

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III. Method

Indicator 1: Calculations of life cycle costs in the planning process

Indicator 1.1: Integration of life cycle costing into the conceptual design phase

The objective of Indicator 1.1 is to clearly present the total life cycle costs from an early planning phase, tailored to the specific context or to the relevant point in time and planning scope.

An LCC model should be drawn up in an early planning phase (planning phase 2–3). The preferred building variants include comparisons of their production costs and relevant subsequent costs, at least including the expected energy costs, i.e. relationship between the initial investment costs and the regular operating costs. The cost data for building planning and construction, including the long-term forecasts for maintenance and replacement schedules, should be technically feasible and representative. Aspects that are not part of the DGNB scope of calculation as per Indicator 3, such as the inclusion of outdoor space, may be included to support early cost planning.

Points can be included in the evaluation if an LCC model contains the following subsequent costs as a minimum ("all relevant building-related subsequent costs"):

- supply and disposal costs (water, fuels, energy, wastewater)
- cleaning costs
- servicing and maintenance costs
- repair costs.

At the early planning phase, the potential synergies between life cycle costs and the long-term environmental benefits can be identified. This is achieved by considering a variant with detailed or simplified life cycle costing (according to the conventions and methods of this criterion), where the life cycle costs are linked to environmental performance, such as energy use and associated GWP in the form of the expected CO2 tax, or use of secondary building components. Results should be presented to and discussed with the client as part of the decision-making process. In the case of a previous deconstruction, the costs for deconstruction and disposal should be included within the scope of the second variant.

Indicator 2: Life cycle cost optimisation detailed design

Indicator 2.1: Life cycle cost optimisation

The objective of planning optimised for life cycle costs under Indicator 2.1 is to address the subsequent costs at the earliest possible stage of the planning process and to reduce or optimise these using variant calculations. Planning optimised for life cycle costs should be carried out at various appropriate stages. This should be from planning phase 4 (at the latest) onwards; the calculation of life cycle costs should include the scope of subsequent costs outlined under Indicator 1. Optimisations should examine the life cycle costs when evaluating significant alternatives for key decisions. Depending on the planning phase, these can vary greatly and influence aspects such as variants of the A/V ratio, service life of planned components or the use of operating materials.

Alternatively, in place of a full assessment (life cycle costs for the entire building in accordance with the scope of analysis of Indicator 3), partial analyses (life cycle costs for a section of the scope of analysis with the most significant impacts) can be incorporated into the evaluation. This is suitable for optimising individual components, for example, and usually takes place during an advanced design phase.

In addition, a financial proposal for a decarbonization plan has been drawn up. An action plan is presented to achieve the targets set out in the decarbonization plan. It must also be demonstrated that the implementation and financing are plausible.

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Aspects that are not part of the scope of analysis of the "cost comparison" (Indicator 3) can also be considered for variant calculations. This includes taking other cost types (external installations or equipment), other energy consumers (such as lifts and user equipment), operating materials (such as refrigerants) or conversion, replacement or modernisation costs into account. Conventions that differ from the cost comparison defined below (see Indicator 3), such as interest rates, rates of price increases, can also be factored into the alternatives. The findings of the planning optimised for life cycle costs should be incorporated into the decision-making process.

Indicator 2.2 : Circular economy bonuses

Indicator 2.2.1 : Circular economy bonuses – reuse

If it can be shown that a significant proportion of the relevant reference value (at least 80%, based on Tier 4 of BoQ) of building components is reused or implemented through business models in or on the building in line with circular or sharing economy principles and that ensure or significantly support circularity, a circular economy bonus may be credited (e.g. performance contracting with a material recovery or reuse strategy). If more than one solution is implemented, these should be in different component groups (Tier 4 level) or differ significantly from each other.

Indicator 2.2.2: Circular economy bonus – end-of-life costs

If the LCC model includes the costs up until the end of the building's life, the bonus can be credited. The costs must be plausibly set out, indicating the source and giving a description of the method used. This method also aligns with Level(s) Indicator 6.1: Life cycle costs. It also applies an additional convention for End-of-Life costs.

Indicator 3: Building-related life cycle costs

Indicator 3.1: Assessment and comparison of the building-related life cycle costs

The assessment method corresponds to the provisions of ISO 15686-5. In order to establish a consistent method for the DGNB documentation, additional specifications are defined based on the content of the standard.

The following building components are incorporated into the assessment of the life cycle costs and the evaluation in this criterion:

Selected production costs in accordance with Appendix 1: refers to Level(s) Indicator 2.1 – "Bill of Quantities (BoQ) materials and lifespans"

- Structural components – construction works (shell elements and fittings)
- Technical components – services (core elements, simplified in accordance with Appendix 3)

Selected operational costs in accordance with Appendices 2, 3 and 4

- Supply and disposal costs
  - Water
  - Fuels, energy
  - Sewerage
- Cleaning and maintenance of buildings
- Operation, inspection, servicing
  - Inspection and servicing of the structures
  - Inspection and servicing of the installations
- Repair costs
  - Structural repairs
  - Repair of the installations

Other costs, including the cost of the plot, planning costs, capital costs, taxes, insurance and costs for demolition and disposal of the building, **are not** currently **included** in the evaluation of the indicator.

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Net present value (NPV) method

Life cycle costs that arise as a result of production and operational costs, distributed across a specified time frame, are capitalised over the year of certification and expressed as a net present value. The net present value method enables various cost/time progressions to be compared. This makes it possible to weigh up initial expenditures and later subsequent costs or savings. Application of the net present value method requires both cost data and information on payment timing. This method also considers price increases and the effective interest rate.

The net present value represents the current capital value of the costs accumulated during the reference period.

Benchmark cost levels serve as a reference point for the certification.

The effective interest rate is specified by the DGNB. This expresses the expected returns for the capital invested, which incorporates inflation and investment risk, along with other aspects.

Conventions

Life cycle cost assessment is flexible and can be adapted to suit the application in many areas. However, when it is used as a benchmarking indicator, the method must be precisely defined and all relevant parameters explicitly specified. This is the only way to ensure that the calculation results can be compared, which is an absolute requirement. Conventions cover the following points:

- reference period
- life cycle phases
- building components included
- calculations included
- price development for different cost types
- effective interest rate
- reference value
- permitted simplifications and cut-off rules
- partial results that are to be shown and associated descriptions
- level of detail of the calculations and the documentation
- timing of payments per period

These conventions are defined for Indicator 3 of this criterion. In certain cases or for particular schemes, it may be appropriate to deviate from these standard conventions. Any deviations from these specifications are defined according to the scheme. The benchmarks to which the life cycle costs are compared have been determined based on the same conventions.

Adaptation to German price benchmarks

General principles

DGNB has developed an LCC online tool for this purpose to simplify the audit procedure. During the transition period, an Excel tool will be used as an alternative. Costs are entered into the DGNB LCC tool in local currency and adapted to German prices. DGNB conducted a worldwide comparison of building construction costs to derive conversion factors for comparing German prices to other countries. This process is automatically completed when the relevant country and its related adaptation factors are entered in the ‘cost calculation’ chart. The country adaptation factors for construction costs are listed in Appendix 6.

NOTE: The adaptation factors for countries not listed in Appendix 6, are to be agreed with the DGNB.

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The reference year and quarter for the current version is **Q4 2022**. The tool generates project specific costs per square metre in local currency as well as in euros and calculates the checklist points to be entered into the evaluation matrix (Euro (€) to local currency exchange rates, see Appendix 7).

Evaluation

Evaluation in the certificate requires an assessment based on the following documents:

- The weighted life-cycle costs in €/m²GFA_S for selected structural and technical building components (according to Appendix 1) and for selected operational and maintenance costs (according to Appendices 2, 3 and 4), based on a 50-year period.
- Final energy demand of the projected and reference buildings from the energy performance certificate (or from the energy demand simulation/calculation) for the completed building (same as in criterion ENV1.1)
- Clear assignment to energy sources (as above, same as in criterion ENV1.1), possible details of feed-in volume and feed-in tariff:
  For the first **20 years**: the feed-in tariff can be included as a credit.
  For the following **30 years**: the feed-in tariff can no longer be included. The building's electricity demand can be reduced by onsite electricity production up to the building's total energy demand, unless onsite energy production is already included in the EPC calculation.
- Values from the calculations for water demand and wastewater from the specifications of criterion "ENV2.2 – Potable water demand and wastewater volume"
- Details of the servicing, inspection and repair costs using the generalised percentages specified in Appen-dix 3, or alternatively based on accessible and documented reference values (such as contracts, manufacturer specifications or similar)
- Assessment of the cleaning costs (see Appendix 2) based on the areas and materials from the building elements catalogue for the life cycle assessment or alternatively based on accessible reference values (such as manufacturer specifications or similar)

The following documents are also required for assessment in accordance with the detailed method:

- Building elements catalogue for the life cycle assessment (criterion "ENV1.1 – Building life cycle assessment")
- Service life of components in accordance with Appendix 3
- Detailed breakdown of production costs that can be assigned to the components in the building elements catalogue that clearly demonstrate assignment to the product-specific service life

Simplified method

In the simplified method, the costs for inspection, servicing and repair are shown as percentages in relation to the production costs. The production costs and operating costs for energy demand, cleaning and water/wastewater are recorded in detail.

The reference period for the building components to be considered and the calculation parameters are specified in the "Conventions" section (see usage-specific description) and the appendices.

The applicable percentages for the generalised representation must be taken from Appendix 3, as applicable to the relevant scheme.

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Detailed method

The detailed method expands the breakdown of the production costs from the simplified method at the sub-level (Tier 3/4) in accordance with Appendix 1, including reference values and building specifications. It must be applied in full; if foundations are considered in detail, all structural components must also be shown in detail. This is intended to prevent elements with a long service life from being shown 'in detail' while the generalised average from the simplified method is used for other elements.

For the analysis of repair costs, an appropriate and plausible service life must be assigned to each element in accordance with Appendix 3, based on its installation and use. Alternatively, accessible reference values, manufacturer specifications or similar must be used. In addition, a breakdown of production costs beyond Tier 3 level may be required in accordance with Appendix 1.

For all other costs considered, the simplified method continues to apply, including the use of accessible reference values, manufacturer specifications or similar. The DGNB provides a tool for submitting documentation, which calculates the LCC data and transfers the results for subsequent conformity checks. When using this tool, project-specific production costs at the time of completion must be adjusted to the relevant reference price levels using applicable price indices for the country in question. The corresponding information must be entered in the "Basic data" tab under reference values. The reference year and quarter for the current version is **Q4 2022**.

The following data must be determined in order to retrieve the construction cost index:

- Year: project-specific
- Quarter: project-specific
- Measured figures with/without VAT: indices including VAT
- Building type: project-specific
- Form: construction work on the building

Appendices depending on scheme

- Appendix 1: Building Components to be included in accordance with this appendix
- Appendix 2: Cleaning costs
- Appendix 3: Parameters for servicing and maintenance
- Appendix 4: Applicable unit prices for energy sources, fresh water and wastewater

Indicator 3.2: Building energy-related CO_2 costs (overfulfillment)

A carbon tax (or future taxes) and relevant environmental costs are of high relevance from an economic perspective. The carbon tax is a form of carbon pricing and, as a market-based approach, is generally seen as a cost-effective way to reduce greenhouse gas emissions. Ambitious CO_2 pricing via emissions trading is one of the key levers to achieve the global climate targets in the construction sector and other sectors. This makes climate protection measures even more economically viable.

Carbon prices are volatile and fluctuate from day to day. Prices are determined by the supply and demand of allowances, e.g. based on the EU emissions trading system (EU ETS)[3]. For the purposes of this criterion, however, carbon dioxide (CO_2) costs shall not be based on market trading prices. Instead, they shall be calculated using estimated climate change damage costs as set out by the German Environment Agency (Umweltbundesamt), which currently specifies a cost rate of €300 per tonne of CO_2[4].

[3] EU Emission Trading System (EU ETS): https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en
[4] Social costs of environmental pollution: https://www.umweltbundesamt.de/daten/umwelt-wirtschaft/gesellschaftliche-kosten-von-umweltbelastungen#gesamtwirtschaftliche-bedeutung-der-umweltkosten

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Carbon costs arise due to damage caused by increases in greenhouse gas emissions over time – one example of this is increases in the value of buildings and infrastructure caused by damage from extreme weather events. Consequently, the applicable cost rates are assumed to increase over time.

The CO_2 cost shall be applied to GHG emissions associated with the building's operational energy use (Module B6.1). The Global Warming Potential (GWP, expressed as CO_2-equivalents per annum) shall be determined in accordance with Criterion ENV1.1, Indicator 3. A carbon cost rate expressed in €/t CO_2 shall be applied as a constant value until the year of operational climate neutrality, with 2050 as the default reference year. Where national legislation specifies a different target year for achieving climate neutrality, such national requirements shall take precedence.

Points for overfulfillment may be awarded where the scheme-specific benchmark applicable to the respective building type continues to be met after incorporation of the calculated CO_2 costs.

Note: Climate positive / carbon neutral buildings, i.e. buildings that are designed to operate in a net greenhouse gas neutral manner within the scope of building energy (module B6.1), will fulfil this indicator automatically.

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IV. Usage-specific description

Conventions

FOR ALL SCHEMES

The following conventions must be assumed for life cycle cost assessment:

Table 1: Conventions for the calculation of life cycle costs (various schemes)

CONVENTIONS

Reference period	**50 years**
Life cycle phases	Construction, use
Costs	Selected building components: **Production costs in accordance with Appendix 1** Structural components – Shell and fittings Technical components – Core installations (including maintenance in accordance with Appendix 3) **Operation costs in accordance with Appendix 2** Supply and disposal costs Water Fuels, energy Sewerage Cleaning and maintenance of buildings Inspection and servicing of the structures Inspection and servicing of the installations Repair costs Structural repairs Repair of the installations
Calculations included	Final energy demand, water demand and wastewater, cleaning areas
Price development for different cost types	General construction price increase 2% Costs for water and wastewater 2% Costs for energy 5%
Effective interest rate	3%[5]
Reference value	m² GFA_S / **Department stores**: m² GFA[6]
Permitted simplifications, cut-off rules	Current cost level based on an estimate of the final construction costs. Representation of the entire building or, for partial buildings, in accordance with the system limits

[5] The effective interest rate was determined using the guide value from the "Guidelines accompanying Commission Delegated Regulation (EU) No 244/2012 of 16 January 2012 supplementing Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings by establishing a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements" for calculating the cost-optimal energy efficiency levels. In-house assessments carried out in 2017 show that an effective interest rate of 3% constitutes a justified assumption.
[6] According to DIN 277:2016, see the document “Terms and Definitions” [T&D], alternatively, ISO 9836.

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	Cost information on Tier 1 of structural (shell) components, on Tier 2/3 of technical (core) components in accordance with Appendix 1 for the simplified method For the detailed method, documentation of the components in the same way as the simplified life cycle assessment method (criterion "ENV1.1 – Building life cycle assessment")
Partial results that are to be shown and associated descriptions	Net present value divided into: ■ Structural (shell and fittings) component production costs in accordance with Appendix 1 ■ Technical (core) component production costs in accordance with Appendix 1 Separate operating costs for: ■ Water ■ Energy ■ Wastewater ■ Cleaning and maintenance Operation costs divided into: ■ Inspection and servicing ■ Repair (separately for structural and technical components in accordance with Appendices 1 and 3)
Level of detail of the calculations and the documentation	See descriptions for the simplified and detailed methods
Timing of the payment per period	In arrears

Logistics **Production**

For industrial buildings with a clear room height greater than 12 m, [m³ GV*a] must be selected as the unit of reference for the calculation of evaluation points. For single-storey and multi-storey industrial buildings with a clear room height of less than 12 m, the reference value [m² GFA_S* a] must be selected.

Special conditions and additional expenses

In the event of justified additional expenses due to special requirements and conditions, these may be deducted from the statement of life cycle costs. A plausible, clear and justified statement of the additional expenses is required for this. Typical cases where additional expenses are treated as neutral for the evaluation include:

- Difficult foundation soil conditions
- Supporting adjacent structures
- Special requirements under construction law, such as historic preservation orders
- Innovations that are prototypical in nature

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The additional expense associated with the special conditions must be quantified (e.g. documentation of the costs at the sub-level in accordance with Appendix 1 with the associated reference values and building specification). The substantiated additional expense (not the overall costs) may be subtracted from the production costs.

The additional expenses resulting directly from an innovation (in accordance with Appendix 1 at the sub-level or individual element) must be documented.

Alternatively, in the event of a significant discrepancy between the building evaluated as part of the certification process and the assumptions underlying the production costs of the reference value, target value and limit value definition (benchmarks), the benchmarks for the 'production costs' benchmark element may be adjusted on a project-specific basis subject to agreement with the DGNB. The underlying assumptions for calculating benchmarks are shown in Appendix 5. Country- and/or project-specific adjustment is permitted for all uses and is recommended for the various climatic zones and structures such as high-rise buildings and high-bay warehouses.

Categorisation

Office **Residential**

For the purposes of evaluation, the building must be plausibly and clearly categorised into one of the following three categories:

Category 1: New buildings are generally evaluated in category 1.

Category 2: Buildings with above-average requirements in terms of representativeness are evaluated in category 2. The measures and features that help achieve the required level of representativeness must be described in order to justify classification in category 2.

Classification into category 2 must be justified in detail and verifiably documented. If this is not done, the building is categorised into category 1 as standard.

The following must be deemed to constitute above-average requirements in terms of representativeness:

- High-quality, high-durability materials (in floors and walls) in terms of materiality and construction
- Requirements resulting from a category A location (lucrative, high-traffic (business) location in the centre of a town or city)
- Advanced technical facilities

Education

For the purposes of evaluation, the building must be plausibly and clearly categorised into one of the following three categories:

- Day care facilities, kindergartens
- Schools
- Institutional buildings

Consumer market

Consumer markets are evaluated in category 1. If the building contains refrigerated counters, additional points can be awarded if the associated annual energy consumption per linear metre of refrigeration units falls below the reference value of 3000 kWh/linear metre.

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Table 2: Energy consumption of refrigerated counters

ANNUAL ENERGY CONSUMPTION PER LINEAR METRE OF REFRIGERATED COUNTER	POINTS
≤ 3000 kWh/linear metre	1
≤ 1200 kWh/linear metre	10

Linear interpolations can be carried out between the specified values.

Shopping centre **Department stores** **Assembly buildings** **Healthcare buildings Type II**

For shopping centres, fit-out carried out by the tenant in the rental areas is excluded from the assessment.

If the building includes underground garages or multi-storey car parks, the life cycle costs can be adjusted for the costs of these areas. Areas: Vehicle parking areas, vehicle circulation areas and other circulation areas (such as driving lanes) in accordance with the space and area description under the chapter T&D_04 must be considered. This deduction can be carried out using a detailed method by documenting the actual costs incurred for these areas, or alternatively using statistical costs given in Table 3:

Table 3: Lump sum cost deduction for vehicle parking areas, vehicle circulation areas (Usable Area – UA7).

TYPE OF CAR PARK	DEDUCTION IN ACCORDANCE WITH THE STATISTICAL INFORMATION FOR CONSTRUCTION COSTS Q4 2022 (NETTO)
Underground garages	808 €/m² GFA_S / Country adaptation factor
Multi-storey car parks	624 €/m² GFA / Country adaptation factor

Note: Costs will be automatically adapted to the local construction costs (adaptation factors according to Appendix 6), via DGNB LCC Excel tool.

Logistics **Production**

For the purposes of evaluation, the building must be plausibly and clearly categorised into one of the following two categories:

- **Category 1:** Warehouses/logistics buildings and production facilities with low requirements are generally evaluated in category 1
- **Category 2:** Production facilities with increased requirements

In principle, logistics buildings and production facilities must be assigned to the following categories depending on the type of air conditioning they use:

I: No air conditioning
II: Heated; indoor air temperatures between 0 °C and 12 °C
III: Heated; indoor air temperatures between 12 °C and 19 °C
IV: Heated; indoor air temperatures > 19 °C
V: Heated, cooled; indoor air temperatures > 19 °C
VI: Air conditioned; indoor air temperatures > 19 °C
VII: Refrigerated; indoor air temperatures < -5 °C

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For category VII properties, the building technology system components of the refrigeration technology, including production costs and associated servicing, inspection, repair and disposal costs, must be taken into account in the LCC calculation.

The final energy demand for refrigeration must be determined separately and calculated over a reference period of 50 years but is not incorporated into the LCC calculation.

Hotel

For the purposes of evaluation, the building must be clearly categorised into one of the following two categories depending on its designation in accordance with the World Tourism Organization (UNWTO) hotel classification system or classification system in cooperation with the ECC-Net (The European Consumer Centres' Network):

- **Category 1:** 0 to 3 stars
- **Category 2:** 4 or more stars or higher level of facilities (swimming pool, spa, etc.)

Healthcare buildings

Healthcare buildings are to be assigned to one of the following building types, depending on the building's function:

Type I: Buildings predominantly without Operating Rooms (OR) and/or intensive care unit (ICU), such as rehabilitation clinics, psychosomatic clinics, polyclinics, medical offices, etc.

Type II: Buildings with Operating Rooms (OR) and intensive care unit (ICU), such as hospitals, university hospitals, etc.

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APPENDIX 1

The following components must be included in the respective cost calculations:

The following building components and facilities are included:

Tier 1	Tier 2	Tier 3	Tier 4	Module A			Module B						Module D
				PRODUCTION PHASE			USE PHASE						BENEFITS OUTSIDE OF THE SYSTEM LIMITS
				PRODUCTION			MAINTENANCE	REPAIR	REPLACEMENT	ENERGY CONSUMPTION DURING OPERATION	WATER CONSUMPTION	CLEANING	POTENTIAL FOR EXPORTED ENERGY
System boundaries of building parts				A1 - A3			B2	B3	B4	B6	B7		D2
Excavation			Excavation work, Support work, Dewatering, other items	x	x	x	x	x					
Shell	Foundations (substructure)	Piles	(i) Permanent piles and caisson; (ii) Pile caps	x	x	x	x	x					
		Basements	(i) Concrete blinding; (ii) Raft footings; (ii) Column bases; (iv) Wall footings; (v) Strap beams; (vi) Tie Beams; (vii) Substructure walls; (viii) Substructure columns; (ix) Lowest floor slabs (Considering ground floor slab); (x) Lowest floor beams (Considering ground floor slab); (xi) Lift pit wall; (xii) Lift pit slab; (xiii) Vertical waterproof tanking; (xiv) Drainage blanket; (xv) Sleeves	x	x	x	x	x					
		Retaining walls	(i) Vertical waterproof tanking; (ii) Drainage blanket; (ii) Drains and skin wall; (iv) Skin wall; (v) Retaining wall; (vi) Retaining wall foundation; (vii) Fireproofing to steel structure; (viii) Sleeves	x	x	x	x	x					

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	Frame (beams, columns and slabs)	(i) Structural internal walls; (ii) Columns; (ii) Upper Floor Beams; (iv) Staircases	x	x	x	x	x			
Loadbearing structural frame	Upper floors	(i) Slabs	x	x	x	x	x			
	External walls	(i) Structural external walls	x	x	x	x	x			
	Balconies	(i) Balconies beams; (ii) Balconies slab	x	x	x	x	x			
	Ground floor slab	(i) Slab blinding; (ii) Bottom slab	x	x	x	x	x			
Non-load bearing elements	Ground floor slab	(i) Slab blinding; (ii) Bottom slab	x	x	x	x	x			
	Internal walls, partitions and doors	(i) Non-structural internal walls; (ii) Non-structural internal partitions; (iii) Acoustic insulation; (iv) Shop fronts; (v) Toilet cubicles; (vi) Moveable partitions; (vii) Cold rooms; (vii) Internal doors; (ix) Internal windows; (x) Roller shutters; (xi) Fire shutters; (xii) Sundry concrete work	x	x	x	x	x	x[3]		x
	Stairs and ramps	(i) Balustrades; (ii) Railings; (iii) Handrails; (iv) Staircases not forming part of the structure; (v) Catwalk not forming part of the structure, cat ladders	x	x	x	x	x	x[3]		
Facades	External wall systems	(i) Non-structural external walls and features;	x	x	x	x	x			x
		(ii) Acoustic insulation; (iii) Thermal insulation;								
		(iv) Curtain walls.						x[3]		x
		(v) Gondolas						x[3]		
	Cladding and shading devices	(i) Facade cladding; (ii) Roller shutters	x	x	x	x	x	x[3]		x
	Façade openings (including windows and external doors)	(i) Facade cladding; (ii) Roller shutters; (iii) External windows (v) External shop fronts; (vi) Fire shutters;	x	x	x	x	x	x[3]		x
		(iv) External doors;								
	External paints, coatings and renders	(i) External wall finishes except cladding	x	x	x	x	x	x[3]		x

Core	Roof	Structure	(i) Roof beams; (ii) Roof slabs	x	x	x	x	x			
		Weatherproofing	(i) Roof finishes; (vi) Roof hard landscaping. (ii) Acoustic insulation; (iii) Thermal insulation; (iv) Waterproofing element; (v) Skylights; (vii) Roof soft landscaping	x	x	x	x	x	x[3]		
	Fittings	Sanitary fittings	(i) Sanitary appliances; (ii) Faucets	x	x	x	x	x	x[3]		
		Ceilings	(i) External false ceilings; (ii) Internal false ceilings	x	x	x	x	x	x[3]		
		Wall and ceiling finishes	(i) Internal wall finishes; (iii) Internal ceiling finishes; (iv) External ceiling finishes (ii) Internal wall cladding;	x	x	x	x	x	x[3]		x
		Floor finishes, coverings and coatings	(i) External floor finishes (under cover); (ii) Internal floor finishes	x	x	x	x	x	x[3]		x
	In-built lighting system[4]	Light fittings	(i) Lighting devices	x	x	x	x	x	x		
		Control systems and sensors	(i) Light control devices; (ii) Light sensor devices	x	x	x	x	x	x		
	Energy system[4]	Heating plant and distribution	(i) Seawater system; (ii) Heating water system; (iii) Steam and condensate system; (iv) Fuel oil system; (v) Unitary air-conditioning system; (vi) Water treatment; (vii) Window air conditioners; (viii) Split-type air conditioners; (ix) Air-curtains; (x) Electric underfloor heating; (xi) Local electrical heating units	x	x	x	x	x	x		
		Cooling plant and distribution	(i) Seawater system; (ii) Chilled water system; (iii) Cooling water system; (iv) Water treatment; (v) Condensate drain system; (vi) Unitary air-conditioning system; (vii) Window air conditioners; (viii) Split-type air conditioners; (ix) Air-curtains; (x) Fans	x	x	x	x	x	x		
		Electricity generation	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system	x	x	x	x	x	x		

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	Electricity distribution	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system	x	x	x	x	x	x	
Ventilation system[4]	Air handling units	(i) Air handling units (AHU)	x	x	x	x	x	x	
	Ductwork and distribution	(i) Kitchen ventilation system; (ii) Fume and smoke extraction system. (iii) Distribution system	x	x	x	x	x	x	
Sanitary systems[4]	Cold water distribution	(i) Cold water supply; (ii) Irrigation water supply; (iii) Cleansing water supply; (iv) Flushing water supply; (v) Water treatment equipment	x	x	x	x	x	x	
	Hot water distribution	(i) Hot water supply	x	x	x	x	x	x	
	Water treatment systems	(i) Wastewater treatment equipment; (ii) Grey water supply	x	x	x	x	x	x	
	Drainage system	(i) Rainwater disposal; (ii) Soil and waste disposal; (iii) Planter drainage disposal; (iv) Kitchen drainage disposal; (v) Sump pits; (vi) Surface water drainage; (vii) Storm water drainage; (viii) Foul and wastewater drainage; (ix) Filtration plant	x	x	x	x	x	x	
Other systems[4]	Lifts and escalators	(i) Lifts / elevators; (ii) Platform lifts; (iii) Escalators; (iv) Travellators | moving walkways; (v) Conveyors	x	x	x	x	x	x	
	Firefighting installations	(i) Fire hydrant and hose reel system; (ii) Wet risers; (iii) Sprinkler system; (iv) Deluge system; (v) Gaseous extinguishing system; (vi) Foam extinguishing system; (vii) Audio/visual advisory system; (viii) Automatic fire alarm and detection system	x	x	x	x	x	x	
	Communication and security installations	(i) Security and alarm; (ii) Close circuit television; (iii) Communal aerial broadcast distribution and the like; (iv) Telecoms and data installations	x	x	x	x	x	x	

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	Building automation[6]	(i) Distributors; (ii) Cables and lines (iii) Monitoring and control systems	x	x	x	x	x	x			
External works[5]		(i) Roads and paving; (ii) Hard landscaping (i) Non-structural external walls and features; (ii) External wall finishes except cladding; (iii) Permanent retaining structures; (iv) Site enclosures and divisions									
System boundaries in the use phase											
Supply		Water								x[1]	x[1]
		Oil							x		
		Gas							x		
		Solid fuels							x		
		District heating							x		x[2]
		District cooling							x		x[2]
		Electricity							x		x[2]

1) Value of the water consumption and waste-water of the building (use phase) is imported from the criterion ENV2.2 incl. water reuse.
2) Exported on-site generated renewable energy (Module D2)
3) Replacement of structural (shell) elements, in simplified version, are considered through the lump sum repair cost of 0.35% (detailed price calculations incl. replacements are also possible in the DGNB LCC tool)
4) For simplified version for all technical installations the life expectancy is 25 years.
5) External works are not the part of LCC benchmarking and assessment scope BUT can be documented under the LCC Excel tool for Level(s) documentation if needed.
6) Unless included in other positions - Beyond the standard BoQ of Level(s) Indicator 2.1: Costs of automation across building systems including the associated distributors, cables and lines unless included in other positions.

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APPENDIX 2

Cleaning costs

COST TYPES	CONTENT	€/M²A
1	**External doors and windows**	
	Easily accessible (without aids)	3.60
	Average value (e.g. façade inspection and maintenance conveyors and cleaning bridges)	4.50
	Difficult to access (e.g. cherry-pickers or climbing harnesses)	6.92
2	**Cladding units (external walls)**	
	Natural stone (soft)	2.83
	Aluminium, stainless steel, copper cladding, steel (corrosion-protected)	1.42
	Ceramics, artificial stone, ashlar, natural stone (hard)	0.71
	Solar protection	2.13
3	**Internal doors and windows**	
	Internal doors	3.60
	Internal windows	2.25
4	**Floorings**	
	Artificial stone, natural stone, screed, flexible floors or similar	6.30

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	Textile or similar	7.08
	Wood or similar	6.30
5	**Sanitary areas**	
	Up to 10 m²	89.25
	Up to 30 m²	59.50
	Up to 30 m²	44.63
	Specific areas in healthcare buildings	
	bed wards	42.90
	Intensive therapy rooms	56.20
	Operating theatres	86.70
	Delivery room	91.30
	Therapeutic rooms	28.90
	Baths/physical therapy	32.50
	Office spaces,	8.00
	Non-medical rooms	8.70
	General circulation areas	4.20
	General technical rooms	6.70

The adaptation to local conditions could not be considered since the final benchmarks are given in accordance with the German pricing index

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Additional information

	€/H (NET)
Hourly charge for cleaning	17.00
Hourly charge for glass cleaning	22.50
Hourly rate for cleaning specific hospital areas in **healthcare buildings**	20.00

The adaptation to local conditions could not be considered since the final benchmarks are given in accordance with the German pricing index

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APPENDIX 3

Parameters for servicing and maintenance

The following table must be applied for the LCC statement in accordance with the simplified method. The detailed method can be used to represent building components on tier 3 level or beyond and involves replacing the specifications from the simplified method with specific details that must be documented. These specific details must be selected to be consistent with the information from the life cycle assessment (see also explanations of durations of use in ENV1.1).

BUILDING COMPONENTS	ASSUMED DURATION OF USE IN YEARS	EXPENDITURE FOR SERVICING/ INSPECTION IN % PER YEAR	EXPENDITURE FOR REPAIRS IN % PER YEAR
Structural building components (shell and fittings, tier 1)			
	In accordance with the document "Guideline for Sustainable Building" on behalf of Ministry of Transport, Building and Housing Germany	**0.1**	Irregular repair: Replacement investment after expiry of the duration of use or lump sum repair cost of **0.35** for all structural building components
Technical building components (core components tier 2/3)			
Cold & hot water distribution, Water treatment & Drainage systems and Gas systems[7]	50	1.01	0.98
Heating & Cooling plants and distribution systems	25	0.41	0.66
Ventilation systems	25	0.96	1.10
Power installations[8]	25	0.60	0.70
Communication and security installations	25	1.04	1.04
Lifts and escalators	25	1.76	1.78

[7] Water extraction and conditioning plants, pressure boosters, pipework, water heaters, sanitary appliances. Gullies, drains, sewers, sewage treatment systems, sewage lifting plants. Gas supply systems for industrial heating: Gas storage and generation plants, supply meter points, pressure control equipment and gas pipes, unless included in costs for heat supply systems.
[8] Lighting systems, Electricity generation and distribution, High, medium pants and low voltage installations, Protection systems.

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Firefighting installations[9] and Use-specific installations[10]	25	1.60	1.40
Building automation[11]	25	1.16	0.76

On the basis of VDI 2067:2000 and supplement on the basis of the values for the duration of use for components as well as AMEV 2013, adjusted (without operation)

The details regarding repair of the building technology (technical building components) should be considered to refer to "ongoing repairs". A replacement investment after expiry of the duration of use must also be considered, but this currently does not include demolition and disposal.

Simplified method:
As an alternative to the simplified method, a detailed list can also be compiled.
For technical building components, it is permissible to assume a replacement investment after 25 years across all components.

[9] Water pipes for the system shell be considered under Cold & hot water distribution systems.
[10] Use-specific and process engineering systems (German CC470) in the life cycle costing is for **Type II healthcare buildings** only: Kitchen equipment, laundry and cleaning systems, Medical and laboratory equipment systems, Bathing equipment, Disposal facilities.
[11] Beyond the standard BoQ of Level(s) Indicator 2.1: Costs of automation across building systems including the associated distributors, cables and lines unless included in other positions.

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APPENDIX 4

Applicable unit prices for energy sources, fresh water and waste-water

MEDIUM	TYPE	NET PRICE/UNIT
Electricity	electricity power generation mix	0.34 €/kWh
Oil		0.13 €/kWh
Natural gas		0.16 €/kWh
Wood pellets		0.09 €/kWh
Woodchips		0.06 €/kWh
Long-distance district heating/CHP	Fossil	0.13 €/kWh
	Renewable	0.10 €/kWh
Fresh water		2.11 €/m³
Waste water	Used water	2.25 €/m³
	Precipitation	1.15 €/m³

Source for electricity price: BDEW 2022, approx. four-year average, net

The adaptation to local conditions could not be considered since the final benchmarks are given in accordance to German pricing index

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APPENDIX 5

Basis of the LCC benchmarks

Production costs:
As a general rule, the target value and reference value of the production costs are assumed to be equal ("sustainable construction does not cost more than the present standard").

Basic data for establishing benchmarks for the schemes: Total of production costs for building structural and technical components (all data in EUR/m² GFA_S – net)

Water/waste water:
Office: A flat rate of €1.28/m²a is used as a reference value, derived from typical assumptions on drinking water demand and costs. The target value is a reduction of 30% on the reference value and the limit value is a premium of 40% on the reference value.
Residential: A flat rate of €7.64/m²a is used as a reference value, derived from typical assumptions on drinking water demand and costs. The target value is a reduction of 30% on the reference value and the limit value is a premium of 40% on the reference value.
Education: A flat rate of €1.05/m²a is used as a reference value, derived from typical assumptions on drinking water demand and costs. The target value is a reduction of 30% on the reference value and the limit value is a premium of 40% on the reference value.
Hotel: A flat rate of €14.23/m²a is used as a reference value, derived from typical assumptions on drinking water demand and costs. The target value is a reduction of 30% on the reference value and the limit value is a premium of 40% on the reference value.
Commercial buildings, shopping centres, consumer markets: Derived from the fm.benchmarking report for 2022, €1.60/m²a is used as the reference value, for the target value the value for the 1st quantile and for the limit value, the value for the 3rd quantile.
Logistics, production: Derived from the fm.benchmarking report for 2022, €1.60/m²a is used as the reference value, for the target value the value for the 1st quantile and for the limit value, the value for the 3rd quantile.
Assembly buildings: Derived from the fm.benchmarking report 2022 ‘Veranstaltungsgebäude’ (‘Event buildings), €1.13/m²a is used as the reference value, for the target value the value for the 1st quantile and for the limit value, the value for the 3rd quantile.

Rainwater:
All uses: The reference value is €0.18/m² floor area per year, derived from 736 mm precipitation per year, typical number of storeys = 4 (all uses except production, logistics and consumer market, here number of storeys = 1) and wastewater costs for rainwater €1.1/m³. The target value is set at €0/m² and the limit value is set equal to the reference value.

Operation costs (Structural and technical components): Regular/irregular
All uses: The reference, target and limit values used are 0.35% of the production costs per year for structural and technical components, an individual value is determined and used for each scheme.

Cleaning costs:
The reference values are drawn from the fm.benchmarking report for 2022 as the mean values for typical uses. For the target values, the values of the 1st quartile are used and for the limit values, those of the 3rd quartile (using an office as an example: target value €6.32/m² GFAa, reference value €9.85/m² GFAa, limit value €15.63/m² GFAa).

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Building energy demand and Reference Energy (RE):
To calculate building operational energy costs, the final energy demand of the building is used: Electricity and Heat. Reference energy represents the “Reference Building” energy demand values of the final energy (end energy), which are defined under the national EPC or calculation or simulation. Definition of the EPC, Reference building and the energy demand calculations or simulations are stated under the criterion ENV1.1, appendix 2: “Building energy demand during operation (Module B6.1)”, where the Reference building implementation and country specific EPC, including energy demand calculation/simulation rules are described.
To calculate energy costs, typical energy source compositions are used. For the target value, a reduction factor of 0.4 from the reference value is used for the final energy demand. For the limit value, a mark-up factor of 1.4 on the final energy demand of the reference value is applied. The basis for calculating the energy costs corresponds to the specifications above. For reference building electricity is set at 34 ct/kWh and heat at 14 ct/kWh.

Formation of benchmarks for healthcare buildings Type II

Due to the complexity and diverse nature of hospitals, the assessment is based on a comparison between a reference building (“virtual twin”) and the object of the assessment. The benchmark, for the current version of the healthcare buildings Type II, may still contain some uncertainties and statistical assumptions, which are expected to be clarified during the initial application phase. The dynamic benchmark is based on the cost allocations through the different types of usable areas i.e. different area types have different cost-weighting factors divided into the different cost-intensive areas. The benchmark for energy is based on the reference energy (RE) as described above (project individual values from EPC or energy calculation). There are two major factors for the cost allocations of virtual building: factors for operation (maintenance, repair, cleaning etc.) and for construction costs. These factors show the costs deviations from the average (statistical mean) for each type of area. To create the reference benchmark, all relevant areas must be set identically to the real building following the cost/area weighting factors:

USABLE AREA (UA)	FLOOR AREAS AND ROOMS FUNCTIONAL DEFINITIONS	SHARE OPERATION.[12]	SHARE CONSTR.
UA 1	Living and common spaces, single and group rooms, break rooms, waiting rooms, dining rooms, children's playroom, relaxation rooms, cafeteria, etc.	26,1%	36,2%
UA 2	Single and multiple office rooms, meeting rooms, conference rooms, design rooms, control rooms, office equipment rooms, computer rooms, cashier's room, gatehouse, guardroom, patient observation room etc.	59,6%	73,4%
UA 3	Chemical, bacteriological, physics and/or electrical labs, production halls, repair/maintenance halls, physical / chemical testing halls, workshops, health and personal care workshops, measuring rooms and rooms for instrumental analysis, nuclear physics lab, Labs with additional hygiene requirements, rooms for animal husbandry (inc. experimental rooms), rooms for plant cultivation, speciality kitchen, dishwashing kitchen, laundry room, equipment cleaning rooms, sterilisation rooms, nursing workroom, preparation rooms etc.	85,3%	121,7%

[12] Based on Abel, J.’s dissertation - Karlsruhe Institute of Technology (KIT), university publisher, Karlsruhe 2009.

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UA 4	Store, distribution and sale spaces, showrooms, storage rooms with hygienic requirements, storage room with ventilation requirements, storage rooms with radiation protection, vault, archive, collection rooms, registry, cold store, food refrigeration rooms, packing rooms, salesrooms etc.	39,2%	64,0%
UA 5	Education, school and culture spaces, classrooms with stage, library rooms, reading rooms, practice rooms, behaviour observation rooms, rehearsal room for performing arts, media library rooms, sport rooms, hall for gymnastics and games, indoor swimming pool, Indoor ice rink, auditorium (spectator area), stage area, museum rooms, visitor area	59,6%	64,0%
UA 6 category 1	Healthcare and nurse spaces: 6.1, 6.2, 6.6, 6.7, 6.9 (see UA6 table below)	59,6%	81,7%
UA 6 category 2	Healthcare and nurse spaces: 6.3, 6.4, 6.5, 6.8 (see UA6 table below)	152,3%	265,6%
UA 7	Other uses, storage rooms, parking areas, Sanitary facilities, closets etc.	45,3%	45,30%

For more precise benchmarking the different UA 6 are subdivided into the several categories as described here:

UA 6	HEALTHCARE AND NURSE	DESCRIPTION
6.1	Rooms with general medical equipment	Rooms for general examination and treatment, emergency medical care and first aid, wound care, counseling (medical preventive and follow-up care), outpatient clinic, autopsy, and morgue rooms.
6.2	Rooms with specialized medical equipment	Rooms for functional diagnostics (clinical physiology, neurophysiology, sensory physiology) and specialized treatments.
6.3	Rooms for surgical procedures, endoscopy and childbirth	Rooms for surgeries, emergency, accident treatment, including operating rooms and preparation and recovery rooms, doctors' washrooms.
6.4	Rooms for radiation diagnostics	Rooms for general and specialized X-ray diagnostics, thermography, nuclear medicine diagnostics (application and measurement rooms).
6.5	Rooms for radiation therapy	Rooms for conventional radiation therapy, high-voltage therapy, teletherapy, and nuclear medical therapy (application and implantation rooms).
6.6	Rooms for physiotherapy and rehabilitation	Rooms for hydrotherapy, physical therapy, electrotherapy, and occupational therapy, as well as for curative treatments; rooms for various types of therapeutic baths, inhalation and climate therapy, physiotherapy and massage, play and group therapy, therapeutic pedagogy, and work therapy.
6.7	Patient rooms with standard equipment in hospitals, nursing homes, and healthcare institutions	Rooms for general care, long-term care, and basic care of patients who are ill, in need of care, or psychiatric patients.
6.8	Patient rooms with specialized equipment	Rooms for postoperative monitoring and intensive care (monitoring, treatment), dialysis, and nuclear medicine.
6.9	Other care rooms	

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The costs of an average hospital are assessed from the statistical average based on publications by the German Information Centre for Construction Costs (BKI, 2022) and the DGNB evaluations based on certified projects. For the current version all costs are adjusted to **Quartal 4 of 2022**, considering the same conventions as for: maintenance, repair/replacement factors, inflation, interest rates, as given under table 1 and appendixes 2 and 3 of this criterion. The current statistical mean value for the construction (production) and operational costs: reference, limit and target values for healthcare buildings type II are calculated as follows:

COSTS	TARGET VALUE €/GFA$_{(S)}$	REFERENCE VALUE €/GFA$_{(S)}$	LIMIT VALUE €/GFA$_{(S)}$
Construction	3120	3120	3432
Operation (without energy)	3264	3663	4366

The whole process of benchmark creation/calculation is integrated into the DGNB LCC tool.

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APPENDIX 6

Adaptation factors

(see also chart in LCC-Tool)

Adapting local construction costs to German price levels

For the calculation of building related life cycles, we propose the following approach:
The construction costs for single building components or technical systems have to be adapted to German prices. Therefore, we created a comparison regarding the costs for constructing costs in other countries to get a coefficient that describes the relation between German prices in comparison to other countries.

The project's cost of manufacture has to be multiplied with the coefficient from the table to get a weighted cost of manufacture that is comparable. This step is automatically completed by the LCC tool.

COUNTRY	FACTOR CONSTRUCTION COSTS	
	Office **Education** **Hotel** **Residential** **Consumer market** **Shopping centre** **Department stores** **Assembly buildings** **Healthcare buildings**	**Logistics** **Production**
ARGENTINA	1.73	1.64
AUSTRALIA	1.03	1.28
AUSTRIA	0.94	0.94
BAHRAIN	1.49	1.46
BELGIUM	1.02	1.00
BRAZIL	2.04	1.31
BULGARIA	2.06	1.81
CANADA	1.16	1.08
CHILE	1.56	1.07

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CHINA	2.71	2.23
COLOMBIA	2.25	1.93
CROATIA	1.59	1.48
CZECH REPUBLIC	1.65	1.38
DENMARK	0.73	0.76
EGYPT	1.88	1.88
FINLAND	0.72	0,68
FRANCE	0.95	0,94
GERMANY	**1.00**	**1.00**
GREECE	1.11	1.04
HONG KONG	0.63	0.40
HUNGARY	1.38	0.97
INDIA	3.69	1.96
INDONESIA	2.35	1.88
IRELAND	0.90	1.00
ITALY	1.10	1.25
JAPAN	0.83	0.51

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KENYA	3.41	3.31
KUWAIT	1.39	1.36
LUXEMBURG	0.88	0.84
MALAYSIA	2.63	2.35
NETHERLANDS	1.23	1.07
NEW ZEALAND	1.14	1.14
NORWAY	0.76	0.66
PHILIPPINES	3,21	2.89
POLAND	1.32	1.55
PORTUGAL	1.48	1.30
ROMANIA	1.95	1.55
RUSSIA	2.13	1.25
SAUDI ARABIA	1.34	1.34
SERBIA	1.88	1.88
SINGAPORE	1.22	1.04
SOUTH AFRICA	2.29	2.16
SOUTH KOREA	1.31	0.95

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SPAIN	1.17	1.36
STATE OF QATAR	1.22	1.05
SWEDEN	0.70	0.81
SWITZERLAND	0.69	0.59
THAILAND	2.21	1.64
TURKEY	2.89	1.82
UAE	1.24	1.24
UKRAINE	1.92	1.66
UNITED KINGDOM	0.72	0.93
USA	0.76	0.72
VIETNAM	2.73	2.40
Adaptation factors for further countries to be agreed with the DGNB		

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APPENDIX 7

Local currency rates

COUNTRY	LOCAL CURRENCY	CURRENCY EXCHANGE RATE FROM Q4 2022
ALGERIA	DZD	142.49
ARGENTINA	ARS	166.08
AUSTRALIA	AUD	1.56
BOTSWANA	BWP	13.43
BRAZIL	BRL	5.40
BRUNEI	BND	1.42
BULGARIA	BGN	1.96
CANADA	CAD	1.38
CHILE	CLP	938.13
CHINA	CNY	7.29
CZECHIA	CZK	24.35
DENMARK	DKK	7.44
EGYPT	EGP	23.82
GEORGIA	GEL	2.77
GERMANY	**EUR**	**1.00**

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HONG KONG	HKD	7.98
HUNGARY	HUF	410.82
ICELAND	ISK	146.42
INDIA	INR	83.78
INDONESIA	IDR	15885.19
IRAN	IRR	43058.33
ISRAEL	ILS	3.57
JAPAN	JPY	145.88
KAZAKHSTAN	KTZ	391.19
S.KOREA	KRW	1391.56
KUWAIT	KWD	0.31
MALAYSIA	MYR	4.70
MAURITIA	MUR	45.18
MEXICO	MXN	20.10
NEW ZEALAND	NZD	1.70
NORWAY	NOK	10.42
OMAN	OMR	0.39

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PERU	PEN	3.99
PHILIPPINES	PHP	58.99
POLAND	PLN	4.71
QATAR	QAR	3.73
ROMANIA	RON	4.92
RUSSIA	RUB	62.26
SAUDI ARABIA	SAR	3.85
SINGAPORE	SGD	1.42
SOUTH AFRICA	ZAR	18.11
SWEDEN	SEK	10.96
SWITZERLAND	CHF	0.98
THAILAND	THB	37.17
TRINIDAD	TTD	6.93
TURKEY	TRY	19.00
UAE	AED	3.76
UKRAINE	UAH	37.69
UNITED KINGDOM	GBP	0.87

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URUGUAY	UYU	40.90
USA	USD	1.02
Adaptation factors for further countries to be agreed with DGNB		

Main sources: The International Monetary Fund (IMF) and European central bank (ECB)

APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation submitted must comprehensively and clearly demonstrate compliance with the requirements of the individual indicators.

Indicator 1: Calculations of the life cycle costs in the planning process

Prove that a life cycle cost model was drawn up for the building and used as part of the planning process, also that this model was drawn up in service phase 3 at the latest. The most likely/preferred building variants available (at least 2), were compared in terms of production costs and relevant subsequent costs, comprising at minimum the expected operational costs. Additionally, it can also be proven that the scope of analysis contains all relevant building-related subsequent costs in accordance with the definition, including extra variant with the building energy relevant CO_2 tax or other aspects like reused building components etc.

For this indicator, the target values used for the comparison and adequate documentation of the communication to the planning team must be produced. The following documents should be used to provide as evidence:

- Number of project alternatives (at least 2) based on the preliminary financial/investment models/analysis (full consideration or partial analysis);
- Preliminary building energy demand calculations/assumptions;
- Variant calculations/assumptions with the CO_2 tax and/or alternative solutions like reuse;
- DGNB Excel based LCC Tool for the variant calculations;
- Any other tool for the financial model calculations with the link to the project;
- Presentation of the considered aspects and variant comparisons;

Indicator 2: Life cycle cost optimisation

It must be proven that planning optimised for life cycle costs has been carried out. All positions/documents mentioned in the indicator 1, considered in more detailed level, reflecting higher detailing grade of the advanced project service phases 3 – 5. Confirmation by the auditor that life cycle assessments were evaluated for important decisions, description of the alternatives considered. Clear demonstration of the relationship between the preliminary assessments (from Ind. 1) and the advanced design of the project in the service phases (3 - 5).

In addition, the life cycle cost analyses (at least in form of filled DGNB Excel LCC tool) was done for the decarbonization plan: indicators 3.2 and/or 4 of the ENV1.1. Corresponding financial plan for implementation of the identified measures is created.

Indicator 2.2.1: Circular economy bonus – reuse

For the circular economy bonus, appropriate documentation must be produced proving the relevance of the implemented solution (share of the relevant reference value) and additionally proving either that the solution was reused or that it was not acquired via a leasing model or similar but that its use is instead an integral part of the contract.

Indicator 2.2.2: Circular economy bonus – end-of-life

The procedure carried out must be demonstrated, including information on the type and quality of the data sources.

Indicator 3: Building-related life cycle costs

The documents below represent a selection of the types of evidence that can be provided. The documentation submitted must comprehensively and clearly demonstrate compliance with the requirements for the target evaluation of the individual indicators.

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- Table showing the production costs via cost calculation in accordance with the Appendix 1;
  Table showing the operation and maintenance costs via cost calculation in accordance with the Appendices 2, 3 and 4 (included in the DGNB LCC Excel tool);
- Presentation of calculation for the local adaptations in accordance with the Appendices 6 and 7;
- Additionally for **Type II healthcare buildings**:
  Table showing the reference building (virtual twin) production and operational costs in accordance with the Appendix 5 (included in the DGNB LCC Excel tool);
- Documentation of the life cycle costs for the entire reference period with regard to m² NFA, m² GFAs and m³ GV
- Final energy demand of the building in accordance with building energy performance certificate or energy simulation (referring to the criterion ENV1.1)
- Data for the referenced energy sources (in order to take building systems that feed energy into the grid into account, documentation of the feed-in rate achieved must be enclosed).
- Water demand and waste water values taken from criterion ENV2.2
- Sources used for application of generalised values or reference
- Values used for the detailed method for servicing and maintenance at the sub-level of structural and technical components or beyond.
- Filled up DGNB LCC Excel tool;

The justification and description of classifications into category (when necessary) 1, 2 or 3 should be documented in accordance with the following specifications:

Category 1 / Special conditions and additional expenses:

- E.g. difficult foundation soil conditions: Via documentation from the expert report regarding the foundation soil
- E.g. supports: Suitable photo documentation or design plans
- Documents and/or specifications required under construction law
- Innovation: reference values and building specification

Category 2:

- Materials or technical facilities used with installation location and quantities
- Expert report regarding the location/site

Category 3:

- Floor plan and cross-section with dimensioning

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- ISO 15686-5. Buildings and constructed assets – Service-life planning – Part 5: Life-cycle costing. Berlin: Beuth publisher. June 2008
- DIN 277-1:2016-01: Floor areas and volumes in construction – Part 1: Hochbau, Berlin, January 2016
- Nachhaltiges Bauen [Sustainable building] guide by the Federal Ministry of Transport, Building and Urban Development (Bundesministerium für Verkehr, Bau und Stadtentwicklung) (2013)
- German information centre for construction costs (BKI): BKI Baukosten 2022 Neubau – Statistische Kostenkennwerte für Gebäude [BKI construction costs 2022, new buildings – Statistical cost parameters for buildings]. Stuttgart 2022
- Sustainable Development Goals icons, United Nations/globalgoals.org
- FM.benchmarking report 2016: Published by Prof. Uwe Rotermund, Ingenieurgesellschaft mbH & Co KG. Höxter, 2016
- European Construction Intelligence 2018, construction cost index, RLB – Euro Alliance.
- International construction costs 2017, Arcadis Consulting, 2016
- Annual Construction Cost Handbook Singapore 2018, Arcadis Consulting, 2018
- Construction Cost Handbook Malaysia 2018, Arcadis Consulting, 2018
- Exchange Rate Report – IMF, International monetary fund, 2017
- International construction market survey 2018, Turner & Townsend, April 2018
- Hotel Classification Systems, UNWTO World Tourism Organization, 2015
- Classification of hotel establishments within the EU, ECC The European Consumer Centres' Network
- Level(s) indicator 6.1: Life cycle costs: User manual (Version 1.2; Aug. 2024, JRC, Unit B.5)
- the Level(s) Indicator 2.1 – “Bill of Quantities (BoQ) materials and lifespans” (Version 1.2; Aug. 2024, JRC, Unit B.5)
- ISO 9836:2017 Performance standards in building — Definition and calculation of area and space indicators, Nov. 2017
- State and Trends of Carbon Pricing Dashboard, World bank: https://carbonpricingdashboard.worldbank.org/-compliance/price
- Destatis: https://www-genesis.destatis.de/genesis/online
- IMF Exchange Rates (per currency unit for the period October 01, 2022 - December 31, 2022)
- Social costs of environmental pollution, https://www.umweltbundesamt.de/daten/umwelt-wirtschaft/gesellschaftliche-kosten-von-umweltbelastungen#gesamtwirtschaftliche-bedeutung-der-umweltkosten Last updated on November 26, 2024

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ECO2.1

Flexibility and adaptability

Objective

This criterion is aimed at making the building's design as flexible as possible and creating the greatest possible potential for conversion. Adaptability and convertibility play a key role in terms of social change and modern challenges. They help to extend a building's lifespan and thus help the property to retain value in the long term.

Benefits

The easier a building can be adapted to changing requirements, the higher the user satisfaction – this can extend the building's service life and reduce costs throughout its life cycle. Flexibility and adaptability reduce the risk of vacancy and contribute to the long-term economic success of a building.

Contribution to overarching sustainability goals



Outlook

As society changes, flexibility and adaptability to different uses will become increasingly important. Changes to demographics, work, industry and digitalisation will fundamentally alter our building requirements. This criterion will become increasingly important, and it will be adapted to incorporate future technological advancements.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Assembly buildings** **Production** **Healthcare buildings**	**5.0%**	**2**

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EVALUATION

The aim here should be to make the buildings more flexible and adaptable with to future needs with measures like ceiling height, building depths that allow for conversion to other usages, a good ratio between the floor area and number of building access cores, aspects allowing flexibility to the floor plans, a highly flexible structural design and highly adaptable technical building services. Indicators like 2.4 Flexibility of floor layout, 2.5 Flexibility aspects of the structure and 2.6 Flexibility aspects of the technical building services are particularly important for EU Taxonomy and Level(s) indicators 2.3 – Design for adaptability and renovation. In this criterion, a maximum of 100 points (Appendix 2 shows a table summarising the breakdown of points per scheme) can be awarded in total without bonuses, or a maximum of 110 points including bonuses.

NO.	INDICATOR	POINTS
1	**Adaptability in design concept** **Office** **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market** **Healthcare buildings**	**Max. 10**
1.1	**Adaptability incorporated in building design concept** The design concept has considered adaptability and possible changes to the floor layout, structure and technical services	**5**
1.2	**Proof of convertibility within the same type of use or another use** A conversion concept is available for the building, which is based on the findings of the site analysis and describes at least one alternative use within the same usage profile and/or at least one alternative use in another usage profile.	**5**
2	**Adaptability in individual factors in detailed design and construction**	**Max. 70**
2.1	**Ceiling height – Shell dimension**	**Max. 10**
	Office **Education** ≥ 3.00 m	10
	Residential ≥ 2.50 m – ≥ 2.75 m	7–10
	Hotel > 2.50 m (hotel rooms) and ≥ 3.25 m (general areas)	10
	Consumer market ≥ 3.25 m (rented space)	10
	Shopping centre ≥ 3.90 m (rented space)	10
	Logistics ≥ 6.00 m – ≥ 10.50 m	5–10
	Healthcare buildings ≥ 3.10 m – ≥ 3.20 m (maintenance and administration)	10 +5

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≥ 4.00 m – ≥ 4.20 m (surgery, intensive care, examination and treatment) +5

Not applicable for **Assembly buildings** **Production** and **Department stores**

2.2 Building depth **10**

Building case 1: Standard scenario (external wall – external wall)
Building case 2: Building access core (external wall – core)

Office **Hotel** 10
Building case 1
10.00 m ≤ building depth ≤ 16.50 m
Building case 2
5.00 m ≤ building depth ≤ 8.25 m

Residential 10
Building case 1
11.50 m ≤ building depth ≤ 13.50 m, uniform building depth
Building case 2
5.75 m ≤ building depth ≤ 6.75 m, uniform building depth

Re 2.2 INNOVATION AREA **As in 2.2**

Conceptual model of alternative approaches demonstrating that different building depths allow the building to be easily converted to other uses.

Not applicable for **Education** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Healthcare buildings**

2.3 Vertical access **10**

Floor-by-floor consideration of the relationship between the gross floor area/number of development cores [GFAs-floor / n building access cores]

Office **Hotel** **Assembly buildings** **Education** 10
≤ 800 m^2 to ≤ 400 m^2

Re 2.3 INNOVATION AREA **As in 2.3**

Conceptual model of alternative approaches demonstrating that the vertical infrastructure allows the building to be easily converted to other uses.

Not applicable for **Residential** **Consumer market Shopping centre** **Department stores** **Logistics** **Production** **Healthcare buildings**

2.4 Flexibility in floor layout

Office **Education** **10**

- Wider column spans are designed that allow for more flexible floor layouts +2.5
- Façade patterns are designed with narrower bays that allow for more internal space configurations +2.5

■ By ensuring unit sizes and access that allow access/egress from sub-divisions of the spaces that provide more sub-letting options	+2.5
■ Sanitary units or connections (manhole) are available for retrofitting and for subsequent division into units ≤ 400 m².	+2.5
Residential	**15**
■ Living spaces of each residential unit consist of rooms with no designated use (e.g. 3 x 3 m, ideally 4 x 4m)	+5
■ Load-bearing and non-load-bearing walls within a given structure allow adaptation to different floor plans according to demand.	+5
■ The potential to segregate a space with adequate dimensions, light and services within the home supports remote working. For a unit with more than one storey, the potential for the ground floor to become a self-contained unit with space for a bed, kitchen, toilet and shower will support future changes in circumstances.	+5
Logistics	**20**
■ Sanitary units or connections (manhole) are available for retrofitting of subsequent division into smaller units.	+10
■ Separate development and use (separate billing or rental units) is possible for division into smaller units	+10
Production	**20**
■ Separate development and use (separate billing or rental units) is possible for division into smaller units.	20
Assembly buildings	**20**
■ Rooms/halls can be divided (e.g. by a floor-to-ceiling curtain or mobile, floor-to-ceiling wall elements)	+4
■ Sufficient storage space is available so that at least 50% of the rooms can be emptied.	+4
■ The electrical distributions and connections are designed to ensure sufficient flexibility, for example, for temporary uses (e.g. for exhibitions or video installations).	+4
■ Primary use and catering areas can be separated to ensure separate use (different opening hours/use scenarios).	+4
■ Project data regarding use as emergency accommodation is available.	+4
Healthcare buildings	**20**
■ Additional multi-functional rooms, not necessarily required by the space allocation plan, are available on each building level and are accessible to all users. They have an area of at least 12 m² and meet the requirements of a recreational area.	20

Re 2.4 INNOVATION AREA

Conceptual model of alternative approaches demonstrating that the rooms can be easily adapted for different uses.



As in 2.4

Not applicable for **Hotel** **Shopping centre** **Department stores** **Consumer market**

2.5 Flexibility aspects of the structure

Office **10**

- Non-load bearing façades allow for changes to be made more easily to both internal layouts and external elements. +2
- The incorporation of redundant load-bearing capacity supports potential future changes in the building's façade and uses. +2
- Structural designs that have the vertical strength to support additional storeys allow for future expansion of the floor area. +2
- Non-load-bearing internal walls within a given structure allow different floor plans to be adapted according to demand. +2
- Partition walls can be installed on any façade axis of the floor grid without interfering with the floor or ceiling. +2

Education **20**

- Load-bearing internal walls are avoided as far as possible. +10
- Partition walls can be installed on any façade axis of the floor grid without interfering with the floor or ceiling. +10

Residential **15**

- Load-bearing internal walls are avoided as far as possible. +7.5
- Shaft configuration allows for flexibility in the planning of kitchen and sanitary connections in a concentrated indoor area. +7.5

Hotel **20**

- Load-bearing internal walls are avoided as far as possible. +10
- Partition walls can be installed on any façade axis of the floor grid without interfering with the floor or ceiling and/or flexible separability into conference and catering areas is possible +10

Healthcare buildings **20**

- Load-bearing internal walls are avoided as far as possible and/or the building was constructed using the skeleton method +10
- Partition walls can be installed on any façade axis of the floor grid without interfering with the floor or ceiling +10

Consumer market **40**

- Live load reserves for conversions are taken into account in the structural calculation and are available, and/or the structural system allows for subsequent changes to load-bearing ceiling or wall areas (a structural calculation must be carried out for any interventions in the load-bearing structure). +20
- Installation areas for rental installations (e.g. refrigeration units) with corresponding live load/space reserves are available. +20

Shopping centre	**20**
■ Useful live load reserves for conversions are included in the static calculation and are available.	+5
■ The structural system allows for subsequent changes to load-bearing ceiling or wall areas (a structural calculation must be carried out for interventions in the load-bearing structure).	+5
■ Installation areas for rental installations (e.g. refrigeration units) with corresponding live load and space reserves are available.	+5
■ Connection points provided in the building's interior structure allow shop façades to be easily installed, removed or modified.	+5
Department stores	**30**
■ Live load reserves for various conversions are taken into account in the structural calculation and are available.	+7.5
■ The structural system allows for subsequent changes to load-bearing ceiling or wall areas (a structural calculation must be carried out for interventions in the load-bearing structure).	+7.5
■ Installation areas for rental installations (e.g. refrigeration units) with corresponding live load/space reserves are available.	+7.5
■ Rental units can be separated and redesigned without major construction work (e.g. changing the façade design). The design solutions envisaged here have been taken into account in the planning.	+7.5
Logistics	**20**
■ Extensions to the building can be implemented without changes to the existing supporting structure or extensions within the building can also be implemented in terms of height (e.g. supports for mezzanine areas).	+10
■ Useful live load reserves for conversions are taken into account in the structural calculation and are available.	+10
Production	**30**
■ Extensions to the building can be implemented without changes to the existing supporting structure.	+7.5
■ Extensions within the building can also be implemented in terms of height.	+7.5
■ The support grid is designed in such a way that sufficient support spans are available in the event of a change/expansion of the production processes.	+7.5
■ Useful live load reserves for conversions are taken into account in the structural calculation and are available.	+7.5
Assembly buildings Type I and II	**Max. 20**
Type I Congress buildings, theatres and concert halls, museums, cultural, civic centres and libraries	
Type II Trade fair and city halls	

Type I and II

- Building units can be separated and redesigned without major construction work (e.g. changing the façade design). Intended design solutions were taken into account in the planning (e.g. in the conversion concept and/or fire protection concept). +5
- In at least one public area, a door is suitable for the passage of large exhibits/furniture (width 2.50 m x height 2.50 m). +5
- Sufficient load-bearing capacities are available in exhibition rooms/halls for moving and displaying large exhibits/furniture. +5
  - **Type I** at least 2 tons floor load capacity
  - **Type II** at least 5 tons floor load capacity

Type I **Max.+ 5**

- Alternative delivery routes are available to prevent set-up, dismantling, catering traffic from passing through foyer areas. +2.5
- Load-bearing internal walls are avoided as far as possible. +2.5
- Exhibition areas have sufficiently large openings/truck gates (minimum width 2.50 m x height 5.00 m) to allow the passage of large exhibits/furniture. +2.5
- Live load reserves for various conversions are available in rooms for the exhibition and for moving large exhibits on the ground floor (at least 2 tons). +2.5
- The walls are designed to withstand the constant change of exhibits-/exhibitions, i.e. they are robust, easy to repair and easy to paint. +2.5
- Tiering in the auditorium can be changed without interfering with load-bearing components, by using removable platforms, for example. +2.5

Type II **Max.+ 5**

- Each hall and each divisible area of the hall has at least one truck door with the following minimum dimensions:
  - at least two truck gates (at least one of which can be divided) with a width ≥ 4.0 m x 5.0 m +2.5
  - at least two truck gates (at least one of which can be divided) with a width ≥ 5.0 m x 5.0 m.

- The load-bearing capacity of the ground floor level is sufficient to allow the passage of trucks. +2.5
  - The structural design is rated for up to ≥ 30 t heavy goods vehicle.
  - The structural design is rated for up to ≥ 60 t heavy goods vehicle.

- The ceiling structure of the primary usable floor area to be considered as an assembly building incorporates suspension points for trade fair installations as follows:
  - Maximum individual bearing load of 5 kN and a resulting area bearing load of 0.2 kN/m² +2.5
  - Maximum individual bearing load of 10 kN and a resulting area bearing load of 0.3 kN/m²

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Re 2.5 **INNOVATION AREA**



As in 2.5

Conceptual model of alternative approaches demonstrating that the structural design is flexible.

2.6 Flexibility aspects of the technical building services

2.6.1 Access to services

Office **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market** **10**

- Access is improved if services are not embedded in the building structure. +2.5
- Future changes to technical equipment are facilitated if there is ease of access to plant rooms and equipment. +2.5
- The inclusion of longitudinal ducts provides flexibility in the location of service points. +2.5
- The use of increased ceiling heights provides greater flexibility in the routing of services. +2.5

Residential **10**

- Location of services within the building to ensure flexibility for future changes. +5
- The internal layout of rooms, distribution networks and connections can be adapted in the case of any layout modifications. +5

2.6.2 Distributions and connections

Office **Residential** **Consumer market** **Healthcare buildings** **Production** **Assembly buildings** **Education** **Hotel** **10**

The distributions and connections can be adapted in the event of a change in layout or a redesign.

Ventilation/air conditioning +2

- Without or with simple structural measures

Cooling +2

- Without or with simple structural measures

Heating +2

- Without or with simple structural measures

Water – vertical toilet connections +2

- Without or with simple structural measures

Electrical engineering +2

- Without or with simple structural measures

Logistics **10**

Heating +5

- Without or with simple structural measures

Electrical engineering +5

- Without or with simple structural measures

Shopping centre **Department stores** **30**

QL 1: Supply has been implemented in the form of a defined transfer point for the rental units. In the event of a change in layout or redesign, adaptation work may be necessary. Adjustment work has taken place; reserves in distribution and generation are not maintained. +10

QL 2: Supply is designed so that reserves in the distribution make it is easier to respond to higher requirements, e.g. an increase in power in the event of a change in layout or redesign.

QL 3: Supply is designed so that reserves in both generation and distribution make it very easy to respond to higher requirements, e.g. an increase in power in the event of a change in layout or redesign.

Shopping centre **Department stores**

Cooling: Cooling supply +5

- QL 2 or better

Heating: Heat supply +5

- QL 2 or better

Electrical engineering: Electrical supply +5

- QL 2 or better

Ventilation/air conditioning +5

- Distributions and connections at least QL 2

Re 2.6 **INNOVATION AREA** **As in 2.6**

Conceptual model of alternative approaches demonstrating that the distribution and connection in technical services is flexible

3 Space efficiency — Max. 20

3.1 Space efficiency value: Ratio of usable area (UA) / Gross Floor Area (GFA) — Max. 10

Office **Education**

≥ 0.48 – ≥ 0.75 1–10

Hotel 1–10

≥ 0.43 – ≥ 0.70

Residential 1–10

≥ 0.60 – ≥ 0.80

Consumer market 1–10

≥ 0.70 – ≥ 0.90

Shopping centre

Category I: ≥ 0.55 – ≥ 0.65 1–10

Category II: ≥ 0.50 – ≥ 0.60 1–10

Department stores

≥ 0.50 – ≥ 0.70 1–10

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Healthcare buildings
≥ 0.47 – ≥ 0.56 1–10

Logistics and **production**
Documentation of the ratio values under a) 1
Documentation of the ratio values under a) and of b) or c) 7.5
Documentation of the ratio values under a) and of b) and c) 10
see under method: a): Cost-related optimisation
b): Environmental optimisation
c): Contribution to optimisation in the social sector

Assembly buildings 1–10
≥ 0.55 – ≥ 0.67

3.2 Multi-use of areas **Max. 10**
The multi-use of a relevant proportion of the areas is integrated into the concept. 5
The multi-use of a relevant proportion of the areas is realised in practice. 10

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4 AGENDA 2030 BONUS – Eco-sufficiency **5**
A eco-sufficiency strategy exists for the building and relevant aspects are implemented.

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5 AGENDA 2030 BONUS – Expandability **5**
A concept for a possible expansion is available.

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Conversion concept is available (same use/different use)	[yes/no]
KPI 2	Shell dimension	[m]
KPI 3	Building depth	[m]
KPI 4	Gross floor area (GFA) [T&D_04] / number of building access cores	[m² GFA]
KPI 5	Flexibility: Support spacing [m], non-load-bearing internal wall system [flexible/inflexible], potential for areas to be divided [m²]	[-]
KPI 6	Space efficiency value: Ratio of usable area (UA) / Gross Floor Area (GFA) [T&D_04]	[%]
KPI 7	Proportion of land for multi-use	[% areas]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

–

II. Additional explanation

Technical and social developments impact the built environment for work, housing and leisure. This requires highly efficient, flexible and adaptable buildings. The need for adaptation may arise from changes to the building use, or as a result of conversion to a different use (e.g. by a new tenant).

In economic terms, the evaluation of the building's space efficiency is based on the proportion of usable and rentable space in relation to the total area of the building.

This criterion is closely related to TEC1.4, which focuses on the adaptability of technical systems.

III. Method

Definitions

Space efficiency is assessed from an economic point of view. As an indicator of how cost-effective the use of the space is, the relationship between usable/rentable areas and the total gross floor area of the building is taken into consideration.

Flexibility:
The slight adaptation of the building structure to changes still within the existing use (e.g. individual offices becoming open-plan offices – a fulfilment centre becoming a warehouse)

Suitability for conversion:
The adaptation of the building structure to a different use (e.g. office use to hotel use, logistics facility to production facility)

The following indicators are evaluated:
Indicator 1: Adaptability in design concept
Adaptability has been considered at the design concept stage of the project.

Indicator 1.1: Adaptability incorporated in building design concept
Factors like future changes to internal space distribution, building services, façade and structure have already been considered by the architects and structural engineers. The value appraisal of these design aspects has been considered by the building promoter and cost surveyors.

Indicator 1.2: Proof of convertibility within the same type of use or another use
The adaptability of buildings will become more important in the context of dwindling resources. It is therefore necessary to adapt the buildings to the changing needs of the users over as long a period of use as possible.

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A concept is available for the convertibility of the building within the same usage profile or another usage profile based on the findings of the site analysis. The change of use can be demonstrated either in a text or in a technical drawing/plan (with brief explanations).

Indicator 2: Adaptability in individual factors in detailed design and construction

Adaptability evaluates the adherence to certain parameters. The following information must be observed for the respective parameters:

Indicator 2.1: Ceiling height – Shell dimensions

In a project, the height can either be determined from the plans or by measuring. If the room height varies within a room, e.g. in an attic, the average room height must be used. A standard floor must be defined and applied for the evaluation. Where it is not possible to clearly define a standard floor, documentary evidence must be provided to prove that 80% of the area complies with the height used for the evaluation. Service storeys and underground car parks are to be disregarded for the purposes of this aspect of this assessment.

In this criterion, the ceiling height is the shell dimension = upper edge of the unfinished floor to the lower edge of the bare ceiling.

Indicator 2.2: Building depth

A standard floor must be defined and applied for the evaluation.
The required building depth between the two façades of the standard floor must be achieved for 70% of the usable area. The rooms to be assessed are highlighted in bold in Appendix 1 of this criterion. The building depth can either be determined on the basis of planning documents or, depending on the progress of the construction work, by measuring.

There are two different scenarios:
Building case 1: Standard scenario (external wall – external wall)**:** As a rule (with single-loaded or multi-loaded corridors), the entire building depth is measured from the inner edge of one external wall to the inner edge of the opposite external wall.

Building case 2: Building access core (external wall – core)**:** Near building access cores (e.g. high-rise or frontage buildings), the building depth is measured from the front of the core, that is the distance between the outer edge of the core wall and the inner edge of the external wall.

Exceptional cases must be assessed in line with scenario 1 or 2.

Appendix 1 lists the rooms to be considered, separated by usage profile.

Indicator 2.3: Vertical access

The layout of the stairs and lifts influences the building's flexibility and convertibility with regard to the size of the building unit (and possibly also allows appropriate development of other uses such as offices or residential). The standard Gross Floor Area should be divided by the number of vertical access cores. The smaller this ratio is, the easier it is to subdivide the building into smaller units. Only cores with fire escape access should be included in the calculation. In buildings with more than three floors, only access cores with lifts should be considered.

Exceptional cases must be clearly and logically presented and evaluated.

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Indicator 2.4: Flexibility in floor layout

Building floor layouts can increase the degree of flexibility and increase the possibility of adaptation to changing general conditions. This indicator lists some aspects of flexibility in the floor plan taking into account the usage scheme. In general, aspects that allow the space to be further sub-divided in future are mentioned.

Depending on the layout, subsequent subdivision into smaller units may require additional sanitary units to be installed. A certain number of these should already be available or connections should be installed so that sanitary units can be retrofitted. It should be possible to repurpose the technical systems without major construction work (e.g. zoning of thermoactive components).

Horizontal access routes are to be included in the planning together with the vertical ones. Some buildings require the presence of access elements with large openings (e.g. lifts or passageways with large opening widths and/or heights) to allow for the transport of large exhibits/furniture within the building. These areas and lifts should be designed for high loads accordingly.

An innovation area is provided so that other aspects of flexible floor plan can also be credited.

Indicator 2.5: Flexibility aspects of the structure

The structural design is assessed in terms of individual components, the quality of which influences the convertibility of buildings:

- internal walls
- partition walls
- façades
- load reserves

An innovation area is provided so that other aspects of flexibility aspects of the structure that are not mentioned can also be credited.

Indicator 2.6: Flexibility aspects of the technical building services

The adaptability of the technical building services is assessed based on the possibility of accessing the services as well as the possibility of making amendments or changes to distribution and connection of the services if required in future.

Amendments to the distribution and connection of the following services are considered:

- ventilation/HVAC
- cooling
- heating
- water
- electrics

This indicator looks at the effort required for structural measures for redesigns/room modifications within the individual building units (flexibility). If any of the services under evaluation is not present, points can be awarded.

Definitions:

- Significant structural measures, e.g. requires masonry work or the removal of reinforced concrete building components

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- Simple structural measures, e.g. assembly openings, doors and corridors are of sufficiently size and number. Accessibility is good. Components can be transported and replaced, e.g. through dry construction work.

An innovation area is provided so that other aspects of flexibility in technical building services that are not mentioned can also be credited.

Indicator 3: Space efficiency

Indicator 3.1: Space efficiency value: Ratio of usable area (UA) / Gross Floor Area (GFA)

To determine how efficiently the space is used, in accordance with the scheme and common practice in the market segment, the proportion of the GFAs [T&D_04] that can be considered usable area (as per the relevant definition) is calculated as follows:

UAs / GFAs [T&D_04]

For this purpose, the following must be noted:

- Circulation areas within units that can be used without restriction are part of the usable area.
- Necessary corridors leading to emergency exit stairwells used by two units are part of the circulation area.
- Corridors within a unit leading to an emergency exit stairwell are part of the usable area (exclusive use by one unit).
- Foyer areas for which there is evidence that they can be used as assembly buildings (provided they comply with the requirements of the building regulations) can be wholly included as part of the usable area.

When calculating the space efficiency factor, it is rounded to two decimal places.

Indicator 3.2: Multi-use of areas

The diverse usability of buildings is determined during the initial planning phases. Multiple use concepts (space sharing concepts) enable more intensive use of areas and a reduction in land consumption. If building areas are designed to accommodate different types of use and if the associated functionalities are taken into account during planning, then sharing concepts can create ecological, social and economic benefits for users, owners and operators. In addition to spatial structures, intelligent sharing concepts also require (management) systems and structures that regulate access to rooms and the necessary facility management.

If concepts for multi-purpose use and building area optimisation were developed and implemented during the planning and execution phases, with the involvement of (specialist) planners and, if necessary, user groups, this will result in a positive evaluation. In addition, clarification and assignment of liabilities, tenancy and property regulations in the corresponding (rental) contracts will support optimal building use.
It is assessed whether the usage concept has been implemented for a relevant portion of the usable building area. The relevance of certain uses must be presented and justified based on the building type.
Building use-concepts must address at least the following topics:

- Types of use (as well as consideration of special requirements for these uses)
- User groups
- Utilization concept (beyond the regular usage times of the main usage)
- Room booking platforms / access management systems
- Requirements for facility management

The '**DGNB Report Circular Economy**'[1], which includes a checklist for the multiple use of buildings, provides assistance.

[1] DGNB Report Circular Economy

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Indicator 4: AGENDA 2030 BONUS – Eco-sufficiency

If a concept is developed where the client considers eco-sufficiency approaches and significant parts of these are implemented, this is taken into account in Indicator 4. An important point here is to question current ratios, for example area/person in the area of housing or area/workplace (or corresponding usage profile).

Indicator 5: AGENDA 2030 BONUS – Expandability

An expansion concept is available. An expansion of both the area and the height can be proposed. The general conditions specified at the site must be adhered to.

IV. Usage-specific description

Indicator 3.1: Space efficiency value: Ratio of usable area (UA) / Gross Floor Area (GFA)

Certain factors (such as the number of floors, access points etc.) can have a significant impact on the space efficiency of buildings. Therefore, certain factors in different schemes have to be taken in account:

Shopping centre

Category I: plot of land with simple requirements

- Buildings with 1–2 storey sales area and 1 additional usage (parking, office, etc.) and low urban planning requirements

Category II: plot of land with high requirements

- Buildings with ≥ 3 storey sales area and 2 further usages (parking, office, etc.) or
- large urban planning restrictions/limitations or
- difficult property layouts that require a high proportion of access areas (e.g. parallel mall, round mall, triangle)

Logistics **Production**

Documentation of ratio values:

- a): Cost-related optimisation: Reduction of construction and operating costs through efficient division of space; poorly usable spaces are avoided.
- b): Environment-related optimisation: Reduction of the environmental impact of a property in operation by reducing the heating, ventilation and cooling system technology of the premises. With an increased area efficiency, the sealing of natural soils can be reduced.
- c): Contribution to optimisation in the social area: Positive influence on the working environment through well-proportioned areas and clear design (e.g. connection of office and social areas, clear mezzanine areas, optimized traffic routes).

Indicator 2.5: Flexibility aspects of the structure

Assembly buildings

For assessment under this indicator, assembly buildings are divided into the following building types:

- Type I: Congress buildings, theatres and concert halls, museums, cultural, civic centres and libraries
- Type II: Trade fair and city halls

Note: Assembly buildings that are not listed here as a building type, can be assigned to one of the above-mentioned types. If an assignment is not possible, please contact the DGNB office directly.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The allocation of points for individual indicators must be backed up by comprehensive and plausible evidence.

Indicator 1: Adaptability in design concept

- Presentation of the adaptability concept(s) (explanations, sketch, plan(s))
- Presentation of the conversion concept(s) (explanations, sketch, plan(s))

Indicator 2: Adaptability in individual factors in detailed design and construction

Ceiling height - Shell dimensions

- Depiction of the heights on the basis of planning documents (sections)

Building depth

- Presentation of the building depth using floor plans and/or cross-sectional plans with explanations and a list of the related floor areas
- Documentary evidence regarding floor plan layout: Concept (architect) that shows alternative approaches for making the building flexible and suitable for conversion using floor plans and sections with a brief written and conceptual justification

Vertical access

- Presentation in floor plans with explanations
- Calculation of the ratio GFAs [T&D_04] / number of building access cores

Flexibility in floor layout

- Presentation using floor plans with explanations
- **Assembly buildings** Proof documents and planning documentation for use as an emergency shelter

Flexibility aspects of the structure

- Presentation of the load-bearing and non-load-bearing components using floor plans with explanations
- Photo documentation with explanations
- Detailed drawings of the ceiling and floor connections, proof of product
- Plausible proof of the calculation of live load reserves

Flexibility aspects of the technical building services

- Excerpts from the technical building services plans with reference to access points, distribution systems and connections for ventilation/HVAC, cooling, heating and sanitary systems with explanations
- Photo documentation with explanations

Indicator 3: Space efficiency

Space efficiency value: Ratio of usable area (UA) / Gross Floor Area (GFA)

- Calculation of the UAs [T&D_04] and a list of related floor space
- Calculation of the GFAs [T&D_04] and a list of related floor space
- Calculation of the space efficiency factor

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Multi-use of areas

- Use concept for the multi-use of areas with details of different uses, use groups as well as regulations on aspects of liability and tenancy and property rights
- Depiction via floor plans as well as indication of areas that allow multiple uses, with explanations of types of use and use groups
- Utilisation concept
- Description of supporting management systems
- Evidence for implemented multiple use: Contracts or similar

Indicator 4: AGENDA 2030 BONUS – Eco-sufficiency

- Concept for the consideration of eco-sufficiency strategies

Indicator 5: AGENDA 2030 BONUSES: Expandability

- Concept with proof of expandability, e.g. through description, plans, sketches

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- ISO 9836:2017: Performance standards in building — Definition and calculation of area and space indicators, International Organization for Standardization (ISO), Geneva, September 2017: https://www.sis-.se/api/document/preview/922406/
- Sufficiency in the building sector – For the whole life carbon roadmap – Final report, BPIE & Ramboll, European Commission, August 2024: https://data.europa.eu/doi/10.2779/5787055
- Level(s) indicator 2.3: Design for adaptability and renovation (Publication version 1.1), European Commission, Brussels, January 2021: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/-412/documents
- EU Taxonomy: Construction and Real estate activities-Substantial contribution to the transition to a circular economy, European Commission, Brussels, June 2021: https://ec.europa.eu/sustainable-finance-taxonomy/activities/activity/350/view

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APPENDIX 1

Indicator 2.2: Building depth

The rooms to be assessed are highlighted in bold (see also [T&D_04])

SCHEME	TYPE OF USABLE FLOOR AREA (UA) FOR WHICH DOCUMENTARY EVIDENCE IS REQUIRED FOR INDICATOR 2.2	
	USE GROUP	FLOOR AREAS AND ROOMS
Office	2 – Office work	**2.1 Office rooms** **2.2 Open-plan offices** 2.3 Meeting rooms 2.4 Design rooms 2.5 Rooms with counter(s) (e.g. ticket office) 2.6 Control rooms 2.7 Surveillance rooms
Consumer market **Shopping centre**	4 – Sales and distribution (excl. storage)	4.4 Acceptance and distribution areas (where these are permanent working areas) **4.5 Sales rooms** 4.6 Showrooms 3.2 Workshops (where these are permanent working areas)
Logistics **Production**	2 – Office work (with proportion of administration)	**2.1 Office rooms** **2.2 Open-plan offices** 2.3 Meeting rooms 2.4 Design rooms 2.5 Rooms with counter(s) 2.6 Control rooms 2.7 Surveillance rooms
	3 – Production, manual and machine work, experiment (with proportion of industrial work)	**3.1 Workshops (where these are permanent working areas)** 3.2 Technological laboratories 3.3 Physics, engineering physics and electrical engineering laboratories 3.4 Chemistry, bacteriology and morphology laboratories

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Residential	1 – Residing and occupying	**1.1 Living spaces** 1.2 Common rooms 1.3 Break rooms 1.4 Waiting rooms 1.5 Dining rooms
Hotel	1 – Staying and occupying (with percentage of hotel rooms)	**1.1 Living spaces** 1.2 Common rooms 1.3 Break rooms 1.4 Waiting rooms 1.5 Dining rooms
	2 – Office work (with percentage of offices)	2.1 Office rooms
Education	5 – Education, teaching and culture	**5.1 Classrooms with fixed seating** **5.2 General classrooms and practice rooms without fixed seating** 5.4 Dedicated classrooms and practice rooms without fixed seating 5.5 Library rooms 5.6 Assembly rooms or areas 5.7 Stages, studios 5.8 Exhibition rooms

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APPENDIX 2

The table summarises the breakdown of points per indicator as per the relevant scheme. The total points that can be achieved per scheme is 100.

SCHEME	ADAPTIBILITY IN DESIGN CONCEPT	ADAPTABILITY IN INDIVIDUAL FACTORS IN DETAILED DESIGN AND CONSTRUCTION							SPACE EFFICIENCY		TOTAL
		CEILING HEIGHT – SHELL DIMENSION	BUILDING DEPTH	VERTICLE ACCESS	FLEXIBILITY IN FLOOR LAYOUT	FLEXIBILITY ASPECTS OF THE STRUCTURE	FLEXIBILITY ASPECTS IN TECHNICAL BUILDING SERVICES		AREA-RELATED EFFICIENCY VALUE	MULTI-USE OF AREAS	
							ACCESS TO SERVICES	DISTRIBUTION AND CONNECTIONS			
OFFICE	10	10	10	10	10	10	10	10	10	10	**100**
EDUCATION	10	10	0	10	10	20	10	10	10	10	**100**
RESIDENTIAL	10	10	10	0	15	15	10	10	10	10	**100**
HOTEL	10	10	10	10	0	20	10	10	10	10	**100**
CONSUMER MARKET	10	10	0	0	0	40	10	10	10	10	**100**
SHOPPING CENTRE	10	10	0	0	0	20	10	30	10	10	**100**
DEPARTMENT STORES	10	0	0	0	0	30	10	30	10	10	**100**
LOGISTIC	10	10	0	0	20	20	10	10	10	10	**100**
ASSEMBLY BUILDING	10	0	0	10	20	20	10	10	10	10	**100**
PRODUCTION	10	0	0	0	20	30	10	10	10	10	**100**
HEALTHCARE BUILDING	10	10	0	0	20	20	10	10	10	10	**100**

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ECO2.2

Commercial viability

Objective

Our goal is to create buildings with maximum user acceptance and long-term market potential, thus ensuring long-term value stability and commercial viability. A long-lasting building stock has a major impact on achieving our climate goals and protecting resources.

Benefits

Unused buildings are a misallocation of economic resources. A building that is vacant (in the medium or long term) is not sustainable. A high degree of commercial viability helps to maintain or even increase the value of a property, making it much easier to position on the market.

Contribution to overarching sustainability goals



Outlook

The longe term significance and evaluation are expected to remain the same.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Assembly buildings** **Healthcare buildings** **Production**	**2.5 %**	1

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EVALUATION

This criterion deals with long-term market potential. Indicator 1 addresses the extent to which the building and its respective use are appropriate for the location. It is not a general assessment of the location, but rather the quality of the property, and aspects of the location are placed in relation to each other. Indicator 2 focuses on the occupancy rate. Indicator 3 addresses the financial value and risk assessment which is aligned with Level(s). EU taxonomy compliance is also taken into account. A maximum of 100 points can be awarded in this criterion, or 110 points including bonuses.

NO.	INDICATOR	POINTS
1	**Analysis of the site and building concept**	
	Office **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market**	**Max.30**
	Healthcare buildings	**Max.40**
1.1	**Location analysis**	**Max.10**
	Office **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market** ■ General perception of the location ■ Demographic and economic development of the local environment (district, neighbourhood, city, possibly region) ■ Direct neighbourhood (interactions, synergies and conflict potentials)	10
1.2	**Building concept and synergies**	
	Office **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market**	**Max.20**
1.2.1	it is demonstrated how the building concept responds to the site analysis.	+10
1.2.2	The building demonstrably utilizes the synergy effect of its surroundings or offers synergy effects to its surroundings and thus has a positive influence on the attractiveness of the location.	+10
	Healthcare buildings	**Max.40**
1.2.3	■ The construction project is the result of ‘target planning’ with regional analysis carried out by an interdisciplinary team. Target planning is defined as a procedure for developping a plan to achieve a target within a foreseeable period of time. This sets out a ranking of the requirements for proper development to ensure that functionality is maintained in all construction phases.	+10
1.2.4	■ The building project is the result of a detailed, integrally developed operational organisation concept that takes into account use-specific aspects, including patient and staff routes, material transport and storage areas, hygiene compliance, positioning of technical facilities in relation to the functions to be supplied, connection to the main building, and future use scenarios.	+15
1.2.5	■ Disaster scenarios have been comprehensively considered in the building planning. Maintaining operations in the event of an emergency (critical infrastructures, such as communication capability, building supply, etc.) guarantees patient care during a disaster.	+15

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2	**Degree of utilisation/units leased at the time of completion**	**Max. 10**
2.1	**Degree of utilisation/occupancy rate** **Office** **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Consumer market** **Education**	**1–10**
	■ 50%–100%	1–10
	Not applicable for **Healthcare buildings**	

3	**Financial value and risk assessment** **Office** **Residential** **Hotel** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Education** **Consumer market** **Healthcare buildings**	**Max. 60**
3.1	**Market Analysis** A market analysis has been conducted showing that there is a high market potential for the planned project in its segment.	**15**
3.2	**Sustainability performance on financial valuation and risk exposure**	**20**
3.2.1	During the early design phase, the benefits of sustainability performance in terms of high investment return, cost-efficient operations and risk mitigation have been discussed with the client and relevant stakeholders.	+5
3.2.2	A comprehensive checklist of how each Level(s) indicator can have an influence on property financial value and risk appraisals has been demonstrably discussed with the client and relevant stakeholders in the early design stages according to the checklist in Level(s) 6.2 – 'Value creation and risk exposure'. Among them, some of the positive influences have been taken into account and incorporated in the project.	+15
3.3	**Taxonomy-compliant building** DGNB ESG verification for EU taxonomy compliance is being sought and the corresponding requirements are being observed.	**25**

4	**AGENDA 2030 BONUS – Connectivity/digital infrastructure** The quality of a building's digital infrastructure and connectivity is an important factor for the attractiveness of the working and living environment due to increasing connectivity. The quality of the internet connection is assessed externally.	**5**

5	**AGENDA 2030 BONUSES – Impulse/attractor** An additional use or feature is implemented that acts as a unique selling point and/or goes hand in hand with the upgrade of the site. The attractiveness of the building and its use beyond the immediate vicinity is assessed.	**5**

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Degree of utilisation/units let at the time of completion	[% area]

APPENDIX A – DETAILED DESCRIPTION

I. Relevance

-

II. Further explanation

The commercial viability of real estate is expressed through investment and leasing decisions. These provide the basis for continuous use of the individual property throughout its life cycle. If the site and property quality of a building is above the usual market level, it can be assumed that it has high commercial viability and therefore also has a low vacancy risk. Conversely, below-average site and property quality lead to reduced commercial viability and limited profitability. Under these circumstances, value retention and rental income suffer. The issues of taxonomy compliance and connectivity will also become increasingly important for more and more properties.

III. Method

Indicator 1: Analysis of the site and building concept

Indicator 1.1: Location analysis

The project environment must be characterised in terms of current and medium-term development trends, potential synergies, image and condition. This is done based on a report by a suitably qualified expert or competent person. Such expert reports are often prepared anyway for new construction projects and refurbishments. If this is not the case, a suitably qualified expert or competent person must be commissioned. The expert report only needs to provide a qualitative site analysis; a quantitative evaluation (value assessment in the narrower sense) is not required for Indicator 1.1.

Indicator 1.2: Building concept and synergies

For Indicator 1.2, the concept developed for the building refers to the site analysis and presents how the building integrates into the site and how the building responds to developments expected in the future. Analysis of climate risks at the site and the corresponding climate adaptations should be carried out as part of SITE1.1 and ECO2.6. These are not part of this indicator.

For points to be credited for using synergies for buildings, at least three synergy effects on the technical, economic, utilisation or social level that form a spatial cluster must be described. Synergies can take place on several levels. Possible examples include:

- Material cycles (e.g. industrial park: operations are integrated into the material cycle)
- Office building without canteen (employees use canteen from neighbouring company or restaurants/snack bars in the neighbourhood are promoted)
- Office building uses waste heat from neighbouring businesses for heating
- Increasing the attractiveness of the site for further uses or competing companies
- Mixed use (e.g. training centre/hotel, office park/serviced apartments)
- Joint construction/use of technical infrastructure (e.g. smart grid)
- Provision of childcare, fitness facilities, etc.

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Indicator 2: Degree of utilisation/units leased at the time of completion

Indicator 2.1: Degree of utilisation/occupancy rate

In addition to the initial leasing, the general commercial viability should also be assessed. In the case of owner-occupancy or a building tailor-made for a main tenant (anchor tenant), the initial leasing requirement is deemed to be met. However, this says nothing about the basic market potential in the case of a possible re-leasing after the initial occupant has moved out. In the case of 100% owner-occupation, the pre-leasing requirement is deemed to have been met in full.

Indicator 3: Financial value and risk assessment

Indicator 3.1: Market analysis

A market analysis has been conducted which shows that there is a high market potential for the planned project in its segment. An analysis of the market risks should be conducted to check that the extent of the planned use of the building project is not based on excessively high expectations of the market. The method used to assess the market potential depends very heavily on the type of use. Buildings are assessed according to the market segment that applies to them (office market, retail market, residential market, etc.). In general, a market analysis can cover:

- Selection and survey of relevant market indicators to estimate the regional demand for residential, leisure, retail, commercial or industrial real estate.
- The effort to identify and understand supply and demand in different market segments.
- Investigation of relations among location, pricing, and market share.
- Strategies to identify hidden markets and create new ones as well as to improve feasibility.

Since sources for market analyses are often not generally accessible, an expert report evaluating the necessary aspects is advantageous when it comes to the evaluation. Alternatively, a market analysis conducted by an estate agent/letting agent/property consultant along with a realistic appraisal can be used as documentary evidence.

Indicator 3.2: Impact of sustainability performance on financial valuation and risk exposure

This indicator is linked to the European reporting framework Level(s). It is used to gain a better understanding of the influence of sustainability aspects on the financial value of a property and the risk assessment. Points are only awarded for Indicator 3.2.1 if the following sustainability aspects have been considered in the early design phases and demonstrably discussed with the client and planning team:

- Investment return – The recognition of a property as a high-quality, sustainable building with a healthy internal environment significantly enhances its potential to sustain high occupancy rates and rental income over time. Additionally, its adaptability to evolving needs and mixed uses may also be a valuable factor.
- Cost-efficient operations – Property investments can be designed to minimize long-term operational costs, including utilities like energy and water, as well as maintenance, repairs, and replacement of building elements.
- Risk Mitigation – Property investments can be designed to minimize future risks, such as stranded assets, unexpected costs, and claims. This includes ensuring the building can withstand projected climatic changes to reduce repair needs and considering how such changes might affect occupant comfort and health.

For Indicator 3.2.2, a checklist of Level(s) for the Indicator ‘6.2 Value creation and risk exposure’ [1] or a list similar in content and scope can be applied. A comprehensive assessment of how sustainability aspects addressed by each Level(s) indicators can have an influence on property financial value and risk appraisals is carried out during the early design stages and is demonstrably discussed with the client. Some of the positive influences have been taken into account and incorporated in the project. Where a positive influence is to be taken into account, a supporting description shall be provided of how and to what extent the influence will be taken into account. The property market valuation method used should also be declared.

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Indicator 3.3: Taxonomy-compliant building

ESG verification aids transparency and risk minimisation, especially in the buying and selling process. In addition to the obligation for financial market participants to disclose project investments, it is expected that taxonomy-compliant projects will receive better financing conditions in the future. For this purpose, the ESG verification for the EU taxonomy shall serve as independent evidence. ESG verification can be carried out both in parallel with and independently of DGNB certification.

Indicator 4: AGENDA 2030 BONUS – Connectivity/digital infrastructure

The quality of the digital infrastructure and connectivity is assessed by an entity not involved in the planning and/or provision of the project's internet connectivity. The number of network operators, the quality of the existing cable and connection types and the cabling in the building are possible characteristics for assessing the overall quality of building connectivity. Another point is the potential for expanding the existing infrastructure.

Indicator 5: AGENDA 2030 BONUS Impulse/attractor

This indicator assesses the attractiveness of the building and its use beyond the immediate vicinity. Possible examples include:

- building/use as a 'place of pilgrimage' with evidence of at least 15 guided tours per month for interested parties from the fields of architecture, technology, ecology, product design, etc.
- attractive shopping facilities that are not available in the wider surrounding area.

IV. Scheme-specific description

Indicator 1: Analysis of the site and building concept

Healthcare buildings

Healthcare buildings are subject to a constant process of change on many levels. As a result, they must continuously adapt to external influences, such as the healthcare system, medical technology, hygiene and treatment methods. Accordingly, other aspects of the building's interior must offer high flexibility in terms of construction and technology for specific uses.

Externally, development potential can be identified and realised through target planning over a reasonable period of time with a view to avoiding piecemeal responses. The target planning sets out a ranking of the requirements for proper development to ensure that functionality is maintained during all construction phases. This ensures that individual measures form part of an overall concept and helps to avoid poor investment decisions. Target planning is therefore a planning strategy that provides a solid foundation for decision-making for the long-term development of healthcare facilities. It sets out the objectives and specifies the necessary measures for implementation during each construction phase; this requires continuous updating. The work must be carried out by an interdisciplinary team of doctors, operational planners, architects and urban planners, which may need to be supplemented by other technical disciplines.

[1] Level(s) common framework, 6.2 Value creation and risk exposure

Determining the needs for the respective use is a basic prerequisite for achieving a functionally optimised space concept. In this context, the uses to be defined in terms of space and personnel requirements as well as a projection of how they are likely to develop must be taken into account. The existence of an operational organisation concept, its level of detail as well as the review and implementation of the stated objectives are evaluated.

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APPENDIX B – EVIDENCE

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

General:
If the assessed building is going to have a positive impact on the existing site, this must be shown in the analysis. The evidence mentioned below should be provided according to the requirement and availability. A clear reference to the project must be presented. Different potential synergies exist, depending on the use.

Indicator 1: Analysis of the site and building concept

Location analysis:

- Qualitative site analysis report by a suitably qualified expert or competent person.

Building concept and synergies:

- Building concept and documentation demonstrating clearly synergies with the surrounding

Indicator 2: Degree of utilisation/units leased at the time of completion

- Signed statement by the building owner on the pre-letting quota at the time of completion in the form of a comprehensible and verifiable list of the respective users and the space taken up

Indicator 3: Financial value and risk assessment

Market Analysis:

- A market analysis report that highlights the market indicator considered and the performance of the project based on these factors. Expert statements or data from recognised market reports can be used. If the above-mentioned documentation does not exist, an market analysis conducted by an estate agent or letting agent or property consultant along with a reasonable appraisal can be used as documentary evidence instead.

Sustainability performance on financial valuation and risk exposure:

- Indicator 3.2.1- Evidence of processing and discussion of the positive influence of improved sustainability performance on financial valuation of a property. Positive influence in terms of high investment return, cost-efficient operations and risk mitigation have been discussed and recorded (minutes, confirmation of the meeting by the client)
- Indicator 3.2.2- Completed checklist according to level(s) indicator 6.2 or a list similar in content with proof documents where each level(s) indicator has been discussed (completed checklist, minutes, confirmation of the meeting by the client). Where a positive influence is to be taken into account, a supporting description shall be provided of how and to what extent the influence will be taken into account. The property market valuation method used should also be declared.

Taxonomy compliant building:

- Proof that the requirements of the EU taxonomy are met (e.g. submission as part of the ESG verification of the DGNB or others)

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Indicator 4: AGENDA 2030 BONUS-Connectivity/Digital infrastructure

- Documentation of the evaluation of the quality of the internet connection, for example according to Wired Score or comparable
- Smart Readiness Indicator

Indicator 5: AGENDA 2030 BONUSES-Impulse/Attractor

Presentation and justification of:

- Regional unique selling propositions
- Supraregional frequency
- New uses/employers/leisure attractors

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- Most market data is not publicly available (GfK data, size of the real estate market, etc.). Experts usually rely on research reports from real estate services or market research companies, or from chambers of industry and commerce and economic development agencies. These are updated annually and are predominantly only available for large cities. Furthermore, they rely on case numbers of the individual healthcare buildings and regional analyses of the health sector. It buys this data (GfK) or it relies on its own data and mathematical determinations.
- Brett, D. L., & Schmitz, A. Real estate market analysis: Methods and case studies (2nd ed.), Urban Land Institute. 2009
- Level(s) indicator 2.3: Value creation and risk exposure (Publication version 1.1), European Commission, Brussels, January 2021: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents
- Smart Readiness Indicator: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings-/smart-readiness-indicator_en (accessed on 16.04.2025)
- Wired Score: https://wiredscore.com/ (accessed on 16.04.2025)

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ECO2.6

Climate resilience

Objective

Buildings are exposed to a wide range of environmental influences. Our objective is to strengthen the resistance and adaptability (resilience) of building's to these influences – now and against the background of expected changes – with a view to enabling the longest and most resource-efficient possible use of the property. This issue is becoming increasingly significant due to imminent climate change and its direct and indirect consequences.

Benefits

The resilience of a building to climatic, extreme weather and related environmental influences occurring at the site significantly impacts its quality of use, its useful life and its value retention. The focus here is on protecting people and property and ensuring usability, while limiting operating, insurance and life cycle costs overall.

Contribution to overarching sustainability goals



Outlook

As a cross-sectoral issue with interfaces to a large number of criteria (building envelope, quality of space, adaptability, quality control, building technology, etc.), the issue of climate resilience is addressed in this version of the criteria catalogue for the first time under the separate criterion ECO2.6. The overarching and long-term relevance of climate change and climate protection requires well-founded and forward-looking action with maximum resource efficiency. In addition, evidenced changes in weather patterns (e.g. temperature, rainfall) call for short-term and pragmatic adaptation measures. Here, both the concept of 'resilience' itself and considerable uncertainties in forecasting future precipitation and air movements require planning with 'buffer capacities'. The short-term objective is to review the methodology of the criterion and raise awareness of the issue. In the medium term, it is intended that the criterion will be supplemented by further indicators that support the balancing act between safeguarding and resource conservation on the basis of practical experience and improved data.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Healthcare buildings**	**5.0%**	**2**

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EVALUATION

This criterion assesses whether the building has an adequate concept with regard to the climate and environmental risks identified under site quality (SITE1.1) (Indicator 1). Based on this, the extent and quality of measures used to address and mitigate identified climate risks are evaluated (Indicator 2). Indicator 3 focuses on the implementation of measures to increase the resistance of the building to other environmental risks (noise, air quality, radon). A maximum of 100 points can be awarded in this criterion, or 110 with bonuses.

NO.	INDICATOR	POINTS
1	**Building concept for addressing the identified risks and exposition of vulnerability**	**Max. 15**
1.1	The concept is only available at a later design phase. It can however be demonstrated that appropriate measures are being implemented or can be subsequently introduced.	10
1.2	In the conceptual design phase, a concept for the building is available that shows how the building responds to the climate risks at the site. If the concept is not implemented until a later stage, proof must be provided that the delayed introduction will not have a negative impact.	15
1.3	**AGENDA 2030 Bonus – Cost/benefit analysis** Costs and benefits of the adaptation measures have been compared and evaluated.	**5**
2	**Climate change adaptation**	**Max. 60**
2.1	**Quantitative evaluation of climate change adaptation and risk reduction measures**	**30**
2.1.1	Identified climate risks: The adaptation solutions implemented demonstrably reduce the climate risks identified in SITE 1.1. Some recommended measures are being implemented.	+10
2.1.2	High risks: Measures are implemented or prepared that demonstrably strengthen the resilience of the building at the site and contribute significantly to the reduction of all risks classified as high in SITE 1.1. These evaluation points can also be applied if no or only minor hazards have been identified and thus no adaptation measures are required.	+10
2.1.3	Minor risks: Measures are implemented that also demonstrably reduce all risks classified as medium/moderate in SITE 1.1. These evaluation points can also be applied if no or only minor hazards have been identified and thus no adaptation measures are required.	+5
2.1.4	Future risks: Measures are prepared to reduce the risks to be expected at the site in the future.	+5
2.2	**Information on the quality of the adaptation solutions implemented**	**Max. 15**
2.2.1	For the adaptation solutions that are implemented, nature-based solutions, passive solutions or solutions that support blue or green infrastructure are selected by preference. These evaluation points can also be applied if no adaptation measures are required.	+5
2.2.2	Reference to overarching climate adaptation plans/strategies	Max.+5
	■ The implemented or preparatory adaptation measures coincide with the local/regional adaptation plans. These evaluation points can also be applied if no adaptation measures are required.	5
	■ The implemented or preparatory adaptation measures are in line with the national adaptation strategy.	3

2.2.3	The implemented or preparatory adaptation measures are monitored and measured using predefined indicators. Provisions are in place to define how corrective measures are implementted if deviations are identified. These evaluation points can also be applied if no adaptation measures are required.	+5
2.3	**Basic resilience to natural hazards**	**Max. 15**
2.3.1	The most important measures for the prevention of damage from natural hazards have been taken and basic resilience for the building is in place.	+10
2.3.2	If earthquakes are identified as a relevant hazard at the site, measures have been taken for earthquake safety.	+5
2.4	**AGENDA 2030 Bonus – Heat stress** Where increased heat stress (increase in hot days and tropical nights) can be expected at the site, the provision for or implementation of measures to reduce heat stress is rewarded.	**5**
3	**Measures to counter further (environmental) risks at the site**	**Max. 25**
3.1	**Outdoor air quality compensation measures**	**10**
	■ Positive changes in the emission level of the surrounding area, e.g. by greening of facades, creation of ventilation corridors, photocatalysis on the building envelope or any alternative measure. The focus here in on the outdoor air quality and measures taken to improve it. It this has already been credited in SOC 1.2 Bonus, points cannot be awarded here.	+5
	■ The protective measures proposed in a risk analysis have been implemented.	+5
3.2	**Outdoor noise compensation measures**	**10**
	Evaluation of outdoor noise compensation measures	
	■ The building has been aligned/positioned in such a way as to optimise noise levels in dwelling areas inside and outside (noise control development).	+2.5
	■ Design includes the preparation of noise protection floor plans to ensure that the required noise levels are met indoors without active measures. The measures can be credited here if they are not addressed in TEC 1.2	+2.5
	■ An expert report has been prepared for the planned building and outdoor areas; optimisation measures (e.g. noise-absorbing façade design with plants) are listed.	+2.5
	■ The optimisation measures proposed in the expert report have been implemented	+2.5
3.3	**Reducing radon hazards**	**5**
	■ Suitable measures are taken in the building to prevent radon from entering the building or to make it considerably more difficult	5

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1*	Classification of climate change adaptation and risk reduction measures: some measures implemented, resilience measures implemented or prepared, no or only minor hazards identified, all measures implemented or prepared for all risks classified as moderate	[yes/no classification]
KPI 2*	Most important measures to prevent natural hazard damage implemented, basic resilience is achieved	[yes/no]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Hardly a week goes by without a natural disaster in the world being reported in the media. Germany is also increasingly being affected by such disasters, particularly storms and floods. The social, economic and ecological damage caused by such disasters is enormous and cannot be quantified.

II. Additional explanation

Dealing with climate impacts and the resultant risks will become more important in the future owing to climate change. Consequences and risks can vary greatly from region to region in terms of their nature and severity. Knowledge of this is necessary in order to design buildings in such a way that they can respond adequately (i.e. accurately and efficiently) to the risks relevant to them. Such an approach contributes to long-term and efficient use of buildings. At the same time, it also reduces subsequent costs, such as natural hazard insurance for the building or in the event of damage.

III. Method

Indicator 1: Building concept for addressing the identified risks and exposition of vulnerability

A building concept shows how the building handles or responds to hazards identified with medium/moderate or high probability of occurrence. If the concept is already prepared during the early design phases, this is awarded more points than preparation during a later design phase. A separate description of how the building responds must be given for each hazard rated with a medium/moderate or high risk of occurrence. The concept is based on a climate risk analysis. This is part of criterion SITE1.1. If the concept for dealing with the identified hazards with high risks is not drawn up until a later design phase, the full number of evaluation points can still be applied if it can be shown that the timing does not have a negative impact, i.e. no additional measures and thus no additional consumption of resources are required to reduce the risk, and the planned implementation leads to the reduction of the hazards classified as relevant in any case.

In addition to measures on the building, measures can also be taken on the site.

While an increase in average temperature and the number of hot days and tropical nights is considered certain (for information on temperature, see Indicator 2.4 Bonus: Heat), forecasts of local precipitation (heavy rainfall events) and regional precipitation (floods) are subject to a high level of uncertainty. Nevertheless, it is undisputed that, with the increase in global temperature, the water balance in the atmosphere is changing and both the frequency and intensity of heavy precipitation are increasing. The risks of flooding are also increasing as a result of this. These new findings may not be modelled in older evaluation tools, but they must be taken into account when evaluating natural hazard sources.

It should always be checked whether more up-to-date and detailed datasets and maps are available for the legally valid hazard maps, which can serve as a basis for assessing the need for action in individual cases. Depending on the local hazard situation, approaches for climate adaptation measures can include:

Heat – drought

Basic assumption: Higher temperatures and longer periods of heat and drought can be expected.

- Heat: For examples of measures, see method for Indicator 2.4
- Drought (long periods without rainfall): see criteria ENV2.2 and ENV2.4

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Heavy precipitation – floods
Basic assumption: An increase in extreme precipitation can be expected.

- Review of assessment basis: Definition of entrance elevations based on current hazard maps/flood maps/flood hazard maps of municipalities and cities.
- Retention: Creation of retention areas through green roofs or suitable outside facilities
- Sea level: If in direct proximity to the sea, consideration of projected sea level rise

Storm – hail – snow
Basic assumption: According to current data, the expected wind and snow loads are covered by the currently applicable standards (and the safety factor included).

- However, it must be ensured that elements for which no statistical verification is required, such as elements of the outside facilities, outdoor furniture and non-load-bearing elements such as canopies, are also dimensioned for the impacts or are secured by other (organisational) measures.
- Storm: Increased soil roughness through planting in the outside areas
  Hail: Use of hail-resistant construction materials on sites with increased hail risk

The full score of evaluation points can also be applied if no or only moderate risks occur on the basis of the analysis (SITE1.1), and thus no risk reduction measures for the building/site need to be envisaged in the concept.

Indicator 1.3: AGENDA 2030 Bonus – Cost/benefit analysis

The bonus assesses whether the costs and benefits of the proposed adaptation solutions are compared and evaluated. This consideration aids decision-making during the design phase. The comparison and the evaluation may be presented in a separate document.

Indicator 2: Climate change adaptation

Indicator 2 assesses adaptation to climate change. This is done in two stages: The first stage assesses the implementtation of measures, and the second step assesses the quality of this implementation. If no climate risks (SITE1.1) are identified for the site, the full score of evaluation points can also be applied.

Indicator 2.1: Quantitative evaluation of climate change adaptation and risk reduction measures

This indicator assesses the implementation or preparation of measures.

- In the first step, points are awarded if some measures are implemented that demonstrably reduce the relevant risks at the building/site.
- Further points are awarded if all risks classified as high are significantly reduced through climate adaptation measures in/on the building or site.
- Further points are awarded if all risks classified as medium/moderate are significantly reduced through climate adaptation measures in/on the building or site.
- A positive assessment is also given if additional measures have been prepared for risks expected to occur at the site in the future (e.g. by taking them into account in the approval and financial planning stages).

The following points must be observed in relation to the measures:

- Measures are considered to be ‘implemented’ if they have already been implemented or are included in the approval planning and the financial plan and will be implemented within the next five years at the latest.

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- Air conditioning is not recognised as a climate adaptation measure. Recognition is possible in exceptional cases if it is proven that an overall concept adapted to the building and its use exists that demonstrates that the construction or use of the building is not feasible without air conditioning or that the users of the building are in particular need of protection (e.g. healthcare, nursing homes). In implementation, a system with below-average refrigerant emissions and the use of a climate-friendly refrigerant must be demonstrated. Climate-friendly refrigerants are natural refrigerants (as per AMEV Refrigeration 2017[1] or other recognised sources) and refrigerants classified as future-proof until 2030 (as per AMEV Refrigeration 2017[1] or other recognised sources)
- Care must be taken during implementation to ensure that the adaptation solutions implemented do not have a negative impact on people, nature, cultural heritage, assets or other economic activities in terms of adaptation efforts or resilience to other climate risks.

Indicator 2.2: Information on the quality of the adaptation solutions implemented

This indicator assesses the quality characteristics of the implemented adaptation solutions.

- A positive evaluation is given where passive measures or nature-based solutions that support blue or green infrastructure are selected. The European Commission defines nature-based solutions as “solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.”
- The consideration of a regional/local adaptation strategy (e.g. municipal heat protection plan, flood protection concept, etc.) is rated more highly than consideration only at national level.
  Exceptions: If it can be demonstrated that no local or regional adaptation strategy or plan exists, the increased number of evaluation points may be applied as an exception for consideration of the national strategy.
- It is considered positive if the effect/functioning of implemented measures is monitored/measured. To this end, indicators must be developed, a monitoring concept must be established and a process should be set up to rectify any ineffectiveness of the measures. In the case of overlaps in content, reference can also be made here to the corresponding PRO criteria.

Indicator 2.3 Basic resilience to natural hazards

For Indicator 2.3.1, the insurance industry refers to damage caused by natural hazards, which can be covered by appropriate insurance. Documentation is required here that presents the risk for these hazards and, in the case of high risk/high probability of occurrence at the site, lists the implemented measures that demonstrably reduce the risk of damage. This information is submitted separately for each hazard. If the risk (for all hazards separately) is rated as low, no actions are necessary. The full number of evaluation points can then be applied directly.

Indicator 2.3.2 assesses whether the building has been assessed for earthquake resistance. The first step is to determine the current earthquake standard for the project location. If the building was planned and constructed in accordance with the standard, no further measures are required. If the building was planned in accordance with an older standard, points may be awarded if the building-specific risk has been assessed:

- If the expected ground acceleration at the site for a 475-year event (or 10% probability of exceedance in 50 years, e.g. according to GSHAP[2] or other relevant sources[3]) is < 0.8 m/s² (low hazard accor-ding to GSHAP or other relevant sources), points may be awarded.

[1] Climate-friendly refrigerants (natural refrigerants) (Table 4 in AMEV Refrigeration 2017) and refrigerants classified as future-proof until 2030 (Table 3 in AMEV Refrigeration 2017): https://www.amev-online.de/AMEVInhalt/Planen/Maschinenbau-und-Versorgungstechnik/Kaelte_2007/

[2] GSHAP Map online – gfz-potsdam.de

[3] Other relevant sources include OpenQuake Map Viewer

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- If the expected ground acceleration at the location is ≥ 0.8 m/s² (moderate or high hazard according to GSHAP or other relevant sources), points may still be awarded if the extent to which the building's seismic design basis (in g or m/s²) deviates from the requirements of the currently applicable standard is checked and the assessment of a structural engineer regarding the need for further action is available.

Recommendation: If the building is not earthquake-proof, it is advisable for the structural engineer to draw up a concept for establishing earthquake safety in accordance with the latest state of the art with a maximum implementation horizon of 5 years.

Indicator 2.4: AGENDA 2030 Bonus – Heat stress

This bonus can be awarded if increased heat stress is to be expected due to the location (e.g. inner city). If this is already taken into account during the construction of the building and measures have been taken or prepared in the design, this will be rewarded. Since some tools do not represent this risk in the necessary detail, publications issued by cities/municipalities/regions or by research institutions should be consulted for the analysis.

While the forecast for precipitation and air movement is very uncertain for an assumed building life cycle of 50 to 80 years, an increase in the average temperature and the number of hot days and tropical nights is considered certain. This is particularly true in urban areas, where the 'heat island effect' reduces night-time cooling.

Possible action areas and measures in response to rising temperatures and thus greater cooling loads include:

- Reducing solar input (e.g. creating shade, insulating the building envelope, using light-coloured surfaces (with higher albedo values))
- Modifying solar inputs (not by converting into heat, but by influencing material properties)
- Removing warm air (e.g. maximising (natural) ventilation in the outdoor space, allowing cold air to circulate at night)
- Producing cool air (e.g. providing green areas (open spaces, façades, roofs), planting trees, providing water areas or installing energy-efficient technical solutions.

Indicator 3: Measures to counter further (environmental) risks at the site

Indicator 3.1: Outdoor air-quality compensation measures

Improving the air quality through measures on the façade, on the roof or in the immediate outdoor space of the building is assessed positively. Points are awarded if it can be plausibly demonstrated, e.g. via measurements, that these measures lead directly to an improvement in the prevailing air quality. Improvements can include greening the façade or using proven air-purifying materials. The focus here in on the outdoor air quality and measures taken to improve it. It this has already been credited in SOC 1.2 Bonus, points cannot be awarded here.

Indicator 3.2: Outdoor noise compensation measures

A poor initial situation in terms of noise can be greatly improved by taking compensatory measures. The measures can be credited here if they are not addressed in TEC 1.2. Implementation of the points stated below is assessed positively. Design options:

- Large distance from the noise source
- Building design includes shielding effect
- Utilisation of natural shielding (earth banks, etc.)
- Smaller building openings facing the noise source (access roads, courtyard openings, windows, loggias, etc.)
- Other passive screening measures (noise barriers, acoustic baffles, vertical greenery, etc.)
- Favourable floor plan orientation

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Indicator 3.3: Reducing radon hazards

The radon concentration in the indoor air must comply with the relevant local standards or SITE 1.1 (whichever is higher). The most important factor for radon protection is to ensure that the building envelope sealing against the ground is as fault-free and airtight as possible. In some countries, the standard-compliant waterproofing of the building may also satisfy the requirements for structural radon protection. In individual cases, however, further measures may be necessary. The World Health Organization (WHO) has suggested measures for reducing radon in indoor environments[4]. If measures have been stipulated at the national or regional level, these should be observed.

Notes on Indicator 3: If the analysis of the air quality, outdoor noise and radon indicators in SITE1.1 has determined that no compensatory measures are required, the full score for these indicators is awarded.

IV. Scheme-specific description

-

[4] World Health Organization (WHO), information on radon – https://www.who.int/news-room/fact-sheets/detail/radon-and-health

APPENDIX B - EVIDENCE

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be comprehensively and plausibly documented on the basis of the evidence documents submitted.

Indicator 1: Building concept for addressing the identified risks and exposition of vulnerability

- Presentation of how the planned building responds to the hazards identified with medium/moderate and high risk/probability of occurrence, i.e. which measures should be implemented to reduce the risk
- Evidence of the design phase in which the concept was developed (e.g. minutes, order/invoice)
- When submitted at later design stages: evidence that no additional measures are required
- Evidence that there are no or only minor risks at the site (reference to SITE1.1)
- Cost-benefit analysis of the adaptation measures

Indicator 2: Climate change adaptation

Indicators 2.1: Quantitative evaluation of climate change adaptation and risk reduction measures and 2.2: Information on the quality of the adaptation solutions implemented

- Evidence of implementation of the measures (plans, photo documentation, building application, etc.)
- Listing of the adaptation measures implemented, with contextual description of why the measure reduces the corresponding risk.
- Credible memorandum of understanding on the implementation of the prepared measures and/or consideration in the building application, consideration in the financial plan
- Explanation of the kind of nature-based measures/blue/green solutions that have been selected and reasoning.
- Description and linkage of the implemented adaptation measures with regional/national/sectoral adaptation plans/strategies
- Process description of monitoring, if necessary, via definition of responsibility for monitoring of adaptation measures (procedural/organisational measures); description of sensor-based measures or reference to documents in PRO qualities
- Air conditioning systems: Building concept for cooling with proof that climate-friendly cooling technologies and passive systems are insufficient, proof of below-average refrigerant release (e.g. comparison with similar buildings, publications) and use of a climate-friendly refrigerant (concept, call for tenders, system description/manufacturer information)

Indicator 2.3: Basic resilience to natural hazards

- Presentation of possible natural hazards: Presentation of hazard and risk/ probability of occurrence; in the case of high risk, planned risk reduction measures
- Confirmation that the risk reduction measures are appropriate. If there are overlaps in the evidence with indicator 2.1, reference can be made to the corresponding evidence there.
- Evidence that there are no or only minor risks of natural hazard damage at the site
- Proof of how the building complies to current earthquake standards
- If the building was planned in accordance with an older standard, proof of ground acceleration at the location
- If needed, documentation/ evidence from structural engineer for earthquake safety

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Indicator 2.4: AGENDA 2030 Bonus – Heat stress

- Indication of heat risk at the site; external evidence (e.g. publications issued by city authorities etc.)
- Description of the measure and its effect in terms of heat risk reduction

Indicator 3: Measures to counter further (environmental) risks at the site

Indicator 3.1: Outdoor air quality compensation measures

- Reference to/result of the analysis from SITE1.1
- Evidence of implementation of the measures (plans, photo documentation, building application, etc.)

Indicator 3.2: Outdoor noise compensation measures

- Reference to/result of the analysis from SITE1.1
- Evidence of implementation of the measures (plans, photo documentation, building application, etc.)

Indicator 3.3: Reducing radon hazards

- Note/result of the analysis from SITE1.1
- If measures are integrated as per national/regional regulations, sufficient proof should be provided

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- Kälte 2017. Hinweise zur Planung, Ausführung und Betrieb von Kälteanlagen und Kühlgeräten für öffentliche Gebäude. Empfehlung Nr. 139, AMEV 2017: https://www.amev-online.de/AMEVInhalt/Planen/Maschinenbau-und-Versorgungstechnik/Kaelte_2007/ (only in German)
- Radon, World Health Organization (WHO): https://www.who.int/news-room/fact-sheets/detail/radon-and-health (accessed on 16.04.2025)
- ESG Verification for EU Taxonomy, New Construction, CPEA and DGNB
- EU Taxonomy: Construction and Real estate activities-Substantial contribution to climate adaptation, European Commission, Brussels, June 2021: https://ec.europa.eu/sustainable-finance-taxonomy/activities-/activity/350/view
- Environmental Noise Directive EU 2002/49/EC: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=-CELEX:32002L0049&from=EN
- A healthier home: but how?: https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long-/3085.pdf
- How can I protect myself from radon?: https://www.bfs.de/EN/topics/ion/environment/radon/protection/protection_node.html (accessed on 16.04.2025)
- EU-level technical guidance on adapting buildings to climate change, European Commission, March 2023: https://op.europa.eu/en/publication-detail/-/publication/7cca7ab9-cc5e-11ed-a05c-01aa75ed71a1/language-en
- Panel on Climate Change (IPCC),Geneva, Switzerland: https://www.ipcc.ch/report/ar6/syr/
- OpenQuake Map Viewer: https://maps.openquake.org/map/gshm-2023-1/#3/36.97/0.98
- Global Seismic Hazard Assessment Program (GSHAP): http://gmo.gfz-potsdam.de/index.html

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Sociocultural and functional quality

The seven sociocultural and functional quality criteria are used to assess buildings with regard to **health**, **comfort** and **user satisfaction** as well as the essential aspects of **functionality**.

SOC1.1	Thermal comfort
SOC1.2	Indoor air quality
SOC1.3	Sound insulation and acoustic comfort
SOC1.4	Visual comfort
SOC1.6	Quality of indoor and outdoor spaces
SOC1.7	Safety and security
SOC2.1	Design for all

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SOC1.1

Thermal comfort



Objective

Our objective is to ensure thermal comfort in both winter and summer that is appropriate for the intended use and provides adequate comfort.

Benefits

Measures that enable users of buildings to exert as much influence as possible on the indoor climatic conditions increase individual well-being. A higher sense of well-being leads to increased satisfaction with the premises and therefore also to higher performance among the building users.

Contribution to overarching sustainability goals



Outlook

Thanks to digital solutions, the available technical options are becoming increasingly sophisticated and more tailored to individual needs. To ensure that these solutions do not need to be described in too much detail to achieve points, planners are encouraged to examine the objectives of the criterion more closely in the context of their project. Furthermore, it is recommended that the projected future climate data be considered from the outset so that the desired thermal comfort parameters in buildings can still be achieved in the future. These climate adaptation measures and increased building resilience is currently only addressed as a bonus but will gain importance in future. A further increase of the objective is not currently planned.

Share of total score

	SHARE	WEIGHTING FACTOR
Consumer market **Logistics** **Production**	**4.5%**	**2**
Shopping centre **Department stores**	**4.1%**	**2**
Residential **Office** **Hotel** **Education**	**3.5%**	**2**
Assembly buildings **Healthcare buildings**	**3.2%**	**2**

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EVALUATION

Thermal comfort is evaluated according to the intended use based on operative temperature, draught, radiation temperature asymmetry and relative humidity, throughout the entire year. To evaluate this criterion correctly, an initial analysis of the location should be carried out. The focus is on measures that have an impact on user comfort. These can vary greatly depending on the heating or cooling period. 'Heating or cooling degree days' (HDD and CDD) are helpful for an objective assessment of whether heating or cooling is particularly relevant for the building. Depending on this, points for Indicators 2 and 3 can only be awarded for either the cooling period or the heating period. If no clear distinction can be made, both periods should be considered as a default. The evaluation methodology and benchmarks can be found in Appendix A. A maximum of 100 regular points can be achieved in the criterion without bonuses or 105 points including the climate adaptation bonus.

NO.	INDICATOR	POINTS
1	**Conceptual design**	**Max.10**
1.1	**Integration of the thermal comfort risk assessment into the building design**	
	Defining measures for indoor thermal comfort at the project location (planning phase 1–2):	
	■ Information about the local climate: CDD[1] (cooling degree days) and HDD[1] (heating degree days), solar irradiation, natural and artificial obstructions (e.g., vegetation, surrounding buildings), is considered, along with the influence of the urban microclimate.	+5
	■ Concept for thermal resilience, considering the following aspects:	+5
	■ Building structures	
	■ Building envelope and façade	
	■ Building air intake systems	
2	**Operative temperature**	
2.1	**Operative temperature for heating and cooling periods**	
	Office Education Residential Hotel Consumer market Assembly buildings Department stores Healthcare buildings	**Max. 35**
	(Area-weighted interpolation is possible)	
	In the standard case, the heating and cooling cases are considered equally. If only one case applies, only half of the points can be awarded.	
	If no heating period is considered, i.e. HDD < 800[2], points can be redistributed to the cooling period.	
	If no cooling period is considered, i.e. CDD < 12[2], points can be redistributed to the heating period.	
	Criteria based on EN 16798-1 or minimum national criteria – whichever is stricter – and supporting documentation are complied with. 5% frequency of exceedance is permissible.	
	■ **Category III**, see Annex 2 for cooling and Annex 3 for heating,	15
	■ **Category II**, see Annex 2 for cooling and Annex 3 for heating,	25
	■ **Category I**, see Annex 2 for cooling and Annex 3 for heating	35

[1] The cooling degree day (CDD) index for buildings above **24°C T_D** and the heating degree day (HDD) index for buildings below **15°C T_D**, where the base temperatures are set to constant values of (respectively) **21°C** and **18°C**, according to JRC PVGIS Typical Meteorological Year: (https://re.jrc.ec.europa.eu/pvg_tools/en/#TMY)

[2] The HDD and CDD may vary due to local regulations, standards and building culture, which can be amended in the DGNB system adaptation process. See Appendix A.

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Shopping centre **Max. 40**

Please note: Different classifications are used to evaluate the indicator for the mall/shop street on the one hand and the rental areas on the other.

Temperature/cooling period **Mall/shop street** +Max. 20

- Compliance with criteria based on EN 16798-1 10
  Category III, upper temperature limit $\theta_i = 0.33\ \theta_{rm} + 18.8°C + 4\ K$
  5% frequency of exceedance is permissible.
- Compliance with criteria based on EN 16798-1 Category I or II, upper temperature limit $\theta_i = 0.33\ \theta_{rm} + 18.8°C + 3\ K$ 20
  5% frequency of exceedance is permissible.

Temperature/cooling period **Rental area** +Max. 20

- 40 W/m² 10
- 60 W/m² 20

Alternative evidence (rental area):

- Compliance with criteria based on EN 16798-1 10
  Category III, see Annex 2 and 3
  5% frequency of exceedance is permissible.
- Compliance with criteria based on EN 16798-1 20
  Category I or II, see Annex 2 and 3
  5% frequency of exceedance is permissible.

Logistics **Production** **Max. 30**

Note: This indicator can be evaluated using different classifications for industrial work and office areas.

Industrial work areas**:** +Max. 15

- If the air temperature in the work areas exceeds 26°C, structural and technical measures must be implemented. 10
- Air temperature in the work area s limited to max. 30°C 15

Office areas**:** +Max. 15

- Compliance with criteria based on EN 16798-1 10
  Category III, see Annex 2 and 3
  5% frequency of exceedance is permissible.
- Compliance with criteria based on EN 16798-1
  Category I or II, see Annex 2 and 3
  5% frequency of exceedance is permissible.

3 Air humidity (quantitative) Max.10

3.1 Relative humidity – heating period

- The indoor air does not become too dry during the heating period (even in low outdoor temperatures or with dry outdoor air), i.e. the indoor air humidity meets the following requirement: 70% ≥φ ≥30%. 5
  This requirement is met for at least 95% of the operating time (heating period).

3.2 Air humidity – cooling period

- The indoor air does not become too humid during the cooling period (even in high outdoor temperatures), i.e. the indoor air humidity meets the following requirements: 5
  Absolute moisture content <12g/kg.

Note: Indicator 3.1 receives 10 points if the cooling period is not considered, and Indicator 3.2 receives 10 points if the heating period is not considered.

4 Draught and temperature asymmetry

4.1 Radiation temperature asymmetry and floor temperature (cooling & heating period)

Office **Education** **Residential** **Hotel** **Assembly buildings** **Healthcare buildings** **Max.10**
Shopping centre **Department stores** **Consumer market**
Logistics **Production** **Max. 15**

- The internal surface temperatures comply with the following limit values: 10
  - Ceiling minimum 16°C
  - Ceiling maximum 35°C
  - Glass areas of façade/wall minimum 18°C
  - Glass areas of façade/wall maximum 35°C
  - Floor minimum 19°C
  - Floor maximum 29°C

Additionally for **Logistics** **Production**

- Proof of sufficient structural/technical measures to prevent radiation temperature asymmetry is provided. +5

4.2 Draught (cooling & heating period) Max. 15

Office **Education** **Residential** **Hotel** **Logistics** **Production** **Assembly buildings**
Consumer market **Healthcare buildings** **Department stores**

- The air velocity at the workstations or in the open space does not rise above the maximum permitted value in accordance with Category B of EN ISO 7730. (See Appendix A) 15

For buildings without mechanical air ventilation (HVAC) systems, this requirement is considered to have been complied with.

Shopping centre

- In all relevant draught areas in malls (e.g. building entrances, air outlets, air vent openings for natural ventilation), necessary measures are implemented to prevent draughts. 10

Note: Points can be redistributed depending on HDD and/or CDD – see method

5 AGENDA 2030 BONUS – Climate adaptation +5

5.1 Resilient thermal comfort through nature-based solutions:

Generating microclimate benefits from green and blue infrastructure. Possible measures include tree shading, localised evapotranspiration, green-roof or soil water retention. A reasonable calculation of green/blue area compared to sealed area must be carried out. Future developments for 2030 and 2050, such as the maturity and extent of the vegetation, should also be estimated.

6 Sustainability information system Max. 15

6.1 Implementation of an information system covering sustainability aspects of the building

- An information system covering sustainability, i.e. digital display of relevant energy data accessible to all users of the building, has been installed +10
- Information system covering sustainability is visible for public or visitors +5
- A sustainability guide has been provided for the user +5

7	**User influence**	**Max. 15**
	■ **A possible change of use:** A possible change of use is considered when designing the heating and cooling circuits and ventilation systems (HVAC can be divided into smaller areas).	+5
	■ **Ventilation during the heating and cooling period:** The air exchange can be influenced room by room.	+5
	■ **Temperatures during the heating and cooling period:** The temperature can be influenced room by room.	+5
	■ **User survey to increase energy efficiency:** User satisfaction with thermal comfort is determined by means of user surveys. A survey is prepared to increase energy efficiency.	+5

re 2–4	**INNOVATION AREA – Alternative forms of documentation** Alternative forms of documentation for Indicators 2 to 4 with an adaptive building model: A complete model is evaluated that considers the previously mentioned indicators. A user survey is recommended, if possible. The model must already include the possibility of further development and adaptation and also a template for a user survey. The system technology must be of a sufficient size to allow any necessary adjustments.	**Max. 70**

SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs based on the application of the criterion.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Minimum design temperature for heating (acc. to Category EN 16798-1)	[°C]
KPI 2	Frequency of exceedance of the minimum design temperature	[%]
KPI 3	Maximum design temperature for cooling (acc. to Category EN 16798-1)	[°C]
KPI 4	Frequency of exceedance of the maximum design temperature	[%]
KPI 5	Room humidity at 95% of operating time	[%]
KPI 6	Climate zone (acc. to Level(s))	[Zone]
KPI 7	Number of heating and cooling degree days (HDD/CDD)	[Number/ Number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The thermal comfort of buildings makes an important contribution to efficient and performance-enhancing working and living environments and contributes significantly to a high level of user satisfaction.

A room is thermally comfortable when it is neither too cold nor too warm, the air is not too dry or too humid and there is no draught. Owing to climate change and considering the new building standard, the summer half-year in particular now plays an increasingly important role. The location of the building must be included in the assessment. A neutral assessment over the entire year can be carried out using heating degree days (HDD) and cooling degree days (CDD). Note: In case of ambiguities, as part of the Project-specific inquiry, it is possible to clarify whether only the heating or the cooling case is to be considered for Indicators 2 and 3; both are usually considered by default.

II. Additional explanation

In both the cooling and the heating seasons, the indoor climate depends on the room air temperature, the temperature of the surfaces, people in the environment, the air velocity in the room and the relative humidity. It is important to consider not only the overall comfort but also the possible occurrence of local phenomena that can affect thermal comfort. For example, a person may experience overall thermal comfort but feel affected by local draughts on one part of the body.

III. Method

As a first step in the planning process, it is essential to assess the local climate of the building site and determine the required level of thermal comfort appropriate for the intended building type. This assessment forms the basis for designing a thermally resilient building. A simple yet effective method for evaluating the thermal demands of the location is to calculate the heating and cooling degree days. This helps to identify whether heating, cooling, or both will be required throughout the year. In addition to general climatic conditions, other site-specific factors such as the urban microclimate, local vegetation, topography, and surrounding structures or obstructions must also be considered. These elements can significantly influence design decisions, particularly with respect to solar exposure, natural ventilation, shading, and thermal buffering.

Thermal comfort or the ability of a building (with and without building services) to maintain pre-defined thermal comfort conditions during the cooling and/or heating period, depending on the site location, is assessed via several individual indicators. The assessment is based on the specifications of EN 16798-1, EN ISO 13790, EN ISO 52016-1, EN ISO 7730, VDI 2078, VDI 3804, DIN 33403 and ASR.

Degree days is a rather simple measure of how much heating or cooling will be necessary over a time period consisting of many days. Degree days are used here only as a way to compare different datasets; the exact values will depend on the method used to calculate the degree days. There is no universal standard for how to calculate degree days. We have used the following definitions, which are also used by EUROSTAT[2]

[2] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Heating_and_cooling_degree_days_-_statistics

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$$HDD_d = \begin{cases} 18 - T_d, T_d < 15, \\ 0, \ T_d \geq 15. \end{cases} \quad \textbf{(1)}$$

Where:

HDD_d	Amount by which the temperature falls below 15 °C in one day
T_d	Average dry-bulb temperature in one day

Similarly, the cooling degree days CDD_d are calculated as:

$$CDD_d = \begin{cases} T_d - 21, T_d > 24, \\ 0, \ T_d \leq 24. \end{cases} \quad \textbf{(2)}$$

Where:

CDD_d	Amount by which the temperature rises above 24 °C in one day
T_d	Average dry-bulb temperature in one day

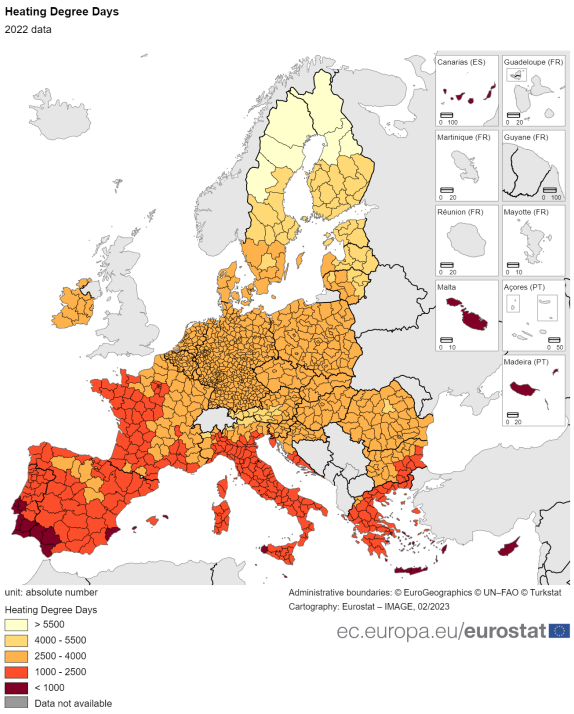
The total HDD or CDD for a year is then calculated by summing HDD_d or CDD_d of the individual days, e.g. for HDD:

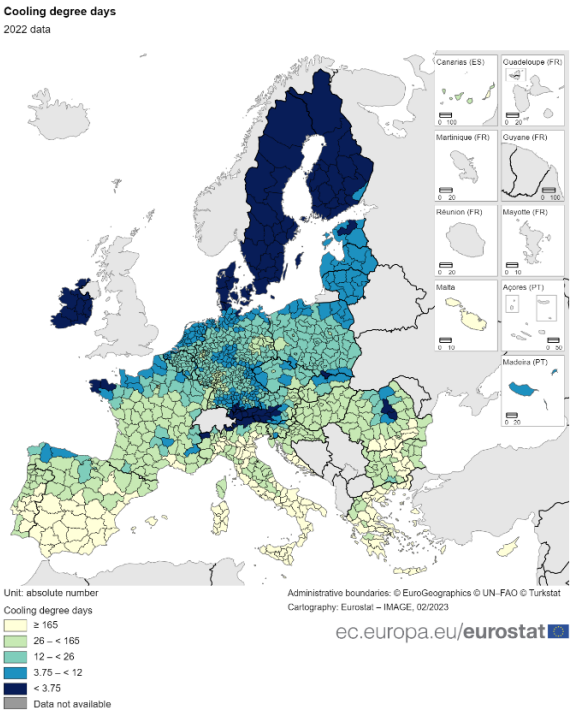
$$\mathbf{HDD} = \sum_{d=1}^{N} HDD_d. \quad \textbf{(3)}$$

To get the output from the PGIS Tool[3], the following steps must be completed:

1. Select a location by clicking on the map or using the address field
2. Use the dropdown menu next to the map and choose ‘dry-bulb temperature’
3. After clicking the ‘View’ field, a summary appears under the map, showing the typical meteorological year results

Figure 1: HDD and CDD in European comparison





[3] https://re.jrc.ec.europa.eu/pvg_tools/en/#TMY

Indicator 1: Conceptual design[4]

When defining the desired or required thermal comfort levels for the building, aligned with national or regional building regulations, various risk factors can be identified that may contribute to thermal discomfort. In general, there are two main aspects to be considered: local environment (site location) and building design. For site location, the following information is to be considered as minimum:

- Information about CDD (cooling degree days) and or HDD (heating degree days);
- Solar irradiation, which can lead to excessive solar gains;
- Natural and artificial obstructions, e.g. vegetation, surrounding buildings which may limit solar gains during winter or summer;
- Urban microclimate, which may lead to increased summer temperatures compared to data from local weather stations;

A building design concept tailored to the local climate and possible future climate change can reduce heating and cooling demands by means of structure, building envelope and ventilation systems. To support resilient design, these three main areas should be identified and considered:

- Building structure:
  Thermally massive building structures offer inherent thermal inertia that can be harnessed to dampen temperature variations and improve indoor comfort. In new construction, this principle can be expanded upon using thermally active designs, where heating and cooling are distributed via the building structure itself. These systems can substantially reduce HVAC system size, even under current climate conditions, due to the building's ability to manage thermal loads over a full cycle.
- Building envelope and façade:
  Material selection can be optimized for both high solar reflectance (albedo) and thermal resistance, effectively reducing solar heat gain and limiting the transmission of external heat into the building envelope.
- Building air intake systems:
  By directing fresh air through shaded exterior spaces or underground ducts, the design can significantly lower the temperature of incoming air, reducing cooling loads and improving indoor environmental quality.

In addition, dynamic thermal simulation is essential for accurately quantifying the benefits of inherently resilient design features. It also supports the optimisation of façade and structural design, as well as the performance of ventilation and cooling systems, to maximise the building's thermal capacity.

Indicators 2: Operative temperature

The verification for the 'Operative temperature' indicator should be carried out using area-weighted averaging. This applies to all rooms listed in Annex 1. Representative rooms/spaces should be examined (clustering). These rooms must be chosen in such a way that 95% of the areas correspond to the quality level assessed. To ensure that results can be transferred to the other areas, the utilisation zones should be divided in such a way that different boundary conditions (e.g. specific internal and external loads) and building services concepts are considered. Critical spaces such as corner rooms, rooms with large glass surfaces, etc. must be included in the verification. As a rule, it can be assumed that a functioning room concept for a critical room will also ensure thermal comfort in non-critical rooms with otherwise identical conditioning.

[4] alternatively for this indicator, Level(s) indicator 4.2: Time outside of thermal comfort range, version 1.1 for level 1 can be used

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A simulation of the entire building can be performed but is not mandatory. Possible short-term deviations are permissible. The specified percentage figures of the permissible frequency of exceedance refer to the degree hours of exceedance during the utilisation period. If night ventilation is provided and an exceedance can be attributed to it, this is permissible. This time can be excluded from the calculation.

The point calculation depends on HDD and CDD. Where both heating and cooling periods are relevant, points are distributed equally (50/50). Where only cooling is relevant (HDD below 800), 100% of points will be assigned in accordance with Annex 2. Where only heating is relevant (CDD below 12), points will be assigned only in accordance with Annex 3.

Table 1: Location-specific evaluation method for Indicators 2 and 3:

	Standard case	< 800 HDD	< 12 CDD
Ind. 2	**Heating & cooling**	**Only cooling relevant**	**Only heating relevant**
	Annex 2 and Annex 3	Max. points for Annex 2	Max. points for Annex 3
Annex 2	50%	100%	0%
Annex 3	50%	0%	100%

Example calculation: In this example, both periods are relevant, and an office building fulfils Category III requirements for the summer (cooling) period (15 sub-points) and Category I for the winter (heating) period (35 sub-points).
The total result from the sub-points (SP) = 15 * 0.5 + 35 * 0.5 = 25 Indicator Points.
Standard case = $SP_{ANNEX\ 2}$ * 0.5 + $SP_{ANNEX\ 3}$ * 0.5

Accordingly, 100% of the points will be awarded either to the cooling or the heating period, depending on whichever is applicable. Information on limit values is compiled in Annexes 2 and 3.

Indicator 3: Air humidity

The requirements for indoor air humidity must be complied with, regardless of whether the rooms are ventilated using window ventilation or a ventilation system. This applies to all rooms marked in Annex 1 (bold font). Representative rooms/spaces should be examined (clustering). These rooms must be chosen in such a way that 95% of the areas correspond to the quality level assessed.

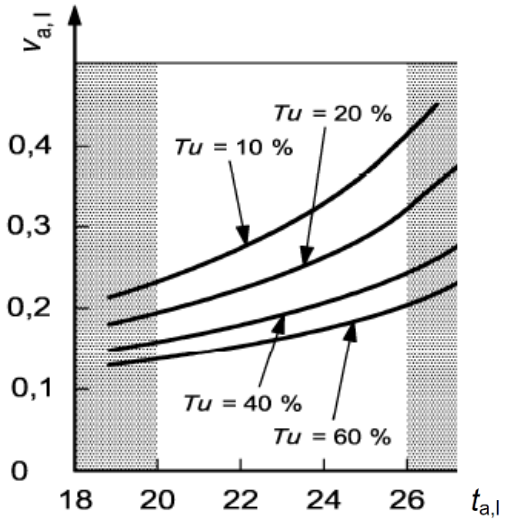
Points are allocated based on climate data. If there is no cooling or heating period, Indicators 3.1 or 3.2, depending on whichever is applicable, will receive 10 points instead of the usual 5 points for the standard case.

Indicator 4.1: Radiation temperature asymmetry and floor temperature (cooling & heating period)
The requirements apply to all rooms marked in **bold** in Appendix 1. The representative room must be selected so that 80% of the usable area under consideration corresponds to the evaluated quality level.

Indicator 4.2: Draught

Whether the design air velocities of the ventilation system may be uncomfortable also depends on the temperature and the degree of turbulence. EN ISO 7730 can be used for a detailed design, otherwise the intensity of turbulence can be set to Tu = 40%. If the air velocities from the HVAC system in the entire building fall below this value ($v_{a,l}$), the indicator is recognised.as fulfilled The following graph can be used for classification:

Figure 2: EN 7730 (Category B)



$t_{a,l}$ = Local temperature [°C]
$v_{a,l}$ = Local average air velocity, m/s
Tu = Intensity of turbulence

Indicator 5: AGENDA 2030 BONUS – Climate adaptation

Only measures that are specifically orientated to the expected climate change can be recognised here. The results are incorporated into the decision-making process as part of the design process. Nature-based solutions with limited technical intervention will be considered favourably during the assessment.

Indicator 6: Sustainability information system

Digital real-time data or monitoring data of relevant parameters (for example, based on energy management system ISO 50001). Relevant parameters could be room temperatures [°C], current PV yield [kwh], current electricity consumption [kwh] or CO_2-monitoring data [ppm]. This refers to graphics and analyses that are easy for the general public to understand.

A sustainability guide can also be handed out or displayed in paper form to the users of the building. The focus here should be on everyday tips for more sustainable building use. It should refer to the specific building and its use.

Indicator 7: User influence

Proof that the respective properties have been met must be provided for 80% of the respective primary use rooms, which are marked in Annex 1. For the **Hotel** usage profile, this applies to living spaces (guest rooms) and office work (administration).

Possible change of use:
Possible change of use is already considered in the design (e.g. one open-plan office becomes three two-person offices). The possible change of use must be considered, e.g. through appropriate design of heating and/or cooling circuits and also in the ductwork for mechanical ventilation.

Ventilation during the heating and cooling period:
The exchange of air ensures that the user is supplied with fresh air. Fresh air can be supplied via window ventilation or controlled ventilation through ventilation and air-purification systems. A positive evaluation is given where the air exchange can be influenced by the users.

Temperatures during the heating and cooling period:
Measures for influencing the temperature must be designed to benefit users. For the purposes of this criterion, opening a window or a comparable measure is considered sufficient, provided that it can be demonstrated that this measure exerts an active influence on the temperature and its adjustability (e.g. via adequately sized dimensioned opening area, air exchange rate).

User survey on increasing energy efficiency
This assessment is applied where a usage survey has been carried out or if a usage survey has been prepared for future use with a defined process. A standardised questionnaire is recommended to enable the survey results to be compared with other buildings and interpreted (see questionnaire from Buildings in Use system (BIU20), ECO2-B – Risk management and long-term asset value). If the survey is conducted, the following points must be observed:

- The questionnaire must cover at least user satisfaction in the sub-area of thermal comfort (Annex 1, points 5 and 6).
- The survey must be conducted with representative stakeholders (clustering).
- The selection of users invited to the survey should be chosen in such a way that 60% of the uses are covered.
- The survey has been evaluated and measures to increase energy efficiency derived from it.

INNOVATION AREA – Adaptive building model

For an evaluation to be made, the basic conditions underlying the adaptive building model must be presented. Additionally, the deviations from the respective standards must be listed and justified. Evidence must be provided in accordance with Indicators 2 to 4.

The following criteria are used to determine whether a building does not include cooling measures and therefore the adaptive comfort model of EN 16798-1 should be applied:

- The rooms must have windows or openings that allow outside air to enter and can be easily opened and adjusted by the occupants.
- No mechanical cooling may be used in the room. Radiant or surface cooling (e.g. chilled ceilings or concrete core cooling/component activation) are also classified as mechanical cooling for this purpose.
- Mechanical ventilation with uncooled air (in the cooling period) may be used, but preference must be given to opening and closing windows to control the indoor climate.
- Other low-energy options can also be used to enable occupants to control the indoor temperature, e.g. shading by blinds, night ventilation.

Information on limit values is compiled in Annex 2. The national annex of standard EN 16798 is not applicable here.

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IV. Scheme-specific description

For Indicator 2, all listed rooms are assessed. For the remaining indicators, the rooms that are to be assessed can be found in Appendix 1 (rooms listed in bold).

Office

The room and area reference is shown in Appendix 1: Rooms to be verified, for use group 2 – Office work.

Education

The room and area reference is shown in Appendix 1: Rooms to be verified, for use group 5 – Education, teaching and culture.

Indicator 2: Operative temperature

In contrast to other education-specific types of use, a different operative room temperature is required for the ‘Day nursery’ use type. See also Appendix 2.

Residential

The room and area reference is shown in Appendix 1: Rooms to be verified, for use group 1 – Residential and recreation.

Hotel

The room and area reference is shown in Appendix 1: Rooms to be verified, for use groups 1 – Residential and recreation and 2 – Office work.

Shopping centre

The room and area reference is given in Appendix 1: Rooms to be verified for use group 2 – Office work and use group 4 – Distribution and sales.

For the following indicators, only the areas within the mall or shopping street are analysed:
3. Air humidity
4.2. Draught
In Indicator 2, a distinction must be made between the mall/shopping street and the rental areas.

Department stores

Unlike Appendix 1, only the sales areas are analysed in the ‘Department stores’ scheme.

Logistics **Production**

Evaluation guide:
The requirements for thermal comfort vary for office and industrial work.
For offices with a usable area of ≥ 400 m² or ≥ 20 permanent workstations, the thermal comfort for both office and industrial areas must be analysed.
Case I: Number of office workstations ≥ 15% of the total workstations or ≥ 20 permanent office workstations:

- Evaluation by proportion of office area and proportion of industrial area
  The room and area references for usable office area are shown in Appendix 1: Rooms to be verified, for use groups 2 – Office work and 3 – Production, manual and machine work.

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For the evaluation, the proportion of office area and the proportion of industrial area must be analysed in the individual indicators.

$$\text{Total points} = (\text{points for proportion of office area} \times \frac{\text{number of office workstations}}{\text{total number of workstations}} + \text{points for proportion of industrial work} \times \frac{\text{number of industrial workstations}}{\text{total number of workstations}})$$

Case II: Number of office workstations < 15% of the total workstations and < 20 permanent office workstations:
Evaluation by proportion of industrial area

- For the evaluation, the proportion of industrial area must be analysed in the individual indicators.
  Total points = points for proportion of industrial work

An evaluation tool has been created to simplify the documentation process.

Indicator 2: For schemes with workplaces, the national workplace directives must be observed.
The following points must be noted for verification (i.e. in compliance with the German Workplaces Ordinance ASR3.5): It is necessary to check whether there are operational requirements at the workstations that could lead to discomfort. These include issues relating to air temperature, air humidity, air velocity, thermal radiation, work intensity or clothing. If this is the case, the risk assessment process must involve checking which technical, organisational or personal measures are necessary, and whether work is to be carried out in hot environments. In addition, the workstations must be categorised based on work intensity (i.e. in accordance with Table 2 of the German Workplaces Ordinance ASR3.5). Local temperature differences and temperature stratification must be taken into account accordingly.

If it is not possible to achieve the minimum temperatures according to the national workplace directives even after exhausting all technical options, additional measures from the following categories, in this order of priority, must be implemented to prevent temperatures from falling too low:

- Technical measures relating to workstations (e.g. radiant heaters, heating mats)
- Organisational measures (e.g. heating periods)
- Personal measures (e.g. suitable clothing).

Documentation that the measures specified above are sufficient can be compiled, for example, using a PMV evaluation in accordance with EN ISO 7730.

Cooling period
In specific cases, working at temperatures above +26 °C can lead to health risks, if, for example:

- work involves heavy physical labour
- special protective clothing must be worn that significantly reduces heat dissipation.

In such cases, additional measures must be identified through a site-specific risk assessment.

Definition
Automated door systems are motorised doors with manual (e.g. radio, pull-cord or push-button) or automatic (e.g. induction loop, radar, laser, light barrier) initiating mechanisms.

High-speed doors are doors with an average opening and closing speed above 0.5 m/s. Suitable organisational measures may include preventing opposing doors from opening simultaneously.

Assembly buildings

The room and area reference can be found in Appendix 1: Rooms for use groups 2 – Office work, 3 – Production, manual and machine work, experiment, 4 – Storage, distribution, sales, 5 – Education, teaching and culture. Additional areas, such as corridors and foyer areas, should be considered where the 'Assembly buildings' scheme applies.

To assess buildings that do not operate year-round, usage and operating times should be adopted from scheme-specific resources, such as the EPC, energy simulation, or calculation. For trade fairs, for example, only the times when the exhibition is open are relevant; periods during which the hall is closed and temperatures may be reduced are excluded.

4.2 Draught/heating period: In some building types, such as trade fair halls, a large number of functional doors are necessary for normal operation, therefore specific measures to avoid draughts will be assessed positively. For all other 'Assembly building' types, compliance with EN ISO 7730 Category B is a necessary requirement.

4.1 Radiation temperature asymmetry and floor temperature/heating period (variable). In buildings, such as trade fair halls, Indicator 3.1 (variable) can be set to 'not relevant' if no permanently occupied areas are in the immediate vicinity of ceiling-high glazed elements, or ceilings and/or floors are not used as a source of cooling or heating.

Healthcare buildings

The room and area reference can be found in Annex 1: Rooms to be verified for use group 1 – Residential and stay, use group 2 – Office work, use group 5 – Education, teaching and culture, use group 6 – Healing and care.

In some cases, the rooms and floor areas in the 'Healing and care' use group include rooms with very different uses. Furthermore, the comfort requirements of patients, staff and visitors must all be given equal consideration. Since these three groups of people have different levels of activity and different levels of clothing insulation, the temperature requirements represent a compromise that is intended to meet the different requirements equally.

For the minimum temperature in the cooling period, Category II can be applied in rooms used for the use group 'Healing and care'. In this case, Category III is not permitted.

Indicator 1: Operative temperature/room air temperature/cooling period. A distinction should be made between offices and patient rooms.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible documentation include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements Some forms of documentation apply to all schemes. Depending on the scheme, different documentation may also be relevant – in such cases, the relevant documentation will be explicitly stated.

In accordance with Appendix 4: "Permitted documentation processes"

Indicator 1: Conceptual design

- Project site evaluation/excerpt from the PMV tool for visualising the HDD and CDD, other site relevant data like solar irradiation, local urban microclimate, winter and summer weather patterns, vegetation and surrounding obstructions etc.
- Concept of appropriate scope and depth in relation to the size of the building, which has been demonstrably incorporated into the planning

Alternatively, reporting format of Level(s) indicator 4.2: Time outside of thermal comfort range, version 1.1 for level 1 can be used. Additionally, thermal simulation based on default input data provided as part of national / regional calculation methods or the default data provided in Annex G of EN ISO 13790 (or EN ISO 52016-1) could be used.

Indicator 2: Operative temperature/indoor air temperature

Basis and results of the completed thermal building simulation
Measurement report for the completed measurements for documenting the thermal comfort
Calculation of the heating load in accordance with EN 12831 or local standard

Indicator 3: Air humidity

Office **Education** **Residential** **Logistics** **Production** **Consumer market** **Assembly buildings** **Shopping centre** **Hotel**

The permitted verification processes depend on whether the room is equipped with a ventilation system with humidification function:
Mechanical ventilation system with humidification and dehumidification function:

- Verification is carried out via documentation of the design of ventilation system

Rooms without humidification via the mechanical ventilation system, without humidification and dehumidification function, or without window ventilation:

- The requirement is considered to have been met if the indoor humidity can be changed via a device/system.

Zonal moisture simulation or expansion of the thermal simulation to include moisture balances that represent the chronological progression of air humidity in the room

Office **Education** **Residential** **Hotel** **Logistics** **Production** **Shopping centre** **Assembly buildings**

Zonal moisture simulation
The permitted verification processes depend on whether the room is equipped with a ventilation system with a humidification function:
Mechanical ventilation system with humidification and dehumidification function:
Verification is carried out via documentation of the design of the ventilation system
Rooms without humidification via the mechanical ventilation system, without humidification and

dehumidification function, or without window ventilation:
Zonal moisture simulation or expansion of the thermal simulation to include moisture balances that represent the chronological progression of air humidity in the room Zonal moisture simulation

Indicator 4.1: Radiant temperature asymmetry and floor temperature

Office **Education** **Residential** **Hotel** **Logistics** **Production** **Assembly buildings**

The permitted documentation process depends on the type of component
Documentation of the design of the cooled components
Heated components:
Verification is carried out via documentation of the design.
Non-heated, opaque components:
If the U-values in accordance with criterion TEC1.3 are complied with, it is assumed that the criteria for minimum temperatures are also met.
Non-heated, transparent components:
Zonal thermal simulation
One-dimensional heat flow calculation
Simplified table method

Representation of the overall concept for the façade/solar radiation protection/cooling system
Zonal room simulations
CFD flow simulations or spectral calculations

Indicator 4.2: Draught

Characteristics of the air outlets, e.g. in the form of manufacturer data sheets
Basis and results of the completed flow simulations

Office **Education** **Residential** **Hotel** **Consumer market** **Logistics** **Production** **Assembly buildings**

Measurement reports

Shopping centre **Logistics** **Production buildings** **Assembly buildings**

Representation and documentation of the relevant draught areas in the mall/shopping street areas
Representation and documentation of the implementation of the required measures to prevent the possibility of draught

Indicator 5: AGENDA 2030 BONUS – Climate adaptation

- Sufficient explanation of the implementation of the measures mentioned
- Photo documentation

Indicator 6: Sustainability information system

- Sustainability guide of appropriate scope and depth in relation to the size of the building, which has been demonstrably incorporated into the everyday life of the users
- Photo documentation

Indicator 7: User influence

Change of use

- Excerpt from planning documents or the heating/ cooling/ ventilation concept for the building, with explanation
- Photo documentation
- Schematic outline diagram/plans of the controls

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Ventilation

- Excerpt from the ventilation concept for the building with main features of the design, key assumptions about the building and the useful energy demand for energy-based air treatment
- Documentation of the spatial allocation of windows to workplaces

Temperatures during the heating and cooling period

- Information on the heating system, e.g. in the form of manufacturer data sheets
- Formulated heating concept with details of the installed components, the control system and the relevant key values such as system temperatures
- Evidence of how a heating system is controlled and of the units (zone-by-zone or room-by-room) by which the users can influence the temperature
- Evidence of the possibilities of control by users, e.g. through photo documentation
- Information on the cooling/ air conditioning, e.g. in the form of manufacturer data sheets
- Formulated cooling/ air conditioning concept with details of the installed components, the control system and the relevant key values such as system temperatures

User survey to increase energy efficiency

- Documentation and evaluation of the user survey conducted for increasing energy efficiency (e.g. questionnaire, analysis of the surveys, percentage of users surveyed, derivation of energy efficiency-increasing measures, etc.)
- Questionnaire used in the energy efficiency survey for future use, plus indication of the survey process by means of information on the involvement and ensuring of the regular user survey

For 2–4: INNOVATION AREA – Adaptive building model

For an evaluation to be made, the boundary conditions on which the adaptive building model is based must be presented. Additionally, the deviations from the respective standards must be listed and justified. Evidence must be provided in accordance with indicators 2 to 4.

Comment: The complete year and the complete building must be considered. The dataset should be selected with a focus on a hot summer.

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APPENDIX C – LITERATURE

I. Version

Change log based on 2026 version

PAGE	EXPLANATION	DATE

II. Literature

- DIN 277: Areas and volumes in building construction. Berlin: Beuth Verlag, August 2021
- DIN 33403-02. Climate at the workplace and in its environments – Part 2: Effect of the climate on the heat balance of human beings. Berlin: Beuth Verlag, August 2000
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ANNEX 1 Rooms to be verified

ROOMS TO BE VERIFIED NOTE: DIFFERENT USES WITHIN A BUILDING SHOULD BE MAPPED ACCORDING TO THE AREAS DESCRIBED BELOW, WEIGHTED BY AREA. REPRESENTATIVE ROOMS/SPACES SHOULD BE EXAMINED (CLUSTERING) THESE REPRESENTATIVE SPACES MUST BE CHOSEN IN SUCH A WAY THAT 95% OF THE AREAS CORRESPOND TO THE QUALITY LEVEL ASSESSED.		
SCHEMES	TYPES OF USABLE AREA (UA)	
	TABLE 1: NO. – USE GROUP	TABLE 2: NO. – FLOOR AREAS AND ROOMS
Office	2 – Office work (UA 2)	**Office spaces** **Open plan offices** Meeting rooms (this also includes conference rooms) Design offices Drawing offices Counter rooms Supervisory rooms
Consumer market **Shopping centre**	2 – Office work (UA 2)	**Office spaces** **Open plan offices** Meeting rooms Design offices Counter rooms Supervisory rooms
Commercial building	4 – Distribution and sales (without storing) (UA 3 and 4)	Receipt and issuing areas (if permanent workspaces) **Sales areas** Showrooms Workshops (if permanent workspaces)
Logistics **Production**	2 – Office work (Administrative part) (UA 2)	**Office spaces** **Open plan offices** Meeting rooms Design offices Counter rooms Supervisory rooms

	3 – Production, manual and machine work, experimentation (Industrial work part) (UA 3)	**Production halls (if permanent workspaces)** **Workshops (if permanent workspaces)** Laboratories
	4 – Storage, distribution, sales, in special (only the designated work zones) (UA 4)	Storage areas Archives, collection rooms **Receipt and issuing areas (also includes picking areas)**
Residential	1 – Residential and stay (UA 1)	**Living spaces** Common rooms Break rooms Waiting rooms Dining areas
Hotel	1 – Residential and stay (hotel rooms part) (UA 1)	**Living spaces** Common rooms Break rooms Waiting rooms Dining areas
	2 – Office work (offices part) (UA 2)	**Office spaces**
Education	5 – Education, teaching and culture (UA 5)	**Teaching rooms with fixed seating** **General teaching and practice rooms without fixed seating** Special teaching and practice rooms without fixed seating Library rooms Assembly rooms Stage, studio rooms Showrooms
Assembly buildings	2 – Office work (UA 2)	**Offices, open-plan offices, meeting rooms**, design offices, drawing offices, counter rooms, supervisory rooms, office equipment rooms

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3 – Production, manual and machine work, experimentation (only the designated work zones) (UA 3)	**Production halls, workshops, laboratories (technological, physical, electrical, chemical, biological etc.), areas for animal husbandry, areas for plant cultivation, commercial kitchens (including issue and return facilities), special work rooms (for housekeeping, laundry care, etc.)**
4 – Storage, distribution, sales, in special (only the designated work zones) (UA 4)	Storage and stock rooms, Warehouses, vaults, silos, archives, collection rooms, registries, cold storage rooms, **receipt and issue rooms, packing rooms, dispatch rooms, sales rooms, trade fair spaces**
5 – Education, teaching and culture (UA 5)	**Teaching and practice rooms, lecture halls, seminar rooms, workshops, practical training rooms, library rooms, reading rooms, sports areas, gymnastics areas, auditoriums** (in cinemas, theatres, sports halls, etc.), stage rooms, studio rooms, rehearsal rooms, **exhibition rooms** (in museums, galleries, etc.), **sacred spaces**

Additionally, in the case of changing use of floor space:

- **Floor areas that are used alternately (e.g. entrance halls to circulation areas, though simultaneously used for information, breaks, exhibitions, etc.) should be allocated to the above-mentioned areas according to the predominant use.**
- **Movement areas within rooms (e.g. between facilities in open-plan offices or between machines in factory halls or visitor aisles in exhibitions) do not belong to the circulation area (CA) but to the use area (UA).**

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	1 – Residential and stay (UA 1)	Common rooms Break rooms Waiting rooms
	2 –Office work (offices part) (UA 2)	**Office spaces** **Meeting rooms**
Healthcare buildings	5 – Education, teaching and culture (if available, e.g. university hospitals) (UA 5)	**Teaching and practice rooms, lecture halls, seminar rooms, workshops,** practical training rooms, library rooms, reading rooms, sports areas, gymnastics areas, auditoriums (in cinemas, theatres, sports halls, etc.), stage rooms, studio rooms, rehearsal rooms, exhibition rooms (in museums, galleries, etc.), sacred spaces
	6 – Healing and care (patient rooms part) (UA 6)	**Rooms for general examination and treatment (for primary care, consultation, etc.),** rooms for special examination and treatment (for endoscopy, physiology, dentistry, etc.), operating rooms, delivery rooms, rooms for radiation diagnostics and radiation therapy, rooms for physiotherapy and rehabilitation, **bed rooms, intensive care rooms**

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ANNEX 2

Permissible upper temperature limits in the cooling period (based on EN 16798-1 and EN ISO 7730)

	ACTIVITY LEVEL	CATEGORIES	PMV INDEX/ OPERATIVE TEMPERATURE, BUILDINGS WITH MECHANICAL COOLING CLOTHING ≈ 0.5 CLO		PMV INDEX/ OPERATIVE TEMPERATURE BUILDING WITHOUT COOLING: ADAPTIVE COMFORT MODEL CLOTHING ≈ 0.5 CLO	
			LOWER LIMIT COOLING PERIOD	UPPER LIMIT COOLING PERIOD	LOWER LIMIT COOLING PERIOD	UPPER LIMIT COOLING PERIOD
Office work	Sitting ~ 1.2 met	Category I		+ 0.2 / +25.5°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +26.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +22.0°C	+ 0.7 / +27.0°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 4\ K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4\ K$
Distribution and sales – I	Stand, walk ~ 1.6 met	Category I		+ 0.2 / +24.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +25.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +20.0°C	+ 0.7 / +26.0°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 6\ K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4\ K$

Distribution and sales – II	Work ~ 2.0 met	Category I		+ 0.2 / +25.5°C*		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +26.0°C*		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +17.0°C*	+ 0.7 / +27.0°C*	$\theta_i = 0.33\theta_{rm} + 18.8°C - 9\ K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4\ K$
Production, manual and machine work, experiment – I	Work ~ 1.6 met	Category I		+ 0.2 / +24.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +25.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +20.0°C	+ 0.7 / +26.0°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 6\ K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4\ K$
Production, manual and machine work, experiment – II	Work ~ 2.0 met	Category I		+ 0.2 / +22.0°C*		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +23.0°C*		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +17.0°C*	+ 0.7 / +24.0°C*	$\theta_i = 0.33\theta_{rm} + 18.8°C - 9K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4\ K$
Residential and stay	Sitting ~ 1.2 met	Category I		+ 0.2 / +25.5°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 2\ K$
		Category II		+ 0.5 / +26.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3\ K$
		Category III	- 0.7 / +22.0°C	+ 0.7 / +27.0°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 4K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 4K$

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Education, teaching and culture	Sitting ~ 1.2 met	Category I	- 0.7 / +22.0°C	+ 0.2 / +25.5°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 4K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 2K$
		Category II		+ 0.5 / +26.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3K$
		Category III		+ 0.7 / +27.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 4K$
Kindergarten	Stand, walk ~1.4 met	Category I	- 0.7 / +21.0°C	+ 0.2 / +24.5°C	$\theta_i = 0.33\theta_{rm} + 18.8°C – 5K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 2K$
		Category II		+ 0.5 / +25.5°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3K$
		Category III		+ 0.7 / +26.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 4K$
Healing and care, examination and treatment	Sitting ~1.2 met	Category I	- 0.7 / +22.0°C	+ 0.2 / +25.5°C	$\theta_i = 0.33\theta_{rm} + 18.8°C - 4K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 2K$
		Category II		+ 0.5 / +26.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3K$
		Category III		+ 0.7 / +27.0°C		$\theta_i = 0.33\theta_{rm} + 18.8°C + 4K$
Healing and care, bed rooms	Lying ~0.8 met (patient)	Category I	- 0.7 / +22.0°C	+ 0.2 / +25.0°C*	$\theta_i = 0.33\theta_{rm} + 18.8°C - 4K$	$\theta_i = 0.33\theta_{rm} + 18.8°C + 2K$
		Category II		+ 0.5 / +26.0°C*		$\theta_i = 0.33\theta_{rm} + 18.8°C + 3K$
		Category III		not permissible		not permissible

* Values determined on basis of EN ISO 7730

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For the analysis of temperature undershoots in the cooling period, the permissible lower limit of category III can generally be applied, regardless of classification, with the exception of healthcare buildings. Here, only category II may be applied for the lower limit temperature in the cooling period in the rooms included in UA 6 Healing and care as per area description (see Building Surface Area and Volume: Key Definitions referring to the DIN 277); category III is not permissible in this case.

In transitional periods between summer and winter (average outdoor temperatures between 10°C and 16°C), the temperature limits can be deviated from. Temperature limits may be applied here that lie between the respective values for summer and winter. This must be documented.

If night ventilation is employed, exceeding the lower temperature limits in the morning hours is acceptable. This must be documented.

If the activity levels or the clothing factors do not match the actual usage conditions, the PMV can be demonstrated as an alternative to the operative temperature. The selected boundary conditions must be documented. The clothing factor must be applied uniformly for the cooling period.

Under EN 16798-1, the adaptive comfort model only applies to sedentary activities with an activity level between 1.0 met and 1.3 met. On the basis of EN 16798-1, an adaptive comfort model is permitted here as an evaluation benchmark for uses with a higher level of activity. The upper limit is set analogously to sedentary work. The lower limit is shifted downwards according to the level of activity. The table above shows the upper and lower limits for the respective usage profiles.

Permissible maximum values of room air temperature in work areas according to ASR A3.5, for industrial work part

For the cooling period, a maximum room air temperature of 26°C is initially assumed as per ASR A3.5. However, shifts are allowed. For the verification of industrial workplaces, 30°C is taken as the maximum limit value.

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ANNEX 3

Permitted lower temperature limits during the heating period (in accordance with EN 16798-1 and EN ISO 7730)

	LEVEL OF ACTIVITY	CATEGORIES	PMV INDEX/OPERATIVE TEMPERATURE FOR HEATING PERIOD LOWER LIMIT CLOTHING ≈ 1.0 CLO	PMV INDEX/OPERATIVE TEMPERATURE FOR HEATING PERIOD UPPER LIMIT CLOTHING ≈ 1.0 CLO
Office work	Sitting ~ 1.2 met	Category I	-0.2 / +21.0 °C	
		Category II	-0.5 / +20.0 °C	
		Category III	-0.7 / +19.0 °C	+0.7 / +25.0 °C
Distribution and sales – I	Standing, walking ~ 1.6 met	Category I	-0.2 / +17.5 °C	
		Category II	-0.5 / +16.0 °C	
		Category III	-0.7 / +15.0 °C	+0.7 / +23.0 °C
Distribution and sales – II	Working ~ 2.0 met	Category I	-0.2 / +14.0 °C*	
		Category II	-0.5 / +12.0 °C*	
		Category III	-0.7 / +11.0 °C*	+0.7 / +21.0 °C*
Production, manual and machine work, experiment – I	Working ~ 1.6 met	Category I	-0.2 / +17.5 °C	
		Category II	-0.5 / +16.0 °C	
		Category III	-0.7 / +15.0 °C	+0.7 / +23.0 °C
Production, manual and machine work, experiment – II	Working ~ 2.0 met	Category I	-0.2 / +14.0 °C*	
		Category II	-0.5 / +12.0 °C*	
		Category III	-0.7 / +11.0 °C*	+0.7 / +21.0 °C*

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Residential and recreation	Sitting ~ 1.2 met	Category I	-0.2 / +21.0 °C	
		Category II	-0.5 / +20.0 °C	
		Category III	-0.7 / +18.0 °C	+0.7 / +25.0 °C
Education, teaching and culture	Sitting ~ 1.2 met	Category I	-0.2 / +21.0 °C	
		Category II	-0.5 / +20.0 °C	
		Category III	-0.7 / +19.0 °C	+0.7 / +25.0 °C
Kindergarten	Standing, walking ~ 1.4 met	Category I	-0.2 / +19.0 °C	
		Category II	-0.5 / +17.5 °C	
		Category III	-0.7 / +16.5 °C	+0.7 / +23.5 °C
Healing and care, Examination and care	Sitting, ~ 1.2 met	Category I	-0.2 / +21.0 °C	
		Category II	-0.5 / +20.0 °C	
		Category III	-0.7 / +19.0 °C	+0.7 / +25.0 °C
Healing care, bed rooms	Lying ~ 0.8 met	Category I	-0.2 / +21.0 °C	
		Category II	-0.5 / +20.0 °C	
		Category III	Not permissble	+0.7 / +25.0 °C

* Values determined in accordance with EN ISO 7730

For analysis of temperatures exceeding limit values during the heating period, the permitted upper limit from **Category III** can generally be used regardless of the classification.

If the levels of activity or the clothing factors do not correspond to those in the actual use conditions, the PMV can also be verified as an alternative to the operative temperature. The selected boundary conditions must be verified. The clothing factor must be applied consistently for the heating period.

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Permitted minimum values for the indoor air temperature in work areas in accordance with workplace regulation A3.5

For the cooling period, a maximum indoor air temperature in accordance with workplace regulation A3.5 of 26 °C is initially assumed. However, changes to the limit are permitted, but a maximum limit value of 30 °C is set for the verification of industrial workstations.

PRIMARY POSTURE	WORK INTENSITY: LIGHT	WORK INTENSITY: MEDIUM	WORK INTENSITY: HEAVY
Sitting	+ 20 °C	+ 19 °C	-
Standing, walking	+ 19 °C	+ 17 °C	+ 12 °C

WORK INTENSITY	EXAMPLES
Light	Light manual/arm work while sitting or standing still, combined with occasional walking
Medium	Medium-intensity manual/arm or leg work while sitting, walking or standing
Heavy	Heavy manual/arm or leg work while sitting, walking or standing

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ANNEX 4

Permissible verification procedures

The procedures listed below are permissible for demonstrating the indicators listed in the criterion or the fulfilment of the respective requirements.

Indicator 2: Operative temperature

1. Zonal, thermal room simulation

The zonally oriented thermal room simulation (= thermal building simulation) must be carried out by a competent person and the software used must be validated according to one of the following standards:

- VDI 6020
- VDI 2078
- EN ISO 52017–1: 2018 -04
- EN ISO 52016-1: 2018-04
- 'BESTEST' test suite, standardised as ASHRAE 140

The simulation results for thermal comfort in the cooling period should only be evaluated for the cooling period (under EN 16798-1, the cooling period is defined as the time during which heating is not required). Thus only the cooling period may be used to determine the permissible frequencies of exceeding and underrun (and not the entire year). If no more precise information on the cooling period (= non-heating period) is available, the period from 1 May to 31 October can be assumed for simplification.

The simulations regarding thermal comfort must be based on the current weather data provided by local Meteorological Services for the relevant site (= test reference year for the region). Assessment have to be performed using the microclimate of the building site location (e.g. "urban heat island" for inner city locations), using typical meteorological climate data in hourly values for the location (test reference year), adopted to the local climate known from the past 30 years. If suspended ceilings and/or sound-absorbing panels are planned in order to ensure that the acoustic conditions of the room are good, the acoustic elements evaluated in criterion SOC1.3 Acoustic comfort must be taken into account during the thermal simulations.

2. Measurement based on EN 16798-1

The measurements for proving thermal comfort in the cooling period must meet the requirements for comfort measurements set out in EN 16798-1. The measurements must be carried out in representative rooms during typical operating phases. The measurements must be carried out under typical weather conditions of the warm season. In the cooling period, measurements should be taken at or above the statistical mean outdoor temperature of the three warmest months of the year.

The duration of the temperature measurements should be chosen so as to be representative.
The measuring equipment used to evaluate the thermal indoor climate must meet the requirements for measuring accuracy specified in EN ISO 7726.

The thermal comfort measurements enable evidence for the indicators:

- Indicator 1: Operative temperature (= at selected, representative workplaces),
- Indicator 2: Relative humidity (= at selected, representative workplaces),
- Indicator 3: Draught (= at selected, representative workplaces) and
- Indicator 4: Radiation temperature asymmetry and floor temperature (= room-side surface temperatures) to be given.

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3. Calculation of the heating load in accordance with EN 12831 or calculation of the cooling load in accordance with EN 16798 (Module M4 from the modular structure of the EN ISO 52000-1)

As an alternative, documentation can be carried out on the basis of the room using the calculation of the heating load in accordance with EN 12831 or the calculation of the cooling load in accordance with EN 16798, if the following conditions have been met for the room being verified:

1. For the heating period

Window area proportion of f < 40%

- The room being verified has a window area proportion of f < 40%.
- The lower limits for the operative temperature specified in Appendix 2 are determined via calculation of the heating load in accordance with EN 12831 for the sizing of the heating system.

Window area proportion of f ≥ 40%

- The room being verified has a window area proportion of f ≥ 40%

Documentation can be carried out via the calculation of the heating load in accordance with EN 12831 if the room is heated via a rapid regulating heating system (e.g. heating sail, radiator, convection heater) with single-room regulation. The following conditions must also be met:

- The room being verified has a window area proportion of f between 40% and 70% with a Uw value of ≤ 1.3 W/m²K.
- The room being verified has a window area proportion with reference to the façade of f > 70% with a Uw value of ≤ 1.0 W/m²K.

- Heating systems integrated into components (e.g. underfloor heating, capillary tube mats) are not rapid regulating heating systems. This means that documentation of the calculation of the heating load in accordance with DIN EN 12831 is not permitted in such cases.
- In order to compensate for the difference between the operative temperature and the air temperature caused by the higher window area proportion (f ≥ 40%), the air temperature as per the calculation of the heating load in accordance with DIN EN 12831 (= design temperature) must be 1 K above the temperatures specified for Categories I, II and III in Appendix 2, in order to achieve the same number of checklist points.

Sales rooms or showrooms (AG > 100 m²)

- For large sales rooms or showrooms (AG > 100 m²), documentation via the calculation of the heating load in accordance with DIN EN 12831 is generally permitted.

As the static calculation of the heating load in accordance with DIN EN 12831 cannot provide information regarding instances where the temperature falls below or exceeds the design temperature, documentation of the frequency of falling below and exceeding the temperature is not required for this verification process, for the purposes of simplification.

2. For the cooling period:

Window area proportion of f < 40%

- The room being verified has a window area proportion of f < 40%.
- The room has active cooling (air-based cooling or radiant cooling).
- The façade has external solar radiation protection.
- The upper limits for the operative temperature specified in Appendix 3 for cooled buildings are determined via calculation of the cooling load for the sizing of the cooling system.

Window area proportion of f ≥ 40%

- The room being verified has a window area proportion of f ≥ 40%.

- The façade has external solar radiation protection.
- A quickly regulating cooling system with single-room regulation is used.
- The cooling system uses both convection cooling and radiant cooling (e.g. cooling sail, chilled ceiling). For purely convective systems (e.g. underfloor convector, fan coils), documentation via calculation of the cooling load is not permitted at higher window area proportions (f ≥ 40%).
- Cooling systems integrated into components (e.g. underfloor cooling, structural component tempering, capillary tube mats) are not rapid regulating cooling systems. This means that documentation of the calculation of the cooling load in accordance is not permitted in such cases.
- A mechanical ventilation system with dehumidification ensures that the cooling system can be continually operated without power losses-. If the only available ventilation is via window ventilation or a ventilation system without dehumidification, this requirement is not met.
- The upper limits for the operative temperature specified in Appendix 3 for cooled buildings are determined via calculation of the cooling load for the sizing of the cooling system.

As the static calculation of the cooling load cannot provide information regarding instances where the temperature falls below or exceeds the design temperature, documentation of the frequency of falling below and exceeding the temperature is not required for this documentation process, for the purposes of simplification.

For rooms that are not cooled or rooms that are categorised as being without cooling, this simplified method is not permitted in principle.

4. Other procedures

The methods listed are permissible for demonstrating thermal comfort during the cooling and heating period

Requirements for summer heat protection (MIN_FAC)

Table 2: Definition of MIN_FAC

	MECHANICALLY HEATED BUILDING (OFFICES AND SIMILARLY USED SPACES)	BUILDING WITHOUT ACTIVE COOLING OR WITHOUT AIR CONDITIONING
MIN_FAC	$S_{HP,} = W_{WR} \cdot g_t \leq 0.16 = S\ hp,_{max}$	$SHP = W_{WR} \cdot g_t \leq 0.16 = S\ hp,_{max}$

where:

W_{WR} is the window to wall ratio = window area / wall area
window area = sum of all windows (including window frames and mullions)
wall area = area of the exterior wall (width * floor to ceiling height) including all transparent and opaque parts of the wall

g_t is the combined total shading coefficient of window system, glazing and sun protection.

S_{HP} (Solar Heat Protection) is the factor to avoid overheating for office rooms according to DIN EN 13363
Alternative: Thermal, solar and daylight properties of building components and elements according to either detailed calculation method ISO 52022-3:2017 or Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing ISO 52022-1:2017.

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Indicator 3: Air humidity

The permissible verification procedures depend on whether or not the room has a ventilation system with humidification.

Rooms with a mechanical ventilation system with humidification and dehumidification

- Proof is provided by documenting the design of the ventilation system.

Rooms with mechanical ventilation without humidification or dehumidification or rooms with window ventilation

- For the heating period: Zonal moisture simulation: Extension of the thermal simulation to include moisture balances, which map the course of the humidity in the room over time. For window ventilation, in the thermal simulations including the moisture balance, the window ventilation intensity, which varies widely over time, must be represented by means of zonal ventilation simulation (air node network). The permissible limit values may be undercut or exceeded by a maximum of 5% during the winter period of use (time reference analogous to indicator 1: winter heating period, not the entire year).

- For the cooling period: Zonal moisture simulation: Extension of the thermal simulation to include moisture balances, which map the course of the humidity in the room over time. For window ventilation, in the thermal simulations including the moisture balance, the window ventilation intensity, which varies widely over time, must be represented by means of zonal ventilation simulation (air node network). The humidity limits (see above) as per EN 16798-1 are considered complied with if they are maintained during at least 95% of the summer operating time (time reference analogous to indicator 2: non-heating season, not the whole year. If no more precise information on the cooling period (= non-heating period) is available, the period from 1 May to 31 October can be assumed for simplification); during a maximum of 5% of the summer operating time, exceeding or falling below the limit values is permissible.

Indicator 4.1: Radiation temperature asymmetry and floor temperature

The permissible verification procedures depend on the type of component.

1. For the heating period only

Heated components

- Verification is carried out via documentation of the design.

Non-heated components

- Non-heated, opaque components
- If the U-values in accordance with criterion TEC1.3 are complied with, it is to be assumed that the criteria for minimum temperatures are also met.
- Non-heated, transparent components
- Only the following documentation processes are permitted:

a) Zonal thermal simulation

Compliance with the permitted interior surface temperatures is verified via an additional evaluation of the zonal thermal room simulation. Here, the temperatures may, in the same way as for indicator 1, exceed or fall below the permitted limit values for no more than 3% or 5% (depending on the category that is to be complied with) of the winter usage period in total (time reference as in indicator 1: Winter heating period, not the entire year).

b) One-dimensional heat flow calculation

If compliance with the permitted interior surface temperatures is verified using one-dimensional heat flow calculations, the following boundary conditions must be applied:

Exterior temperature: -5 °C
Interior temperature: 20 °C
Heat transfer resistance in accordance with EN ISO 6946:
External: R_a = 0.04 m²K/W
Internal: Heat flow
Upwards: R_i = 0.10 m²K/W
Horizontal: R_i = 0.13 m²K/W
Downwards: R_i = 0.17 m²K/W

c) Simplified table method

If no simulations or one-dimensional heat flow calculations have been carried out, documentation can be compiled via a simplified method using the table below.

WINDOW AREA PROPORTION WITH REFERENCE TO THE FAÇADE BY ROOM	REQUIREMENT OR DOCUMENTATION
f ≤ 40 %	The requirement is considered to be met.
40% < f ≤ 70%	At a heat transfer coefficient for the windows of U_w ≤ 1.3 W/(m²K) [1] and a radiator positioned under the glazing, this requirement is considered to be met.
f > 70%	The heat transfer coefficient of the windows is equal to or less than U_w ≤ 1.0 W/(m²K)².

[1.] for the projects in various climatic zones: compliance with minimum national requirements for the Heat transfer coefficients or Optional U - Values (minimum requirement) for the various climatic zones according to the Appendix 1 of criteria TEC1.3

[2.] for the projects in various climatic zones: 25% Overachievement of the minimum national requirements for the Heat transfer coefficients or Optional U - Values (minimum requirement) for the various climatic zones according to the Appendix 1 of criteria TEC1.3

2. For cooling period only:

Cooled components

- Verification is provided by the documentation of the design.

Non-cooled components (especially glass facades)

- No verification required for small window area ratio (f <40%)

  The verification of the maximum internal surface temperatures of the glass façade can be omitted for rooms with a window area ratio f <40%. The window area ratio f refers to the room-side façade area(s) or the façade area(s) visible from the inside.

- Verification for external solar protection
  Where external solar protection is present, verification can be provided by a representation of the overall concept of the façade/solar protection/cooling system. The thermal qualities of the components, the position and type of solar protection and the arrangement and modes of operation of the ventilation and cooling systems must be indicated and named.
- Larger window area ratio (f ≥40%) and no external solar protection
  If external solar protection is not used for rooms with a large window area ratio (f ≥40%), the maximum internal surface temperatures must also be verified using suitable simulation calculations. Only zonal room simulations, CFD flow simulations or spectral calculations based on EN ISO 52022-3 or ISO 15099 are permissible for this purpose.

Indicator 4.2: Draught

The draught model in EN ISO 7730 requires as input parameters the room air temperature, the average air velocity and the standard deviation of the air velocity (or degree of turbulence; for mixed ventilation, a degree of turbulence of 40 to 50% is assumed, and for source air, 20 to 25%). The procedure in EN ISO 7730, Annex A, Figure A.2 is applicable in temperature ranges from 20 to 26°C. This model is used in an idealised way to evaluate the draught indicator. Regardless of the verification method, the verification must generally be provided for all types of air outlets and fan-driven air flows (e.g. ventilation system). The following methods are permissible for the verification of draughts:

- Key data of air outlets – manufacturer data
  Using the key data of the air outlets provided by the manufacturers, the air velocity can be determined as a function of the distance to the air outlet. The air velocity must not exceed the maximum permissible value in the recreational area closest to the air outlet.
- Flow simulations
  Alternatively, the air flow in the room can also be determined using high-resolution CFD flow simulations. The air velocity in the recreational area must not exceed the maximum permissible value.
- Measurements
  Alternatively, the air velocity can also be determined using measurements for representative recreational areas. The air velocity at the recreational area must not exceed the maximum permissible value.
- Zonal room simulation
  Compliance with the permissible room-side surface temperatures is verified using an additional evaluation of the zonal, thermal room simulation. Analogously to indicator 5, the permissible limit values may be undercut or exceeded for a maximum of 3 or 5% (depending on the category to be complied with) of the summer utilisation period (time reference as in indicator 5: summer cooling period, not the entire year).
- CFD flow simulation
  Compliance with the permissible room-side surface temperatures is verified with a high-resolution CFD flow simulation for a typical summer situation.
- Spectral calculations based on EN ISO 52022-3 or ISO 15099
  If the verification is carried out with spectral calculations based on EN 13363-2 or ISO 15099, a maximum outdoor temperature of +32°C, a vertical global solar irradiation of 600 W/m² for south-facing facades or 720 W/m² for east or west-facing facades (VDI 2078) and an indoor air temperature of 26°C should be assumed.

Measurements: Alternatively, the temperatures can also be determined by means of measurements (see verification method for indicator 2).

SOC1.2

Indoor air quality

Objective

Our objective is to ensure indoor air quality that does not impair the well-being and health of the people using the space.

Benefits

Nowadays, humans spend up to 90 percent of their time in enclosed spaces. Indoor air quality therefore plays a significant role in performance and health. Ensuring high air quality in rooms through the use of low-emission products and providing an adequate air exchange rate increases users' well-being, productivity and satisfaction.

Contribution to overarching sustainability goals



Outlook

The target and reference values are based on scientific findings. If these findings advise further tightening, this will likely be reflected in the future formulation of the criterion.

Share of total score

	SHARE	WEIGHTING FACTOR
Consumer market **Logistics** **Production**	**4.5%**	**2**
Shopping centre **Department stores**	**4.1%**	**2**
Office **Hotel** **Education** **Residential**	**3.5%**	**2**
Assembly buildings **Healthcare buildings**	**3.2%**	**2**

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EVALUATION

The ‘indoor air quality’ criterion is an exclusion criterion within the DGNB certification system. A building that does not meet the minimum requirements for indoor air quality cannot be certified.

Ensuring indoor air that does not adversely affect users is evaluated by assessing the indoor air concentration of volatile organic compounds (VOCs) (Indicator 1) and via the ventilation rate (Indicator 2). Improvements to the indoor air quality through innovative solutions can be acknowledged with an innovation area.

As a prerequisite for this criterion, Indicator 1 must meet the minimum indoor air quality requirements and achieve at least 5 or 10 points, depending on the applicability and timing of indoor air quality measurements. Higher scores are awarded where measurements are conducted within four weeks of completion of the assessed rooms and where the measurement scope includes user areas/tenant fit-out spaces in addition to common areas. For certain schemes, construction product declarations are required instead. For assessment the highest measured value is used to evaluate the indoor air concentration. Interpolation between values is not permitted. A total of 100 regular points, or maximum of 115 points including bonuses can be achieved.

MINIMUM REQUIREMENT

FOR ALL TYPES OF BUILDINGS:
The minimum points, as described above, for indoor air quality (IAQ) must be achieved.

NO.	INDICATOR		POINTS
1	**Indoor air quality – Volatile organic compounds (VOCs)**		
1.1	**Measurement of volatile organic compounds**		
	Office **Education** **Hotel** **Assembly buildings** **Healthcare buildings**		
	■ Evaluation of the indoor air concentration of volatile organic compounds according to ISO 16000-6, -3 standards		
	TVOC [µg/m³]	Formaldehyde [µg/m³]	**Max. 50**
	> 3000	> 100	0
	≤ 3000	≤ 100	10
	≤ 1000	≤ 60	25
	≤ 500	≤ 30	50
	Alternatively:		
	■ Evaluation of non-comparable VOC measurements according to ISO 16000-6, -3 standards (measured more than four weeks after completion)		
	TVOC [µg/m³]	Formaldehyde [µg/m³]	**Max. 25**
	> 3000	> 100	0
	≤ 3000	≤ 100	5
	≤ 300	≤ 30	25
	Alternatively:		
	■ Evaluation of the indoor air concentration of volatile organic compounds according to EPA (Environmental Protection Agency US) standards TO-1 / TO-15 / TO-17 and TO-11A (Formaldehyde)		**Max. 40**
	TVOC [µg/m³]	Formaldehyde [µg/m³]	
	> 3000	> 100	0

≤ 3000	≤ 100	10
≤ 1000	≤ 60	20
≤ 300	≤ 30	40

Alternatively:

- Evaluation of non-comparable VOC measurements according to EPA standards TO-1 / TO-15 / TO-17 and TO-11A (measured more than four weeks after completion) **Max. 20**

TVOC [µg/m³]	Formaldehyde [µg/m³]	
> 3000	> 100	0
≤ 3000	≤ 100	5
≤ 300	≤ 30	20

Alternatively:

- Evaluation of the indoor air concentration of volatile organic compounds according to ASHRAE 189.1-2014 (TVOC reporting shall be in accordance with CDPH (California Department of Public Health) Standard Method V1.1 and shall be in conjunction with the individual VOCs listed in Annex 3). **Max. 20**

TVOC [µg/m³]	Formaldehyde [µg/m³]	
> 500	> 100	0
< 500	< 100	10
< 200	< 30	20

Alternatively:

- Evaluation of the indoor air concentration of volatile organic compounds according to the National (local) Regulation[1] **Variable**

Residential

- If representative measurements are not possible for ≥ 80% of the common rooms due to the implemented tenant fit-out, the lower evaluation must be applied (evaluation of the indoor air concentration of volatile organic compounds according to ISO 16000-6, -3 standards).

TVOC [µg/m³]	Formaldehyde [µg/m³]	Tenant fit-out		**Max. 30/50**
		< 80%	/ ≥ 80%	
> 3000	> 100	0	0	0
≤ 3000	≤ 100	5	10	5/10
≤ 1000	≤ 60	10	25	10/25
≤ 500	≤ 30	30	50	30/50

Alternatively:

- Evaluation of non-comparable VOC measurements according to ISO 16000-6, -3 standards (measured more than four weeks after completion)

TVOC [µg/m³]	Formaldehyde [µg/m³]	Tenant fit-out		**Max. 10/15**
		< 80%	≥ 80%	
> 3000	> 100	0	0	0
≤ 3000	≤ 100	5	5	5
≤ 300	≤ 30	10	15	10/15

[1] TVOC and Formaldehyde measurement methods, concentration limit values and max. points, **must** be agreed with the DGNB

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Alternatively:

- If representative measurements are not possible for ≥ 80% of the common rooms due to the implemented tenant fit-out, the lower evaluation must be applied (evaluation of the indoor air concentration of volatile organic compounds according to EPA standards TO-1 / TO-15 / TO-17 and TO-11A (Formaldehyde)).

TVOC [µg/m³]	Formaldehyde [µg/m³]	Tenant fit-out < 80%	Tenant fit-out ≥ 80%	**Max. 25/40**
> 3000	> 100	0	0	0
≤ 3000	≤ 100	5	10	5/10
≤ 1000	≤ 60	10	20	10/20
≤ 300	≤ 30	20	40	20/40

Alternatively:

- Evaluation of non-comparable VOC measurements according to EPA standards TO-1 / TO-15 / TO-17 and TO-11A (measured more than four weeks after completion)

TVOC [µg/m³]	Formaldehyde [µg/m³]	Tenant fit-out < 80%	Tenant fit-out ≥ 80%	**Max. 7.5/10**
> 3000	> 100	0	0	0
≤ 3000	≤ 100	5	5	5
≤ 300	≤ 30	7.5	10	7.5/10

Alternatively:

- If representative measurements are not possible for ≥ 80% of the common rooms due to the implemented tenant fit-out, the lower evaluation must be applied (**e**valuation of the indoor air concentration of volatile organic compounds according to the ASHRAE 189.1-2014 (TVOC reporting shall be in accordance with CDPH (California Department of Public Health) Standard Method V1.1 and shall be in conjunction with the individual VOCs listed in Annex 3)).

TVOC [µg/m³]	Formaldehyde [µg/m³]	< 80% / ≥ 80%		**Max. 5**
> 500	> 100	0	0	0
< 500	< 100	5	10	5/10
< 200	< 30	10	20	10/20

- Additional points for tenant obligations if representative measurements of ≥ 80% of the common rooms are not possible due to the tenant fit-out:
  It is documented that the tenants/apartment owners have undertaken to implement at least 50% of the total rental spaces in accordance with quality level 3 of the criterion ‘ENV1.2 Local environmental impact’ and that compliance with the requirements after completion of the rental space corresponds to the following results:
  Evaluation of the indoor air concentration of volatile organic compounds according to ISO 16000-6, -3 standards

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 15**
≤ 3000	≤ 100	5
≤ 1000	≤ 60	10
≤ 500	≤ 30	15

Alternatively:

Evaluation of the indoor air concentration of volatile organic compounds according to EPA standards TO-1 / TO-15 / TO-17 and TO-11A (Formaldehyde)

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 10**
≤ 3000	≤ 100	5
≤ 1000	≤ 60	7.5
≤ 300	≤ 30	10

Alternatively:

Evaluation of the indoor air concentration of volatile organic compounds according to the ASHRAE 189.1- 2014 (TVOC reporting shall be in accordance with CDPH (California Department of Public Health) Standard Method V1.1 and shall be in conjunction with the individual VOCs listed in Annex 3).

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 5**
≤ 500	≤ 100	2.5
≤ 200	≤ 30	5

Alternatively:

- Evaluation of the indoor air concentration of volatile organic compounds according to the National (local) Regulation[2] — **Variable**

Shopping centre **Department stores** — **Max. 30**

- Only low-emission construction products are used in the communal areas. The products are declared in full and fulfil the quality level 3 according to ENV1.2. — +15
- It is documented that the tenants have undertaken to comply with quality level 3 as a minimum in accordance with ENV1.2 for at least 50% of the rental spaces and have confirmed compliance after completion of the rental space. — 10
- It is documented that the tenants have undertaken to comply with quality level 3 as a minimum in accordance with ENV1.2 for at least 80% of the rental spaces and have confirmed compliance after completion of the rental space. — 15

Logistics **Production** — **Max. 50**

- A declaration has been made and documented for all products of the floor surfaces. The products fulfil at least quality level 3, according to ENV1.2. — 25
- A declaration has been made and documented for all products of the floor surfaces and other interior surfaces. The products fulfil at least quality level 3, according to ENV1.2. — 40
- In addition, evaluation of the indoor air concentration of volatile organic compounds in compliance with ISO 16000-6, -3 standard

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 10**
> 3000	> 100	0
≤ 3000	≤ 100	5
≤ 1000	≤ 60	7.5
≤ 500	≤ 30	10

Alternatively:

Evaluation of the indoor air concentration of volatile organic compounds in compliance with EPA standards TO-1 / TO-15 / TO-17 and TO-11A

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 7.5**

[2] TVOC and formaldehyde measurement methods, concentration limit values and max. points, to be agreed with the DGNB

> 3000	> 100	0
≤ 3000	≤ 100	2.5
≤ 1000	≤ 60	5
≤ 300	≤ 30	7.5

Alternatively:

Evaluation of the indoor air concentration of volatile organic compounds in compliance with the ASHRAE 189.1- 2014 (TVOC reporting shall be in accordance with CDPH (California Department of Public Health) Standard Method V1.1 and shall be in conjunction with the individual VOCs listed in Annex 3).

TVOC [µg/m³]	Formaldehyde [µg/m³]	**+Max. 5**
> 500	> 100	0
≤ 500	≤ 100	2.5
≤ 200	≤ 30	5

Alternatively:

- Evaluation of the indoor air concentration of volatile organic compounds according to the National (local) Regulation[3] **Variable**

Consumer market 30

Assembly buildings exception: 25

- A declaration has been made and documented.

Note: According to 'IV. Usage-specific description', certain rooms in **Assembly buildings**, can be assessed by means of a declaration.

Note: Exception for timber construction:
In the results of measurements made in timber constructions (see definition in section 'Method'), the following substances: limonene, alpha pinene, beta pinene and carene can be ignored and need not be included in the TVOC total.

1.2 AGENDA 2030 BONUS – REDUCTION IN POLLUTANT EMISSIONS IN THE INDOOR AIR, HEALTH AND WELL-BEING

Max. 15

The objective of the AGENDA 2030 BONUSES is to reduce premature death and promote good health and well-being.

1.2.1 Protection of non-smokers: People are not adversely affected by other people smoking within the building or surrounding zones. In the surrounding outside areas, suitable measures are in place to ensure that cigarette smoke cannot enter the building. +2.5

1.2.2 Particulate matter in interiors: Particulate matter pollution due to copiers and laser printers is prevented by using low-emission inkjet printers or by installing copiers and laser printers in a separate printer room with sufficient ventilation. +2.5

1.2.3 Incoming air filtration depending on the outdoor air quality (ODA) for the building location and supply air (SUP) category demand (see method):

- Filters with the required specifications (for the relevant ODA(P) and SUP) are installed (particulate filters) +5
- Filters with the recommended/required specifications (for the relevant ODA(G) and SUP) are installed (gaseous pollutant filters) +5

[3] TVOC and Formaldehyde measurement methods, concentration limit values and max. points, to be agreed with the DGNB

2 Indoor air quality – Ventilation rate

2.1 Ventilation rate

Office **Education** **Hotel** **Assembly buildings** **Healthcare buildings** **Residential** **Logistics** **Production**

Mechanical ventilation **Max. 50**

Category under EN 16798-1:2022

■ III	Acceptable, moderate level of expectations; can be applied to existing buildings.	0
■ II	Average level (II) of expectations; recommended for new and renovated buildings	25
■ I	For users with special needs (I)	50

Natural ventilation through opening windows **Max. 50**

■ No evidence is provided	0
■ Workplace regulation A 3.6[4] is met. Ventilation or boost ventilation. See Appendix A	25
■ Workplace regulation A 3.6 is met. Ventilation or boost ventilation. See Appendix A In addition, the room air is monitored via sensors and the windows are opened mechanically.	50

Mechanical ventilation and window ventilation **Max. 50**

If the building is mechanically ventilated only in certain areas, an area-weighted point allocation is possible.

Alternatively:

Zonal flow simulation **Max. 50**

CO_2 concentration higher than the exterior air concentration [ppm] (Category under EN 16798-1:2022)

■ IV	> 900	0
■ III	> 550 and ≤ 900	25
■ I and II	≤ 550	50

Shopping centre **Department stores** **Consumer market**

Note regarding **Shopping centre** : This indicator can be assessed using a different classification for the mall and shops. The mall is documented separately (total max. 70 points).

Mechanical ventilation **Max. 70**

Category under EN 16798-1	Description		
■ IV	Values outside categories I to III; should only be used for a limited period of the year.		0
■ III	Reasonable, moderate expectations; can be used for existing buildings	**Shopping centre (shops)**	25
		(mall)	10
		Department stores	35
		Consumer market	30
■ I and II	Normal expectations; recommended for new and renovated buildings	**Shopping centre (shops)**	50
		(mall)	20
		Department stores	70
		Consumer market	70

[4] See method explaining quantitative assessment of the different flow rates.

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Logistics **Production**

Natural ventilation through opening windows or mechanical ventilation	**Max. 50**
■ No verification	0
■ The requirements of workplace regulation A 3.6 are met. See Appendix A	25
■ Regulation of ventilation as required	40
■ Overfulfilment of the hygienically required minimum air exchange by at least 20%.	50

re 2 **INNOVATION AREA**

Explanation: If the indoor air quality is verifiably improved using alternative, innovative solutions, points can be awarded accordingly.

As in 2.1

SUSTAINABILITY REPORTING

Appropriate parameters (KPIs) for communication include measurement of TVOCs and the formaldehyde results determined in Indicator 1 as well as the air exchange rate and the maximum CO_2 concentration. The findings can also be used for reporting in accordance with Level(s) Indicator 4.1 – 'Indoor air quality' (the common EU framework of core environmental indicators).

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Measured value for TVOCs (with number/share of the rooms for which the measured values are applicable)	[µg/m³]
KPI 2	Measured value for formaldehyde (with number/share of the rooms for which the measured values are applicable); corresponds to elements of the Level(s) Indicator 4.1	[µg/m³]
KPI 3	Total ventilation rate (with number/share of the rooms for which the ventilation rate is applicable); corresponds to elements of the Level(s) Indicator 4.1	[l/s]
KPI 4	CO_2 concentration above the outdoor air concentration ■ CO_2 (ppm above outdoor air concentration) (level 3, Table 4.1.1) ■ CO_2 (ppm indoor) and (ppm outdoor) (level 3, Table 4.1.2)	[ppm]
KPI 5	Outdoor air quality (particulate matter and gas) categories – ODA(P) and ODA(G); corresponds to elements of the Level(s) Indicator 4.1 – Indoor air quality	[category]
KPI 6	Filter classes – according to EN 779 corresponds to elements of the Level(s) Indicator 4.1	[class]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

II. Additional explanation

Buildings are excluded from certification if TVOC and formaldehyde concentrations exceed the limit values listed in the evaluation tables above, guide value 2 in Annex 2, or the regulatory and advisory values in Annex 3, to the extent that indoor hygiene is compromised in dwellings, offices or teaching rooms used by the same persons for several hours. In rooms where occupants only stay for a few hours and change on a continuous basis (e.g. sales rooms, film screening rooms), appropriate methods must be applied to reduce the abovementioned danger to hygiene to the lowest possible level. Buildings presenting an identifiable risk to health must be excluded from certification. Rooms where surrounding building components pose only a minor risk and rooms that are not in continuous use (e.g. large sheds or warehouses) are considered low health risk. The objective is for building materials and methods in rooms of this type to produce only minimal pollution levels. In the analyses specified above, unpleasant olfactory perception should also be avoided.

III. Method

Indoor air quality (IAQ) is evaluated on the basis of a checklist including various indicators, which are combined to produce a total score. The following indicators are assessed as part of the checklist:

Indicator 1: Indoor air quality – Volatile organic compounds (VOCs)

For this indicator, a purely planning-based evaluation approach is taken in addition to the measurement-based approach. For buildings where the requirements for the subsequent indoor air quality have not or only partially been decided in the planning phase, e.g. because fit-out is to be carried out by the tenant, a replacement method (low-emission products) is used.

Exemption rules for timber construction:
Definition of timber construction:
An interior is classified in the timber construction category if it has at least 40% open, uncoated timber shell surfaces. Wood-based panels cannot be included. Exceptions: The following substances:

1. Limonene (Cas no. 138-86-3),
2. Alpha pinene (Cas no. 80-56-8),
3. Beta pinene (Cas no. 127-91-3) and
4. Delta 3 carene (Cas no. 13466-78-9)

can be disregarded for the purposes of TVOC evaluation of measured spaces. This means that no evaluation takes place and the substances are omitted from the determination of the TVOC (total value).

Explanation/background for this rule:
The focus is on the evaluation of natural wood pollutant emissions (excluding wood-based panels), for which no serious limit values can be set. Emissions from natural wood depend on different parameters, such as wood species, storage time, depth of cut and types of cuts. If necessary, a waiting period must be observed until sampling is taken for indoor air measurement.

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Indicator 1.2: AGENDA 2030 BONUS – Reduction in pollutant emissions in indoor air, health and well-being
The objective is to reduce premature death and promote the good health and well-being of humans.

1.2.1 Protection of non-smokers
The harmful effects of smoking and passive smoking are firmly established. For this reason, people in the building or other surroundings should not be adversely affected by smoking. Suitable measures should be implemented, in and around the building, in order to prevent cigarette smoke from entering the building from the outside.

1.2.2 Particulate matter (fine dust) in interiors
Ultra-fine particulate matter is particularly dangerous to humans. Copiers and laser printers in particular contribute to a significant increase in ultra-fine particulate matter in indoor air and increased concentrations of volatile organic compounds. Because every printing process expels ultra-fine particulate matter into the air, where it can cause damage to human respiratory organs, laser printers should be replaced with low-emission inkjet printers or copiers and laser printers should be installed in a separate printer room with sufficient ventilation.

1.2.3 Incoming air filtration
To avoid harmful fine particulate matter from penetrating into the indoor air from the outside, the relevant filtration is necessary and/or recommended. Depending on the outdoor air pollution level, respective measures should be designed and implemented. For this, defining the outdoor air quality (ODA) for the building location is the first step, whereby information about the different particulate matters is defined in the criterion SITE1.1. The pollution levels (content of fine dust matters) are classified under the 3 different ODA(P) classes according to the EN 16798-3:

- ODA(P)1 applies when outdoor air is considered to be clean, i.e. not exceeding the annual average values from the PM2.5 and PM10 table 1[5] and all national standards or regulations on outdoor air quality and where excessive dust loads might only occur temporarily (e.g. due to pollen).
- ODA(P)2 applies when the average annual values of relevant parameter(s) exceed the limits by up to 50%.
- ODA(P)3 applies when the average annual values of relevant parameter(s) exceed the limits by more than 50%.

Table 1: Limit values for particulate matter

PARAMETER	CONCENTRATION	TIME WEIGHTING	SOURCE
Fine particulate matter ($PM_{2.5}$)	20 µg/m³	Annual average	Directive 2008/50/EC
Coarse particulate matter (PM_{10})	40 µg/m³	Annual average	Directive 2008/50/EC

The quality of supply air depends on the intended use of the ventilated space; i.e. different zones of the building will require different air treatment. User and building zone-specific SUP should be defined during the planning phase. An indicative guide to the supply air (SUP) categories is provided below:

[5] Referring to the Directive 2008/50/EC (21 May 2008) on ambient air quality and cleaner air for Europe

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Table 2: SUP categories based on the desired air quality[6]

CATEGORY	IAQ REQUIREMENT COMPARED TO OUT-DOOR AIR	OCCUPATION RATE	EXAMPLES
SUP 1	Supplied air is < 25% of the PM2.5 and PM10 limits	n/a	N/A (only for commercial/industrial applications with stringent hygiene requirements, such as hospitals, pharmaceuticals, semi-conductor production, etc.)
SUP 2	Supplied air is < 50% of the PM2.5 and PM10 limits	Rooms for permanent occupation	Kindergartens, offices, hotels, residential buildings, meeting rooms, exhibition halls, conference halls, theatres, cinemas, concert halls
SUP 3	Supplied air is < 75% of the PM2.5 and PM10 limits	Rooms with temporary occupation	Storage rooms, shopping centres, washing rooms, server rooms, copier rooms
SUP 4	Supplied air is < 100% of the PM2.5 and PM10 limits	Rooms with short term occupation	Toilets, stairways
SUP 5	Supplied air is < 150% of the PM2.5 and PM10 limits	Rooms without occupation	Waste storage rooms, data centres, underground car parks

Although there is no direct or predictable relationship between particulate removal efficiency for EN 779 and EN 16890 classes, an indicative relationship is provided below.

Table 3: Indicative translation of EN 779 filter classes into EN 16890 results.

EN 779:2012	EN ISO 16890 – RANGE OF ACTUAL MEASURED AVERAGE EFFICIENCIES		
Filter classes	**ePM1**	**ePM2,5**	**ePM10**
M5	5–35%	10–45%	40–70%
M6	10–40%	20–50%	60–80%
F7	40–65%	65–75%	80–90%
F8	65–90%	75–95%	90–100%
F9	80–90%	85–95%	90–100%

Note: Consultation with filter manufacturers is highly recommended to ensure that the correct specifications are used in the design.

Combined mean separation efficiency for one filter stage or for several filter stages according to the mean separation efficiency specified in EN 779 can be calculated according to the equation:

$$E_t = 100 * (1 – ((1 – E_{S1}/100) * (1 – E_{S2}/100) * … * ((1 – E_{SN+1}/100)) \quad (1)$$

[6] Eurovent Recommendation 4/23 – 2018. Selection of EN ISO 16890 rated air filter classes for general ventilation applications.

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Where:

E_t - the combined separation efficiency

E_{SN+1} - the separation efficiency of each individual filter stage

With optional gas filtration (filter classes F7 and above), the main contaminants must be identified depending on the actual outdoor air and selected supply air quality. The selected supply air quality must be identified and taken into account when planning the gas filtration, see Table 4.

Table 4: Use of gas filters in addition to particle filters for gaseous contaminants in outdoor air

OUTDOOR AIR QUALITY	SUPPLY AIR QUALITY				
	SUP1	**SUP2**	**SUP3**	**SUP4**	**SUP5**
ODA(G)1	Recomended				
ODA(G)2	Required	Recommended			
ODA(G)3	Required	Required	recommended		

Where:

- ODA(G)1 – Outdoor air is considered clean, i.e. not exceeding annual average values of benzene (5 µg/m³) and nitrogen dioxide (40 µg/m³)[7]
- ODA(G)2 – Average annual values of relevant parameter(s) exceed the limits by up to 50%.
- ODA(G)3 – Average annual values of relevant parameter(s) exceed the limits by more than 50%.

Indicator 2: Indoor air quality – Ventilation rate

There are a number of different evaluation approaches for this indicator depending on the building use.

IV. Usage-specific description

Office **Education** **Residential** **Hotel** **Assembly buildings** **Healthcare buildings**

Indicator 1: Indoor air quality – Volatile organic compounds (VOCs)

The indoor air measurement is conducted in a random sample of rooms no more than four weeks after building completion (see table of the representative furnishing types). The building is deemed complete when all works with a possible impact on indoor air quality, including building service installations, painting and commissioning of sanitary and ventilation systems, have been completed. Furniture that is permanently installed in the building (e.g. built-in cupboards) is to be taken into account in the indoor air measurement, while furniture provided by the user (chairs, computer, table, etc.) is not. In addition to the total TVOCs, the substances listed in Annex 2 or Annex 3 must be quantified individually and the concentration of formaldehyde in the indoor air must be determined. The TVOC concentration and the formaldehyde content in the indoor air are determined on the basis of the relevant standards. The TVOC value is assessed in accordance with the specifications of:

- ISO 16000-6, or US EPA (United States Environmental Protection Agency) Compendium Method TO-1 / TO-15 or TO-17, or TVOC value reported in accordance with the ASHRAE 189.1 standard;

The formaldehyde concentration is assessed in accordance with the specifications of:

- ISO 16000-3, or US EPA Compendium Method TO-11A, or formaldehyde value reported in accordance with the ASHRAE 189.1 standard.

All other national or local standards and methods must first be agreed with DGNB in the system adaptation process.

[7] Referring to the Directive 2008/50/EC (21 May 2008) on ambient air quality and cleaner air for Europe

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Ventilation of the selected rooms is carried out in accordance with the specifications of EN ISO 16000-5. This process differentiates between naturally and mechanically ventilated rooms. Alternatively, measurement can be carried out according to the specifications described in ASHRAE 189.1-2014 standard in the chapter 'Post-Construction, Preoccupancy, Baseline IAQ Monitoring'.

The assessment regarding the ventilation must be based on the following conditions:

- Naturally ventilated rooms are ventilated intensively for 15 minutes. Then, all doors and windows must be kept closed for at least eight hours preceding the measurement (preferably overnight). Finally, the measurement is conducted with all doors and windows closed.
- In rooms with mechanical ventilation, the system should be operated as usual. The system must be put into operation no less than three hours before the measurement is conducted. In rooms with a recommended ventilation pattern (e.g. schools, crèches) an entire cycle of typical use should be completed.
- The operation of the mechanical ventilation or the conditions of ventilation before the measurement must be documented in a ventilation protocol similar to that described in DIN EN ISO 16000-1, Annex D, sections D and E.

The ventilation must be coordinated with an accredited laboratory and the report regarding the ventilation must be presented as documentation. Measurements taken at a later date are not comparable as a result of the building materials' varying emission patterns. Levels measured at a later date can be accepted if they are lower than those required for hygiene. In this case, the evaluation is carried out in accordance with Table 3 (Evaluation of income-parable VOC measurements).

Table 5: representative rooms

ROOMS IN THE BUILDING	TYPE OF ROOM	NUMBER OF ROOMS TO BE SAMPLED
≤ 100	All of the rooms within the building have essentially the same interior (fit-out)	2
	Room interiors (fit-outs) vary throughout the building. Each room type accounting for more than 10% of NFA in the building must be tested [T&D_04]	1 per type
> 100	All of the rooms within the building have essentially the same interior (fit-out)	3
	Room interiors (fit-outs) vary throughout the building. Each room type accounting for more than 10% of NFA in the building must be tested [T&D_04]	2 per type

Rooms are considered essentially similar if they have floor coverings, wall and ceiling surfaces and permanent installations that feature no significant differences with regard to the materials used and their emissions performance. Differences in colour, pattern, shape or manufacturer are not relevant.

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This means, for example, that two textile coverings with different manufacturers and structures, both of which have been fixed in place with low-emission adhesives and certified with the *GUT* label (i.e. emissions-controlled), can be considered to constitute a single, essentially identical room specification. Here it must be noted that TVOC and formaldehyde emissions from construction materials such as floor coverings can decay at different rates. Not all carpets are tested up to the TVOC end value of 300 or 100 µg/m³ guaranteed by the label (e.g. *GUT, RAL-UZ*). In principle, *AgBB* (Committee for the Health Assessment of Construction Products Emissions)-certified carpets are permitted to still display a test chamber concentration of up to ≤1.0 mg/m³ TVOC after 28 days. It is therefore recommended to take necessary decay times into account.

A building cannot be certified if it has a TVOC concentration exceeding 3000 µg/m³ (or 500 µg/m³ if the measurement process refers to the ASHRAE 189.1 standard) or a formaldehyde content exceeding 100 µg/m³.

Any situation where the limits for the substances specified under guide value I (Annex 2) have been exceeded consistently is not acceptable. For this reason, a statement is required regarding instances where guide value I is exceeded, indicating the source of the substance or including a declaration regarding the decay behaviour. The same also applies for Annex 3 where the reference 'Health numbers' are provided. These values are used as a recommendation for exposure levels for chronic inhalation (i.e. > 8h per day). The ASHRAE 189.1 threshold values also serve as the guide values and where a threshold is exceeded a relevant statement (as described above) must be provided. For the evaluation of volatile organic compounds without guide values, the VOC guide values for new buildings determined as part of a research project of the German Federal Environment Agency must be used – see Annex 2. For substances with provisional odour reference values derived from the German Committee on Indoor Air Guide Values, odour reference value II is documented in each case. Values of this magnitude indicate that unpleasant odours can be expected.

Measured values that exceed these comparison values indicate that the building studied features levels of indoor air VOC pollution that are higher than the background level to a statistically significant degree. If significantly higher concentrations than would 'normally' be expected occur for individual VOCs (this refers to the new construction benchmarks value in accordance with Annex 2), this does not result in the building being rejected, but does mean that an independent expert report must be presented alongside the test report, indicating the source of the substance or including a declaration regarding the decay behaviour. If this information is not provided, the measurement will not be accepted. The recommendation of the expert (such as recommended ventilation or further measurement) in the event that levels of individual substances or of TVOCs and formaldehyde exceed the limit values must be made available to the client/building owner to enable measures to be taken at an early stage. A template for the verification has been created to simplify the documentation process (see Annex 1).

Exception for **Assembly buildings:**
Assessment of **Assembly buildings** is based on the abovementioned 'usage-specific description' (such as **Education**). For certain assembly building types, with constantly changing fit-outs, exhibitions, and inventory (e.g. exhibition halls), assessment may be carried out via a declaration on the surface, subsurface materials, and products, such as primers, top coatings, coverings and adhesives. The basis for evaluation is a project-specific list divided by room types:
Lounge (measurement according to 'usage-specific description' such as **Education**)
Lounge area with constantly changing fitouts, exhibitions, and inventory (assessment based on a declaration of surface, subsurface products, and materials in accordance with the 'usage-specific description' such as **Consumer market**)
The division of rooms is plausible and based on the use of the space. Rooms that are assessed by means of a declaration are included in the assessment with a weighted area of 25 points if the requirements of quality level 3 according to ENV 1.2 are met and verified for these rooms.

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Consumer market

Due to the significant impact of the facilities on the indoor air quality, indoor air quality measurements typically are not included in the assessment. The assessment is based on a declaration of the products used. Indoor air quality measurements may be used, among other methods, as an alternative[8] and to monitor the planning objectives.

A declaration is required for all products situated close to the surfaces in the communal areas and, if applicable, the rental spaces. This includes, in particular, paints, varnishes, and coatings for walls, ceilings, and floors, as well as adhesives and sealants. The declaration is based on the requirements of criterion ENV1.2, 'Risks to the local environment'. The requirements of at least quality level 3 according to ENV1.2 for mentioned above products must be met and documented.

Shopping centre **Department stores**

Due to the significant impact of the facilities installed on the indoor air quality, indoor air measurements are not included in the evaluation. The evaluation is carried out via declaration of the products used. In some circumstances, indoor air measurements can be used to monitor planning objectives. A declaration is required for all products situated close to the surfaces in the communal areas and, if applicable, the rental spaces. These include, in particular, paints, varnishes and coatings on walls, ceilings and floors as well as adhesives and sealants. Declarations are produced on the basis of the specifications in criterion ENV1.2, 'Recording local impacts'. The requirements of quality level 3 in accordance with ENV1.2 must be complied with and documented. Involving the tenants in the requirements for the construction materials is evaluated particularly positively. Documenting that the tenants have undertaken to comply with quality level 3 as a minimum for at least 50% of the rental spaces and that compliance has been confirmed after completion of the rental space is evaluated positively.

Logistics **Production**

The indoor air quality of industrial buildings is affected quite significantly by the use of the building and the ventilation system installed. Users are subject to occupational health and safety requirements. In buildings where low-emission products are verifiably used in the interior, a comparatively low level of indoor air pollution can be expected. The evaluation is therefore not solely performed using the results of indoor air measurements. Indoor air measurements are a suitable method for monitoring planning objectives. A declaration is required for all products situated close to the surfaces in work areas; these include, in particular, paints, lacquers and coatings on walls, ceilings and floors as well as adhesives and sealants. Declarations are produced on the basis of the specifications in criterion ENV1.2, 'Recording local impacts'. The requirements of quality level 3 in accordance with ENV1.2 must be demonstrated and complied with. Involving the tenants in the requirements for the construction materials is evaluated particularly positively.

The measurement is conducted in a random sample of rooms no more than four weeks after building completion. In addition to the total TVOCs, the substances listed in Annex 2 must be quantified individually and the concentration of formaldehyde in the indoor air must be determined. The rooms must be selected such that the significant differences between the interior surfaces are recorded. If rooms are divided into smaller parts, at least two measurements must be carried out in different rooms. In the case of a single large hall, one or more measurements and a ventilation system structured on the basis of those measurements must be used to achieve the closest possible approximation of the actual pollution levels. The measurement must be coordinated with an accredited laboratory and the report regarding the measurement must be presented as documentation. The TVOC concentration and the formaldehyde content in the indoor air are determined on the basis of the applicable standards (EN ISO 16000-5, ISO 16000-6, ISO 16000-3, US EPA TO-1 / TO-15, US EPA TO-17, US EPA TO-11A and methods described in the ASHRAE 189.1 standard).

[8] In this case communication/agreement with the DGNB office is necessary.

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The comparative evaluation is carried out on the basis of measurements taken within four weeks of completion. A building cannot be certified if it has a TVOC concentration exceeding 3000 µg/m³ or a formaldehyde concentration exceeding 100 µg/m³ (respectively 500 µg/m³ if the ASHRAE 189.1 standard list was used) or if the most recent version of guide value II or regulatory and advisory numbers have been exceeded.

A building will achieve the maximum evaluation points if the TVOC value is < 500 µg/m³ (respectively 300 µg/m³ or 200 µg/m³ for a measurement referring to US EPA TO-1/15/17 or the ASHRAE 189.1 standard) and the formaldehyde value is < 30 µg/m³. The partial target value is achieved if the TVOC value is < 1000 µg/m³ and the formaldehyde value is < 60 µg/m³. For the evaluation of volatile organic compounds without a guide value I, the VOC guide values for new buildings determined as part of a research project of the German Federal Environment Agency must be used, see Annex 1. Measured values more than 50% higher than these comparison values indicate that the building studied features levels of indoor air VOC pollution that are higher than the background level to a statistically significant degree.

If significantly higher concentrations than would "normally" be expected occur for individual VOCs, this does not result in the building being rejected, but does mean that the test report must indicate the source of the substance or include a declaration regarding the decay behaviour. If this information is not provided, the measurement will not be accepted.

Indicator 2: Indoor air quality – Air exchange rate

Office **Education** **Assembly buildings** **Hotel** **Healthcare buildings**

All room types to be considered, e.g. for hotels the office and guest rooms.

Multiple alternative evaluation methods are available for evaluating the ventilation rate. For mechanical ventilation using ventilation systems, the evaluation can be carried out in accordance with EN 16798-1:2022 or via a zonal flow simulation. For natural ventilation by opening windows, documentation is possible via the workplace regulation or a zonal flow simulation.

The evaluation of the total ventilation rate for non-residential buildings must be carried out in accordance with the calculation specifications of EN 16798-1, Annex B. The person component considers the natural occupant emissions as well as CO_2 emissions from respiration. The total ventilation rate q_{tot} (= air flow per person + air flow for the building component) defines occupant satisfaction in accordance with EN 16798-1.

$$\mathbf{q_{tot} = n * q_P + A * q_B}$$ (n: Number of persons, A: Floor area) **(2)**

Where:

q_{tot} is the total ventilation rate of the room, in l/s;
n is the design specification for the number of persons in the room, –;
q_P is the ventilation rate for the occupancy or use per person, l/s;
A is the floor area of the room, m^2;
q_B is the ventilation rate based on the building emissions, l/s, m^2.

The ventilation rates recommended in EN 16798-1:2022 are based on complete mixing of the air in the room. If the air distribution does not equate to complete mixing, the required ventilation rates can be adjusted accordingly. The ventilation rates recommended in EN 16798-1 can be divided by the ventilation efficiency.

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The following flat-rate values can be applied for the ventilation efficiency:

- Ventilation efficiency for mixing ventilation = 1.0
- Ventilation efficiency for displacement ventilation = 1.3

If it is documented that the implemented ventilation outlets achieve a higher ventilation efficiency, that value can be applied instead.

For the building component evaluation, the building can be categorised as ‘very-low polluting’, ‘low polluting’ or ‘non-low polluting’. Classification is according to EN 16798-1:2022. The category of ‘very low-polluting building’ under EN 16798-1 can be used as an alternative to Annex B.4 for DGNB verification if the VOC emissions are limited to the target value (50 points) of the TVOC/formaldehyde indicator. The category ‘low-polluting building’ is achievable with the indoor air quality of the partial target value (25 points) of the indicator. The category of ‘very low-polluting building’ in accordance with EN 16798-1 can be applied for the DGNB documentation as an alternative to Annex C if the requirements of quality level 4 in accordance with ENV1.2 are complied with and documented for all internal materials. The category of ‘low-pollution building’ can be achieved by complying with the requirements of quality level 3.

For natural ventilation, the evaluation of the ventilation rate is carried out in accordance with the specifications of workplace regulation A 3.6, Section 5 (see also Table 6 below). Natural ventilation can be implemented either as boost ventilation or as continuous ventilation.
The following values must be plausibly presented for the review as a minimum:

- Natural ventilation system
- Description of the representative room, demonstrating that it can be applied to the other rooms
- Compliance with the maximum permitted room depth with regard to clear room height in accordance with workplace regulation A 3.6 (Table 3.1.3)
- Calculation documenting the opening surfaces (see also the calculation examples in the appendix of workplace regulation A 3.6).

As an alternative, it is possible to document the ventilation rate via a zonal flow simulation, both for naturally ventilated and mechanically ventilated rooms. The flow simulations must be based on the same information as is required for the thermal simulations for documentation of SOC1.1, ‘Operative temperature’. The aerodynamic surfaces of the window casements must be illustrated for the natural ventilation simulation. For windows/doors that are opened manually, suitable boundary conditions for the user behaviour must be selected. A simulation covering the entire year, demonstrating the progression of the CO_2 concentration over time, is required for documentation of the ventilation rate. The maximum permitted CO_2 concentration in excess of the exterior air concentration (see Table NA.9 of EN 16798-1:2022 as demonstrated below) must be complied with for ≥ 95% of the use time.

Table 6: Standard design values for CO_2 concentration above the concentration in outside air (EN 16798-1:2022)

CATEGORY	CORRESPONDING CO_2 CONCENTRATION ABOVE THE CONCENTRATION IN OUTDOOR AIR, IN PPM, FOR UNADAPTED INDIVIDUALS
I	350
II	550
III	900
IV	1350

Note 1: If CO_2 concentrations in the indoor air exceed 1000 ppm, the measures specified in the Technical Rules for Workplaces (ASR A3.6) must be considered.

Note 2: An average CO_2 concentration of 400 ppm in outdoor air can be used as a reference if local measurements are not available.

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The boundary conditions of the zonal flow simulation must be clearly documented, e.g. occupancy scenarios, CO_2 emissions from users, ventilation elements and cross-sections, ventilation behaviour. In addition, the aerodynamic parameters for the ventilation openings used in the simulations must be also specified.

Shopping centre **Department stores** **Consumer market**
In accordance with EN 16798-1, the ventilation rates for non-residential buildings are designed on the basis of the building and person component. The evaluation of the total ventilation rate for non-residential buildings must be carried out in accordance with the calculation specifications of EN 16798-1, Annex B 'Basis for the criteria for indoor air quality and ventilation rates'. Here, the component person considers natural occupant emissions as well as CO_2 emissions due to respiration. The total ventilation rate q_{tot} (= air flow per person + air flow for the building component) defines the satisfaction rate of users in accordance with EN 16798-1.

$\mathbf{q_{tot} = n * q_P + A * q_B}$ (n: Number of persons, A: Floor area)

Where

q_{tot} is the total ventilation rate of the room, in l/s;
n is the design specification for the number of persons in the room, –;
q_P is the ventilation rate for the occupancy or use per person, l/s;
A is the floor area of the room, m^2;
q_B is the ventilation rate based on the building emissions, l/s, m^2.

The ventilation rates recommended in EN 16798-1 are based on complete mixing of the air in the room. If the air distribution does not equate to complete mixing, the required ventilation rates can be adjusted accordingly. The ventilation rates recommended in EN 16798-1 can be divided by the ventilation efficiency. The following flat-rate values must be applied for the ventilation efficiency:

- Ventilation efficiency for mixing ventilation = 1.0
- Ventilation efficiency for displacement ventilation = 1.3

If it is documented that the implemented ventilation outlets achieve a higher ventilation efficiency, that value can be applied instead. The evaluation of the ventilation rate due to persons must be carried out within Categories I to III in accordance with the table 'Examples of recommended ventilation rates' (EN 16798-1). The same applies to the applicable building component, i.e. contamination due to the building itself.

General specifications for rental spaces and mall spaces for **Shopping centre** **Department stores**:
Evaluation of the rental and mall spaces takes place separately. The following basic principles apply to both areas: EN 16798-1 includes recommendations for the occupancy rate of department stores (17 m² per person), but it is possible to deviate from these recommendations in justified cases. Studies of various building types have shown that this occupancy rate is generally not achieved in reality. For this reason, one of the following methods can be applied for determining the occupancy rate for the purposes of the DGNB certification:

- Reliable project-specific predictions are applied (the following are required: daily number of customers, average length of stay, opening times)
- Assignment to one of the specified typical profiles (discount store, full-range supplier, DIY store); the auditor recommends the assignment to the DGNB and plausibly justifies this assignment. The assignment must be approved by the DGNB.
- If no information is available, application of the conservative value of 17 m² per person in accordance with EN 16798-1, Annex C.

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The daily number of customers, average length of stay and opening times are entered into this tool. A safety margin of 100% is also applied to the average length of stay by the tool in order to take peak times into account. This process calculates the number of persons applicable for the evaluation, considering the parameters mentioned above.

In addition, in all cases (1 to 3), categorisation as a ‘very low-polluting’, ‘low-polluting’ or ‘polluting’ building must be carried out in order to enable the building components to be considered on a project-specific basis; this categorisation is fundamentally carried out in accordance with EN 16798-1 .

For the DGNB documentation, a ‘very low-polluting’ or ‘low-polluting’ building can be categorised on the basis of criterion ENV1.2 as an alternative. Quality level 4 as defined in criterion ENV1.2 corresponds to a very low-polluting building, quality level 3 corresponds to a low-polluting building and quality levels 1 and 2 correspond to a non-low polluting building.

It is assumed that a reasonable selection of construction materials is considered as part of the project planning. In addition, it must be ensured that the indoor air quality is not adversely affected by using construction materials that are not considered in ENV1.2. If a rental space has no documentation proving that emissions from construction materials are restricted (cf. Indicator 1), that area must be categorised as ‘not low-polluting’.

Overflow from rental spaces:
If the building concept provides for air overflowing from the shop or rental spaces into the mall and contributing to ensuring hygienic air exchange there, this may also be applied for the evaluation. In order to do so, the relevant data (air flow rate, customers, etc.) for all shops is entered into the tool. Considering the intended ventilation quality (Category I to IV) in the shops, the tool automatically calculates how much ‘fresh’ air is still available and makes this amount available to the mall (see ‘Fresh air share’, ‘Mall overflow’). This overflow must be plausibly documented, and (partial) extraction of the used air in the rental spaces must be considered accordingly (e.g.: If 100,000 m³/h of supply air is introduced into the rental spaces and 70,000 m³/h of this is extracted into the mall and the rest is extracted into the shops, a value of ‘70%’ must be entered into the tool).

Logistics **Production**

The evaluation of the ventilation is carried out in accordance with workplace regulation A 3.6. For mechanical ventilation, the exterior air flow must be designed to ensure that loads (substances, moisture loads, thermal loads) are reliably removed and that the CO_2 concentration does not exceed 1000 ppm.

For natural ventilation, it must be documented that the requirements of workplace regulation A 3.6 have been met (e.g. compliance with the maximum room depths in accordance with Table 3 of the workplace regulation). The opening surfaces must be dimensioned such that they meet the requirements for either continuous ventilation or boost ventilation. Alternatively, in the case of natural ventilation, it is also permitted to prove via a zonal building simulation that the loads are removed and the CO_2 concentration does not exceed 1000 ppm.

For both natural and mechanical ventilation, it must be ensured that the exterior air is not contaminated to an impermissible degree and is not noticeably adversely affected, e.g. by outgoing air from extraction or indoor air ventilation systems, by heavy traffic or by poorly ventilated locations.

If the indoor air quality in work areas is adversely affected by additional loads (e.g. substances, moisture loads or thermal loads), it must be documented that suitable measures are in place to ensure sufficient air quality is achieved as per Technical Rules for Workplaces regulation A 3.6.

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If tasks are carried out at the workstation that involve hazardous substances or biological agents that could thereby endanger employees, the provisions in accordance with the German Ordinance on Hazardous Substances or the German Biological Agents Ordinance, including the corresponding technical rules, shall apply with regard to the dangers resulting from substances at these workstations.

The appropriate level of ventilation can be achieved via the following measures, for example:

- A concept for natural ventilation is created. At minimum, the ventilation surfaces required for continuous ventilation in accordance with Technical Rules for Workplaces regulation A 3.6 are motorised and operated automatically via sensors (e.g. CO_2 sensors).
- The fresh air flow rate of the mechanical ventilation can be adjusted to suit current requirements either by the user (e.g. step switch) or automatically via sensors (e.g. CO_2 sensors).

Overfulfilment of the hygienically required minimum air exchange by at least 20% must be documented in the following way: First, the substance loads resulting from emissions due to persons, the building and industrial processes must be determined. These must be used as a basis for determining the required air quantities or natural ventilation cross-sections. For documentation of the target value, these values must be increased by 20% across at least 95% of workstations.

Natural ventilation through opening windows

Table 7: The requirements of workplace regulation A

System	Maximum permissible room depth in relation to the clear room height (h) [m]	Opening surface to ensure minimum air exchange	
		for continuous ventilation [m^2/present person]	for purge ventilation [m^2/10 m^2 floor area]
I one-sided ventilation*	Room depth = 2.5 x h (at h > 4 m: max. depth of space = 10 m) (assumed air speed in cross-section = 0.08 m/s)	0.35	1.05
II Cross ventilation*	Room depth = 5.0 x h (at h > 4 m: max. depth of space = 20 m) (assumed air speed in cross-section = 0.14 m/s)	0.20	0.60

System I: Single-sided ventilation through external wall.
System II: Transverse ventilation from external wall to wall or from external wall to roof.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The allocation of points for individual indicators must be backed up by comprehensive and plausible evidence.

Indicator 1: Indoor air quality – Volatile organic compounds (VOCs)

- Determination of levels of volatile to semi-volatile organic compounds and formaldehyde
- Confirmation of rooms selected for measurement and time of measurement (template for the confirmation can be found in Annex 1)
- Share of total number of rooms for individual furnishing types
- Accreditation of the institute conducting measurement (analytical laboratory/measuring institute), including details of name, business address, legal entity and a copy of the accreditation certificate
- Assurance of the implementation of quality level 3 in the rental areas and confirmation of compliance

Indicator 1.2: AGENDA 2030 BONUS – Reduction in pollutant emissions in the indoor air, health and well-being

- Floor plans/site plans
- Photos
- Explanation of the implemented measures
- Filter specifications in ventilation system for incoming air
- Outdoor air annual average particulate matter reports/measurements/local statistics

Indicator 2: Indoor air quality – Ventilation rate

- Assessment of the air exchange rate due to persons in accordance with EN 16798-1
- Documentation in accordance with the workplace regulation
- Completion of a zonal flow simulation
- Specifications of the sensors; product data sheet

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ANNEX 1

Template for verification

Confirmation of rooms selected for measurement and time of measurement (VOC):

Confirmation by the auditor or commissioned expert that the indoor air VOC measurements have been carried out in accordance with the requirements listed in the criterion.

We, _____, hereby confirm for the project: _____
in the scheme: _____
that the interior furnishings of the rooms selected for the indoor air measurement correspond to the main furnishing types found in the building, and that the rooms are therefore a representative sample for determining possible pollution of the indoor air by the installed construction materials and construction products. The measured rooms have been selected on the basis of Table 1 in the criterion. Measurements have been carried out on all furnishing types with a share of more than 10% of all rooms in the building.

We confirm that the sample collection was carried out within four weeks following completion of the rooms to be sampled in each case.

_____

Date Signature of the auditor or appointed expert Stamp

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Guidelines for commissioning and implementation of the indoor air measurements, required documentation:

1 The relevant interior surfaces for specifying the furnishing types in the rooms

- Floor covering type with details of system structure (above top edge of unfinished floor)
- Wall coverings, where relevant panelling, partition wall systems, etc.
- Ceiling surfaces, e.g. acoustic ceiling, with type of coatings
- Ceiling sails
- Door types (timber, plastic, metal, lacquer surfaces, etc.)
- indoor surfaces of windows (lacquer, metal, plastic, etc.)
- Built-in furniture (permanently installed or custom-fitted into a specific space)

2 Measuring conditions/measuring apparatus:

- Room conditioning before and during sampling in accordance with EN ISO 16000-5 or ASHRAE 189.1
- Submission of ventilation reports, e.g. in accordance with the template in EN ISO 16000-1 Annex D Guidelines for information to be recorded during indoor air measurement
- Sampling for formaldehyde with DNPH cartridge, ISO 16000-3, or US EPA TO-11A
- Sampling for TVOCs with Tenax TA tubes, ISO 16000-6, US EPA TO-1, or Sampling onto Sorbent Tubes US EPA TO-17, or Canister samplers US EPA TO-15.
- Please note: Sampling is carried out in coordination with the laboratory, and there are no special requirements for the sampler – except for the declarations mentioned above.

3 Institute conducting measurement (analytical laboratory/measuring institute):

- Accreditation documentation of the institute conducting measurement, including details of name, business address, legal entity and a copy of the accreditation certificate for the relevant standards and methods.

4 Laboratory report/measurement report:

- Determination of VOCs in accordance with: ISO 16000-6 / US EPA TO-1 / 15 / 17
- Determination formaldehyde: ISO 16000-3 / US EPA TO-11A / ASTM Standard Method D 5197
- Individual VOC values (quantification of all substances in the New Construction Benchmarks list in Annex 2 or Annex 3)
- Comparison of individual values with Guidelines 2, Regulatory and Advisory numbers and New Construction Benchmarks in a suitable table format
- Specification of TVOCs and formaldehyde

5 Evaluation of the measurement results:

- Summary report/expert report
- Statement regarding source or decay behaviour if New Construction Benchmarks, Heals numbers and Guidelines 1 are exceeded
- Evaluation of the measurement results in accordance with criterion (the worst value is used for the evaluation. The use of intermediate values is not possible).

6 Persons responsible for reporting:

The areas of responsibility can vary from project to project; one possible distribution is:

- Explanation of the criterion: Auditor
- Confirmation and specification of the furnishing types in the rooms: Auditor/expert
- Points 2 and 5: Expert
- Points 3 and 4: Analytical laboratory

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ANNEX 2*

New Construction Benchmarks for evaluation of individual substances as part of VOC measurements

#	SUBSTANCE NAME	CAS-NR.	GUIDE-LINES 2	GUIDE-LINES 1 / NEW CON-STRUCTION BENCH-MARKS (NOW)	UNIT
ALDEHYDE					
01	Acetaldehyde	75-07-0	1000	100	µg/m³
02	Furfural	98-01-1	100	10	µg/m³
03	Benzaldehyde	100-52-7	200	20	µg/m³
04	∑ C4-C11 Aldehydes	Group	1000	100	µg/m³
ALIPHATIC HYDROCARBONS					
05	∑ C9-C14- Alkanes/isoalkanes	Group	2000	200	µg/m³
ALCOHOLS					
06	1-Propanol	71-23-8	46000	14000	µg/m³
07	2-Propano	67-63-0	45000	22000	µg/m³
08	Propane-1,2-diol	57-55-6	600	60	µg/m³
09	1-Butanol	71-36-3	2000	700	µg/m³
10	2-Ethylhexanol	104-76-7	1000	100	µg/m³
11	Benzyl alcohol	100-51-6	4000	400	µg/m³
AROMATIC HYDROCARBONS					
12	∑ C7-C8 Alkylbenzole	Group	1	1	$R_i = C_i/RWII_i$
13	Toluene	108-88-3	3000	300	µg/m³
14	∑ Xylenes (total)	Group	800	100	µg/m³
15	∑ Naphthalene and compounds similar to naphthalene	Group	30	10	µg/m³
16	Ethylbenzene	100-41-4	2000	200	µg/m³
17	∑ C9-C15 Alkylbenzenes	Group	1000	100	µg/m³
18	∑ Cresols	Group	50	5	µg/m³
19	Phenol	108-95-2	200	20	µg/m³
20	Styrene	100-42-5	300	30	µg/m³
CARBOXYLIC ACIDS					
21	Acetic acid	64-19-7	3700	1300	µg/m³
22	Propionic acid	79-09-4	1600	780	µg/m³
23	Octanoic acid	124-07-2	-	***20*** *(NOW)*	µg/m³
ESTERS					
21	Methyl methacrylate	80-62-6	2100	1100	µg/m³
22	Ethyl acetate	141-78-6	6000	600	µg/m³
23	n-Butyl acetate	123-86-4	-	***60*** *(NOW)*	µg/m³

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GLYKOLE / GLYKOLETHER / GLYKOLESTER					
24	Ethylene glycol monophenyl ether (EGMP, 2-Phenoxyethanol)	122-99-6	100	30	µg/m³
25	Ethylene glycol monomethyl ether, 2-Methoxyethanol	109-86-4	200	20	µg/m³
26	Diethylene glycol methyl ether	111-77-3	6000	2000	µg/m³
27	Diethylene glycol dimethyl ether	111-96-6	300	30	µg/m³
28	Ethylene glycol monoethyl ether, 2-Ethoxyethanol	110-80-5	1000	100	µg/m³
29	Ethylene glycol monoethyl ether acetate	111-15-9	2000	200	µg/m³
30	Diethylene glycol monoethyl ether, ethyldiglycol	111-90-0	2000	700	µg/m³
31	Ethylene glycol monobutyl ether	111-76-2	1000	100	µg/m³
32	Ethylene glycol monobutyl ether acetate	112-07-2	2000	200	µg/m³
33	Diethylene glycol monobutyl ether	112-34-5	1000	400	µg/m³
34	Ethylene glycol hexyl ether	112-25-4	1000	100	µg/m³
35	1,2-Propylene glycol monomethyl ether, 1-methoxy-2-propanol	107-98-2	10000	1000	µg/m³
36	Dipropylene glycol monomethyl ether	34590-94-8	7000	2000	µg/m³
37	Propylene glycol monoethyl ether	1569-02-4	3000	300	µg/m³
38	2-Propylene glycol-1-tert-butyl ether (2PG1tBE)	57018-52-7	3000	300	µg/m³
39	Default value: Glycol ether with insufficient data available		0,050	0,0050	ppm
40	∑ Glykolether		1	1	$R_i = C_i/RWII_i$
HALOGEN HYDROCARBONS					
41	Tetrachloroethene	127-18-4	1000	100	µg/m³
42	2-Chloropropane	75-29-6	8000	800	µg/m³
KETONE					
43	Acetophenone	98-86-2	220	66	µg/m³
44	Aceton	67-64-1	160000	53000	µg/m³
45	Methyl ethyl ketone, ethyl methyl ketone	78-93-3	-	**290** *(NOW)*	µg/m³
46	Methyl isobutyl ketone	108-10-1	1000	100	µg/m³
TERPENE					
47	∑ Monocyclic monoterpenes (lead substance d-Limonene)	5989-27-5	10000	1000	µg/m³
48	∑ Bicylic terpene (α- Pinene, ß-Pinen, 3-Caren)		2000	200	µg/m³
FURTHER					
49	Benzothiazole	95-16-9	-	15	µg/m³
50	Butanone oxime	96-29-7	60	20	µg/m³
51	1-Methyl-2-pyrrolidone	872-50-4	1000	100	µg/m³
52	∑ Cyclic dimethylsiloxane D3-D6 (total guide value)		4000	400	µg/m³
53	Diethyl phthalate	84-66-2	-	***5*** *(NOW)*	µg/m³
54	Epsilon-Caprolactam	105-60-2	-	***7*** *(NOW)*	µg/m³

* Annex 2 is regularly updated in accordance with newly derived guidelines published by the German Committee on Indoor Guide Values.

Note on the detection of RW II, RW I and NOW: All required compounds and groups can be detected with sufficient certainty using the assigned analytical method on Tenax TA tubes in accordance with ISO 16000-6 or DN'PH in accordance with ISO 16000-3. For some of the compounds, there are other detection methods with which a higher detection reliability (e.g. acetic acid) can be achieved, but the limits of quantification with Tenax are below the respecttive guideline values or NOW by a sufficiently safe margin. The DGNB focusses on the AIR substance classes relevant in new buildings and updates the system when new findings are available through its expert committees. The selection of substances to be sampled from the AIR guideline values is therefore based on their relevance for new buildings (sampling of existing buildings must be planned for specific properties and occasions and is described in the corresponding utilisation profiles).

Note on carboxylic acids: The results of an indoor air measurement for TENAX are sufficient to demonstrate compliance with the guideline values for acetic acid (ethanoic acid) and propionic acid (propanoic acid). No separate measurement is required for the detection of formic acid (methanoic acid), as it has never occurred indoors, even in purely wood-based rooms, at a level close to the AIR guideline value I (0.59 mg/m³) or guideline value II (1.0 mg/m³). If, after measurements, there is nevertheless a well-founded suspicion of a very high carboxylic acid concentration, this can be verified separately using the appropriate test methods in accordance with VDI 4301 Sheet 7. This is at the discretion of the experts and testing institutes and is not required by the DGNB.

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ANNEX 3**

Reference concentrations (RfC) and regulatory numbers for evaluation of individual substances as part of VOC measurements:

CAS NO.	SUBSTANCE NAME	ASHRAE 189.1 BENCHMARKS [µg/m³]	HEALTH NUMBERS[9] (NON-CANCER) [µg/m³]	REGULATORY AND ADVISORY NUMBERS[10] [µg/m³]
79-34-5	1,1,2,2-Tetrachloroethane; C2H2C14		3000	3.500
79-00-5	1,1,2-Trichloroethane; C2H3C13		400	4.500
57-14-7	1,1-Dimethylhydrazine; C2H8N2		1	15
120-82-1	1,2,4-Trichlorobenzene; C6H3C13		200	4.000
96-12-8	1,2-Dibromo-3-chloropropane; C3H5Br2C1		1	10
106-88-7	1,2-Epoxybutane (1,2-butylene oxide); C4H8O		20	590
75-55-8	1,2-Propyleneimine (2-methylazindine); C3H7N		46	460
542-75-6	1,3-Dichloropropene; C3H4C12 (cis)		20	1.000
106-46-7	1,4-Dichlorobenzene (p-); C6H4Cl2	800	800	6.000
123-91-1	1,4-Dioxane (1,4 Diethylene oxide); C4H8O2	3000	30	3.600
540-84-1	2,2,4-Trimethyl pentane; C8H18		350	35.000
79-46-9	2-Nitropropane; C3H7NO2		20	9.000
75-05-8	Acetonitrile (cyanomethane); C2H3N		60	7.000
98-86-2	Acetophenone; C8H8O		490	3.200

[9] Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA (Environmental Protection Agency US).
[10] Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are non-regulatory values provided by the Government or other groups as advice.

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107-02-8	Acrolein (2-propenal); C3H4O		1	25
79-06-1	Acrylamide; C3H5NO		1	30
79-10-7	Acrylic acid; C3H4O2		1	300
107-13-1	Acrylonitrile (2-propenenitrile); C3H3N	5	5	430
62-53-3	Aniline (aminobenzene); C6H7N		1	1.900
71-43-2	Benzene; C6H6	60	5	320
100-44-7	Benzyl chloride (a-chlorotoluene); C7H7C1		22	220
57-57-8	Beta-Propiolactone; C3H4O2		15	150
542-88-1	Bis(chloromethyl) ether; C2H4C12O		0.5	3
75-25-2	Bromoform (tribromomethane); CHBr3		50	500
56-23-5	Carbon tetrachloride; CC14	40	40	1.200
120-80-9	Catechol (o-hydroxyphenol); C6H6O2		200	2.000
79-11-8	Chloroacetic acid; C2H3C1O2		42	190
108-90-7	Chlorobenzene; C6H5C1	1000	1000	8.000
67-66-3	Chloroform; CHC13	300	150	300
126-99-8	Chloroprene (2-chloro-1,3-butadiene); C4H5C1		20	400
1319-77-3 , 95-48-7, 108-39-4, 106-44-5	Cresylic acid (cresol isomer mixture); C7H8O		4	50
98-82-8	Cumene (isopropylbenzene); C9H12		400	4.000
111-44-4	Dichloroethyl ether (BIS(2-Chloroethyl)Ether); C4H8C12O		100	300

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77-78-1	Dimethyl sulfate; C2H6O4S		5	50
79-44-7	Dimethylcarbamyl chloride; C3H6C1NO		2	7
106-89-8	Epichlorohydrin (l-chloro-2,3-epoxy propane); C3H5C1O	3	3	1.000
140-88-5	Ethyl acrylate; C5H8O2		5	2.000
100-41-4	Ethylbenzene; C8H10	2000	2000	10.000
106-93-4	Ethylene dibromide (1,2-dibromoethane); C2H4Br2		1	30
107-06-2	Ethylene dichloride (1,2-dichloroethane); C2H4C12		400	2.000
107-21-1	Ethylene glycol C2H6O2	400	400	10.000
75-34-3	Ethylidene dichloride (1,1-dichloroethane); C2H4C12		500	5.000
50-00-0	Formaldehyde; CH2O	33[11]	9	100
87-68-3	Hexachlorobutadiene; C4C16		90	240
67-72-1	Hexachloroethane; C2C16		80	1.000
110-54-3	Hexane; C6H14	7000	200	18.000
78-59-1	Isophorone; C9H14O	2000	12	11.000
67-63-0	Isopropanol C3H8O	7000	320	2.450
67-56-1	Methanol; CH4O		4000	10.000
71-55-6	Methyl chloroform (1,1,1 trichloroethane); C2H3C13	1000	1000	6.800
78-93-3	Methyl ethyl ketone (2-butanone); C4H8O		1000	5.900

[11] If the US EPA TO-11A method will be used for a measurement, then the threshold for Formaldehyde can be set at 100 µg/m³

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108-10-1	Methyl isobutyl ketone (hexone); C6H12O		80	2.000
80-62-6	Methyl methacrylate; C5H8O2		320	2.040
1634-04-4	Methyl tert-butyl ether; C5H12O	8000	3000	14.500
60-34-4	Methylhydrazine; CH6N2		2	20
108-38-3	m-Xylene; C8H10		240	2.600
91-20-3	Naphthalene	9	9	5.000
121-69-7	N,N-Dimethylaniline; C8H11N		25	2.500
68-12-2	N,N-Dimethylformamide; C3H7NO	80	30	3.000
98-95-3	Nitrobenzene; C6H5NO2		2	500
95-48-7	o-Cresol(2-Methylphenol); C7H8O		100	2.200
95-47-6	o-Xylene; C8H10		80	900
108-95-2	Phenol; C6H6O	200	6	1.900
78-87-5	Propylene dichloride (1,2-dichloropropane); C3H6C12		4	3.500
107-98-2	Propylene glycol monomethyl ether	7000	2000	20.000
106-42-3	p-Xylene; C8H10		80	900
96-09-3	Styrene oxide; C8H8O		6	1.900
100-42-5	Styrene; C8H8	900	1000	8.500
127-18-4	Tetrachloroethylene (Perchloroethylene); C2C14	35	40	1.700
108-88-3	Toluene; C7H8	300	500	5000

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79-01-6	Trichloethylene; C2HC13	600	500	6.000
121-44-8	Triethylamine; C6H15N		7	1.900
108-05-4	Vinyl acetate; C4H6O2	200	200	1.500
1330-20-7,95-47-6, 108-38-3, 106-42-3	Xylenes (isomer & mixtures); C8H10	700	400	4.350

** This list of 72 compounds for TO-1/15/17 measurement standards, more closely matches with the EPA 8260 target list, but this list can be extended to 100 compounds. In some cases (for some regions or countries) where availability of the relevant laboratory equipment is restricted, measured compounds list can be shortened. In this case, information about the measurement procedures and technical aspects must be communicated and agreed with DGNB in the system adaptation phase.

Description “Health numbers”:
Vast majority of Health numbers are referring to the US EPA Reference Concentrations (RfC) and California Environmental Protection Agency (CalEPA) reference exposure levels. The reference concentration or RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human populartion (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Generally used in EPA's noncancer health assessments. The California Environmental Protection Agency (CalEPA) has established a chronic reference exposure level. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur.

Description “Regulatory and advisory numbers”:
Regulatory numbers are referring to OSHA PEL (Occupational Safety and Health Administration's permissible exposure limit) expressed as a time weighted average - the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek. Majority of advisory numbers are referring to ACGIH TLV (American Conference of Governmental and Industrial Hygienists' threshold limit value) expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects and to NIOSH REL (National Institute of Occupational Safety and Health's recommendded exposure limit) exposure limit for an 8- or 10-h time-weighted-average exposure. (All “Regulatory and advisory numbers” have been corrected in compliance with to odour thresholds, chronic exposure levels and NOAEL- non observed adverse effect levels).

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- EN 16798-7: Energy performance of buildings – Ventilation for buildings – Part 7: Calculation methods for the determination of air flow rates in buildings including infiltration, Berlin: Beuth Verlag. November 2017
- EN 16798-1: Energy performance of buildings – Ventilation for buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics – Module M1-6 Berlin: Beuth Verlag. March 2022
- EN 12599. Ventilation for buildings – Test procedures and measurement methods
- to hand over air conditioning and ventilation systems. Berlin: Beuth publisher. January 2011
- ISO 16000-1. Indoor air – Part 1: General aspects of sampling strategy. Berlin: Beuth publisher. June 2006
- ISO 16000-3: Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds; active sampling method. Berlin: Beuth publisher. March 2003
- EN ISO 16000-5: Indoor air – Part 5: Sampling strategy for volatile organic compounds (VOCs). Berlin: Beuth publisher. May 2007
- ISO 16000-6: Indoor air – Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on TENAX TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID. Berlin: Beuth publisher. December 2004
- EN ISO 16000-9: Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method. Berlin: Beuth publisher. April 2008
- EN ISO 16000-11: Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens. Berlin: Beuth publisher. June 2006
- Sustainable Development Goals icons, United Nations/globalgoals.org
- Level(s) – Common EU framework of core environmental indicators -http://publications.jrc.ec.europa.eu/-repository/bitstream/JRC109285/jrc109285_171205_levels_eu_framework_of_building_indicators_parts_1_and_2_pubsy_version_b1.0.pdf
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 - Standard for the Design of High-Performance Green Buildings, ASHRAE and U.S. Green Building Council, 2014.
- EPA/625/R-96/010b - Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analysed By Gas Chromatography Mass Spectrometry (GC/MS), Centre for Environmental Research Information, U.S. Environmental Protection Agency, 1999
- EPA/625/R-96/010b - Compendium Method TO-1, Method for the Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Tenax® Adsorption and Gas Chromatography/Mass Spectrometry (GC/MS), Centre for Environmental Research Information, U.S. Environmental Protection Agency, 1999
- EPA/625/R-96/010b - Compendium Method TO-17, Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes, Centre for Environmental Research Information, U.S. Environmental Protection Agency, 1999
- Volatile Organic Compounds (VOC) Criteria for New Construction - White Paper, approved by AIHA (American Industrial Hygiene Association) Construction and Toxicology Committees, 2017

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- Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profiles for VOCs (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998
- California Environmental Protection Agency (CalEPA). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997.
- Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxicant Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998
- American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
- National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
- U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999The WHO European Centre for Environment and Health, Bonn Office, WHO guidelines for indoor air quality selected pollutants, 2010.
- Standard Method for the Testing & Evaluation of VOC Emissions, Division of Environmental and Occupational Disease Control, California Department of Public Health 2010.
- OEHHA (the Office of Environmental Health Hazard Assessment) Acute, 8-hour and Chronic Reference Exposure Levels (chRELs), 2016.
- EN 16798 – 1 Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, May - 2021.

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SOC1.3

Sound insulation and acoustic comfort

Objective

Our objective is to guarantee sound insulation that is appropriate for the use of the spaces, avoids unacceptable nuisance and ensures adequate user comfort.

Benefits

Protection against disturbing noise is an important factor in determining the well-being and satisfaction of the occupants of a building. Good sound insulation has a positive influence on the ability to concentrate, the protection of confidentiality, the need for a quiet environment, living comfort and health. Good acoustic conditions are an important prerequisite for the performance and comfort of the users.

Contribution to overarching sustainability goals



Outlook

There are currently no plans to make any of the requirements stricter.

Share of total score

	SHARE	WEIGHTING FACTOR
Hotel	**5.2%**	**3**
Office **Education** **Residential**	**3.5%**	**2**
Assembly buildings **Healthcare buildings**	**3.2%**	**2**
Consumer market **Shopping centre** **Department stores** **Logistics** **Production**	**0.0%**	**0**

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EVALUATION

The respective requirements of building acoustics must be met by all building components at all times to ensure that the corresponding quality level is reached. The most unfavourable room situations are decisive. The acoustic comfort of the spaces is evaluated based on the use of the spaces. The objective is to create an appropriate level of user comfort. In this criterion 100 regular points are available. A further 20 points are available as an AGENDA 2030 bonus to recognise the actual structural implementation. **Assembly buildings** are categorised into different building types for evaluation purposes. These are explained under 'IV. Scheme-specific description'. No requirement/evaluation of building acoustics for **Consumer market** **Commercial building** **Shopping centre** **Logistics** and **Production**

NO.	INDICATOR	POINTS
1	**Building acoustics**	
1.1	**Design concept**	**Max. 20**
	Building acoustics: Analysis addressing at least the following points has been conducted: - Identification of potential noise sources from the environment - Presentation of the structural sound insulation measures - Identification of rooms with high requirements and internal sound sources	+10
	Room acoustics: A room acoustic design concept was developed at an early stage including: - Identification of rooms with noise reduction requirements or speech intelligibility - Presentation of the structural and non-structural room acoustic measures	+10
1.2	**Airborne sound insulation against external noise**	**Max. 10**
	Compliance with the values from Appendix 1 depending on relevant external noise	
	■ Requirements fulfilled, see Appendix 1	5
	■ Overfulfillment by 3 dB, see Appendix 1	10
	If no suitable room type exists in Appendix 1: Use the value for 'Office spaces and similar'	
1.3	**Footfall sound insulation of dividing ceilings and stairs**	**Max. 10**
	Requirement $L'_{n,w}$ – Horizontal / Requirement $L'_{n,w}$ – Vertical	
	■ ≤ 60 dB / ≤ 53 dB	5
	■ ≤ 53 dB / ≤ 46 dB	7.5
	■ ≤ 46 dB / ≤ 46 dB	10
1.4	**Airborne sound insulation between rooms**	**Max. 10**
	Within the room's own area – partition walls **R'_w** and corridor doors **R_w** Rooms with normal requirements	
	Partition walls R'_w / Doors R_w	
	■ ≥ 37 dB / ≥ 27 dB	5
	■ ≥ 42 dB / ≥ 32 dB	7.5
	■ ≥ 45 dB / ≥ 37 dB	10
	Room with increased requirements and noise from other areas	
	■ ≥ 42 dB / ≥ 32 dB	5
	■ ≥ 45 dB / ≥ 37 dB	7.5
	■ ≥ 50 dB / ≥ 42 dB	10
1.5	**Airborne sound insulation against noise from building services installations (water installations, other building services)**	**Max. 10**
	Airborne sound insulation against building services installations (HVAC)	
	■ Requirements fulfilled, see Appendix 1	5
	■ Overfulfillment by 3 dB, see Appendix 1	10

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1.6 AGENDA 2030 BONUS – Acoustic measurements

10

Acoustic measurements: Applicable Indicators 1.2–1.5 achieve at least the reference value, have been implemented and have been confirmed **via measurements**. On this basis, it is possible to achieve a high level of acoustic quality in the building and a high level of acoustic comfort for building users. This minimises noise as a harmful factor and supports sustained, long-term user performance.

NOTE: If the building is placed in outdoor noise level IV or higher (see Appendix 1), the reference value (10 points) needs to be fulfilled in Indicator 1.2 in order for points to be awarded for room acoustics

2 Room acoustics — Max. 40

2.1 Small rooms up to 40 m² and residential rooms — Max. 10

Residential — Max. 40

Compliance with the requirements for reverberation times

ARITHMETIC MEAN OF THE REVERBERATION TIME $\overline{T}$ IN S IN AN EMPTY, UNFURNISHED STATE (OCTAVE BANDS 125 TO 4000 HZ)

- $1.0 < \overline{T} \leq 1.5$ — 5
  Residential — 15
- $0.8 < \overline{T} \leq 1.0$ — 7.5
  Residential — 25
- $\overline{T} \leq 0.8$ — 10
  Residential — 40

2.2 Rooms larger than 40 m² — Max. 10

Compliance with the requirements for reverberation times

MEAN VALUE OF THE *A/V*-RATIO $\overline{A/V}$ IN M^{-1} IN AN EMPTY, UNFURNISHED STATE (OCTAVE BANDS 125 HZ TO 4000 HZ)	ARITHMETICAL MEAN OF THE REVERBERATION TIME $\overline{T}$ IN S IN AN EMPTY, UNFURNISHED STATE (OCTAVE BANDS 125 TO 4000 HZ)	
$0.16 < \overline{A/V} \leq 0.2$	$0.8 < \overline{T} \leq 1.0$	5
≥ 0.2	≤ 0.8	10

Alternative:

Provision of sound absorption areas on the ceiling in open office structures or on the ceiling and the room dividers, in the case of floor-to-ceiling room dividers:

- 70% of the average equivalent sound absorption area on the ceiling and/or the floor-to-ceiling room dividers, as applicable — 10

2.3 Rooms with special requirements in terms of speech intelligibility (such as meeting rooms, seminar rooms, classrooms, etc.)

Compliance with the requirements for reverberation time T_{target}

Office **Hotel** **Assembly buildings** - Types III and IV **Healthcare buildings** **Education** — Max. 10

- Compliance of all rooms with requirements. See Appendix 2. — 5
- Taking into account inclusive use (teaching/communication inclusive, speech/lecture inclusive). See Appendix 2. — 10

Assembly buildings - Type I **Max. 20**

- Compliance of all rooms with requirements. See Appendix 2. +10
- Taking into account inclusive use (teaching/communication inclusive, speech/lecture inclusive). See Appendix 2 +10

Assembly buildings – Type II **Max. 30**

- Carrying out detailed acoustic simulations to evaluate room acoustic parameters for theatres and concert halls. For each room, clearly justified requirements for the mean reverberation time T, reverberation time and sound pressure level distribution, strength G, degree of clarity D and clarity C for typical occupancy conditions are to be calculated and assessed. 10
- Classification of the acoustician – Good acoustic conditions are to be expected. +10
- Classification of the acoustician – Very good acoustic conditions are to be expected. +20

Office **Education** **Hotel** **Assembly buildings** – Types I, III and IV **Healthcare buildings**

Alternative: 10

Implementation of a detailed acoustic simulation of an open-plan office or for evaluation of other room acoustics parameters for open-plan offices and rooms in room group A ≥ 500 m³

2.4 Rooms with special requirements for noise reduction and/or room acoustics comfort (such as cafeterias, libraries or break rooms, etc.) **Max. 30**

Note: **Assembly buildings:**

For **Assembly buildings**, rooms such as exhibition rooms, traffic areas with high quality of occupancy, etc. must be included in the assessment.

Compliance with the recommendations for the A/V ratio, see Appendix 2

Office **Education** **Hotel** **Healthcare buildings** **Assembly buildings** – Type II 10

Assembly buildings – Type I 20

Assembly buildings – Types III, IV 30

2.5 AGENDA 2030 BONUS – Acoustic measurements **10**

Acoustic measurements: The applicable Indicators 2.1–2.4 achieve at least the reference value, have been implemented and have been confirmed **via measurements**. On this basis, it is possible to achieve a high level of acoustic quality in the building and a high level of acoustic comfort for building users. This minimises noise as a harmful factor and supports sustained, long-term user performance.

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SUSTAINABILITY REPORTING

Information regarding reverberation times and the sound absorption area can be used as key performance indicators (KPI) for the communication.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Target reverberation times in seconds for different room types, which are at least maintained (office, meeting room, etc.)	[s]
KPI 2	Equivalent sound absorption area/volume (A/V) for different room types (office, meeting room, etc.)	[m²/m³]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Depending on the size and use of a room, different measures may be necessary to achieve good acoustic conditions. In rooms designed for spoken communication, the priority is to achieve a good level of speech intelligibility between the positions of the speakers and the positions of the listeners. In call centres and in dining rooms, achieving a low background noise level and good speech intelligibility over short distances is prioritised. In music rooms, enhancing the music experience throughout the room takes priority. Compliance with the different requirements described in the DGNB criterion is required in order to achieve good room acoustic conditions in accordance with the use of the rooms.

II. Additional explanation

–

III. Method

The method is generally based on the following relevant international standards and norms.

Façade sound insulation: Focuses on protection against external noise. Calculations follow EN 12354-3, while the rating procedure is based on ISO 717-1. Measurement methods include ISO 10052 (Survey, S) and ISO 16283-3 (Measurement, M). Environmental noise is assessed using ISO 1996-1.
Airborne sound insulation: Addresses noise reduction between adjacent rooms or buildings. Calculations use EN 12354-1, with ratings per ISO 717-1. Measurements are conducted according to ISO 10052 (S) or ISO 16283-1 (M).
Impact sound insulation: Protects against structure-borne noise (e.g., footsteps). Calculations follow EN 12354-2, rated via ISO 717-2, and measured with ISO 10052 (S) or ISO 16283-2 (M).
Service equipment noise: Covers noise from building services (e.g., HVAC). Calculations follow EN 12354-5, while ISO 10052 and ISO 16032 guide ratings. Measurements use ISO 10052 (S) or ISO 16032 (M).
Sound absorption in rooms: Controls reverberation, background noise, and speech clarity. Calculations follow EN 12354-6, with ratings per ISO 11654. Measurements apply ISO 3382-2 (S/M) and ISO 3382-3 (M).

These methods are also compliant with LEVEL(S) Indicator 4.4 – Acoustics and protection against noise.

Acoustic comfort is evaluated via several individual indicators on the basis of the different room types. If a detailed acoustic simulation is carried out, additional points can be awarded in the criterion. With the exception of **Assembly buildings** – Type II, where the evaluation takes place mainly via a simulation. When evaluating the acoustic comfort, the rooms specified in the indicators are relevant for the analysis (office rooms, rooms with special requirements in terms of speech intelligibility such as meeting rooms, seminar rooms, classrooms, etc. and rooms with special requirements for noise reduction and/or room acoustics comfort such as cafeterias, libraries or break rooms, etc.). Any other permitted alternative verification options are listed in the relevant indicators.

Indicator 1: Building acoustics

Indicator 1.1: Design concept
Careful planning is required to ensure good yet cost-effective, use-specific room acoustics and noise protection. The objective is therefore to create an acoustic concept at the earliest possible stage of the planning process. As the first step, identification of potential noise sources from the environment and own sound sources is crucial. Acoustic insulation against noise from the street or airborne sources is important for occupant wellbeing.

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Environmental noise includes both noise from traffic and industry. Traffic noise can include noise from aeroplanes, roads, railways and even boats. Industrial noise includes all continuous events and non-temporary work, including plant operations, harbours, wind turbines, ships at anchor, concert venues, sports stations, outdoor activity from restaurants, for example, and building transmitted noise, from ground floor bars and restaurants, for example. Noise levels at the façade of a building, due to environmental noise, are predicted as a yearly average or a maximum level. Predictions can be made according to the calculation method described in Annex II of Directive 2002/49/EC or the relevant national public information service such as national outdoor noise maps. Estimates and sound power measurements of noise sources should be made in accordance with ISO 3744 and ISO 9614, or alternatively, environmental noise level measurements should be measured in accordance with ISO 1996-1 or an equivalent national standard. To predict indoor noise levels from environmental noise, any calculator included in acoustic software models can be used. In addition to external noise, internal sources of noise should be considered:

- airborne sound insulation: protection from airborne noise within adjacent rooms and spaces or buildings;
- presentation of noise protection countermeasures.
- Impact sound insulation: protection from the sound of impacts within adjacent spaces or on an adjacent floor or wall.
- Service equipment noise: protection from noise generated by service equipment for the building as a whole and/or specific floors, departments, or individual spaces

Acoustic performance depends on the activities the rooms are used for. Therefore, all rooms and areas inside the building are to be categorised into typologies according to their usage. This avoids the need to make subsequent, and generally cost-intensive, improvements to the room acoustics. In general buildings can be separated into residential and non-residential usage:

- Residential buildings: habitable rooms (e.g. living rooms and bedrooms), common access areas, etc.
- Non-residential buildings: office rooms, rooms with special requirements in terms of speech intelligibility (such as meeting rooms, seminar rooms, classrooms, etc.) and rooms with special requirements for noise reduction and/or room acoustics comfort (such as cafeterias, libraries or break rooms, etc.)

The design aspects and related factors that influence the incorporation of design features and material selection to address acoustic performance should be taken into account. Each aspect informs what is required to ensure that the right decisions are made at the concept design stage to achieve better outcomes at later stages. This indicator should consider the importance of architectural aspects including façade design, party walls, floors, internal subdivisions and partitions, surface finishing materials and treatments and other architectural elements that can affect acoustic performance. The indicator also considers the acoustic performance and the mitigation of service equipment noise. All components must satisfy the relevant requirements. The values must be verifiable on site. The calculation and verification procedures are based on the normal calculation procedures of the generally recognised standards: sound insulation calculations can be made using ISO 12354 parts 1 to 4 using laboratory measurements from ISO 10140 series or table values. If no national classification scheme, guideline or similar is available for residential buildings, the use of ISO TS 19488 is recommended.

Indicator 1.2: Airborne sound insulation against external noise

The requirements in accordance with DIN 4109 apply for the evaluation of airborne sound insulation against external noise. Airborne sound insulation against external noise must be at least 3 dB higher than the requirements of DIN 4109 or documentation of better airborne sound insulation must be provided. The values are listed in Appendix 1.
If there is significant external noise pollution (above a threshold of > 66 dB(A)), non-window-dependent ventilation is necessary for the proper evaluation of the sub-target value and target value. This generally means that a mechanical ventilation system is required.

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For a definition of R'w see also European Acoustics Association (EAA) in ACOUSTIC CLASSES – AIRBORNE SOUND INSULATION.

Indicators 1.3–1.5:
For indicators 1.3–1.5, the reference values can be found directly in the assessment section above. For footfall sound insulation of dividing ceilings and stairs and airborne insulation between rooms, the assessment has been divided into three levels to create incentives for higher performance. For rooms with increased requirements, such as doctors' offices, consultation rooms in banks or other rooms where confidential information is shared, the increased values must be applied. The classification for this must be justified and is to be determined by the building owner. The requirements for airborne sound insulation against internal noise from building services installations can be either fulfilled or overfulfilled.

Indicator 1.6 AGENDA BONUS – Acoustic measurements
The measurement method must be in compliance with the norm listed in the table above. The measurements must confirm the values estimated from the previous indicators on the construction site or in the finished building. The measurement must be carried out by suitable specialist personnel.

Indicator 2: Room acoustics

Indicator 2.1: Individual offices and multi-person offices up to an area of 40 m²
This indicator covers office rooms and multi-person offices up to an area of 40 m² in particular. Acoustic damping measures in individual offices can be assessed based on the reverberation time. The reverberation time in furnished rooms when in use depends heavily on the distribution of sound-absorbing surfaces within the room, the furnishings and the number and type of objects used. This indicator therefore evaluates whether basic acoustic damping of the room has been ensured via the sound absorption of the enclosing surfaces installed on site. The classification refers to offices that have been constructed and are ready for occupancy but unoccupied. Alternatively, verification for completed projects can be carried out via measurements in accordance with the standard method of ISO 3382-2 in an empty or furnished but unoccupied state.

Indicator 2.2: Multi-person offices with an area of more than 40 m²
This indicator covers office rooms and multi-person offices with an area of more than 40 m² in particular. Acoustic damping measures can be assessed based on the reverberation time and additional parameters, including the A/V ratio in the frequency range 250–2000 Hz, in an unfurnished state.

Alternatively, verification for completed projects can be measured in accordance with the standard method of ISO 3382-2 in an unoccupied empty state (no furnishings).

Possible additional points
In large multi-person offices, a high level of comfort with regard to room acoustics conditions can only be achieved in open office structures with a sound-absorbing ceiling and measures for shielding between workstation groups. Since sound-absorbing areas on the ceiling have a considerably higher impact in terms of sound propagation damping than those on the floor, additional points can be awarded for these. Comfortable room acoustics conditions can also be achieved using floor-to-ceiling room dividers which absorb sound on both sides; in this case, additional points for sound absorption areas on the ceiling and the room dividers can be awarded.

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Indicator 2.3: Rooms with special requirements in terms of speech intelligibility (such as meeting rooms, seminar rooms, classrooms, etc.)
For rooms with special requirements in terms of speech intelligibility, such as meeting or seminar rooms, room acoustics verification is carried out by calculating the reverberation time of the relevant room while furnished and with 80% occupancy. The room groups that are to be documented and the target reverberation time are described in Appendix 2. Acoustic damping measures in rooms for speeches and lectures or teaching and communication can be assessed based on the reverberation time in furnished rooms with 80% occupancy. The values used for sound absorption of persons and furnishings must be documented.

If inclusion has also been considered, this will be assessed positively. Alternatively, verification can be carried out via measurements in accordance with the standard method of ISO 3382-2 in an unoccupied furnished state. An occupancy level of 80% can be taken into account in the calculations.

Indicator 2.4: Rooms with special requirements for noise reduction and/or room acoustics comfort (such as cafeterias, libraries or break rooms, etc.)
The acoustic damping in rooms of building usage types B3–B5 (also type B2 **Assembly buildings** – Type II) with spe-cial requirements for noise reduction and/or the room acoustics comfort is assessed via the reverberation time while furnished and with 50% occupancy level. Compliance with the recommendations for the A/V ratio in the frequency range 250–2000 Hz is required to achieve good room acoustics conditions. The room groups are described in Appendix 2. The values used for sound absorption of persons and furnishings must be documented.

Alternatively, verification can be carried out via measurements in accordance with the standard method of ISO 3382-2 in an unoccupied furnished state. An occupancy level of 50% must be taken into account in the calculations.

As an alternative to indicators 2.1–2.4: Completion of a detailed acoustic simulation
Conventional statistical calculation methods can be used to determine average reverberation time values sufficient for assessing rooms with typical uses and geometries. For rooms with special geometries and higher acoustic quality requirements, detailed calculation methods with location-specific parameters are required to develop optimal acoustic conditions. Simulation calculations can be used to determine the effectiveness of acoustics measures in detail and check and evaluate more complex conditions.

Indicator 2.5 AGENDA BONUS - Acoustic measurements
The measurement method used must be in compliance with the norm listed in the table above. The measurements must confirm the values estimated from the previous indicators on the construction site or in the finished building. The measurement must be carried out by suitable specialist personnel.

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IV. Usage-specific description

Healthcare buildings can be evaluated in the same way as **Hotel**

Assembly buildings

For the assessment in this criterion, assembly buildings are categorised into the following building types:

- Type I: Congress buildings;
- Type II: Theatres and concert halls;
- Type III: Museums, cultural and civic centres, libraries;
- Type IV: Trade fair and city halls,

Note: 'Assembly buildings' that are not listed above can be assigned to one of the building types listed. If no assignment is possible, please contact the DGNB office directly.

A distinction is made between the application and evaluation of the individual indicators based on the use of the building or land. A DGNB tool supports the assignment of the indicators and the evaluation of the criterion.

In principle, at least 95% of the representative rooms must correspond to the assessed quality level. According to variant 1, the evaluation is to be carried out area-weighted on the basis of the actual area ratios NUF (R) according to DIN 277-1; each of the indicators is weighted as a percentage with the area share of the associated use; the maximum possible number of points is related to the rooms actually subject to assessment. Variant 2 cannot be used for the usage profile for **Assembly buildings**.

Rooms with special uses that cannot be assigned in accordance with the indicators must be treated separately.
Indicator 2.3: Rooms with special requirements in terms of speech intelligibility (such as meeting rooms, seminar rooms, classrooms, etc.)
For **type II** (theatres and concert halls), good room acoustics are crucial for the successful function of the building. Since the requirements vary greatly depending on the project, detailed acoustic simulations and the acoustician's classification of the acoustic conditions to be expected based on key figures are used for the evaluation.

Indicator 2.4: Rooms with special requirements for noise reduction and/or room acoustics comfort (such as cafeterias, libraries or break rooms, etc.)
In the case of **Assembly buildings**, in addition to the type B3–B5 rooms, type B2 rooms must be also considered (Appendix 2). Within the indicator, there is the possibility of evaluating the relevant rooms (corresponding to the B2, B3, B4, B5 types) weighted by area.

Residential

The same values for Indicator 1.2 to 1.5 are used for the residential scheme as for all other usage profiles. This is based on the standard ISO TS 19488:2021 'Acoustic classification of dwellings', which specifies classes A to F for residential buildings; Class A has the highest requirements with the value L'nT < 46 dB for "Between habitable rooms in a dwelling and rooms outside the dwelling in all directions." Class F has the lowest requirements with the value L'nT < 66 dB. Therefore, the DGNB rating from 46 to 60 covers Class A to Class D. For room acoustics, the residential rooms are assessed on the same basis as small rooms in Indicator 2.1 **only**. Here, the standard ISO TS 19488:2021 specifies a range from T ≤ 0.6 (Class A) to T ≤ 2.1(Class F). The DGNB rating extends up to 1.5 s and corresponds to Class D in accordance with the standard.[1]

[1] ISO/TS 19488:2021. Acoustics – Acoustic classification of dwellings. Geneva: International Organization for Standardization, 2021

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible documentation include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements. In the case of **Assembly buildings**, assignment of the building to the certain type must be argued and documented.

Indicator 1.1: building acoustics design concept

- Proof of the external noise level, for example with noise maps or measurements
- Calculation of the sound insulation effect of exterior walls and windows
- Measurement of the interior noise level
- Visualisation of noise immission using simulation software
- Room acoustics concept with detailed description of the measures implemented in the rooms, transparent representation of the updates during the planning process as well as transparent consideration of the interaction between room acoustics and architectural planning as well as the interaction with other construction tasks.

Indicator 1.2 – 1.4:

- Presentation of standard components with corresponding calculation of sound insulation values
- Sound insulation certificate required under building regulations, showing the individual values

Indicator 1.5: AGENDA 2030 BONUS

- Description of the results of the calculation as well as the measurements carried out.

Indicator 2.1: Individual offices and multi-person offices up to an area of 40 m²

- The basis and result of the calculation as well as
- measurement of the reverberation time.
- Documentation of the values used for sound absorption of persons and furnishings.

Indicator 2.2: Multi-person offices with an area of more than 40 m²

- The basis and result of the calculation
- as well as measurement of the reverberation time.
- Documentation of the values used for sound absorption of persons and furnishings.
- Documentation of the sound absorption measures implemented on the ceiling or in the form of room dividers, e.g. by means of an order confirmation and photo documentation.

Indicator 2.3: Rooms with special requirements regarding speech intelligibility

- The basis and result of the calculation
- as well as measurement of the reverberation time of the sound-absorbing areas.
- Documentation of the values used for sound absorption of persons and furnishings.
- **Assembly buildings** – Type II: Documentation of the detailed acoustic simulations
- as well as the acoustician's classification of the expected acoustic conditions.

Indicator 2.4: Rooms with special requirements regarding noise reduction

- The basis and result of the calculation
- as well as measurement of the reverberation time.
- Documentation of the values used for sound absorption of persons and furnishings.

Indicator 2.5: AGENDA 2030 BONUS

- Description of the results of the calculation as well as the measurements carried out.

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I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN 18041:2016-03. Acoustic quality in small to medium-sized rooms. Berlin: Beuth Verlag.
- ISO 3382-2. Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms. September 2008
- ISO 3382-2 Corrigendum 1:2009-09. Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms
- ISO 354. Acoustics – Measurement of sound absorption in a reverberation room. December 2003
- ISO TS 19488:2021 – Acoustic classification of dwellings. June 2021
- ISO-717-1-2020 Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation. December 2020
- ISO 1996-1Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures. March 2016
- VDI 2569: 2016-02 (draft) "Sound protection and acoustical design in offices". Düsseldorf: Verein Deutscher Ingenieure e.V.
- ISO 226:2023-03 Acoustics - Normal equal-loudness-level contours https://www.dinmedia.de/de/norm/iso-226/366990648
- European Acoustics Association (EAA) - ACOUSTIC CLASSES - AIRBORNE SOUND INSULATION https://www.researchgate.net/publication/375526673_Acoustic_classes_-Airborne_sound_insulation-September 2023 Italy

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Appendix 1

REQUIREMENTS IN ACCORDANCE TO THE DIN 4109

Airborne sound insulation against outside external noise

„Relevant external noise level“ in dB	Room types		
	Bedded rooms in hospitals and sanatoriums	Sitting rooms in apartment, overnight stays rooms in accommodation establishments, teaching rooms und similar	Office spaces and similar
	R'_w total of outdoor components in dB		
I : to 55	35	30	—
II : 56 to 60	35	30	30
III : 61 to 65	40	35	30
IV : 66 to 70	45	40	35
V : 71 to 75	50	45	40
VI : 76 to 80	b	50	45
VI : > 80	b	b	50

Maximum permissible A-evaluated sound pressure level in protection required external rooms, generated by technical buildings equipment and structurally with the building related usageColumn	1	2	3	4
Row	Noise sources		Maximum permissible A-evaluated sound pressure level dB	
			Living spaces and bedrooms	Teaching- und workrooms
1	Sanitary equipment/water installations (Water supply and wastewater system collectively)		L_{AF},max,n ≤ 30[a,b,c]	L_{AF},max,n ≤ 35 [a,b,c]
2	Other in-house appliances, permanently installed sound sources of technical equipment, Supply and disposal like garage facilities		L_{AF},max,n ≤ 30[c]	L_{AF},max,n ≤ 35[c]
3	Restaurants including kitchens, Sales outlets,	Days from 6:00 until 22:00	Lr ≤ 35 L_{AF},max ≤ 45	Lr ≤ 35 L_{AF},max ≤ 45

4	business places and similar.	Nights until 6:00	*L*r ≤ 25 *L*AF,max ≤ *35*	*L*r ≤ 35 *L*AF,max ≤ *45*

a single short-time noise spikes, which generated when water taps and devices are actuated according to the table 11 (opening, closing, switching, interrupting) , are currently not considered.

b requirements for the fulfilment of the permissible sound pressure level:

— The execution documentation must regard the requirements of Sound insulation, i. e. For the construction components the required sound proofs must be available;

— In addition, the responsible construction company must be named and for a partial decrease before closing or cladding of the installation must be consulted.

c Deviating from DIN EN ISO 10052: 2010-10, 6.3.3, is dispensed with measurement in the loudest room corner (see also DIN 4109-4).

Requirements for Maximum permissible A-evaluated sound pressure level in protection required rooms, in the same apartment, generated by air conditioning systems in the same living area

Column	1	2	3
Row	Noise sources	Maximum permissible A-evaluated sound pressure level dB	
		Living spaces and bedrooms	Kitchen
1	Permanently installed sound sources of air conditioning systems in the same living- and workspace	*L*AF,max,n ≤ 30[a,b,c,d]	*L*AF,max,n ≤ 33[a,b,c,d]

a single short-time noise spikes , which generated when the systems are switched on and off, may exceed a maximum of 5 dB.

b requirements for the fulfilment of the permissible sound pressure level:

— The execution documentation must regard the requirements of Sound insulation, i. e. For the construction components the required sound proofs must be available;

— In addition, the responsible construction company must be named and for a partial decrease before closing or cladding of the installation must be consulted.

c Deviating from DIN EN ISO 10052: 2010-10, 6.3.3, is dispensed with measurement in the loudest room corner (see also DIN 4109-4).

d It is allowed by 5 dB higher values, if it is continuous noises without noticeable single tones.

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Appendix 2

Reverberation time of the room - Target

Indicator 4. Rooms with special requirements in terms of speech intelligibility
(based on DIN 18041)

A1 "Music": Predominantly musical performances. (For example, music room with active music and singing)

$T_{\text{Target,A1}}=(0.45\lg\frac{V}{\text{m3}}+0.07)$ s 30 m³≤ V <1 000 m³

A2 "Language/Lecture": Linguistic performances are in the foreground, usually from a (frontal) position. Simultaneous communication between several people at different points in the room is rarely carried out. (For example, Courtroom and council hall, community hall, lecture hall, assembly room, school auditorium)

$T_{\text{Target,A2}}=(0.37\lg\frac{V}{\text{m3}}-0.14)$ s 50 m³≤ V <5 000 m³

A3 "Teaching/Communication" (to 1000 m³): Communication-intensive uses with several simultaneous speakers distributed in the room. (For example: Classroom, Conference room, Group room in day-care centres or care facilities)
and
"Language/Lecture inclusive" (to 5000 m³): Rooms of type **A2** for people who are particularly dependent on good language comprehension. Required for inclusive use.

$T_{\text{Target,A3}}=(0.32\lg\frac{V}{\text{m3}}-0.17)$ s 30 m³≤ V <5 000 m³

A4 "Teaching/communication inclusive": Communication-intensive uses with several simultaneous speakers distributed in the room according to type A3, but for people who are particularly dependent on good language comprehension. This type of use is not suitable for rooms larger than 500 m³ and for musical uses. Required for inclusive use.

$T_{\text{Target,A4=}}(0.26\lg\frac{V}{\text{m3}}-0.14)$ s 30 m³≤ V <500 m³

A5 "Sport": In sports halls and swimming pools Multiple groups communicate (even at the same time) with different content.

$T_{\text{Target,A5}}=(0.75\lg\frac{V}{\text{m3}}-1.00)$ s 200 m³≤ V <10 000 m³

$T_{\text{Target,A5}}=2.0$ s V ≥10 000 m³

The following figure shows the Tolerance zone depending on the frequency (X-Axis).

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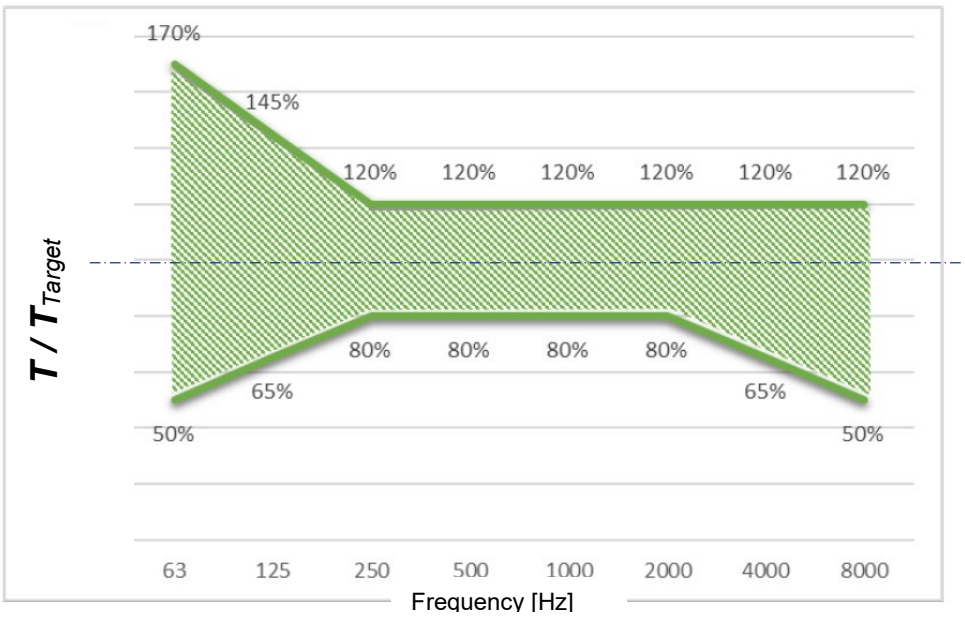


Figure 1: Tolerance range in % (illustration according to DIN18041)

A/V in the frequency range 250–2000 Hz - Requirements

Indicator 6. Rooms with special requirements for noise reduction and/or room acoustics comfort
(based on DIN 18041)

TYPE OF USE	DESCRIPTION	*A/V* M2/M3 BY ROOM HEIGHTS H ≤2.5 M	*A/V* M2/M3 BY ROOM HEIGHTS H >2.5 M
	Only for **Assembly buildings** – Type II		
"B2"	**Rooms for short term lingering** *Entrance halls, corridors, stairwells and similar circulation areas with quality of stay (reception area with waiting areas, etc.), showrooms, counter halls, and Changing rooms in sports halls*	$A/V \geq 0.15$	$A/V \geq [4.80+4.69 \ln (h/1\ m)]^{-1}$
"B3"	**Rooms for longer-term lingering:** *Exhibition rooms with interactivity or increased noise levels (multimedia, sound/video art, etc.), circulation areas in schools and day-care centres (kindergarten, crèche, after-school care centre, etc.), circulation areas in hospitals and care facilities (e.g. open waiting areas), patient waiting rooms, break rooms, bed rooms, quiet rooms, operating theatres, treatment rooms, examination rooms, consulting rooms, dining rooms, canteens, laboratories, libraries, sales rooms, Single-office*	$A/V \geq 0.20$	$A/V \geq [3.13+4.69 \ln (h/1\ m)]^{-1}$

	Rooms with need for noise reduction and room comfort:		
"B4"	*Reception/counter area with permanent workstation, laboratories with permanent workstation, lending areas in libraries, serving areas in canteens, residents' rooms in care facilities, citizens' offices, office*	$A/V \geq 0.25$	$A/V \geq [2.13+4.69 \ln (h/1\ \text{m})]^{-1}$
	Rooms with special need for noise reduction and room comfort		
"B5"	*Dining rooms and canteens in schools, daycare facilities (kindergarten, crèche, after-school care centre, etc.), hospitals and care facilities, work rooms with particularly high noise levels (e.g. workshops, workrooms, canteen kitchens, sculleries), call centres, control centres, security centres, intensive care areas, guard stations, exercise rooms in daycare facilities, play areas and changing rooms in schools and daycare facilities (kindergarten, crèche, after-school care centre, etc.).*	$A/V \geq 0.30$	$A/V \geq [1.47+4.69 \ln (h/1\ \text{m})]^{-1}$

A - the equivalent sound absorption surface of a room in square meters [m²]
V - the volume of a room in cubic meters [m³]
h - the light room height in meters [m]

SOC1.4

Visual comfort

Objective

Our objective is to ensure a sufficient and unimpeded supply of daylight and artificial lighting in all permanently used interiors. Visual comfort forms the basis for general well-being and efficient work and improved performance. Natural light has a positive effect on people's mental and physical health. In addition, good use of daylight offers a high energy-saving potential with regard to artificial lighting.

Benefits

User satisfaction is closely linked to the perception of comfort and well-being. The view is particularly important as it provides users with information about the time of day, the surroundings, weather conditions, etc. The productivity and satisfaction of users are strongly influenced by visual comfort.

Contribution to overarching sustainability goals



Outlook

Consistent importance and evaluation can be expected.

Share of total score

	SHARE	WEIGHTING FACTOR
Consumer market **Logistics** **Production**	**4.5%**	**2**
Shopping centre **Department stores**	**4.1%**	**2**
Office **Education** **Residential**	**3.5%**	**2**
Assembly buildings **Healthcare buildings**	**3.2%**	**2**
Hotel	**1.7%**	**1**

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EVALUATION

To ensure a sufficient and unimpeded supply of daylight and artificial light, visual comfort is assessed on a use-specific basis using six indicators. The availability of daylight in the entire building and at permanent workplaces is assessed using Indicators 1 and 2. Existing direct visual links to the outside are rewarded in Indicator 3. Indicator 4 evaluates the sun/anti-glare system in place. The artificial lighting conditions and the duration of exposure to daylight are evaluated in Indicators 5 to 6. A total of 100 regular points can be awarded in this criterion.

NO.	INDICATOR		POINTS
1	**Availability of daylight for the entire building**		
1.1	**Daylight supply**		
	Office **Education** **Assembly buildings**		**10–20**
	Residential **Hotel**		**20–40**
	Healthcare buildings		**8–20**
	50% of the usable area (UA) has an illuminance or daylight factor (DF) as per EN 17037 of:		
	■ a daylight factor of DF ≥1.0% or illuminance E_T ≥150 x	**Office** **Education**	10
		Assembly buildings	10
		Hotel **Residential**	20
		Healthcare buildings	8
	■ a daylight factor of DF ≥1.5% or illuminance E_T ≥200 lx	**Office** **Education**	14
		Assembly buildings	14
		Hotel **Residential**	30
		Healthcare buildings	15
	■ a daylight factor of DF ≥2.0% or illuminance E_T ≥300 lx	**Office** **Education**	20
		Assembly buildings	20
		Hotel **Residential**	40
		Healthcare buildings	20
	Consumer market		
	Areas exposed via side windows have at least a daylight factor DF ≥1.0% and areas exposed via skylights have at least a daylight factor DF ≥2.0%. The area exposed to daylight is obtained by combining all individual areas exposed to daylight.		**Max. 50**
	■ The combined area has the following proportions of the usable area (UA):		**15–35**
	■ A ≥15% of UA		15
	■ A ≥25% of UA		25
	■ A ≥50% of UA		35
	■ Uniformity of daylight supply to the area illuminated by skylights:		**+15**
	The distance between the centres of the skylights is no more than the clear ceiling height. Alternatively, the uniformity ($g_1 = D_{min}/D_{avgl}$) of the area exposed via skylights of more than 0.5 can be verified via a daylight simulation.		
	Shopping centre		
	Daylight factor DF of at least 2.0%		**10–40**
	■ A ≥15% of UA		10
	■ A ≥25% of UA		25
	■ A ≥50% of UA		40

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Department stores

Areas exposed via side windows have at least a daylight factor of 1.0% and areas exposed via skylights have at least a daylight factor DF ≥2.0%. The area exposed to daylight is obtained by combining all areas exposed to daylight. **10–40**

The combined area has the following proportions of the usable area (UA):

- A ≥5% of UA 10
- A ≥10% of UA 25
- A ≥15% of UA 40

Production **15–30**

50% of the usable area (UA) as per Annex 1 has an illuminance or a daylight factor DF as per EN 17037 of:

- Illuminance E_T ≥75 lx or daylight factor DF ≥0.5% 15
- Illuminance E_T ≥100 lx or daylight factor DF ≥0.75% 20
- Illuminance E_T ≥150 lx or daylight factor DF ≥1.0% 30

Does not apply for **logistics**

2 Daylight availability for permanent workplaces

2.1 Annual relative useful (motive) exposure

Office **Education** **Assembly buildings** Type I areas **8–20**

Logistics **Max. 30**

Logistics here: proportion involved in office work (max.15 points or distribution by share of office-based workplaces)

Healthcare buildings **6–15**

Annual relative useful exposure

- ≥45% (with documentation via simulation or calculation with detailed documentation of the obstruction index I_{VJ}) **Healthcare buildings** 6 / 8
- ≥60% (with documentation via simulation or calculation with detailed documentation of the obstruction index I_{VJ}) **Healthcare buildings** 10 / 12
- ≥75% (with documentation via simulation or calculation with detailed documentation of the obstruction index I_{VJ}) **Healthcare buildings** 15 / 20

Logistics here: Proportion involved in industrial work (max.15 points or distribution by share of industrial-based workplaces; max. 30 points if industrial work only) **6–15**

Assembly buildings Type II areas **8–20**

Translucent skylight portion of roof surface

- ≥0.5% **Logistics** 6 / **Assembly buildings** 8
- ≥2.0% **Logistics** 9 / **Assembly buildings** 15
- ≥4.0% **Logistics** 15 / **Assembly buildings** 20

Not applicable for **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Production site**

3 Visual contact with the outside

3.1 Availability of line of sight to the outside

Shopping centre **Department stores** **Max. 40**

Consumer market **Max. 18**

■ Direct visual link to the outside from all offices and direct visual link to the outside from at least 80% of all break and social rooms; at least quality level 'medium' according to EN 17037	**Shopping centre**	+10
	Department stores	+10
	Consumer market	+9
■ Share of open facade area (excluding shop facades in the mall) in the total net sales area 0% to 5%; at least quality level 'low' according to EN 17037	**Shopping centre** **Department stores**	+0–10
■ Shop areas with a direct visual link to the outside present; at least quality level 'low' according to EN 17037	**Shopping centre** **Department stores**	+10
■ Direct visual link from 0% to 50% of the façade area of the shop areas to the outside; at least quality level 'low' according to EN 17037	**Shopping centre** **Department stores**	+0–10
■ A direct visual link to the outside at all cashier workstations; at least quality level 'low' according to EN 17037	**Consumer market**	+9

Office **Education** **Hotel** **Logistics**

Assembly buildings Type I areas **Max. 20**

Residential **Max. 30**

Healthcare buildings **Max. 15**

■ Possibility of visual contact to outdoor areas; at least quality level 'low' according to EN 17037	**Residential**	10
	Office **Education**	8
	Hotel **Logistics**	8
	Assembly buildings	8
	Healthcare buildings	6
■ Possibility of visual contact to the outside in the direct field of vision at the workplace/from the living areas, hotel rooms or recreational areas; at least quality level 'medium' according to EN 17037	**Residential**	18
	Office **Education**	15
	Hotel **Logistics**	15
	Assembly buildings	15
	Healthcare buildings	10
■ Possibility of visual contact to the outside area in the direct field of vision at the workplace/ from the living areas or hotel rooms, recreational area (e.g. event room, foyer) even with closed glare/solar protection; at least quality level 'high' according to EN 17037	**Residential**	30
	Office **Education**	20
	Hotel **Logistics**	20
	Assembly buildings	20
	Healthcare buildings	15

Alternative for **Residential** **Hotel** **Healthcare buildings**

■ The maximum sill height is 0.95 m from the upper edge of the finished floor, the lintel height is at least 2.2 m from the upper edge of the finished floor and the width of the windows is at least 55% of the room width (dimensions of glazed area in each case).	**Residential**	18
	Hotel	15
	Healthcare buildings	10

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Assembly buildings Type II areas **Max. 20**

- Daylit visual link in the recreational areas, e.g. function room, foyer 8
- Possibility of visual contact from the common areas (e.g. event room, foyer) to the outside area; at least quality level 'low' in accordance with EN 17037 15
- Possibility of visual contact with the outside area in the direct field of vision of the common areas (e.g. event room, foyer); at least quality level 'low' according to EN 17037 20

Not applicable for **Production**

4 Absence of glare in daylight

4.1 Absence of glare due to solar/glare protection system

Office **Education**

Assembly buildings Type I areas

Assembly buildings Type II areas (variable) **Max. 20**

Healthcare buildings **Max. 10**

If solar/glare protection systems with different classifications are present at the same time, the higher classification is used for evaluation.

- The DGP is ≤0.45. An excess of <5% during the utilisation period is permissible.
  Office **Education** 10
  Assembly buildings Type I 10
  Healthcare buildings 6
- The DGP is ≤0.40. An excess of <5% during the utilisation period is permissible.
  Office **Education** 15
  Assembly buildings Type I 15
  Healthcare buildings 8
- The DGP is ≤0.35. An excess of <5% during the utilisation period is permissible.
  Office **Education** 20
  Assembly buildings Type I 20
  Healthcare buildings 10

Additionally for **Assembly buildings**, type II areas **(variable)**

- Light-directing systems present in combination with glare protection with direct light suppression 20

Alternatively:

- Use of roof skylights with a high diffuse northern light component (e.g. shed roof)

Consumer market 12

- Up to a room floor area of 600 m², the size of the areas intended as visual connections must be at least 1/10 of the room floor area. For larger rooms, the size of the visual connection must be at least 60 m².
- In addition, a distortion-free and colour-neutral view must be possible. Ra ≥ 90.

Logistics **Max. 20**

- Solar/glare protection system present (without further proof of quality as per EN 14501) 5
- Solar/glare protection system = Class 2 10
- Solar/glare protection system ≥ Class 3 20

Production 30

- Light-directing systems present in combination with glare protection with direct light suppression

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Alternatively

- Use of roof skylights with a high diffuse northern light component (e.g. shed roof)

Not applicable for **Residential** **Hotel** **Shopping centre** **Department stores**

5 Artificial lighting

5.1 Artificial lighting – Creation of a lighting concept

Office **Education** **Assembly buildings** **Consumer market** **Department stores**
Hotel **Healthcare buildings** **Shopping centre** 5
Logistics **Production** 10

- Creation of a lighting concept

Not applicable for **Residential**

5.2 Artificial lighting – Implementation of the planning concept and compliance with requirements

Office **Education** **Assembly buildings** **Consumer market** **Department stores**
Hotel **Healthcare buildings** **Shopping centre** **Max. 15**
Logistics **Max. 20**
Production **Max. 30**

The lighting requirements of EN 12464-1 are met. **+5**
Logistics **+5**
Production **+10**

At least two optimisation measures have been implemented. **+5**
Logistics **+10**
Production **+15**

Further optimisation measures have been implemented. **+5**
Logistics **+5**
Production **+5**

Not applicable for **Residential**

6 Exposure to daylight

6.1 Duration of exposure to daylight

Residential **5–30**

- Duration of exposure to daylight of at least one living space per residential unit is ≥1.5 h. 5
- Duration of exposure to daylight of at least one living space per residential unit is ≥2.0 h. 15
- Duration of exposure to daylight of at least one living space per residential unit is ≥3.0 h. 30

Hotel **Healthcare buildings** **8–20**

- Duration of exposure to daylight of 100% of the guest rental units (hotel) or patient rooms (healthcare buildings) is ≥1.5 h. 8
- Duration of exposure to daylight of 50% of the guest rental units (hotel) or patient rooms (healthcare buildings) is ≥2.0 h. 12
- Duration of exposure to daylight of 60% of the guest rental units (hotel) or patient rooms (healthcare buildings) is ≥2.0 h, and for the remaining 40%, the duration of exposure to daylight is ≥1.5 h. 16
- Duration of exposure to daylight of 60% of the guest rental units (hotel) or patient rooms (healthcare buildings) is ≥3.0 h, and for the remaining 40% the duration of exposure to daylight is ≥1.5 h. 20

Not applicable for **Office** **Education** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings**

SUSTAINABILITY REPORTING

The following information can be taken as key performance indicators (KPI) for the communication.

NO.	KEY METRICS/KPI	UNIT
KPI 1*	Daylight factor for 50% of the usable area	[%]
KPI 2*	Relative annual useful exposure	[%]
KPI 3	Duration of exposure to daylight with indication of number or proportion of rooms	[%]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Visual comfort in buildings makes an important contribution to an efficient and productive working and living environment and contributes significantly to a high level of user satisfaction.

II. Additional explanation

Visual comfort is achieved using balanced lighting without significant influences, such as direct and/or reflected glare, and also through sufficient lighting levels and individual adaptation to specific needs. User satisfaction is closely related to the perception of comfort and well-being. The view is particularly important as it provides users with information about the time of day, the surroundings, weather conditions, etc. Other criteria include freedom from glare, light distribution and light colour in the space. The requirements apply for both daylight and artificial lighting; the evaluation of the supply of daylight to the interior plays a particularly important role. A sufficient and unimpeded supply of daylight and artificial light must therefore be ensured in all permanently used indoor spaces.

III. Method

The usable area (UA) is determined based on DIN 277. The spaces to be considered in the criteria are specified by the use profile in Annex 1. Depending on the indicator, in some cases only the rooms in permanent use or the rooms with permanent workplaces need be evaluated; this information is listed below for each indicator.

Indicator 1: Availability of daylight for the entire building

The assessment of the daylight supply should consider the availability of daylight at the site and also the properties of the space. Influencing factors include, for example, external cladding, transmittance of the glazing and the reflectance of the interior surfaces of the room. The evaluation must be carried out in accordance with EN 17037. The daylight factor (DF) or alternatively the illuminance (ET) and the corresponding proportions of the usable area (UA) must be determined.

In the criterion, the permanently used rooms as per Annex 1 must be considered. In the case of **Offices** **Consumer markets** **Shopping centres** **Department stores** **Production ,** the usable areas specified in Annex 1 must be considered, including corridors in open-plan, group or combined offices that are directly connected to the workplaces. It is therefore not possible to classify the above-mentioned areas as circulation areas.

In the case of **Education ,** the usable floor area in Annex 1 must be considered, including corridors of offices, workspaces, etc. that are directly connected to the workplaces. It is therefore not possible to classify the abovementioned areas as circulation areas. Workshops or laboratories that require little or no daylight due to the typological requirements of the use of the spaces are excluded.

For **Assembly buildings ,** the usable floor area based on Annex 1 must be considered, excluding the areas that do not require daylight due to the typological requirements of the use of the spaces (such as cinema auditoria). A list of spaces with corresponding allocation and explanation of the spaces should be enclosed with the verification.

The availability of daylight for the entire building is demonstrated via the usable floor area (UA), which has at least a certain daylight factor or a certain illuminance level. When calculating the daylight factors, the following effects must be considered regardless of the chosen assessment method:

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- All external shading, e.g. by neighbouring buildings, topography, inner courtyard/atrium, plants/trees, etc.
- Reduction of the passage of daylight through the façade (light transmittance of the glazing, frame/glazing bars, dirt, incidence of radiation)

Method 1: Determination by means of daylight simulations and/or calculations

When determining the daylight factors by means of daylight simulations to EN 17037, not all rooms need be simulated; it is sufficient if a few representative rooms are simulated and the results are transferred to the remaining rooms of the UA by means of reasonable interpolation.

Calculation using the simplified method from DIN V 18599-4

I. Division of the rooms (zones) that are to be allocated to UA into:

a) Area supplied with daylight A_{DL}

b) Area not supplied with daylight A_{NDL}

The following applies to all rooms in the usable area (UA) (see below): $A_{TOT} = A_{DL} + A_{NDL}$

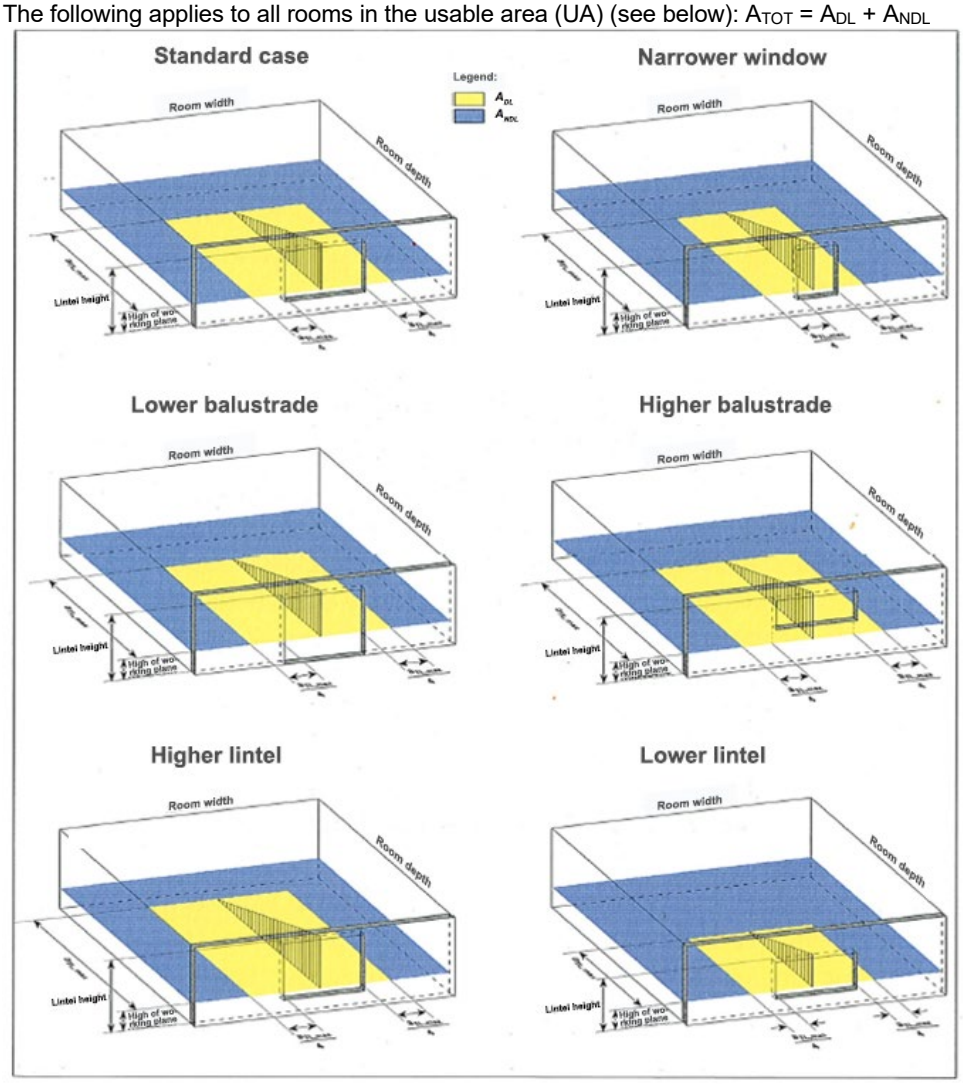


Fig. 4–21: Illustration of the effect of the window width and the lintel/ balustrade height on the area supplied with daylight

© *Heizen, Kühlen, Belüften & Beleuchten* – Bilanzierungsgrundlagen zur DIN V 18599 [Heating, cooling, ventilating and lighting – Fundamentals of balancing for DIN V 18599]; David, de Boer, Erhorn, Reiß, Rouvel, Schiller, Weiß, Wenning, published by Fraunhofer IRB Verlag, 2006, ISBN-13: 9-783-8167-7024-4

II. Reduction of the daylight factor D_{Rb} from the DIN V 18599 calculation

c) Use of the daylight factor D_{Rb} from the DIN V 18599 calculation, which only applies for openings in the structural work.

d) Use of the approximated effective light transmittance $\tau_{eff,SNA}$ from the DIN V 18599 calculation.

e) Assessment of the actual effective daylight factor D_{eff}, taking into account reduction due to glazing, frames/-sash bars, dirt, and non-vertical angle of incidence of sunlight, using the following equation:
$D_{eff} = D_{Rb} \cdot \tau_{eff,SNA}$

f) The obstruction index I_{Vj} must be determined in detail in accordance with DIN V 18599-4 (at least by storey or appropriate façade sections) and is incorporated into the assessment of D_{Rb}.
The lump sum approach to the obstruction index $I_{Vj} = 0.9$ – permitted in accordance with the EPC – does not adequately represent the actual shading in most cases and is therefore not permitted for the documentation of this indicator.

This effective daylight factor D_{eff} applies in accordance with the country-specific EPC, as an average value along the axis at half of the depth of the area supplied with daylight, parallel to the façade area under consideration (see below):

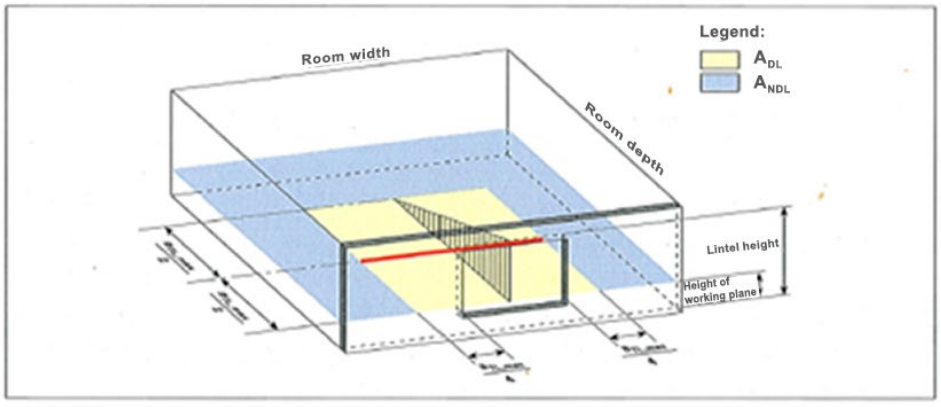


Fig. 4–28: Diagram of the check location for determining the daylight factor

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I. Assessment of the portion $A_{1.0\%/1.5\%/2.0\%,j}$ of the area supplied with daylight A_{DL} in the room j that has a daylight factor of at least 1.0%/1.5%/2.0%, via linear **interpolation** of the depth of the area supplied with daylight $a_{1.0\%/1.5\%/2.0\%,j}$ that has a daylight factor of at least 1.0%/1.5%/2.0%:

$$a_{1,0\%,j} = \frac{a_{TL}}{2} + \frac{a_{TL}}{2} \cdot \left(\frac{D_{eff} - 1{,}0\%}{D_{eff}} \right)$$

$$a_{1,5\%,j} = \frac{a_{TL}}{2} + \frac{a_{TL}}{2} \cdot \left(\frac{D_{eff} - 1{,}5\%}{D_{eff}} \right)$$

$$a_{2,0\%,j} = \frac{a_{TL}}{2} + \frac{a_{TL}}{2} \cdot \left(\frac{D_{eff} - 2{,}0\%}{D_{eff}} \right)$$

II. The relevant depth of the area supplied with daylight $a_{1.0\%/1.5\%/2.0\%,j}$, which has a daylight factor of at least 1.0%/1.5%/2.0%, can be used together with the width of the area supplied with daylight $b_{DL,j}$ to derive the area in the room *j* with this daylight factor as a minimum:

$$A_{1.0\%,j} = a_{1.0\%,j} \cdot b_{DL,j}$$

$$A_{1.5\%,j} = a_{1.5\%,j} \cdot b_{DL,j}$$

$$A_{2.0\%,j} = a_{2.0\%,j} \cdot b_{DL,j}$$

III. Assessment of the portion of the total UA in the building that has a daylight factor of at least 1.0%/1.5%/2.0% by simply determining the sum of the relevant partial areas $A_{1.0\%/1.5\%/2.0\%,j}$ across all *n* rooms in the building that must be allocated to UA, that is to be taken into account, meaning that the following equations apply:

$$A_{UA,1.0\%}=\sum_{j=1}^{n} A_{1.0\%,j}$$
$$A_{UA,1.5\%}=\sum_{j=1}^{n} A_{1.5\%,j}$$
$$A_{UA,2.0\%}=\sum_{j=1}^{n} A_{2.0\%,j}$$

The relevant partial area with a daylight factor of at least 1.0%/1.5%/2.0% is then compared to 50% of the usable area of the building, and the result can be classified in accordance with the evaluation table.

Assessment via daylight simulations:
When using daylight simulations to assess the daylight factor, it is not necessary to simulate all rooms within UA; it is sufficient to simulate a few representative rooms and apply the results to the remaining rooms in UA via appropriate interpolation.

Method 2: Determination by means of daylight measurements
Under EN 17037 (alternatively DIN 5034), the daylight factors must always be measured when the sky is completely overcast. Similarly to the daylight simulations, not all rooms need be measured; it is sufficient for the daylight factors to be measured in a few representative rooms and the results transferred to the remaining rooms of the UA by means of reasonable interpolation.

Indicator 2: Daylight availability for permanent workplaces

For workplaces, an additional requirement applies with regard to the fulfilment of visual tasks. This is considered by applying the required illuminance. The daylight availability is determined by the temporal weighting of the orientation-dependent occurrence of the two different façade states, i.e. solar and/or glare protection not activated and solar and/or glare protection activated. The anti-glare shields must be activated when the façade is exposed to sunlight.

This criterion considers the permanently used workplaces as per Annex 1.
In the case of **Office** **Education** **Logistics** **Assembly buildings,** the usable floor areas as per Annex 1, including corridors in open-plan, group or combined offices etc., that cannot be converted to workplaces and by contrast to Indicator 1 cannot be assigned to the usable floor area being examined, are considered to be circulation areas. This applies if the corridors

- have a reduced ceiling height compared to the surrounding office (cavities for supply ducts) and
- have a different artificial light source (corridor lighting instead of office lighting) and
- demonstrably cannot be used as workplaces.

Clear documentary evidence is required for these cases.

The methods listed below are generally permissible for determining the relative annual useful exposure. Since DIN V 18599-4 does not consider shading by trees or vegetation, but these do reduce daylight incidence, daylight simulations should be used as a verification method if shading by trees or vegetation is actually planned or present.

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If the simplified procedure stated in DIN V 18599-4 is used, planting should be treated conservatively as a daylight reduction factor (applying the maximum height and width of the planting as building dimensions).

Calculation using the simplified procedure from DIN V 18599-4
If the relative annual useful lighting is verified with the help of DIN V 18599-4, the daylight supply factor $C_{DL,suppl}$ must first be calculated for this. In this case, the daylight reduction factor I_{Vj} must be determined in detail according to DIN V 18599-4 and included in the determination of the daylight supply factor $C_{DL,suppl}$ or the daylight factor of the shell opening D_{Rb}.
The flat-rate application – permissible for EPC – of the daylight reduction factor I_{Vj} = 0.9 does not adequately represent the actual shading in most cases and therefore involves a significant deduction of points for verification of this indicator.
If there are partial areas in the rooms with permanent workplaces that are not supplied with daylight according to DIN V 18599-4 (i.e. the area with daylight is smaller than the floor area of the rooms), the area not supplied with daylight must be accounted for in the area-weighted averaging of the daylight supply factor with an annual relative useful exposure of 0%.
Since the daylight supply factor $C_{DL,suppl}$ specified in DIN V 18599-4 refers exclusively to the so-called daytime hours (= time of use during which daylight is available), whereas the relative annual useful exposure according to DIN 5034 covers the entire time of use (irrespective of whether daylight is available), the area-averaged daylight supply factor $C_{DL,suppl}$ must therefore be corrected using the day and night hours according to DIN V 18599-10, Annex A, as follows:

$$H_{use,rel} = C_{DL,supp,j} \times \frac{t_{day}}{t_{day} + t_{night}}$$

$H_{use,rel}$: relative, annual useful exposure as per DIN 5034
$C_{DL,supp,j}$: daylight supply factor as per DIN V 18599-4
t_{day}: annual hours of use during the day as per DIN V 18599
t_{night}: annual hours of use at night as per DIN V 18599

For this correction, the annual hours of use during daytime and nighttime as per DIN V 18599-10, Annex A should be used; these are calculated for the site of the construction project and the expected hours of use (= normal working hours, e.g. weekdays 08:00–18:00) in accordance with DIN V 18599-10, Annex A. The relative annual useful exposure $H_{use,rel}$ determined in this way forms the basis for the evaluation of this indicator.

Daylight simulation
When determining the relative, annual useful exposure by means of daylight simulations, not all rooms need be simulated; it is sufficient for a few representative rooms to be simulated and the results transferred to the remaining rooms of the UA by means of reasonable interpolation.

Indicator 3: Visual contact with the outside

The visual connection to the outside must be determined qualitatively by evaluating the view according to EN 17037. As a reference point, choose a position appropriate to the use (height: 1.20 m for sitting position, 1.70 m for standing position or depending on use). The spaces examined should be representative. These representative spaces must be chosen in such a way that 95% of the areas correspond to the quality level assessed. The areas considered include all permanently used rooms as per Annex 1. For **Consumer market** **Shopping centre** **Department stores**, the rooms are evaluated separately depending on their use. For social and break rooms, 80% of the area must correspond to the assessed quality level.

The outward view is divided into three different levels: sky, landscape and ground. The quality of the view depends on the size of the daylight opening, the width of the view, the external viewing distance and the number of levels and quality of the surrounding information. In addition, for views that are glazed, it must be ensured that the view through the glazing is perceived as clear, undistorted and colour-neutral.

To achieve the highest score, the glare or solar protection must be taken into account. If shading and glare protection systems with different classifications are present at the same time, they are evaluated according to the less favourable classification. The class of solar/glare protection with regard to visual contact with the outside is determined using DIN EN 14501, Table 9.

Table 1: TABLE 1 Class of solar/glare protection with regard to visual contact with the outside

PERPENDICULAR/PERPENDICULAR LIGHT TRANSMITTANCE	PERPENDICULAR/DIFFUSE FRACTION OF LIGHT TRANSMITTANCE		
	$0 < \tau_{v,n\text{-}dif} \leq 0.04$	$0.04 < \tau_{v,n\text{-}dif} \leq 0.15$	$\tau_{v,n\text{-}dif} \leq 0.15$
$\tau_{v,n\text{-}n} > 0.10$	4	3	2
$0.05 < \tau_{v,n\text{-}n} \leq 0.10$	3	2	1
$0.00 < \tau_{v,n\text{-}n} \leq 0.05$	2	1	0
$\tau_{v,n\text{-}n} = 0.00$	0	0	0

When designing solar/glare protection with horizontal slats, the following angles should be used as a basis for determining the degrees of light transmission:

- Normal incidence of radiation from the sun (analogous to screens)
- Tilt angle of movable slats: maximum opening angle (horizontal)
- Angle of inclination of rigid slats: as installed

When designing solar/glare protection with vertical slats, the following angles should be used as a basis for determining the degrees of light transmission:

- Normal incidence of radiation from the sun (analogous to screens)
- Rotation angle of rotatable slats: maximum opening angle (vertical)
- Angle of rotation of rigid slats: as installed

Residential **Hotel** **Healthcare buildings**

Alternatively, for living spaces, the visual connection to the outside can also be verified using window sizes on the basis of DIN 5034. The dimensions refer to the finished dimensions (finished floor, plaster) up to the glazed area (frames are ignored):

- Sill height: maximum 0.95 m from the upper edge of the finished floor, and for care rooms of bedridden persons, to a maximum of 0.70 m from the upper edge of the finished floor,
- Lintel height at least 2.2 m from the upper edge of the finished floor
- Width of the windows is at least 55% of the room width

For **Hotel** **Healthcare buildings**, only the living spaces can be verified using the window size (on the basis of DIN 5034). This alternative does not apply to the other rooms. For scoring, the lower score achieved is then applied for the entire building.

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Indicator 4: Absence of glare in daylight

Glare is evaluated by means of the daylight glare probability (DGP) according to EN 17037. The simplified assessment procedure in E.3.2 or measurement on site may be used. The position chosen for the reference point should be appropriate to the use. If there are multiple possible positions, the least favourable should be assessed. The spaces examined should be representative. These representative spaces must be chosen in such a way that 95% of the areas correspond to the quality level assessed. The daylight glare probability can only be measured for laterally lit interiors, not for horizontally lit interiors and not for sales rooms, sports halls or areas a large distance from the daylight opening and thus cannot be verified for these room types either.

For **Consumer market**, compliance with glare-free conditions must be verified using the occupational health and national safety guideline, and in the case of **Production**, the light component must be shown if skylights are used or described with the glare protection system. For **Logistics**, only the existing solar/glare protection is assessed according to EN 140501.

The shading and/or glare protection must be classified with regard to the glare protection function as per EN 14501. The class of solar control/glare protection in regard to freedom from glare is determined on the basis of Table 7.

Table 2: Class of solar/glare protection with regard to freedom from glare

PERPENDICULAR/DIFFUSE PORTION OF LIGHT TRANSMITTANCE LEVEL	PERPENDICULAR/ PERPENDICULAR LIGHT TRANSMITTANCE				
	$\tau_{v,n\text{-}n} = 0.0$	$0.00 < \tau_{v,n\text{-}n} \leq 0.01$	$0.01 < \tau_{v,n\text{-}n} \leqslant 0.02$	$0.02 < \tau_{v,n\text{-}n} \leqslant 0.03$	$0.03 < \tau_{v,n\text{-}n} \leqslant 0.05$
$\tau_{v,n\text{-}dif} \leqslant 0.03$	4	4	3	3	1
$0.03 < \tau_{v,n\text{-}dif} \leqslant 0.06$	4	3	2	2	1
$0.06 < \tau_{v,n\text{-}dif} \leqslant 0.10$	4	3	2	1	0
$0.10 < \tau_{v,n\text{-}dif} \leqslant 0.15$	3	2	1	1	0
$0.15 < \tau_{v,n\text{-}dif} \leqslant 0.20$	2	2	1	1	0
$0.20 < \tau_{v,n\text{-}dif} \leqslant 0.25$	1	1	0	0	0

When designing solar/glare protection in the form of horizontal slats, the following angles should be used as a basis for determining the degrees of light transmission:

- Normal incidence of radiation from the sun (analogous to screens)
- Tilt angle of movable slats: maximum closing angle (approx. 70° to 75°)
- Angle of inclination of rigid slats: as installed

When designing solar/glare protection in the form of vertical slats, the following angles should be used as a basis for determining the degrees of light transmission:

- Normal incidence of radiation from the sun (analogous to screens)
- Rotation angle of rotatable slats: maximum closing angle
- Angle of rotation of rigid slats: as installed

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The areas to be considered are rooms with permanent workplaces where activities such as reading, writing or using display devices take place, as per Annex 1.

Indicator 5: Artificial lighting

Indicator 5.1 Artificial lighting – Creation of a lighting concept

A lighting concept on the basis of EN 12464-1 must be drawn up as required for the task and activity area. The following points should be addressed:

- Luminance distribution
- Illuminance
- Glare
- Light direction and spatial lighting
- Colour rendering and light colour
- Flicker
- Variability of light

In doing so, the values specified under EN 12464-1 must be named, measures for optimisation indicated and target values defined.

Illuminance:
The information on illuminance in national workplace guideline (if available) and EN 12464-1 are minimum requirements/recommendations. To evaluate illuminance, the designed illuminance and the adaptability (e.g. dimmability of the lighting) to visual tasks and to the occupancy of the room must be considered. In addition, the use of daylight (e.g. daylight control) must be assessed and the surroundings (room, surrounding surfaces, etc.) must be considered.

Energy efficiency:
When drawing up the lighting concept, energy efficiency measures must be addressed and the determination of the maintenance factor of the lighting f_m and possible controls or regulations (e.g. daylight control, presence detectors, dimmers) must be named and evaluated.

Variability of light:
Changing illuminance levels, depending on the time of day and season, and different colour temperatures and spectra contribute to improving people's sense of well-being. Here, for rooms with longer dwell times (classrooms, offices, workrooms, healthcare rooms, etc.), the strength and timing of light exposure and the spectral light distribution must be addressed.

If only partial areas are considered, the evaluation can be area-weighted.

Indicator 5.2: Artificial lighting – Implementation of the planning concept and compliance with requirements

The requirements of EN 12464-1 and national workplace guideline (if available) must be complied with.

- Illuminance
  Minimum requirement under national workplace guideline and EN 12464-1
- Colour rendering
  Colour rendering index as per workplace guideline (national); if no information is available, as per EN 12464-1, whereby a colour rendering index of R_a = 40 must be extensively justified.
- Uniformity of illuminance
  The minimum values given in EN 12464-1 must be met. For rooms without windows that have only skylights or purely artificial lighting, the background range must not fall short of U_0 > 0.10.
- Freedom of glare with artificial light – UGR value

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The glare caused by artificial light is evaluated via the UGR value (unified glare rating). The lower this value, the lower the psychological glare. The following procedures are permissible for demonstrating that the limit values are not exceeded:

- Artificial light simulation
  For selected, representative spaces, the UGR value (unified glare rating) is calculated using artificial light simulations and evaluated according to EN 12464-1.
- Product data sheets with UGR values
  Verification of glare limitation in accordance with EN 12464-1 using the table method by means of product data sheets with UGR values. If there are multiple luminaires, the evaluation of the luminaire with the highest UGR value is sufficient. If the spatial situation deviates significantly from that of the table procedure, a further evaluation of the values should be performed by a specialist planner. Reference should be made to the installation situation, the luminaires and the room. The same applies in the case of lighting systems (instead of a single luminaire).
- Assessment by sampling the luminaires (this must be documented in a verifiable manner)
- Rooms that are indirectly illuminated (proportion >65%) do not need to be considered.

If measures from the design concept (Indicator 5.1) that bring added value for the users or increase energy efficiency are implemented, this is assessed positively. If only partial areas are considered, the evaluation can be area-weighted. The areas to be considered according to Annex 1:
for **Office** **Education** **Logistics** **Production site** **Shopping centre** **Department stores,**
rooms in constant use;
for **Logistics** **Production site** **Hotel**,
workplaces in constant use and;
for **Consumer market,**
at least 80% of the total useable space to be verified and at least 80% of the permanent workplaces.

Indicator 6: Exposure to sunlight

For **Residential** **Hotel** **Healthcare buildings**, the duration of exposure to sunlight of the windows (of living spaces, guest rooms, patient rooms) for one day in the period from 1 February to 21 March is determined using suitable shading calculations based on EN 17037, Annex D. All external shading, e.g. from neighbouring buildings, topography, inner courtyard/atrium, planting and trees, etc., must be taken into account.

The areas to be considered are permanently used spaces according to Annex 1. The spaces examined should be representative. For **Residential ,** the quality requirement is at least one living space per dwelling unit. In the case of residential buildings with predominantly 1-room apartments/flats (e.g. halls of residence), the requirements apply to at least 80% of the units. For **Hotel,** only the guest rooms and for **Healthcare buildings** only the patient rooms must be evaluated.

Indicator 7: Daylight colour rendering

The colour rendering index Ra for the combination of glazing and solar radiation/glare protection must be determined for all daylit areas in constant use.

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IV. Scheme-specific description

In Annex 1, the areas to be considered, usable floor areas (UA) 1 to 7 (according to Annex 1, DIN 277), are assigned to the respective usage profiles and the areas relevant in the relevant indicators are marked with an x. Usable areas that do not require daylight, e.g. due to the typological requirements of the use, such as cinema auditoria, are excluded.

Hotel

Indicator 2 and 4:

These indicators are not evaluated.

Residential

Indicator 1: Availability of daylight for the entire building

The verification must be carried out for living spaces in accordance with Annex 1.

Indicator 2 and 4, and 5:

These indicators are not evaluated.

Consumer market **Shopping centre** **Department stores**

Visual comfort also plays a major role in retail buildings, even if the lighting requirements are fundamentally different from those in office buildings, for example. The energy demand for artificial lighting is usually very high. With increased use of daylight, employee satisfaction can be increased and energy savings made. In addition, studies have clearly shown that daylight illumination in retail buildings has positive effects on purchasing behaviour. To benefit both groups of users, employees and customers, Indicator 3 distinguishes between different areas of use within retail buildings (e.g. offices, cashier workplaces, social rooms, shop areas). The distinguishing criterion is primarily whether a given area is a permanent workplace.

Permanent workplace:

Permanent workplaces include, for example, sales areas, offices, kitchens, cash desks, and customer services areas. For employees, visual comfort forms the basis for efficient and productive work and contributes to well-being. For psychological and physiological reasons, daylight is always preferable to artificial light. The use of daylight also creates a link to the outside world.

Customer areas:

For customers, visual comfort is also decisive for their well-being and thus also influences the length of time they spend in the space. Studies have identified increased purchasing activity in daylit retail buildings, thus demonstrating a positive impact in monetary terms as well. Furthermore, accent lighting represents an important aid to orientation within the building/shop for the customer. A sensible lighting design must be ensured, including daylight and artificial light, that takes into account energetic, physiological and functional aspects.

Indicator 2 and 6:

These indicators are not evaluated.

Indicator 3: Visual contact with the outside

Visual contact with the outside is determined according to the floor plan. The quality of the view should be documented by means of photographs. This is the case for all cashier workstations where the line of sight to a window or glazed door is not obstructed by permanent fixtures. Transparent internal walls or open staircases (e.g. escalators) are not considered disruptive elements here. Windows or doors that serve to provide a view to the outside must be transparent and be between 1 m and 2.2 m in height.

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Mall areas:
All publicly accessible, i.e. non-lockable, areas of the shopping street including food areas, open sales areas and open stairs must be taken into account. Ancillary areas can be disregarded if reasonably justified by the auditor.

Rental areas:
All rentable floor areas listed in Annex 1 are treated as 'rental floor areas'. Tenant fit-outs including light partition walls can be ignored.

Logistics
The visual comfort requirements for office and industrial spaces vary.

Indicator 1 and 6:
These indicators are not evaluated.

Indicator 2: Daylight availability for permanent workplaces
For ≥400 m² office floor space (usable area as specified in Annex 1, DIN 277) or ≥20 permanent workplaces, visual comfort must be considered for both office and industrial spaces.

Two alternative approaches are possible for the evaluation:

1. Procedure with predefined weighting: A maximum of 15 points can be achieved for office workplaces, and a maximum of 15 points for industrial workplaces. The maximum total score is 30 and is independent of the quantity and type of workplaces.
2. Procedure with weighting depending on the actual proportions of office and industrial workplaces. The maximum number of points is also 30. The calculation is performed as indicated below:

Number of office workplaces ≥15% of total workplaces or ≥20 permanent office workplaces present:

Evaluation is partly office and partly industrial

In the evaluation, the proportion of office and that of the industrial part should be considered in the individual indicators.

$$\text{Total points} = (\text{points for office part} \times \frac{number\ of\ office\ workplaces}{total\ number\ of\ workplaces} + \text{points for industrial part} \times \frac{number\ of\ industrial\ workplaces}{total\ number\ of\ workplaces}) \times 2$$

Number of office workplaces <15% of total workplaces and <20 permanent workplaces present:

Evaluation based on the industrial part

For the evaluation of Indicator 2.1, only the industry part is considered; the maximum score is 30:

Total points = points for industrial part

In the warehouse area of logistics buildings, daylight is only possible to a small extent via the outer walls due to the size of the halls. For this reason, the halls are supplied with daylight via skylights, if at all. Smaller surface areas are compensated for by the much higher light yield of skylights compared to that of vertical windows (approx. 4 times). The problem of unwanted heat input and UV exposure of the stored goods can be compensated by not placing skylights in the shelving areas, where there are no permanent workplaces, but concentrated in the picking area and comparable permanent workplaces.

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Assembly buildings

Area allocation: In the case of assembly buildings, the areas as per Annex 1 are allocated to the following types and evaluated on an area-weighted basis:

Type I areas:

- Workplaces in administration offices UA 2 – Office work (as per Annex 1, DIN 277)
- Event rooms or work rooms with comparable visual tasks to those of offices, but which are assigned according to UA 5 (Annex 1, DIN 277) – Education, school and cultural spaces (e.g. lecture halls, seminar rooms, work rooms, library rooms, reading rooms). Foyer areas that are also used as event areas are assigned to this type.

Type II areas:

- Areas considered here are event spaces such as exhibition spaces (in museums, galleries, etc.) and trade fair halls, which due to their primary use admit little or no daylight and due to their use have large room volumes (hall character) and for which daylight can only be reasonably obtained to a small extent via the exterior walls. Rooms that do not require daylight due to the typological requirements of their use (such as cinema auditoria) need not be considered.

Indicator 2: Daylight availability for permanent workplaces

Evaluation:

- Type I areas: Use of the method appropriate to **Education** via ‘annual relative useful exposure’
- Type II areas: Use of the method appropriate to **Logistics** on the basis of the ‘translucent skylight portion of the roof surface’
- If no allocation to Type I or Type II is given, all areas should be considered according to Annex 1.

Indicator 3: Visual contact with the outside

The visual contact of all areas to the outside represents an optimum condition for the visual comfort of an assembly building. In areas where visual contact with the outside is not possible, it is considered a positive if a daylight reference is created, e.g. through window strips, so that times of day and lighting conditions can be recognised. In the case of assembly buildings whose primary use does not allow permanent daylighting (e.g. concert halls and cinemas), it is nevertheless considered a positive in terms of flexibility of use if temporary daylighting can be used, e.g. in the foyer. For assembly buildings, areas are assigned to types by use as per Indicator 2 and evaluated on an area-weighted basis. The visual contact with the outside is determined according to the floor plan; the quality of the view is documented using photos. The class of solar/glare protection with regard to visual contact with the outside is based on EN 14501, Table 9, on the perpendicular-perpendicular light transmittance $\tau_{v,n\text{-}n}$ and the diffuse proportion of the light transmittance $\tau_{v,n\text{-}dif}$ (see Method).

Indicator 4: Absence of glare in daylight

In the case of assembly buildings, the areas are assigned to the following types (as per Indicator 1) by type of use and are evaluated on an area-weighted basis.

- For type I areas, compliance with the daylight glare probability requirement of EN 17037 must be demonstrated. The shading and/or glare protection must be classified with regard to the glare protection function as per EN14501 (see Method).
- For Type II areas, the presence of light-directing systems in combination with glare protection and direct light suppression, or skylights with a high diffuse northern light component, is viewed positively.
- Variable: For buildings that can be assumed to be glare-free due to their type of use, this indicator can be set to ‘not relevant’.

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Indicator 6: Exposure to sunlight

This indicator is not evaluated.

Healthcare buildings

Visual comfort in healthcare buildings provides the basis for an efficient and productive working environment for the staff. At the same time, the healing processes of patients are significantly influenced by natural and artificial lighting conditions.

Indicator 5: Artificial lighting

The lighting requirements of EN 12464-1 must be met for all rooms. This also applies to areas used for examinations and treatments with high demands, e.g. operating rooms, delivery rooms.

Office

Indicator 6: Exposure to sunlight

This indicator is not evaluated.

Education

Indicator 6: Exposure to sunlight

This indicator is not evaluated.

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APPENDIX B - EVIDENCE

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

As per Annex 2: 'Permissible verification procedure'

Indicator 1: Availability of daylight for the entire building

- Principles and result of the daylight simulation performed as per DIN EN 17037
- Measurement protocol of the daylighting measurements performed
- Calculation using the simplified procedure of DIN V 18599-4

Additionally for **assembly buildings:**

- List of areas, usable floor areas (UA) 1 to 7 as per DIN 277, with allocation and explanation of any areas not considered

Indicator 2: Daylight availability for permanent workplaces

- Principles and result of the daylight simulation performed
- Calculation using the simplified procedure of DIN V 18599-4
- In the case of corridors that cannot be converted into workplaces, clearly verifiable documentation must be kept, e.g. by means of photos, detailed plans, lighting concepts.

Additionally for **assembly buildings:**

- List of areas incl. area allocations type I and II and presentation of the area-weighted evaluation and explanation of any areas not considered

Indicator 3: Visual contact with the outside

- Indication of the area of use and the reference point chosen for the evaluation
- Determination of the horizontal angle of view
- Determination of the external visibility range
- Photo documentation of the visible levels (sky, landscape, ground) by means of appropriate plans
- Classification of the installed solar/glare protection based on EN 14501
- Data sheets of the installed solar/glare protection systems
- Photo documentation of the solar/glare protection systems

Indicator 4: Absence of glare in daylight

- Indication of the area of use and the reference point chosen for the evaluation
- Calculation of the daylight glare probability (DGP)
- Classification of the installed solar/glare protection based on EN 14501
- Data sheets of the installed solar/glare protection system

Additionally for **assembly buildings:**

- List of areas incl. area allocations type I and II and presentation of the area-weighted evaluation

Explanation of any areas not considered

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Indicator 5: Artificial lighting

- Lighting concept with detailed description of measures taking into account ARS A 3.4 and DIN EN 12464-1
- Principles and results of the artificial lighting calculations and/or simulations carried out
- Product data sheets with colour rendering
- Product data sheets with UGR values
- Spectral measurement of the light composition
- List of areas where area-weighted evaluation is used
- Evidence of the optimisation measures implemented

Indicator 6: Exposure to sunlight

- Evidence of representative number of spaces (guest rooms/living spaces/patient rooms)
- Floor plans, sections, site plan
- Solar progression chart
- Calculation of duration of exposure to daylight

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APPENDIX C - LITERATURE

I. Version

Change log based on 2026 version

PAGE	EXPLANATION	DATE

II. Literature

- DIN V 18599-4: Energy efficiency of buildings – Calculation of the net, final and primary energy demand for heating, cooling, ventilation, domestic hot water and lighting – Part 4: Net and final energy demand for lighting. Berlin: Beuth Verlag. September 2018
- DIN 5034-1: Daylight in interiors – Part 1: Terms and minimum requirements. Berlin: Beuth Verlag. August 2021
- DIN 5034-2: Daylight in interiors – Part 2: Principles. Berlin: Beuth Verlag. August 2021
- DIN 5034-3: Daylight in interiors. Berlin: Beuth Verlag. August 2021
- EN 12464-1: Light and lighting - Lighting of work places – Part 1: Indoor work places. November 2021
- ISO 52022-1: Energy performance of buildings – Thermal, solar and daylight properties of building components and elements – Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing. January 2018
- EN 17037 Daylight in buildings. May 2022
- ArbStättV. Workplaces Ordinance (Arbeitsstättenverordnung - ArbStättV). 12.08.2004; last amended December 2022
- ABR A3.5 Beleuchtung. April 2011, Last amended GMBI 2022
- VDI 6011 Sheet 1: Lighting technology – Optimisation of daylight use and artificial lighting. Düsseldorf: Verein Deutscher Ingenieure e. V. July 2016
- EN 14501 Blinds and shutters – Thermal and visual comfort – Performance characteristics and classification. September 2021
- DIN EN 13363 Part 2: Solar protection devices combined with glazing – Calculation of total solar energy transmittance and light transmittance – Part 2: Detailed calculation method; German version EN 13363-2:2005. Berlin: Beuth Verlag. June 2005 incl. DIN EN 13363-2 Corrigendum 1 published April 2007
- DIN 6169: Colour rendering. Berlin: Beuth Verlag. February 1976

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ANNEX 1

Areas to be considered for usage profiles

SCHEMA	USE GROUP	FLOOR SPACE AND ROOMS	INDICATOR					
			1	2	3	4	5	6
Office								
NEW CONSTRUCTION OFFICE AND ADMINISTRATIVE BUILDINGS	1_Residential and stay (part of social spaces) (UA 1)	Common rooms Break rooms Waiting rooms Dining areas	x		x		x	
	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x	x	x	x	x	
Residential								
NEW CONSTRUCTION RESIDENTIAL BUILDINGS	1_Residential and stay (UA 1)	Living spaces Common rooms Break rooms Waiting rooms Dining areas	x		x			x
Education								
NEW CONSTRUCTI	1_Residential and stay (UA 1) (part of social spaces)	Common rooms Break rooms Waiting rooms Dining areas	x		x		x	

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	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x	x	x	x	x	
	3_Production, manual and machine work, research and development (UA 3) (Industrial work part)	Workshops (if permanent workplaces) Technological laboratories Physical, physical-technical, electrical engineering laboratories Chemical, bacteriological, morphological laboratories	x	x	x	x	x	
	5_Education, teaching and culture (UA 5)	Teaching and practice rooms, lecture halls, seminar rooms, workshops, practical training rooms, library rooms, reading rooms, sports areas, gymnastics areas, auditoriums (in cinemas, theatres, sports halls, etc.), stage rooms, studio rooms, rehearsal rooms, exhibition rooms (in museums, galleries, etc.), sacred spaces	x	x	x	x	x	

Department stores **Consumer markets** **Shopping centre**

NEW CONSTRUCTION RETAIL BUILDINGS	1_Residential and stay (part of social spaces) (UA 1)	Common rooms Break rooms Waiting rooms Dining areas	x		x		x	
	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x		x	(x)	x	
	4_Storeage, distribution and sales (UA 4)	Sales areas (cash desk workstations) Measuring rooms (workplaces)	x		x	(x)	x	

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Hotel

NEW CONSTRUCTION HOTEL BUILDING	1_Residential and stay (NFU 1)	Living spaces (guest rooms) Common rooms Break rooms Waiting rooms Dining areas	x		x		x	x
	2_Office work (Administrative part) (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x		x		x	

Production site

NEW CONSTRUCTION INDUSTRIAL BUILDINGS	1_Residential and stay (UA 1) (part of social spaces)	Common rooms Break rooms Waiting rooms Dining areas	x				x	
	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x			x	x	
	3. Production, manual and machine work, research and development (UA 3) (Industrial work part)	Factory halls (if permanent workplaces) Workshops (if permanent workplaces) Laboratories	x			x	x	
	4_Storeage, distribution and sales (UA 4) (Industrial work part)	Storage areas Archives, collection rooms Receipt and issuing areas (also includes picking areas) (where these are permanent workplaces)	x			x	x	

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Logistics

NEW CONSTRUCTION INDUSTRIAL BUILDINGS	1_Residential and stay (UA 1) (part of social spaces)	Common rooms Break rooms Waiting rooms Dining areas			x		x	
	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms		x	x	x	x	
	3 Production, manual and machine work, research and development (UA 3) (Industrial work part)	Factory halls (if permanent workplaces) Workshops (if permanent workplaces) Laboratories		x	x	x	x	
	4 Storage, distribution and sales (UA 4) (Industrial work part)	Storage areas Archives, collection rooms Receipt and issuing areas (also includes picking areas) (where these are permanent workplaces)		x	x	x	x	

Assembly buildings

NEW CONSTRUCTION ASSEMBLY BUILDINGS	1_Residential and stay (UA 1)	Living spaces, bedrooms, accommodation areas, kitchens in flats, common rooms, recreational areas, standby areas, break rooms, tea kitchens, relaxation rooms, waiting rooms, dining areas, detention rooms	x		x		x	

	2_Office work (UA 2)	Office spaces, open-plan offices, meeting rooms, design offices, drawing offices, counter rooms, supervisory rooms, office equipment rooms	x	x	x	x	x	
	3 Production, manual and machine work, research and development (UA 3)	Factory halls (if permanent workplaces), workshops (if permanent workplaces) laboratories (if permanent workplaces), rooms for animal husbandry, rooms for plant cultivation, commercial kitchens, special work rooms (if permanent workplaces)	x	x		x	x	
	4 Storage, distribution and sales (UA 4)	Storage and stock rooms, warehouses, vaults, silos, archives, collection rooms, registries, cold storage rooms, receipt and issue rooms, packing rooms, dispatch rooms, sales rooms, trade fair spaces	x					
	5 Education, teaching and culture (UA 5)	Teaching and practice rooms, lecture halls, seminar rooms, workshops, practical training rooms, library rooms, reading rooms, sports areas, gymnastics areas, auditoriums (in cinemas, theatres, sports halls, etc.), stage rooms, studio rooms, rehearsal rooms, exhibition rooms (in museums, galleries, etc.), sacred spaces	x	x	x	x	x	
	7 Other uses (UA 7)	Storage rooms, bicycle rooms, refuse collection rooms, vehicle parking areas, passenger accommodation areas, technical installations for the operation of use-specific facilities, technical installations for the supply and disposal of other structures, shelters, sanitary	x		x		x	

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		rooms, changing rooms (locker rooms, artists' dressing rooms, etc.), cleaning sluices						

Healthcare buildings

	2_Office work (UA 2)	Office spaces Open plan offices Meeting rooms Design offices Counter rooms Supervisory rooms	x	x	x	x	x	
NEW CONSTRUCTION HEALTHCARE BUILDINGS	6_Healing and care (UA 6)	Rooms for general examination and treatment (for primary care, consultation, etc.), rooms for special examination and treatment (for endoscopy, physiology, dentistry, etc.), operating rooms, delivery rooms, rooms for radiation diagnostics and radiation therapy, rooms for physiotherapy and rehabilitation, bedrooms, intensive care rooms	x	x	x	x	x	x

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SOC1.6

Quality of indoor and outdoor spaces

Objective

Our objective is to offer the occupants of the building indoor and outdoor spaces with the widest possible variety of recreational opportunities and good quality furnishings. Functional and high-quality user areas are intended to provide comfort for all users and thus to increase and ensure the long-term sustainability of the building.

Benefits

Buildings with high-quality spaces improve the well-being and health of users and occupants. Such qualities encourage social interaction and exchange among the users. They also play a crucial role in improving the utility value of the building.

Contribution to overarching sustainability goals



Outlook

This criterion considers the quality of space, both in the outdoor space and indoor area of the building. With regard to the practical application of this criterion, an in-depth review is currently underway, considering whether two quality of space criteria – one for the interior and one for the exterior – may be recommended in future.

Share of total score

	SHARE	WEIGHTING FACTOR
Healthcare buildings	4.8%	3
Logistics Production	4.5%	2
Shopping centre Department Stores	4.1%	2
Office Hotel Residential Education	3.5%	2
Assembly buildings	3.2%	2
Consumer market	2.3%	1

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EVALUATION

This criterion evaluates the qualities of indoor and outdoor space. It addresses the following: spaces designed to promote communication, additional services and provisions for users, facilities designed for family-friendly, child-friendly and senior-friendly purposes, the quality of interior access and circulation areas, as well as the quality and functionality of the outdoor areas. A maximum of 100 points can be awarded, or 110 points with bonuses.

NO.	INDICATOR	POINTS
1	**Indoor spaces to facilitate communication**	**Max. 15**
1.1	**Communication zones of primary use**	**15**
	■ Various communication zones, e.g. open meeting areas or meeting zones, conditioned atria and inner courtyards, alcoves used as meeting points. For **Residential**: In residential buildings, primarily communal facilities and communication zones, e.g. seating areas, common rooms, multifunctional rooms within the dwelling units. For **Shopping Centre** **Assembly buildings**: Flexible and freely usable (action) areas are available.	+7.5
	■ Interior design of spaces that promotes communication, e.g. glazed door and wall elements, clear sightlines allowing a direct view of multiple rooms (e.g. learning spaces, recreational areas, exhibition rooms).	+7.5
Re 1	**INNOVATION AREA** **Future-orientated spatial concepts**: Spaces or zones that promote communication by means of individual solutions. Space concept for innovative living, working, teaching, learning and exhibitions that offers a wide range of different uses and fulfils the needs and requirements of the residents/staff/users/guests and the activities that take place within the building, and offers optimal flexibility and economic viability (e.g. lounge for creative work, open spaces for needs-orientated living and care concepts, technology-based service support for the everyday lives of older people, 'networked living', desk-sharing, open spaces for educational concepts with open forms of teaching, etc.) ■ For each innovative communication solution (in accordance with the indicators under 1.1), an equivalent score can be assigned.	**as in 1.1**
2	**Additional provisions for users**	**Max. 15**
2.1	**Additional provisions/services**	**10**
	■ Additional facilities, multifunctional rooms or common rooms, e.g. cafeteria, fitness facilities, library, wellness, sauna	
	Additionally for **Shopping centre** **Consumer market** **Department Stores** **Assembly buildings**	
	■ Lockers as storage spaces and/or cloakrooms for customers and/or visitors	
	Additionally for **Residential**	
	■ Common rooms are accessible to all users.	
	■ Combination of extensive washing and/or drying areas as communal and social spaces – in residential buildings, this may mean not having connection points for washing machines in dwellings.	
	Additionally for **Healthcare buildings**	
	■ The additional services are accessible to all building users.	

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2.2	**Navigation/information**	**Max. 5**
	■ Navigation system (e.g. signage, information boards/columns)	+5
	■ The presence of an information desk integrated into the overall interior design concept and manned by staff (during opening hours/specified times), e.g. in shopping centres, consumer markets, large residential complexes, office complexes etc.	+5

Re 2	**INNOVATION AREA** Alternative, tailored solutions that constitute additional provisions for users or assist with navigation or provide information, e.g. cradle-to-cradle concept for innovative communal washing machine use and management. ■ Per solution (in accordance with the indicators under 2.1 and 2.2)	**As in 2.1 and 2.2**

3	**Family-friendly, child-friendly and senior-friendly design**	**Max. 20**
3.1	**Provisions for families, children and senior citizens in the building**	**20**
	■ Premises for childcare facilities	+5
	■ Space for baby changing facilities and separate breastfeeding rooms/areas (tailored to the individual scheme)	+5
	■ Spaces for children's play areas (without childcare)	+5
	■ Spaces for senior citizens to use for socialising and games (e.g. board game areas)	+5
	■ Appropriately dimensioned (width ≥ 2.7 m) and marked parking spaces for families are provided in the parking areas to enable convenient loading and unloading.	+5
	Additional for **Hotel**	
	■ At least 5% of rooms are family-friendly with baby-changing table, children's bed, the possibility of preparing food and blackout roller blind (at least three features should be provided).	+5

Re 3	**INNOVATION AREA** Innovative, individual solutions that serve to promote family-friendly design.	**As in 3.1**

4	**Quality of interior access and circulation areas**	**Max. 20**
4.1	**Quality of interior access and circulation areas**	**Max. 20**
	The following or similar features are implemented in the access and circulation areas:	
	■ Widenings, galleries, alcoves, stairways with sufficient width and air openings for communication between people on different floors, outdoor staircases, and seating (e.g. suitable projecting elements, steps, benches.)	
	■ Daylit access and circulation areas.	
	■ Door openings to exterior common areas, e.g. balconies, roof terraces, atria, are provided.	
	■ Access and circulation areas have stricter thermal, acoustic or soundproofing requirements to allow for flexible use of these areas.	
	■ Alternative escape routes are provided so that access areas can be furnished and used without restriction.	

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Number of implemented features:*

- 3 — 10
- 4 — 15
- ≥5 — 20

*If the aforementioned qualities are implemented in different areas of the building, these can be taken into account accordingly in the evaluation.

Re 4 **INNOVATION AREA** — **As in 4.1**

Innovative, individual solutions that create a pleasant, suitable quality of space in the access and circulation areas.

---

5 Quality of space in the outdoor area — Max. 60

5.1 Design concept for outdoor facilities — 15

There is a design concept tailored to the needs of the users that provides for different functions in the outdoor area. In addition, the choice of materials, an environmentally and socially compatible lighting scheme, intuitive orientation, the avoidance of unsafe spaces and the integration and greening of necessary technical installations and ancillary facilities are taken into account. Alternatively, there is a guideline for the design of private open spaces that respects the individual design wishes of the residents but provides a framework for coherent design of the space. This guideline contains information on the outdoor facilities programme for all outdoor spaces. — 15

For **Healthcare buildings**, care must be taken to ensure that the recreational areas do not adjoin noisy, odour-intensive or other surroundings that would similarly detract from their usability.

5.2 Common areas outdoors — Max. 15

Common areas available for the users of the building

- >10% of the roof surface (but at least 5m² usable area (UA)) — +5
  >1% of the roof surface, for **Shopping centre** **Logistics** **Production** **Assembly buildings**
- Balconies, loggias or conservatories with at least 3m² usable floor area (UA) per unit. — +5
  Additionally for **Healthcare buildings**
  The balconies/loggias/conservatories are positioned in such a way that the majority of building occupants have access to at least one balcony/loggia-/conservatory.
- >25% of the outdoor area (but at least 30m²) — +5

5.3 Needs-based functions of outdoor recreation areas — Max. 25

On the basis of a design concept for outdoor facilities, the following functions are provided in the outdoor area, tailored to the needs of the users:

- Facilities are accessible to the public — +5
- Access and networking function — +5
- Meeting and communication function — +5
- Sport and play function — +5
- Work and focus function — +5
- Rest and recreation function — +5
  Perception of safety, technical safety equipment

- Social control of the outdoor areas by way of links between the building and the outdoor space is ensured. +5
- Sustainable and socially designed lighting for main paths, paths to parking areas and paths to bicycle parking spaces +5
- Emergency call phones, video surveillance, public announcement systems; for **Office,** a voice alarm or comparable systems +5

Re 5.3 **INNOVATION AREA** — as 5.3

Innovative, individual solutions that allow building occupants to use the outdoor spaces at the site.

- For each solution (in accordance with the indicators under 5.1, 5.2 and 5.3)

5.4 Comfort in the outdoor common areas — Max. 15

Comfort for the users only has to be demonstrated for the important and high-quality common areas. The qualities of the common areas are determined separately and an average value should be derived.

- **Solar radiation on 21 December in hours**
  ≥1h (At least 80% of the areas in the study area receive one hour of solar radiation on 21 December.) +2
  Or ≥3h (At least 80% of the areas in the study area receive three hours of sunlight on 21 December.) +5
- **Summer solar protection**
  ≥10% of the areas in the study area have summer solar protection in the form of trees, rigid or adaptive/flexible shading systems or buildings. +2
  Or ≥30% of the areas in the study area have summer solar protection in the form of trees, rigid or adaptive/flexible shading systems or buildings. +5
- **Wind protection**
  There are no negative effects for the common areas (wind tunnel effects, dealing with downdrafts from high-rise buildings, etc.) Wind protection measures are employed in areas affected by wind gusts. +5
- **Shelter that protects against weather** +5

Re 5.4 **INNOVATION AREA** — As in 5.4

Innovative, individual solutions that increase comfort in the outdoor areas for building occupants or user groups. The measures must correspond qualitatively and quantitatively to the previous points.

5.5 AGENDA 2030 BONUS – Climate factor of surface structures and climate protection optimisation of outside facilities — Max. 10

5.5.1 Climate factor of surface structures — 5

The thermal quality is evaluated based on the surface structure with a factor for the surfaces.

- Climate factor ≤3

5.5.2 Climate protection optimisation of outside facilities — 5

Solutions are implemented in the design and construction of the outdoor facilities that have significantly reduced greenhouse gas emissions overall.

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SUSTAINABILITY REPORTING

It is helpful to communicate the communication provisions for users and for families, children and senior citizens as a number.

NO.	KEY METRICS/KPI	UNIT
KPI 1	Number of provisions for promoting communication	[Number]
KPI 2	Number of additional offers for users	[Number]
KPI 3	Number of provisions for families, children, senior citizens	[Number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Outdoor recreational areas in the immediate vicinity of the building serve the general well-being of the users, offer alternative working and break areas, promote interaction between the users and increase the general acceptance of the building. The outdoor spaces can also contribute to improving the cityscape and the microclimate if designed appropriately.

II. Additional explanation

In addition to representative and design aspects, indoor and outdoor recreational areas can increase the comfort of all users (tenants, property owners and/or external users). The design of the functional areas must be viewed first and foremost within the context of the well-being of the users. These areas offer the possibility of providing special places to spend time, communicate and regenerate.

III. Method

The quality of space is described using qualitative and quantitative indicators. The quality of space of the outdoor and indoor areas is assessed in terms of quantity and quality.

Indicator 1: Indoor spaces to facilitate communication

Indicator 1.1: Communication zones of primary use

Example of communal facilities and communication zones can include open meeting rooms, conditioned atria and inner courtyards, extended corridor zones, break areas and kitchenettes that offer a variety of seating options.
For **Residential**: Examples could include seating areas in the common zone, or multifunctional rooms and spaces among the dwelling units.
For **Shopping centre** **Assembly buildings**: Examples could include the flexible and freely usable areas designed to facilitate communal activities among users.

An innovation area is provided so that future-orientated space concepts to promote communication activities can also be credited.

Indicator 2: Additional provisions for users

Additional provisions can fulfil various functions, such as services or recreation, or extend the use-specific facilities. Where appropriate, they may also extend the usage times of a building as part of the day/night cycle, which may also have the effect of helping to regenerate the immediate local area. Additional provisions can include cafeteria/canteen, fitness, sauna, library, music room, living and working spaces available for rent, guest accommodation, multifunctional spaces, common rooms, workshops, large-scale laundry facilities or similar, which complement the main use of the building.

Guidance and information systems are also an important element of use.
These must be features of the building itself; service offerings are not assessed.

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Additional cases for some of the specific usage schemes can also be credited (e.g. storage lockers for **Shopping centre** **Consumer market** **Department Stores** **Assembly buildings**, laundry areas specifically designed to promote communal activities for **Residential**, and additional services which are accessible to all building users for **Healthcare buildings**).

An innovation area is provided so that the individual solutions that represent an additional benefit for users or serve as navigation/information can also be credited.

Indicator 3: Family-friendly, child-friendly and senior-friendly design

The expansion of family-friendly building structures is – in addition to the social service it provides – another important feature for describing and evaluating a property. Depending on the use, this can include, for example, on-site childcare facilities, such as a company day-care centre or kindergarten, or children's play areas. Rooms with baby-changing and breastfeeding facilities can also serve to meet the needs of users with young children.

An innovation area is provided so that the individual solutions that serve to promote family, child and senior-friendly design can also be credited.

Indicator 4: Quality of interior access and circulation areas

Access areas should be well lit and appropriately sized for their intended use such that they can be used multifunctionnally. This informal use of access spaces, for example for communication, for retreat or other activities, is becoming increasingly important. The perception of spatial qualities, such as orientation and communication, is improved by visual connections inside the building and out to the exterior and also between floors. Attractive views increase the quality of space.

An innovation area is provided so that the individual solutions that create a pleasant, suitable quality of space in the access and circulation areas can also be credited.

Indicator 5: Quality of space in the outdoor area

Indicator 5.1: Design concept for outdoor facilities

There is a design concept tailored to the requirements that provides for different functions (see Indicator 5.3) for users in the outdoor area. In addition, the choice of materials, an environmentally and socially compatible lighting scheme, intuitive orientation, the avoidance of unsafe spaces, a sense of security and the integration and greening of necessary technical installations (waste disposal areas, bicycle parking, underground ventilation etc.) are taken into account. Alternatively, there is a guideline for the design of private open spaces that respects the individual design wishes of the residents but provides a framework for the coherent design of the space. This guideline contains information on the outdoor facilities programme for all outdoor spaces (open space plan, conceptual representtations and construction description, additional detailed plans where required).

For **Healthcare buildings**, care must be taken to ensure that the recreational areas do not adjoin noisy, odourintensive or other surroundings (e.g. busy roads, railway lines, sewage treatment works, exhaust air systems) that would be comparably restrictive of use.

Indicator 5.2: Common outdoor areas

This assessment covers roof surfaces (roof terraces, roof gardens, planted glass houses, etc.), the façade (façade elements, balconies, loggias, conservatories, etc.) and the ground-level outdoor spaces (atria, courtyards, outdoor seating areas, terraces, etc.)

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Where possible, the common areas should have good exposure to daylight in winter and appropriate shading in summer.

For **Shopping centre** **Logistics** **Production** **Assembly buildings**, more than 1% of the roof surface areas should be available for users of the building.
For **Healthcare buildings**, the balconies/loggias/conservatories should be positioned in such a way that the majority of building occupants have access to at least one of those facilities.

Indicator 5.3: Needs-based functions of outdoor recreation areas
On the basis of a design concept for outdoor facilities, the following functions are provided in the outdoor area, tailored to the needs of the users: If a feature meeting one of these functions can be reached on foot and is within 100 m of the main or side entrances to the building, it can be credited. For an outdoor recreational area to be evaluated, it must be demonstrated to have a minimum area of 30 m². It can be made up of different sub-areas that belong to the same function and are related to each other.

- Access and networking function
  Access routes within the building, taking into account socio-spatial, community-building aspects, networking and connection to existing adjacent open spaces and recreational opportunities
- Meeting and communication function
  Places for exchange that are designed for communal use, such as areas of seating with tables, face-to-face seating and standing areas, barbecue areas with seating, weatherproof outdoor furniture for meal breaks with table and chair elements, etc.
  Wind and summer solar protection is recommended, preferably designed in harmony with nature.
- Sport and play function
  Places to promote the activities of running, walking, active play, playing with high-quality equipment, such as a playground, permanently installed fitness and exercise equipment, Finnish track, walking path, outdoor chess, boules court, table football, table tennis, etc.
  Wind and summer solar protection is recommended, preferably designed in harmony with nature and with adjacent seating options.
- Work and focus function
  Places for reflection that are protected from noise and view and are technically equipped, such as individual, smaller seating areas with tables, including electricity and/or internet access, etc.
  Wind and summer solar protection is recommended, preferably designed in harmony with nature.
- Rest and recreation function
  Places to switch off and retreat that are protected from noise and visibility, e.g. unenclosed, green open spaces that can be used for resting, sunbathing areas, etc.
  Wind and summer solar protection is recommended, preferably designed in harmony with nature.

An innovation area is provided for 5.1 to 5.3, so that the individual solutions that allow building's users to use the outdoor area can also be credited.

Indicator 5.4: Comfort in outdoor common areas
Comfort must be demonstrated for high-quality and important recreational areas in courtyards or outdoor areas. This includes all recreational areas that can be assigned to a function based on Indicator 5.3. Generally, all common areas in the outdoor space where thermal comfort is a concern should be investigated.

The comfort of the recreational areas is of great importance for their daily and seasonal use and also for their attractiveness. The areas should have good climatic conditions throughout the year, i.e. enough sun and protection from cold winds and rain in winter and protection from sun and excessive heat in summer.

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Without this, the spaces remain unattractive and can only be used for parts of each day or year. Therefore, common areas should have good exposure to daylight (‘solar access’) and good shading in summer. Windbreaks are designed to minimise unpleasantly strong and cold air movements. Green spaces, open water areas, the choice of materials (for their absorption and reflection properties) and natural shading elements in particular can increase comfort in summer. In winter, solar radiation is particularly relevant. Wind protection is particularly relevant from autumn to spring and is intended to help reduce high wind speeds near the ground.

When evaluating comfort of the recreational areas, the three basic indicators of solar radiation, shading and wind protection are considered. If it is demonstrated by a qualified person that the objectives have been met, the maximum score can be awarded. The qualities of the common areas are determined separately and an average value should be derived.

An innovation area is provided for 5.4 so that the individual solutions that increase comfort in the outdoor areas for building occupants or user groups can also be credited.

Indicator 5.5: Agenda 2030 BONI

Indicator 5.5.1 Bonus: Climate factor of surface structures

The thermal quality is evaluated on the basis of the surface structure with a factor for the surfaces. The thermal properties of all open spaces, green spaces in their final state and building surfaces with a positive climatic effect (e.g. green roofs) are weighted by specific factors. According to climatic effects, the surfaces are assigned a factor of -5 to +5, which describes the temperature-reducing capacity of the surface compared to an asphalt surface (see Table 1). For example, tree-covered areas in a meadow have a factor of -5, permanent lake and pond areas have a factor of 0, and hard surfaces with dark asphalt or stone coverings have a factor of 5. This means that surfaces with a factor of 5 cause a temperature increase and with a factor of -5 a maximum temperature decrease.

This factor is multiplied by the area size of the specific area type. All horizontal surfaces (outdoor and building roof surfaces) are grouped in the ‘Base areas’ category. The base areas combined form the total area. Façade areas are also factored into the calculation. The factor for the surfaces is calculated by relating the evaluated areas to the total area of the property. The factors specific to each area category are stored in the tool provided by DGNB.

The climate factor F_K of the surfaces is calculated using the following formula:

$$F_C = \frac{\left((\mathrm{BA}_1 * \mathrm{F}_1) + (\mathrm{BA}_n * \mathrm{F}_n)\right) + \left((\mathrm{FS}_1 * \mathrm{F}_1) + (\mathrm{FS}_n * \mathrm{F}_n)\right)}{A_{tot}}$$

Fc	Climate factor of the surfaces
BA	Base areas (all horizontal areas that add up to the total area of the land plot)
FS	Façade surfaces
A_{tot}	Total area

Table 1 Climate factor – Surface factors

NO.	SURFACE CHARACTER OR LAND USE	FACTOR F
1	**Base areas BA**	
1.1	Hard surfaces with dark asphalt or stone coverings	5
1.2	Hard surfaces with light-coloured asphalt or stone coverings	4
1.3	Water-bound surfaces and grass paving	2
1.4	Lawns (e.g. sports fields)	0

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1.5	Natural grasslands	-3
1.6.1	Tree-covered areas (over sealed surface)	-2
1.6.2	Tree-covered areas (over meadow)	-5
1.7	Temporary water areas (e.g. rainwater retention, greywater treatment)	0
1.8	Lake and pond areas, permanent	0
1.9	Covered area	2
2	**Façade surfaces FS**	
	Façade greening	-2
	Bright façade surfaces: reflection >50%	-1
	Dark façade surfaces: reflection < 30%	1
3.1	**Roof areas RA**	
	Roof areas with extensive green roofs (also with PV systems)	-2
	Roof areas with intensive green roofs	-3

5.5.2: Climate protection optimisation of outside facilities

Solutions have been implemented in the design and construction of the outside facilities that have significantly reduced greenhouse gas emissions overall. Proof is provided by means of a life cycle CO_2 balance (life cycle assessment). The reduction achieved should be presented compared to either an original planning status, a reference value from studies or other projects, or typically (state of the art) implemented solutions. The actual implemented solution should be at least 30% better in this respect.

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IV. Scheme-specific description

Healthcare buildings

The facilities and spaces available to all user groups of a healthcare building (patients, staff, visitors) are decisive in evaluating the quality of space. On the one hand, the outdoor spaces of healthcare buildings assume the function of outdoor recreational areas for patients, who may be accompanied by staff or visitors, and offer them relief from their time spent in the enclosed area of the building. On the other hand, they provide the staff with opportunities for rest and communication during work breaks. The necessary areas for supply and disposal, for immobile patient and emergency access and for parked vehicles should be functionally designed and integrated into the qualitative outdoor space areas. Consideration of barrier-free accessibility is of particular importance in healthcare buildings.

Indicator 2: Additional provisions for users

In **Healthcare buildings**, the additional provisions are accessible to all building users.

Indicator 3: Family-friendly, child-friendly and senior-friendly design

For **Healthcare buildings**, changing and breastfeeding areas that are generally accessible to visitors and the majority of building users are addressed within this indicator (excluding those in maternity wards). The recreation and play areas for children and other people, such as senior citizens, should also be sensibly positioned so that they are available to the majority of users.

For **Hotel**, the provisions for family-friendly, child-friendly and senior-friendly uses are particularly important; therefore, in order to be awarded the points, at least 5% of the rooms with at least three features must fulfil the requirement.

Indicator 4: Quality of interior access and circulation areas

For **Healthcare buildings**, it is important that the qualities should be experienced at various points within the building or in an area accessible to all building users. Features that, for example, can only be experienced in a small area and only by a small circle of users cannot be credited.

Indicator 5: Quality of space in the outdoor area

For **Healthcare buildings**, only outdoor spaces that do not adjoin noisy, odour-intensive or other surroundings that would similarly detract from their usability – e.g. busy roads, railway lines, sewage treatment works, exhaust air systems – are considered for the evaluation of socio-cultural use.

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APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

1. Indoors
   - Each evaluated aspect of the areas being assessed is documented by means of photos/ views/ sections/ ground plans together with a statement of its positive impact in terms of the indicator.
   - Interior design concept
   - Excerpts from the floor plans and sections, including spatial and functional allocation, and furnishings if appropriate

2. Outdoors
   - Each evaluated aspect of the areas being assessed is documented by means of photos/ views/ sections/ ground plans together with a statement of its positive impact in terms of the indicator.
   - Concept for the design of outside facilities (with conceptual representations)
     Rooftop/ ground plan of roof areas with details of the proportion for technical superstructures,on planting, on the choice of materials and colours for the roof covering and the usable areas
   - Design concept for the roof surface
   - Simulation of solar radiation, shading and wind influences (for indicator 5.4: Comfort in the outdoor common areas)
   - Calculation of the climate factor including allocation of the spaces on a site plan and the views (for indicator 5.5: Climate factor of the surface structures)

   Supplementary evidence:
   - three-dimensional visualisation (renderings, model photos, sketches)
   - Site plan
   - Other

Indicator 5.5.2:

- Life cycle assessment/life cycle CO_2 balance results and achieved reduction compared to reference/start value

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APPENDIX C – LITERATURE

I. Version

Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN 277-1: 2016-01: Areas and volumes in building construction - Part 1: Structural engineering, Berlin, January 2016
- International Property Measurement Standards (IPMS) , January 2023: https://ipmsc.org/wp-content/uploads/2023/01/ipms-all-buildings-.pdf
- BNatSchG (Nature Conservation and Landscape Management Act), Bundesnaturschutzgesetz in the version of 29 July 2009, BGBl. I p. 2542.
- BMVBS (Federal Ministry of Transport, Building and Urban Affairs) (2010): Focus topics, URL: www.nationale-stadtentwicklungspolitik.de
- VDI 3787 Sheet 2: Environmental meteorology - Methods for human-biometeorological evaluation of the thermal component of the climate. Part I: Climate, Nov. 2008
- Sustainable Development Goals Icons, United Nations/globalgoals.org

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SOC1.7

Safety and security

Objective

Our objective is to devise a design concept that prevents dangerous situations in buildings and their immediate vicinity to the greatest extent possible.

Benefits

A high sense of security makes a vital contribution to people's comfort. By contrast, uncertainty and anxiety restrict freedom of movement. Measures to increase the sense of security also generally help to reduce the possibility of assault.

Contribution to overriding sustainability goals



Outlook

Hazardous incident risks are also part of the safety and security topic. This topic may thus be added to this criterion in a later version.

Share of total score

	SHARE	WEIGHTING FACTOR
Logistics **Production**	**4.5%**	**2**
Consumer market	**2.3%**	**1**
Department stores **Shopping centre**	**2.0%**	**1**
Office **Hotel** **Education** **Residential**	**1.7%**	**1**
Healthcare buildings **Assembly buildings**	**1.6%**	**1**

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EVALUATION

The type and scope of building measures required in order to increase people‘s sense of security and to prevent dangerous situations in buildings and their immediate vicinity are assessed using Indicator 1. Safety measures that fall outside of the scope of the proposed topics can alternatively be credited under the innovation area indicator. In this criterion, a maximum of 100 points can be attained.

NO.	INDICATOR	POINTS
1	**Subjective perception of safety and protection against assault**	**Max.100**
1.1	**Level of visibility** General areas (entrance areas, main thoroughfares, inner courtyard paths) and underground garages, ground-level car parks and multi-storey or rooftop car parks (where available) offer clear visibility.	**40**
1.2	**Level of lighting** Main thoroughfares, paths to car parks and bicycle parking areas are well lit.	**30**
1.3	**Technical safety equipment** **Office** **Education** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Healthcare buildings** **Residential** Number of technical safety installations (emergency telephones, CCTV, PA systems (in offices), voice alarm systems or comparable installations): ■ 1 **Residential** ■ ≥ 2 **Residential**	**Max. 30** **Max. 20** 15 10 30 20
1.4	**Preventive safety measures** **Residential** Measures to prevent burglaries, e.g. roller shutters on the lower storeys, alarm systems, RC protection class. Does not apply to **Office** **Education** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Assembly buildings** **Logistics** **Production** **Healthcare buildings**	**10**
Re 1	**INNOVATION AREA** Explanation: Safety measures that cannot be assigned to any of the categories or measures listed above but demonstrably make people feel safer and more secure and protect them from assault	**As in 1.1–1.4**

SUSTAINABILITY REPORTING

The number of safety installations and measures provided are suitable key performance indicators (KPIs) for reporting purposes.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Number of technical safety installations and preventive measures	[number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Building measures can help to increase people's perception of safety and prevent dangerous situations.

II. Additional explanation

Building users' subjective perception of safety can be raised, for example, by ensuring that there is adequate visibility and lighting in the outdoor areas, clear layout of paths, and by using technical safety equipment. These measures serve to prevent danger and reduce attacks and accidents.

III. Method

Indicator 1: Subjective perception of safety and protection against assault

A sense of safety, security and protection from assault should be increased using suitable measures. Indicators for this are as follows:

Indicator 1.1: Level of visibility

People's sense of safety and security on the site and within the building itself should be increased by improving visibility and providing comprehensive sign-posting. Open spaces and outdoor paths are assessed here. The evaluation takes into consideration the visibility in all general areas and rooms as well as the visual links between rooms and general areas, e.g. main thoroughfares, entrance areas, inner courtyards and an underground car parking design that affords clear visibility.

Indicator 1.2: Level of lighting

Well-lit main thoroughfares, publicly accessible outdoor spaces and the ability to reach destinations (bicycle parking areas, car parks, bus stops) directly without detours help to increase people's sense of safety and security.

Indicator 1.3: Technical safety equipment

Technical safety equipment suggests that help is readily accessible and available in a dangerous situation. This feature gives users a feeling of increased safety while discouraging potential offenders. Technical safety equipment includes CCTV, emergency telephones and PA systems.

Only areas in which data protection laws will not be violated can be monitored using CCTV equipment.

Indicator 1.4: Preventive safety measures

Measures to prevent burglaries, e.g. roller shutters on the lower storeys, alarm systems or burglary-resistant doors/windows (rated using resistance classes (RC)) are evaluated here.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible documentation include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

Indicator 1: Subjective perception of safety and protection against assault

Indicator 1.1: Level of visibility

- Excerpt from the detailed design plans showing the visual relationship between rooms and general areas such as main thoroughfares, paths and roads, the entrance areas and inner courtyards and clear visibility of the underground car park.
- Written explanations of the plans
- Photo documentation

Indicator 1.2: Level of lighting

- Plan of the paths
- Lighting concept for the paths
- Documentary evidence demonstrating the light intensity (illuminance) or light densities (luminance), e.g. from data sheets for the lighting used or by measuring, simulating or calculating these values
- Documentation showing the location of the car parks, e.g. on the site plan or the underground car park plan
- Documentation showing the location of the bicycle parking areas, e.g. in the site plan or the underground car park plan

Indicator 1.3: Technical safety equipment

- List and documentary evidence of the technical safety installations present, e.g. through the functional specification created or contracts made
- Location of the technical safety installations, e.g. on plans
- Photo documentation of the safety installations that have been provided, specifying their location

Indicator 1.4: Preventive safety measures

- As in indicator 1.3

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APPENDIX C – LITERATURE

I. Version

Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

- EN 12464-1. Light and lighting – Lighting of work places – Part 1: Indoor work places. Berlin: Beuth publisher. August 2011. http://www.ageta.lt/app/webroot/files/uploads/filemanager/File/info/EN_12464-1.pdf
- EN 12464-2. Light and lighting – Lighting of work places – Part 2: Outdoor work places. Berlin: Beuth publisher. October 2007. http://svstsv.com/assets/files/content/norms/bur/EN-12464-2.pdf
- Technical regulations for workplaces A3.4/3 Safety lighting [in German: ASR A3.4/3 Sicherheitsbeleuchtung]. May 2009. https://www.baua.de/EN/Topics/Work-design/Workplaces/Workplaces-ordinance/Workplaces-ordinance_node.html
- State building regulations
- Sustainable Development Goals, United Nations/globalgoals.org
- Risk maps (CEDIM Risk Explorer)

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SOC2.1

Design for all

Objective

Our objective is to make the entire built environment accessible to everyone, without restriction, regardless of their individual situation.

Benefits

It is essential to recognise diversity in society as an asset. If the principles of barrier-free construction are taken into account during the planning and construction of the project, subsequent costs for adaptation and costly reconstruction can largely be avoided by taking a forward-looking approach. Barrier-free design makes buildings more attractive to all user groups, especially to those with impaired motor skills, and sensory and cognitive impairments. With the constant change in demographics and society in general, barrier-free construction represents a contribution to the sustainability of a building.

Contribution to overriding sustainability goals



Outlook

Accessibility requirements are likely to become more stringent in the future.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Hotel**	**3.5%**	**2**
Education **Residential**		
Healthcare buildings	**3.2%**	**2**
Shopping centre **Department stores**	**4.1%**	**2**
Consumer market	**4.5%**	**2**
Assembly buildings	**4.8%**	**3**
Logistics **Production**	**0.0%**	**0**

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EVALUATION

The barrier-free design criterion is an exclusion criterion within the DGNB certification system. If a building does not fulfil the minimum requirements for barrier-free design, it will be excluded from certification.

The criterion is evaluated in both qualitative and quantitative terms based on how well it meets barrier-free design requirements. The more areas of the building that are barrier-free, easily accessible and usable by people with impaired motor skills, sensory impairments and/or cognitive impairments, without significant difficulty, and most importantly without the need for third-party assistance, the higher the score the building will be awarded. For the schemes **Assembly buildings** and **Healthcare buildings**, there are only two quality levels.

For some schemes, additional points can be awarded within the quality levels. A maximum of 100 regular points can be awarded for this criterion.

MINIMUM REQUIREMENT

FOR ALL TYPES OF BUILDINGS: Compliance with quality level QS1 is required. This must be complied with for all uses (main/secondary/and subordinate uses). For exemptions, see the use-specific description under the method.

NO.	INDICATOR	POINTS
1	**Quality level 1/DGNB minimum requirement**	
1.1	**Degree of barrier-free design**	
	Office **Education** **Residential** (also student residences, boarding houses)	
	Hotel **Shopping centre**	**10**
	Department stores **Consumer market**	**Max. 20**
	Assembly buildings **Healthcare buildings**	**50**
	Logistics and **Production** (minimum requirement according to the use-specific description)	**0**
	The requirements of the national building regulations with regard to barrier-free design have been fulfilled. The following have been implemented as a minimum: ■ Internal and external infrastructure: Access routes to entrances, entrances and manoeuvring areas in front of the entrance door(s) (and lift, where relevant) and the associated circulation, secondary and general areas of the building that are important for its use are barrier-free in accordance with ISO 21542:2021* [Accessibility and usability of the built environment]; alternatively DIN 18040 or the local norm** can be used as a valid standard. ■ Barrier-free infrastructure for all units in the building, regardless of whether these are used by one or a number of different users. ■ Dedicated access routes to disabled parking spaces ■ Operating information (e.g. for entrance doors, lift) provided in line with the 'multiple-sense principle' ('at-least-two-senses principle' – e.g. visual, audible, tactile). ■ At least one barrier-free toilet cubicle can be accessed from a public area. Access is provided even where there are separate use areas in the building and is given equal status to other bathroom facilities in terms of its location	

* With an **exception** regarding the unobstructed door width: The minimum unobstructed width of main doorway(s), as well as entrance width of elevator(s) and barrier-free toilet(s) must be 900 mm.
** Only if comparable with the mentioned standards and to be agreed with the DGNB in the scheme adaptation process.

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(equal status for a barrier-free toilet cubicle on a basement storey is only achieved if, for example, other standard toilet cubicles are also provided as part of the bathroom facilities and their furnishings match those in the above-ground building area).

For **Residential**:

- Barrier-free bathroom facilities must be installed in barrier-free housing units.

For **Department stores** **Consumer market**:

- A barrier-free toilet cubicle must be provided in rented areas of department stores and consumer markets with a sales area ≥ 3000 m².
- **Additional points for quality level 1:** A barrier-free toilet cubicle has been provided in rented areas of department stores and consumer markets with a sales area < 3000 m². **+** 10

Also in **Department stores** **Consumer market** **Shopping centre**:

- Staff entrances have either been implemented in the form of dedicated barrier-free staff entrances or barrier-free access has been provided in the main entrance areas via the publicly accessible common areas (mall), provided that access to all ground-level functional units are accessible..

Also in **Residential**:

- Barrier-free residential dwellings (2% of the total number of dwellings in the building, but at least 2 units) in accordance with the recommendations of the ISO 21542:2021 standard or DIN 18040-2 (alternatively see footnote **)
- General areas of the building (including dwelling entrance doors) must be designed to allow for unrestricted use by people in wheelchairs (see footnote above). This applies at least to the storeys with barrier-free dwellings.

Also in **Assembly buildings**

- A detailed overall concept for accessibility has been created. At least all publicly accessible areas are ‘barrier-free’ in accordance with ISO 21542:2021 or DIN 18040-1 (alternatively local norm, see footnote **)
- Easily accessible, barrier-free sanitary rooms are arranged in all use areas.

additionally, for **Healthcare buildings**

- A detailed overall accessibility concept has been devised.
- All visitor and examination areas, patient rooms and areas within the building where patient presence and movement is to be expected are accessible and feature a ‘barrier-free’ design in accordance with ISO 21542:2021 or DIN 18040-1 (alternatively local norm, see footnote **)
- Staff entrances for employees feature a barrier-free design, either via separate barrier-free staff entrances or in the main entrance areas granting barrier-free access to visitors, or via the publicly accessible general areas.

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2 Quality level 2

2.1 Degree of barrier-free design

Office **Education** **Hotel** **Shopping centre** **Department stores** **Consumer market** **Residential** **25** **Max. 40**

- Quality level 1/DGNB minimum requirement has been achieved.
- A detailed overall barrier-free design concept has been devised.

In addition, use-specific building areas have been designed to be barrier-free as follows:

Office

- At least 10% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas.

Education

- All rooms/areas dedicated to teaching, including the associated circulation and secondary areas/rooms
- The requisite barrier-free toilet cubicles are located in these areas (on each of the relevant storeys)

Residential

- At least 25% of all dwellings (in accordance with the recommendations of ISO 21542:2021 standard or DIN 18040-2), including the associated circulation and secondary areas (footnote from QL1 must be considered for general areas of the building and for the main entrance doors for dwellings).
- **Additional points for quality level 2:** Of this 25%, every tenth dwelling (one as an absolute minimum) is designed to be barrier-free and to allow for unrestricted use by people in wheelchairs (footnote from QL1 to be considered also for internal areas of the dwellings) **+** 15

Hotel

- 1% of all rooms (one room as an absolute minimum) comply with the requirements of the non-domestic buildings category ISO 21542:2021 or DIN 18040 (footnote from the QL1 to be considered)

Shopping centre **Department stores** **Consumer market**

- At least 25% of the sales area (defined in Appendix A) in the building plus all areas of the outdoor facilities that are a necessary part of the infrastructure

3 Quality level 3

3.1 Degree of barrier-free design

Office **Education** **Hotel** **Shopping centre** **Department stores** **Consumer market** **50**

Residential **Max. 65**

- Quality level 1/DGNB minimum requirement has been met.
- A detailed overall barrier-free design concept has been devised.

In addition, use-specific building areas have been designed to be barrier-free as follows:

Office

- At least 50% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas.

Office **Education** **Residential**

- At least 25% of the outdoor areas that people can traverse or spend time in (where present)

Education

- Quality level 2 has been met.
- At least 25% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas.

Residential

- At least 50% of all dwellings (in accordance with the recommendations of ISO 21542:2021 standard or DIN 18040-2), including the associated circulation and secondary areas (footnote from QL1 must be considered for general areas of the building and for main entrance doors of dwellings).
- **Additional points for quality level 3**: Of this 50%, every tenth dwelling (one as an absolute minimum) is designed to be barrier-free and to allow for unrestricted use by people in wheelchairs (footnote from QL1 also to be considered for internal areas of the dwellings) + 15

Hotel

- In accommodation with 13 or more rooms, 5% of all rooms are adapted to the needs of people with mobility, hearing and visual impairments in accordance with categories non-domestic buildings ISO 21542:2021 or DIN 18040 (the footnote from the QL1 to be considered)

Shopping centre **Department stores** **Consumer market**

- At least 50% of the sales area in the building plus at least 25% of the outdoor areas that people can traverse or spend time in

Also in Shopping centre:

50% of the areas designated as workspaces for running the building (centre), including the areas that are relevant for operational reasons and the associated circulation and secondary areas

4 Quality level 4

4.1 Degree of barrier-free design

Office **Education** **Residential** **Shopping centre** **Department stores** **Consumer market** **75**

Hotel **Max. 90**

- Quality level 1/DGNB minimum requirement has been achieved.
- A detailed overall barrier-free design concept has been devised.

In addition, use-specific building areas have been designed to be barrier-free as follows:

Office

- At least 75% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas.

Office **Education** **Residential**

- At least 50% of the outdoor areas that people can traverse or spend time in (where present)

Education

- Quality level 3 has been met.
- At least 50% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles in these areas

Residential

- At least 75% of all dwellings (in accordance with the recommendations of ISO 21542:2021 standard or DIN 18040-2), including the associated circulation and secondary areas (footnote from QL1 must be considered for general areas of the building and for main entrance doors of dwellings). +15

- **Additional points for quality level 4**: Of this 75%, every tenth dwelling (one as an absolute minimum) is designed to be barrier-free and to allow for unrestricted use by people in wheelchairs (footnote from QL1 to be considered also for internal areas of the dwellings)

Hotel

- In accommodation with 13 or more rooms, 8% of all rooms (one room as an absolute minimum) are adapted to the needs of people with mobility, hearing and visual impairments in accordance with the category non-domestic buildings ISO 21542:2021 or DIN 18040 (the footnote from the QL1 to be considered)
- At least 50% of the outdoor areas that people can traverse or spend time (where present)

Shopping centre **Department stores** **Consumer market**

- At least 75% of the sales area in the building plus at least 50% of the outdoor areas that people can traverse or spend time in
- Also provided that: 75% of the areas designated as workspaces for running the centre, including the areas that are relevant for operational reasons and the associated circulation and secondary areas (may not apply to new department stores/new consumer markets)

5 Quality level 5

5.1 Degree of barrier-free design

Hotel **Office** **Education** **Residential** **Shopping centre** **Department stores** **Consumer market** **Assembly buildings** **100**

- Quality level 1/DGNB minimum requirement has been met.
- A detailed overall barrier-free design concept has been devised

Also: Barrier-free (in accordance with the applicable standard(s) and the generally accepted rules of good engineering practice) areas:

Office

- At least 95% of the areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas.

Office **Education** **Residential**

- At least 75% of the outdoor areas that people can traverse or spend time in (where present)

Education

- Quality level 4 has been met.
- All areas designated as workspaces, including the areas that are relevant for operational reasons and the associated circulation and secondary areas
- The requisite barrier-free toilet cubicles are located in these areas

Residential

- At least 95% of all dwellings (in accordance with the recommendations of the ISO 21542:2021 standard or DIN 18040 - 2), including the associated circulation and secondary areas (footnote from QL1 must be considered for general areas of the building and for main entrance doors of dwellings). Of this 95%, every tenth dwelling (one as an absolute minimum) is designed to be barrier-free and to allow for unrestricted use by people in wheelchairs (footnote from QL1 to be considered also for internal areas of the dwellings)

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Hotel

- In accommodation with 13 or more rooms, 10% of all rooms (one room as an absolute minimum) are adapted to the needs of people with mobility, hearing and visual impairments in accordance with the category non-domestic buildings ISO 21542:2021 or DIN 18040 (the footnote from the QL1 is to be considered)
- 100% of the outdoor areas that people can traverse or spend time (where present)

Shopping centre **Department stores** **Consumer market**

- At least 95% of the sales area in the building plus at least 75% of the outdoor areas that people can traverse or spend time in
- Also provided that: 95% of the areas designated as workspaces for running the centre, including the areas that are relevant for operational reasons and the associated circulation and secondary areas (may not apply to new department stores/new consumer markets)

Assembly buildings

- The overall concept for building accessibility was created by an expert with the involvement of a responsible officer from the public sector (if local regulations for barrier-free building exist). +10

Barrier-free design of workplaces:

- Barrier-free design of at least 10–95% of workplace areas, including the office-work relevant areas, also associated circulation and secondary areas; the requisite barrier-free toilet cubicles are located in these areas +2–10

Circulation spaces:

- At least 10–100% of the accessible areas and the common areas of the outdoor facilities are barrier-free (in accordance with applicable standards and the generally recognized rules of technology). +1–10

Sanitary areas:

- There is at least one barrier-free toilet in each sanitary facility. Alternatively, it is ensured that barrier-free sanitary areas are easily and quickly accessible for people with restricted mobility (without lift routes) and that these can be used by people with different mobility restrictions (different space requirements). +5

Space for spectators:

- In assembly rooms, at least 2% of the visitor spaces (but at least four spaces) are available for wheelchair users along with additional seats for accompanying persons in the immediate vicinity. +5
  Alternatively:
- Designated barrier-free spectator seats for people with mobility aids (e.g. wheelchair users) have been implemented in different locations throughout the space. Space is therefore available in at least 3 different price categories.
- The proportion of wheelchair spaces has been adapted to an above-average need (> 2% of the visitor spaces, e.g. in health resorts or spa resorts). +2
- In addition to the seats designed for wheelchair users, an appropriate number of seats with enhanced features is provided, offering improved visibility and/or increased comfort for people with motor or sensory impairments: +2
  - Seating that facilitates getting up, e.g. through an appropriate seat height and grip options on the armrests +2
  - Seats that contrast with surrounding surfaces +2

- Larger seats for tall people
- Furniture (e.g. on tables or chairs) includes fittings on which walking aids, such as sticks or crutches, can be safely stored.

Equal participation:

- Podiums, orchestra and/or stage areas are accessible via ramps, lifts or lifting platforms for people with mobility aids, both from the visitor area and from the artist area. +5
- In all barrier-free areas, furniture is designed in such a way that it can be easily used by people with restricted mobility (wheelchair-accessible/height-adjustable). The furniture is part of the detailed overall concept for accessibility. +5
- Exhibition areas/showcases/exhibits are designed in all areas of the barrier-free areas in such a way that they are easily accessible and fully visible for people with restricted mobility. Information aids are equally accessible to all users. The exhibition concept forms part of the detailed overall accessibility concept. +5

Healthcare buildings

- The overall accessibility concept has been prepared by an accessibility expert with special qualifications in the field of hospital construction or healthcare construction and specific areas of expertise (such as dementia). +10

Barrier-free design of workplaces in accordance with applicable standards; and generally recognised rules of technology:

- Barrier-free design of at least 10–95% of UA 2 (office work) including work-related areas and associated circulation and ancillary areas. Provision for future adaptation and maximum distance to barrier-free toilets: as per office requirements +2–10

Design of the patient areas (care, examination, and treatment):

- All corridors in patient areas are equipped with handrails. +5
- At least one barrier-free wet room (with washbasin with knee clearance, mirror for use while sitting and standing, compliance with the maximum height of the toilet seat, shower that is level with the floor and/or bathtub that is suitable for disabled persons) is available on each ward/nursing unit. +5
- Balconies, loggias or conservatories assigned to the wards/nursing units are accessible and usable without thresholds. +10

Patient rooms

- Balconies, loggias or conservatories directly assigned to the patient rooms are accessible without thresholds. +10
- The sill height in the patient rooms is a maximum of 0.6 m. +2
- In all bathrooms, the sanitary fixtures are equipped with at least one grab/support handle. +5
- All showers are accessible at floor level. +10
- All showers are equipped with a folding seat. +5
- In all bathrooms, the maximum height of the toilet seat and all movement areas of the sanitary facilities are compliant with ISO 21542:2021 or DIN 18040-1 (alternatively local norm, see footnote **) +10

Design of visitor areas (classification as ‘public areas’)	+5
■ All corridors in the visitor areas are equipped with handrails.	+5
■ The interior visitor areas are fully barrier-free in accordance with current standards.	
Visitor areas and patient areas:	
■ Furniture (e.g. reception counters in registration areas) is designed in all areas in such a way that it can be easily used by people with motor impairments (wheelchair accessible/height-adjustable). The furniture is part of the detailed overall accessibility concept.	+5
Barrier-free design of the outdoor facilities:	+1–10
■ At least 10–100% of the outdoor accessible areas and common areas feature a barrier-free design (in accordance with applicable standards and the generally recognised rules of technology).	

The minimum requirement is to be fulfilled. A linear interpolation between the individual quality levels is possible.

SUSTAINABILITY REPORTING

The percentage of the building that consists of barrier-free areas and the number of barrier-free bathroom facilities are suitable key performance indicators (KPIs) for reporting purposes.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Proportion of barrier-free, generally accessible areas and common areas in outdoor spaces	[% area]
KPI 2	Proportion of floor space that can be used without barriers/proportion of floor space that can be used without restriction with a wheelchair	[% area]
KPI 3	Application of Levels (s) Indicator 2.3 ‘Design for adaptability and renovation’ (Level 1, L1.4., 4.) ‘Checklist: Adaptation of residential properties to life changes’ was carried out. Data has been transferred to the L1.5 reporting format.	[-]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

–

II. Additional explanation

–

III. Method

When evaluating the barrier-free design of a building, the extent to which all people have equal access to and use of the building is examined and assessed.

All buildings that are to be certified must fulfil the barrier-free design requirements of the building regulations in accordance with the applicable standard(s) and the generally accepted rules of good engineering practice; they must fulfil the 'DGNB minimum requirement' as an absolute minimum. The DGNB minimum requirement is based on the most recent applicable international building norms, which constitute standard and minimum building regulations and are used by federal states as the basis for their state building regulations. Assessment is implemented through the ISO 21542:2021 [Accessibility and usability of the built environment].

It is also advisable to use the latest version of the 'Berlin Design for All' [Accessible Public Buildings] guide as an aid to planning and as a planning tool. This describes fields of action and potential solutions for implementing the objectives and requirements of ISO 21542:2021.

Barrier-free design at the planning and construction stages
The planning phase offers the greatest opportunities for influencing the implementation of barrier-free design in the form of structural measures. Due to the complexity of the various legal bases of barrier-free building, it is advisable to enlist the services of experts in order to implement the planning and provide specialist advice throughout the project.

In order to incorporate all relevant aspects of barrier-free design into the planning and construction phases, it is of paramount importance that the specific needs of the project are established at the outset. The requirements ascertained from this are generally based on the specifications agreed with the building owner as part of requirements planning (e.g. barrier-free workstations and workspaces) and are integrated into an overall barrier-free design concept and incorporated into draft and detailed designs.

From quality level 2 onwards, an overall barrier-free design concept must be devised. This should provide information on the scope of the building requirements that must be met, as well as any retrofitting work that may need to be carried out at a later date. Special barrier-free design requirements for workstations and workspaces that have been established, e.g. in consultation with the representative bodies for people with severe disabilities, should also be described and represented in the overall concept (where this exists). The concept can also include solutions that fulfil the objectives of ISO 21542:2021 but that are not expressly stated in this ISO standard.

Barrier-free design measures for the building
In all publicly accessible and non-public areas of the building, all building requirements must be met essentially in line with the generally accepted rules of good engineering practice. This includes, for example, full accessibility, manoeuvring areas, door and corridor widths, provision for future installation of support rails near the toilet.

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In areas that are not open to the public, aids such as a guidance system, contrasts, tactile elements, etc., can be retrofitted at a later date (provided these are not required immediately for performing certain activities when the building first enters into use). Full documentary evidence must be provided for all retrofitting work in the form of plans with a well-conceived overall design concept (list of measures that are included in the plan but have yet to be implemented).

Barrier-free building areas:
Barrier-free use encompasses various areas, especially the 'publicly accessible areas' and the areas designated as workspaces, including the associated circulation and secondary areas. Circulation areas and outdoor facilities are included in the assessment, since these generally form the outdoor infrastructure. Other areas of the building are described in the usage-specific description.

Publicly accessible areas:
According to this criterion 'publicly accessible areas' are areas of the building that are intended to allow anyone (the building's users and/or visitors) to traverse and/or use them, e.g.:

- Entrance areas and foyers
- Cloakrooms
- Sales rooms
- Public bathroom facilities
- Offices designed to accommodate visitors
- Counters and waiting areas
- Press and representation areas
- Rooms offering food and accommodation
- Exhibition rooms and event halls
- Reading rooms, open-access library areas
- Teaching and conference rooms
- Rooms for sport
- Associated infrastructure areas or corridors adjoining the rooms listed above

For the purposes of this criterion, it does not matter whether the services offered are public or private, and whether they are provided free of charge or for a charge.

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Areas designated as workspaces:
Areas that are not open to the public and are predominantly used as workspaces. Areas designated as workspaces are areas required for performing the normal range of activities, such as:

- Working rooms (e.g. office rooms, laboratories)
- Meeting and conference rooms
- Storage, machinery and ancillary rooms
- Break and standby rooms
- Kitchenettes and cafeterias
- First-aid rooms
- Bathroom facilities
- Internal infrastructure (circulation routes, ramps, stairways, doors, escape routes, emergency exits)

If additional areas are required for performing the normal range of activities, these must also be designed to be barrier-free. Barrier-free design must be implemented in all areas that are relevant for operational reasons.

Circulation areas and outdoor facilities:
Where there are areas that people can spend time in outdoors, documentary evidence must be provided of the extent to which these allow for barrier-free access and can be used for their intended purpose.

Sales areas:
For the purposes of this criterion, sales rooms are defined as follows:

- Sales rooms (department stores, shop rooms, kiosks, including store windows)
- Exhibition spaces (exhibition halls, sample rooms)
- Operating rooms (sorting rooms, distribution rooms, packing rooms, dispatch rooms, supply and disposal of bases)

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APPENDIX 1

Documentary evidence template

Confirmation of the planning and implementation of barrier-free design measures for the building:

Assurance by the appointed architect or expert that the building complies with the barrier-free design requirements listed in the criterion. The architect or expert must be suitably qualified.

We, _____, hereby confirm
that the barrier-free design requirements in accordance with the quality level (as per DGNB criterion SOC2.1)

specified below for the _____ scheme

have been planned and implemented
in the _____ project.

REQUIREMENT	POINTS (ENTER)	REQUIREMENT FULFILLED
Quality level 1 has been achieved. Documentary evidence has been appended.	_____	☐
Quality level:_____ for scheme:_____ has been achieved. Please note: The DGNB reserves the right to request individual pieces of documentary evidence on a random basis at a later date as part of the conformity inspection.	_____	☐

_____

Date Signature of the appointed architect/expert Stamp

The auditor hereby confirms that they have checked that the information contained in the relevant documents is a true and fair representation of the facts:

_____

Date Auditor's signature Stamp

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IV. Usage-specific description

Dwellings: Residential

Areas specific to the Residential category that also apply generally include:

- External infrastructure (including the building entrance)
- Internal infrastructure (after the building entrance) – stairwells, lifts and doors, etc., including entrances to individual dwellings
- Dwellings
- Ancillary rooms such as basement rooms, storage areas for wheelchairs/walking aids, assessed by quantity and quality

Trading spaces: Consumer market Shopping centre Department stores

Retail establishments are publicly accessible buildings with barrier-free building specifications that are often covered in the state building regulations, the incorporated technical building requirements and state-specific retail establishment regulations. Requirements with regard to circulation areas, changing rooms, floor coverings, check-out areas, service counters and the design of navigation systems, etc. can be found in ISO 21542 and must be met. The tenant must confirm that they have completed measures that they are required to plan and implement. This confirmation must be included with the other documentary evidence submitted for the purposes of certification; where the tenant is not yet known, confirmation of these measures must be provided for in the tenancy agreement in the form of a tenant interior finishing obligation.

Furnishing requirements intended to facilitate use by people with impaired motor skills, sensory impairments and/or cognitive impairments are also beneficial in the overall barrier-free design concept that is to be devised from quality level 2 onwards, and should be incorporated from the planning stage. These include, for example, sales display cabinets, sales counters and shelving systems that allow goods in self-service areas to be reached.

Assembly buildings

‘Assembly buildings’ are publicly accessible buildings, whose structural requirements for barrier-free construction are taken into account in the state building regulations. Specifications for circulation areas, seating, toilet rooms, fire protection equipment and the design of orientation systems are among the requirements to be met according to ISO 21542 or DIN 18040 – 1. If the planning and implementation of the abovementioned measures lies within the responsibility of a tenant or the operator, their implementation must be confirmed and enclosed with the documentation for the certification.

For ‘Assembly buildings’, the creation of an overall **concept for barrier-free access** is already required in quality level 1. Since this concerns ‘publicly accessible buildings’, all publicly accessible areas must be designed in such a way that the independent, equal and safe use of these areas is possible for all building users, including people with disabilities.

The overall concept for barrier-free access is intended to provide information on the scope of the building’s technical requirements that enable people with motor or sensory impairments to use the building autonomously. This also includes enabling them to actively participate in self-rescue in the event of an emergency (taking into account fire protection and escape route security). It is recommended that an accessibility expert accompanies the preparation of the concept with the involvement of a responsible representative for people with disabilities*. (if possible*, since state and district representatives are not always available in regions without statutory regulation).

For ‘Assembly buildings’, from quality level 5 and above, assessment is carried out on the basis of qualitatively and quantitatively implemented aspects.

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Accessible design of workplaces:
Additional requirements for the barrier-free design of workplaces, which are presented and structurally implemented in the overall concept will be rated positively.

Circulation areas: campus/multi-building situation:
For building complexes, requirements for the route design between the individual buildings and functions must be included.

Circulation areas in the building:
All circulation areas in ‘Assembly buildings’ are designed in such a way that they can be used by all user groups in a comfortable and independent manner (e.g. stairs should have a barrier-free, alternative routes of equivalent quality (ramps/lift), doors should be easy to open, close and pass through for all users). Cash registers/checkpoints should allow safe and unhindered use by all users (e.g. wheelchair users, people of short stature or people who rely on personal assistance or mobility aids) with sufficient passage widths and movement areas.

Sanitary areas:
Quick access to barrier-free toilets and sufficient space in the sanitary areas for people with restricted mobility is often of great importance. Barrier-free sanitary areas/toilets are to be planned in such a way that:

- they are conveniently located in the building, thus ensuring easy and quick access for people with restricted mobility
- they can be used by people with different mobility restrictions (different space requirements).

Space for spectators:
The provision of extra space for people with sensory impairments or people with restricted mobility (e.g. wheelchair users) along with seats for accompanying persons (or assistance dogs) is also rated positively with a view to demographic change. Seats should be available for different users. This applies to both the number of seats and their features (e.g. armrests and backrests, clearly legible seat numbers, improved perception of spectator seats through contrasts to surrounding surfaces). Safe and comfortable access to the spectator seats (platforms/ramps), as well as an adequate view of the performance areas (e.g. through a suitable seat height) and good hearing quality through the use of suitable hearing enhancement systems must also be guaranteed. This must already be taken into account at the conception and planning phase (for fixed, but also for loose seating). The implementation of extra space for sensory or motor-impaired people (e.g. wheelchair users) along with seats for accompanying persons (or assistance dogs) is rated positively with a view to demographic change.

For a positive evaluation:

- Seats of different types (e.g. seat size/features) are offered.
- Seats are offered in different (spectator) areas and price categories and thus enable a seat selection that promotes the integration of people with disabilities.
- The proportion of wheelchair spaces is adapted to an above-average need (location and event-specific, such as in health resorts/spa resorts).
- At least 2% of the seats plus seats for accompanying persons (in the immediate vicinity) are implemented. For most regions, doubling this provision in response to demographic change is recommended.
- Fittings are provided on furniture (e.g. on tables or chairs) in which walking aids such as sticks or crutches can be safely stored.

Equal participation:
‘Assembly buildings’ are buildings in which events, assemblies, exhibitions and/or cultural performances take place.

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In order to allow people with motor and/or sensory impairments to participate in what can be 'experienced' in these buildings, it is necessary not only to guarantee structural accessibility, but also to create opportunities that enable these users to participate equally. This can be done, for example, with the help of appropriately designed furniture, the use of technical aids and various forms of presentation, information and communication that take into account the needs of the user. 'Assembly buildings' should offer solutions for all categories of disabilities, in order to enable these users to enter the building, and fully experience what the building has to offer. The overall concept for accessibility should therefore also take into account aspects that go beyond structural accessibility:

- Podiums, orchestra and/or stage areas should be accessible from both the visitor area and the artist area (e.g. with the help of ramps/lifts/lifting platforms, taking into account the multi-sensory principle).
- Furniture should be designed in all parts of the barrier-free areas in such a way that it can be easily used by people with restricted mobility (e.g. by taking into account knee clearance or height adjustment of tables and lecterns, including technology such as microphone/illumination or ensuring visibility and usability at the counter height from both a sitting and a standing position).
- Exhibition areas/showcases/exhibits and their content should be designed in all parts of the barrier-free areas in such a way that they are easily visible and understandable for people with motor and sensory impairments with the help of various information and communication aids (e.g. via electro-acoustic sound systems, audio signals, lighting, tactile plans). The exhibition concept is thus part of the detailed overall concept for accessibility.

Healthcare buildings

Compared to other buildings, healthcare buildings are used by an above-average number of people with physical disabilities. Therefore, high requirements are already set out in quality level 1, which include the barrier-free accessibility of all patient, examination and visitor areas. In the presentation and evaluation of accessibility, a differentiation must be made between the needs of patient and staff user groups. The requirements of visitors should also be included in the evaluation. For the staff user group, the requirement for accessibility to be demonstrated is limited to the administrative areas. In addition to the offices and social spaces, this also includes areas such as the gate and reception area. The suitability of areas with different uses for wheelchair users depends on the implementation and the respective capabilities or equipment requirements. The widest possible implementation is advisable.

Visitor areas in healthcare buildings are considered 'public areas' under quality level 5, according to the definition of the DGNB, and must fully comply with the accessibility requirements (these areas are excluded from the possibility of retrofitting described in the criterion).

Healthcare buildings type I

The number of patient rooms to be assessed in quality level 5 may be reduced if a detailed overall accessibility concept is provided, reflecting the specific use of the building. However, all required measures must be implemented accordingly in the patient rooms.

Logistics and Production buildings

If there are ≥ 20 permanent workstations and/or the office area ≥ 400 m², the minimum requirements for office buildings as described in quality level 1 must be met. If the total office area and/or number of permanent workstations do not exceed these values, the minimum requirements for office area (e.g. spatial dimensions, movable areas, door width, slopes at the main entrance, barrier-free toilets and all relevant general aspects, see QL1) must be designed to be 'fit-out ready', to allow straightforward subsequent refurbishment if required. This means that the dimensions of the relevant units, such as circulation areas, toilets, corridors, main doors, main entry without stairs or obstacles (> 2 cm), ramps, etc. must be provided to allow future adaptations without major construction (refurbishment) work.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Documentation that must be provided:
Documentation for "Quality level 1/DGNB minimum requirement":
General explanations and descriptions of the building's barrier-free design. Relevant excerpts from plans in which the areas in which to manoeuvre, clearance widths, etc. that are a necessary part of barrier-free design are clearly marked and represented with dimensions:

- Relevant plans (e.g. floor plans showing the circulation areas between all the use areas, ground floor plan with outdoor facilities and transition to the public space, including car parks).
- Relevant details (transitions, navigation systems, operating elements, fixtures, equipment, etc.)
- Photo documentation
- Confirmation by the appointed architect or expert (in accordance with Appendix 1) that the building complies with the minimum barrier-free design requirements listed in this criterion.

Documentary evidence and confirmation of the planning and implementation of barrier-free design measures for the building for quality levels 2–5:
The areas defined as barrier-free workspaces and the outdoor spaces in which people can spend time must be drawn and labelled on the floor plans and outdoor facilities plan, which must be submitted. In addition, assurance by the architect or expert that the building complies with the barrier-free design requirements listed in the criterion is acceptable as documentary evidence (see Appendix 1). The architect or expert must be suitably qualified.

The DGNB reserves the right to request individual pieces of documentary evidence on a random basis at a later date as part of the conformity inspection. The documentary evidence that is required in such cases is as follows:

Information on the building's barrier-free design

- Detailed description of the overall concept of the barrier-free design outside and inside the building, including all the barrier-free design measures.
- Overall concept
- Documentary evidence of the individual measures as part of planned retrofitting work stipulated in the concept

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The following must be submitted for the (indoor and outdoor) areas defined as barrier-free:

- Floor space list featuring the barrier-free working and use areas and specifying the proportion of barrier-free floor space (demonstrating compliance with the areas required in the quality level). Here, the proportion of barrier-free floor space is stated in relation to the usable area (UA according to the definition under the [T&D_04]).
- Documentary evidence of barrier-free design based on plans and photos: The barrier-free rooms (incl. the barrier-free toilet cubicles), areas in which to manoeuvre, corridors, door widths, etc. must be drawn, marked and labelled with dimensions using photos or plans:
- Relevant floor plans, e.g. for a standard floor, site plan (showing the outdoor facilities), attic and, if appropriate, basement floor/underground garage
- Relevant sections and detailed drawings (transitions, navigation systems, operating elements, fixtures, equipment, etc.)
- Photo documentation with explanations

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN EN 81-70: Safety rules for the construction and installations of lifts, September 2005
- Sustainable Development Goals, United Nations/globalgoals.org
- Berlin-Design for all: Accessible Public Buildings (2nd edition) - Berlin Senate Department for Urban Development and the Environment Communication, Berlin, March 2013
- ISO 21542:2021 Building construction — Accessibility and usability of the built environment Technical Committee: ISO/TC 59/SC 16
- DIN 18040 – 1 Construction of accessible buildings, Design principles – Part 1: Publicly accessible buildings, DIN Deutsches Institut für Normung e.V. 2010
- DIN 18040 – 2 Construction of accessible buildings, Design principles – Part 2: Dwellings, DIN Deutsches Institut für Normung e.V. 2011

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Technical quality

The six technical quality criteria provide a scale for evaluating the **technical quality** with regard to relevant sustainability aspects.

TEC1.1	Fire safety
TEC1.3	Quality of the building envelope
TEC1.4	Building technology
TEC1.5	Ease of cleaning building components
TEC1.6	Circular construction
TEC3.1	Mobility infrastructure

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TEC1.1

Fire Safety

Objective

Fire events not only endanger life and safety of humans and animals but also damage the building fabric, emit pollutants and cause harm to the environment. The issue of fire safety therefore forms an integral part of DGNB`s certification procedures.

NOTE: Neither the DGNB certificate as a whole nor the fire protection evaluation points awarded by the DGNB replace official permits or official acceptance. Due to the limited scope of checks and assessments, the awarding of points does not constitute confirmation that the project has been implemented and is utili-zed in accordance with the fire protection documents submitted and/or provided otherwise by the Applicant for certification purposes. Rather, the certificate and the fire protection evaluation points awarded are based primarily on declarations made by the Applicant, and DGNB and its auditors rely on such declarations being complete, true and not misleading. The Applicant's responsibility to ensure full conformity with the applica-ble fire protection regulation remains unaffected. For further restrictions, please see preamble paragraph 2 and section 13.2 of the Certification Agreement.

Benefits

The main benefits of fire safety measures are the reduction of potential loss of life and injury during a fire, as well as the destruction caused by fire, and hence the associated repair and liability costs in the aftermath. It is essential to prevent the occurrence of a fire and the spread of fire and smoke, which will affect not just the building itself, but also its surroundings. Equipping a building with sufficient fire safety measures will reassure building users during normal operation by allaying safety concerns. Fire safety measures include those that are

- intended to prevent ignition of an uncontrolled fire
- used to limit the spread and impact of a fire after it starts
- planned during the construction of a building or implemented in existing structures
- communicated to the building's occupants.

Essential fire safety measures are installed within a building or premises as a vital feature to prevent injury and loss of life in the event of fire. Furthermore, these ensure that people and animals can be rescued and firefighting can be carried out effectively in the event of a fire. Examples of such measures are listed in Indicator 2 and Indicator 3 below.

Contribution to overarching sustainability goals



Outlook

Ideally, this criterion will no longer be needed in a few years' time, when the topics addressed in the criterion have become local standard practice.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Logistics** **Production** **Healthcare buildings**	**2.5%**	**2**
Consumer market **Shopping centre** **Department stores** **Assembly buildings**	**2.3%**	**2**

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EVALUATION

Fire safety is evaluated based on a checklist. A maximum of 100 regular points can be attained. For a positive evaluation of these indicators, the design documents must clearly demonstrate that the minimum standards have been met. Note that the building inspection authority allows for alternative fire safety concepts and permits deviations from the applicable building regulations under certain conditions.

ADVICE: The checklist points under Indicators 2 and 3 can only be achieved if the additional measures are not mandatory. This is the case where additional measures are voluntary options that do not form part of the local building regulation or compensatory measures within the fire safety concept. Other local fire safety features of the design and structure (Indicator 2) or of the technical building system (Indicator 3) not listed below may be considered after consultation with DGNB experts.

MINIMUM REQUIREMENT

FOR ALL TYPES OF BUILDINGS:

Indicator 1: Fire safety certificate must be presented

NOTE: Buildings that are without basic fire safety features and do not comply with local building regulations cannot be certified.

NO.	INDICATOR	POINTS
1	**Fire safety certificate**	**Max. 25**
	Fire safety features have been designed in accordance with the local building regulations, or deviations from local building regulations have been approved by the relevant authorities and meet the required safety level.	25
2	**Additional fire safety features of the design and structure**	**Max. 40**
	■ Dimensional improvements that exceed legal requirements	+10
	■ Direct external access to fire alarm centre and equipment room/fire brigade control panel, or fire brigade information system.	+5
	■ Photoluminescent guiding pathway close to the ground	+10
	■ Self-closing panic locks/bolts on the building entrance doors or emergency exit doors	+10
	■ Glass panel on all doors on escape routes	+ 5
3	**Additional fire safety features of the technical building system**	**Max. 75**
	■ Dynamic escape and rescue guidance system	+12.5
	■ Increased illumination of safety lighting (at least 10 Lux)	+7.5
	■ Smoke extraction systems with air vents/air supply apertures that open automatically.	+7.5
	■ Additional (i.e. not mandatory) automatic fire extinguishing system (e.g. sprinkler system)	+12.5
	■ Automatic fire extinguishing system – low-pressure water mist extinguishing system	+7.5

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- Automatic fire extinguishing system – high-pressure water mist extinguishing system +12.5
- Radio system operating on the emergency services bandwidth and linked to the fire brigade where this is not required by building regulations +7.5
- Safety equipment, e.g. fire extinguishers, wall hydrants, emergency buttons with photoluminescent materials when this is not already required by fire safety regulations +2.5
- Lift for the fire brigade or a planned passenger lift as a fire brigade lift when this is not already required by building regulations +15

Re 3	**INNOVATION AREA** Additional, innovative fire protection measurement: If the quality and scope correspond to the aspects presented above, the respective points can be credited according to the evaluation logic applied above.		**As in 3**

SUSTAINABILITY REPORTING

Not available

NO.	KEY PERFORMAMCE INDICATORS / KPIS	UNIT
-		

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Fire safety of buildings is of utmost importance. Therefore, this criterion contains a minimum requirement (i.e. Indicator 1). If this is not met, the building cannot be certified. The minimum requirement is to provide basic fire safety features and comply with local building regulations.

II. Additional explanation

Minimum requirements for fire safety are regulated in local building regulations. Structural and technical measures can be implemented to provide sustainable fire protection beyond the minimum requirements. In the interests of sustainability and the prevention of injury and life as the primary goal, the implementation of additional measures is viewed positively – for example, measures to reduce fire events risk or to increase the safety of escape and rescue routes. The evaluation assesses the effectiveness of the measures as well as the implementation costs.

III. Method

Indicator 1. Fire safety certificate

This indicator represents the minimum requirement for fire safety. It assesses basic fire safety features and their compliance with local building regulations. Requests for approvals for deviations from local building regulations are examined on a case-by-case basis.

Indicator 2. Additional fire safety features of the design and structure

Additional points may be awarded for each feature of the design or structure that enhances fire safety and contributes to the building. The effectiveness of any such features should be considered within the context of each individual building. Additional points may be awarded for improvements to fire safety measures that exceed the legal requirements, such as:

- smaller fire and smoke compartments (at least 20% smaller area)
  and/or
- shorter escape route length (at least 20% shorter routes)
  and/or
- increased escape route width (at least 20% wider routes)

This indicator is evaluated by calculating the sum of the individual measures.

Indicator 3. Additional fire safety features of the technical building

Additional points may be awarded for each technical feature of the building system that enhances fire safety and contributes to the building. The effectiveness of any such features should be considered within the context of each individual building. The method is identical to that of Indicator 2.

If the legally required engineering measures for fire safety are exceeded, further points may be awarded. This includes the installation of a comprehensive fire alarm system, a dynamic escape and rescue guidance system or an automatic fire extinguishing system. This indicator is evaluated by calculating the sum of the individual measures.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The allocation of points for individual indicators must be backed up by comprehensive and plausible evidence.

Indicator 1. Fire safety certificate

- Summary of legal requirements and any additional conditions attached to planning permission.
- Precisely formulated fire safety concept.
- Detailed fire safety plan and compensation measures.
- Final fire safety certificate/permission

Indicator 2. Additional fire safety features of the design and structure

- Evidence of additional fire safety features of design and structure, including e.g. extracts from fire safety plan, drawings and specifications for additional features, or photographic evidence.

Indicator 3. Additional fire safety features of the technical building

- Evidence of additional technical fire safety features, including e.g. extracts from fire safety plan, drawings and specifications for additional features, or photographic evidence.

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN EN 15269. Extended application of test results for fire resistance and/or smoke control for doors, shutter and operational window assemblies, including their elements of building hardware. The following parts of this Standard can be considered for this criterion:
  - DIN EN 15269-1. General requirements - Part 1. Berlin: Beuth Publisher. July 2010
  - DIN EN 15269-2. Fire resistance of hinged and pivoted steel doorsets – Part 2. Berlin: Beuth. February 2012.
  - DIN EN 15269-3. Fire resistance of hinged and pivoted timber doorsets and openable timber framed windows – Part 3. Berlin: Beuth Publisher. October 2012
  - DIN EN 15269-7. Fire resistance for steel sliding doorsets - Part 7. Berlin: Beuth Publisher. April 2010
  - DIN EN 15269-10. Fire resistance of steel rolling shutter assemblies - Part 10. Berlin: Beuth Publisher. July 2011
  - DIN EN 15269-20. Smoke control for hinged and pivoted steel, timber and metal framed glazed doorsets - Part 20. Berlin: Beuth Publisher. December 2009
- DIN EN 13501. Fire classification of construction products and building elements. The following parts of this Standard can be considered for this criterion:
  - DIN EN 13501-1. Classification using data from reaction to fire tests – Part 1. Berlin: Beuth Publisher. January 2010
  - DIN EN 13501-2. Classification using data from fire resistance tests, excluding ventilation services – Part 2. Berlin: Beuth Publisher. December 2016
- DIN EN 1634-1. Fire resistance test for door and shutter assemblies and openable windows – Part 1. Berlin: Beuth Publisher. April 2018
- DIN EN 12101. Smoke and Heat Control Systems. The following parts of this Standard can be considered for this criterion:
  - DIN EN 12101-1. Specification for smoke barriers – Part 1. Berlin: Beuth Publisher. October 2018
  - DIN EN 12101-2. Natural smoke and heat exhaust ventilators – Part 2. Berlin: Beuth Publisher. August 2018.
  - DIN EN 12101-3. Specification for powered smoke and heat control ventilators – Part 3. Berlin: Beuth Publisher. December 2015
  - DIN EN 12101-4. Natural smoke and heat exhaust ventilators – Part 4. Berlin: Beuth Publisher. August 2017
  - DIN EN 12101-7. Smoke duct sections – Part 7. Berlin: Beuth Publisher. August 2011

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TEC1.3

Quality of the building envelope

Objective

Our objective is to minimise the energy demand for air conditioning in buildings while at the same time ensuring high thermal comfort and preventing building damage.

Benefits

A well-planned building envelope is a prerequisite for achieving high user comfort and low energy costs.

Contribution to overarching sustainability goals



Outlook

The different levels of quality of the building envelope defined in the criterion will be adjusted to correspond to technical and, potentially, legislative developments in the medium term.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Healthcare buildings** **Logistics** **Production**	**2.5%**	**2**
Consumer market **Shopping centre** **Department stores** **Assembly buildings**	**2.3%**	**2**

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EVALUATION

The quality of the building envelope is evaluated using four indicators, which are intended to create the necessary conditions required to ensure high thermal comfort with the lowest possible energy demand. The heat transfer coefficients (Indicator 2), existing thermal heat bridges (Indicator 3), airtightness (Indicator 4) and summer heat protection (Indicator 5) are intended to ensure buildings are energy efficient. In this criterion, a maximum of 100 points, or a maximum of 105 points including bonuses, can be achieved.

NO.	INDICATOR			POINTS
1	**Potential analysis of the building envelope** (conceptual design)			**Max. 10**
1.1	**Investigation of the potential of the building façade (wall and window areas)**			
	■ Potential for the use of the PV application			+5
	■ Potential for the use of greening			+5
	■ Investigation of different variants with a focus on durability over the entire life cycle			+5
	■ Use of renewable raw materials for insulation and cladding			+2.5
	■ Individual components can be replaced in a non-destructive manner			+2.5
	■ Investigation of different variants with a focus on heat loss via the building envelope			+2.5
2	**Heat transfer**			**Max. 30**
2.1	**Heat transfer coefficients**			**10–30**
	Opaque exterior components[1] Transparent exterior components[1] Curtain wall Glass roofs, strip lights, skylights	W/(m²·K)	≤ min. country-specific mandatory requirement	10
	Opaque exterior components[1] Transparent exterior components[1] Curtain wall Glass roofs, strip lights, skylights	W/(m²·K)	-15% of the min. mandatory requirement	20
	Opaque exterior components[1] Transparent exterior components[1] Curtain wall Glass roofs, strip lights, skylights	W/(m²·K)	-30% of the min. mandatory requirement	30

Note: **For: Logistics** **Production**
In areas with low temperatures (between ≥ 12 °C and <19 °C), the required U-values differ from those specified in other schemes, e.g. as outlined in Appendix 1 of this document.

Note: If no mandatory regulation exists, U-values from Appendix 1 can be used as min. requirements for the heat transfer coefficients.

Note: Results of a detailed calculation may be interpolated.

[1] If not included in the components curtain wall, glass roofs, strip lights and skylights.

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3	**Thermal heat bridges[2]**		**Max. 10**
3.1	**Thermal heat bridge correction factors**		**5–10**
	Thermal heat bridge correction factor ΔU_{WB} in W/(m²·K)	≤ 0.05	5
		≤ 0.02	10
	Note: Results of a detailed calculation may be interpolated.		

4	**Airtightness (as built)**		**Max. 20**
4.1	**Airtightness measurement**		**5–20**
	Air exchange rate nL50 or via the air permeability of the building envelope qE50 (at a pressure difference of 50 Pa)		
	Buildings – interior volume ≤ 1500 m³	n_{L50} ≤ 1.5 1/h	5
	Buildings – interior volume > 1500 m³ applies	q_{E50}: 2.5 m³/(hm²)	
	Buildings – interior volume ≤ 1500 m³	n_{L50} ≤ 1.0	10
	Buildings – interior volume > 1500 m³ applies	q_{E50}: 2.0 m³/(hm²)	
	Buildings – interior volume ≤ 1500 m³	n_{L50} ≤ 0.6	20
	Buildings – interior volume > 1500 m³ applies	q_{E50}: 1.8 m³/(hm²)	
	Note: Results of a detailed calculation may be interpolated.		
	Alternatively, to airtightness measurement, joint permeability of windows and doors		**Max. 10**
	Joint permeability Q in accordance with EN 12207		
	■ Class 2		5
	■ Class 3		7.5
	■ Class 4		10

5	**Summer heat protection**		**Max. 25**
5.1	**Avoid overheating in summer**		**5–15**
	Compliance with minimum national criteria to avoid overheating in summer, or with MIN_FAC[3], whichever is stricter.	S ≤ x Shp,max	
		x = 1	5
		x = 0.8	15
	Alternative: Thermal simulation		
	Number of overheating/excess temperature hours	≤ x Kh/a	
		x = 500	5
		x = 350	15
	For **Residential**		
	Number of overheating/excess temperature hours	≤ x Kh/a	
		x = 1200	5
		x = 840	15
	Note: Results of a detailed calculation may be interpolated		
5.2	**Verification and variants for summer heat protection**		**Max. 10**
	■ Examination of different variants		+5
	■ Examination of the non-staying (non-accommodation) rooms		+5
	■ Examination of the building with local weather dataset including the planned use. The results are incorporated into the decision-making process during the design phase		+10
	■ Exceeding the legal minimum requirements by ≥ 20 %		+10

[2] Adaptation possible, project-specific values must be agreed with DGNB in the project adaptation process. The local code/standard may be used as a reference value.
[3] For a definition of MIN_FAC, see Table 2 in Appendix 1

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5.3	**AGENDA 2030 BONUS – CLIMATE ADAPTATION** Resilient thermal comfort: The frequency of exceedance during the heating and cooling period is determined for buildings using climate data predictions for 2030 and 2050. The results are used in the decision-making process at the planning stage.	**5**
6	**Quality assurance**	**Max. 15**
6.1	**Implementation of quality control measures**	**max. 15**
	■ Differential pressure measurement (blower door test) during the construction phase, for quality control of the airtightness level	+7.5
	■ Thermography of the building as a quality control measure during the construction phase or shortly before completion	+7.5
	■ Other measurements relevant to the building envelope were taken to ensure the quality of the construction.	+7.5

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SUSTAINABILITY REPORTING

Appropriate key performance indicators (KPI) include communicating information regarding heat transfer coefficients, thermal heat bridge correction factors, the results of the airtightness measurement, solar transmittance parameters and, if necessary, the number of temperature exceedance hours. The results of a thermal simulation can be used for reporting in accordance with the ‘Level(s) – Common EU framework of core environmental indicators’ (for more details see chapter ‘Terms and definitions’).

NO.	KEY METRICS/KPI	UNIT
KPI 1	Heat transfer coefficients, differentiated by different exterior components	[W/m²*K]
KPI 2	Thermal heat bridge correction factors	[W/m²*K]
KPI 3	Air exchange rate	[1/h]
KPI 4	Solar transmittance parameters	[-]
KPI 5	Number of temperature exceedance hours, corresponds to Level(s) Indicator 4.2: Time outside of thermal comfort range – Time out of range	[kh/a or %]
KPI 6	Number of temperature exceedance hours in 2030 and 2050, corresponds to Level(s) Indicator 5.1: Time outside of thermal comfort range – Time out of range 2030/2050	[kh/a or %]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

–

II. Additional explanation

–

III. Method

The required values are defined below and serve as comparison values for the implemented design. The following methods are used to evaluate the implemented design:

Indicator 1: Potential analysis of the building envelope (conceptual design)
When examining the potential of the building façade (wall and window), all surfaces must be considered and evaluated. The following points are usually relevant for consideration:

Potential for the use of PV systems:

- Alignment and shading
- Design
- Yield forecast
- Operating model
- Economic efficiency
- Life cycle assessment (production, recyclability)
- Synergy effects

Potential for greening, design and quality of space:

- Greening systems (e.g. façade-bound system, wall-bound system)
- Benefits for residents and the local environment (rainwater retention and cooling through evaporation and shading, noise protection, air quality through oxygen production and reduction of fine dust, urban gardening)
- Design process (e.g. weather-related, construction-related, plant-specific factors)
- Economic efficiency (e.g. savings potential, synergy effects for PV use or pre-cooling of supply air, maintenance effort and servicing)

Examination of different variants with a focus on durability over the entire life cycle:

- The façade should also be examined as part of the life cycle assessment, criterion ENV1.1.

Use of renewable raw materials for insulation and cladding:
Here, the entire façade construction, including interior cladding, insulation, and exterior cladding must be considered.

- Renewable insulation materials: Flax, hemp, wood fibre, wood shavings, wood wool, jute, cork, sheep’s wool, seagrass, reed panels, straw, cellulose
- Renewable raw materials for cladding
- Plasters, paints: clay or lime-based
- Required additives (flame retardants, moth repellents, support fibres must be declared in full, and their safety must be demonstrated)
- Emission behaviour must be tested and a low level of pollutants must be demonstrated.

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Individual components can be replaced non-destructively:

- Screwed façade
- Standard dimensions (no special production, no special vehicles required for replacement)
- Substructure accessible (at most, partial dismantling of the outer cladding or insulation necessary)
- Durability of the individual products/layers is matched to one another
- Documentation provided for subsequent replacement or deconstruction

Note: see criterion TEC 1.6

Examination of different variants with a focus on heat loss via the building envelope:

Here, the entire façade construction with substructure and thermal bridge formation must be considered

- Energy saving
- Economic efficiency (e.g. savings potential (heating and cooling), maintenance, installation, durability)

Indicator 2: Heat transfer

This indicator is evaluated based on the selected energy performance certificate (EPC); for more details regarding the EPC, refer to the criterion ENV1.1. The lowest average value must be used for the evaluation in each case.

Indicator 2.1: Heat transfer coefficients

For all buildings, the calculation of the average heat transfer coefficient of the respective building component category is decisive. The components shall be considered in proportion to their area. The calculation can be carried out according to ISO 13789:2017 ‘Mean thermal transmittance of building fabric’ or DIN V 18599 or a standard that complies with the requirements specified in ISO 52000-1, such as EN ISO 52016-1:2017 or any national annex to these. In addition, transparent components can be calculated according to ISO 10077-2, ‘Thermal performance of windows, doors and shutters’, EN 673: ‘Glass in building. Determination of thermal transmittance (U value). Calculation method’. The heat transfer coefficients of building components to unheated rooms or the ground shall be additionally weighted by a factor of 0.5. When calculating the average value of the floor slabs adjacent to the ground, the areas that are more than 5 m from the outer edge of the building may be disregarded. The gates and doors are assigned to the opaque components in the case of an opaque design and to the transparent surfaces in the case of a transparent design.

If a building only meets the requirement for low or normally heated areas (≥ 19°C), the evaluation can be determined on an area-weighted basis.

Note: In order to prevent damage in the long term, the building envelope must always be designed to ensure that only non-critical amounts of condensation water form in the envelope surface components. Verification is carried out via a written declaration by the specialist planner. If the specialist planner does not classify structural components as inherently non-critical, documentation of the vapour diffusion must be carried out for these components using static or dynamic calculation. This also applies to enclosing surfaces of building zones with markedly different indoor climates (e.g. cold storage rooms). If this verification is not carried out, no points can be awarded in this indicator.

Indicator 3: Thermal heat bridges

Indicator 3.1: Thermal heat bridge correction factors

The thermal heat bridges must always be designed to ensure that the structural minimum heat insulation (moisture protection) is complied with throughout the entire area to provide long-lasting protection against damage. Verification is carried out via a written declaration by the specialist planner. If the specialist planner does not classify thermal heat bridges as inherently non-critical, a two-dimensional isothermal calculation must be carried out for these design details in accordance with ISO 13788:2012 ‘Hygrothermal performance of building components and building elements’. If this verification is not carried out, no points can be awarded in this indicator.

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The thermal heat bridge correction factor ΔU_{WB} is determined in accordance with ISO 10211:2017 'Thermal bridges in building construction'.

Indicator 4: Airtightness

Indicator 4.1: Airtightness measurement

The measurement must include all building areas that are to be heated/cooled after building completion. Differential pressure measurement (blower door test) in accordance with EN ISO 9972 or EN 13829.
Buildings with an air volume ≤ 1500 m³:

- Determination of the air exchange rate n_{L50} in h^{-1} at a pressure difference of 50 Pa

For buildings with an air volume > 1500 m³ the following applies in addition:

- Determination of the air permeability q_{E50} in m³/(m²h) (air exchange rate related to the enclosed surface)

Alternatively: Joint permeability of windows and doors

Documentation of the joint permeability Q in accordance with EN 12207. The lowest value of the components installed is used here. If there are differences in classes, deviations up to 10% of the total area (area of the windows and doors) can be ignored.

Indicator 5: Summer heat protection

Indicator 5.1: Avoid overheating in summer

Documentation of summer heat protection (S_{HP}) must be carried out in accordance with EN 13363. As an alternative, documentation of summer heat protection can be created in accordance with a more recent version of ISO 52022-3:2017 standard. This includes assessment of the solar transmittance parameter S in the simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing ISO 52022-1:2017. The documentation must include the rooms specified as relevant in the applicable version of the local EPC.

Requirements for summer heat protection (MIN_FAC) in the simplified calculation:

Table 1: Definition of MIN_FAC

	MECHANICALLY HEATED BUILDING (OFFICES AND SIMILARLY USED SPACES)	BUILDING WITHOUT ACTIVE COOLING OR WITHOUT AIR CONDITIONING
MIN_FAC	$S_{HP,} = W_{WR} \cdot g_t \leq 0.16 = S\ hp,_{max}$	$S_{HP} = W_{WR} \cdot g_t \leq 0.16 = S\ hp,_{max}$

where:

W_{WR} is the window to wall ratio = window area/wall area
window area = sum of all windows (including window frames and mullions)
wall area = area of the exterior wall (width * floor to ceiling height) including all transparent and opaque parts of the wall

g_t is the combined total shading coefficient of the window system, glazing and sun protection.

S_{HP} (Solar Heat Protection) is the factor used to assess overheating risk for office rooms according to DIN EN 13363
Alternatively: This covers thermal, solar and daylight properties of building components and elements according to either the detailed calculation method under ISO 52022-3:2017 or the simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing under ISO 52022-1:2017.

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Alternative: **simulation**
If it is not possible to carry out documentation in accordance with the simplified method, a dynamic thermal simulation calculation can be carried out to assess the number of temperature exceedance hours for the purposes of evaluating the thermal conditions. This applies in particular if rooms or space suitable for assessment incorporate the following structural facilities:

- Double façades or
- Transparent thermal insulation (TTI) systems.

In such cases, the thermal simulation must be carried out with consistent calculation boundary conditions in accordance with the standards described in criterion ENV1.1. Simulations must be in accordance with standard ISO 7730, ASHRAE 55 or DIN 4108.

Indicator 5.2: Verification and variants for summer heat protection
When examining various options for summer heat protection (e.g. night ventilation, fixed shading, canopies, neighbouring buildings), possible thermal masses, ventilation options during the utilisation period as well as during the latter part of the night (night ventilation) and the control of shading will be addressed, among other things.
Building law requirements typically apply only to recreation areas. In this case, all non-windowless rooms (e.g. corridor and connecting corridor) are to be explicitly examined and evaluated.

Indicator 5.3: Agenda 2030 bonus: Thermal comfort climate adaptation
The frequency of exceedance during the heating and cooling period is determined for buildings using climate data projections for 2030 and 2050. The results inform decision-making during the planning stage. The climate data used should be based on the UN IPCC ‘Mitigation’ (SRES E1) emissions scenario. The ‘Medium-high’ (SRES A1B) emissions scenario can be used as a second worst-case scenario. Information regarding the assessment methodology and the possible areas of focus in the planning process can be found in the Level(s) framework published by the European Commission (Source: ‘Level(s) – A common EU framework of core sustainability indicators for office and residential buildings’, publication version 1.1, Brussels, 2021).

Indicator 6: Quality assurance (as built)

This indicator requires measurements to be taken to ensure that the planned quality is achieved. The measurement methods listed may indicate execution faults that could affect the long-term life of the building. The following measurements should be performed:

- Differential pressure measurement, as described in Indicator 4, during the construction process for intermediate quality checks
- Thermal imaging measurement of the building in accordance with EN 13187 or ISO 6781
- Other possible measurements: e.g. immissions control measurements, smoke extraction tests, moisture measurement prior to laying floor coverings in order to prevent moisture damage, checking of the integrity of ventilation duct work (according to EN 15727). This should include submission of an associated no-defect declaration.

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IV. Usage-specific description

Office **Education** **Hotel** **Assembly buildings** **Healthcare buildings**
Consumer market **Shopping centre** **Commercial building** **Residential buildings**

Indicator 2: Transmission via the building envelope

For properties with normally heated and low heated zones, the evaluation is carried out separately. If the requirement is not met for either low or normally heated areas, the assessment can be made on an area-weighted basis.

If applicable: Alternatively, for: **Residential buildings**

Indicator 2: Transmission via the building envelope

For residential buildings, the assessment can also be carried out via the H'_T – transmission heat loss of the building envelope surface (value, measured in watts per Kelvin (W/K)). The requirement refers to the maximum percentage value in relation to the corresponding value of the reference building according to the local valid EPC or see Table 1 under Appendix 1 of this document.

Logistics **Production**

Indicator 2: Transmission via the building envelope

Doors and gates may be assigned to the glass roofs category.

Assembly buildings

Evaluation of seasonal/irregularly used buildings, i.e. buildings that do not operate all-year-round, such as exhibition halls, will be performed only for operational (in use) time, without taking into account periods during which the building is vacant.

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APPENDIX 1: Worldwide climatic zones and U-Values for orientation

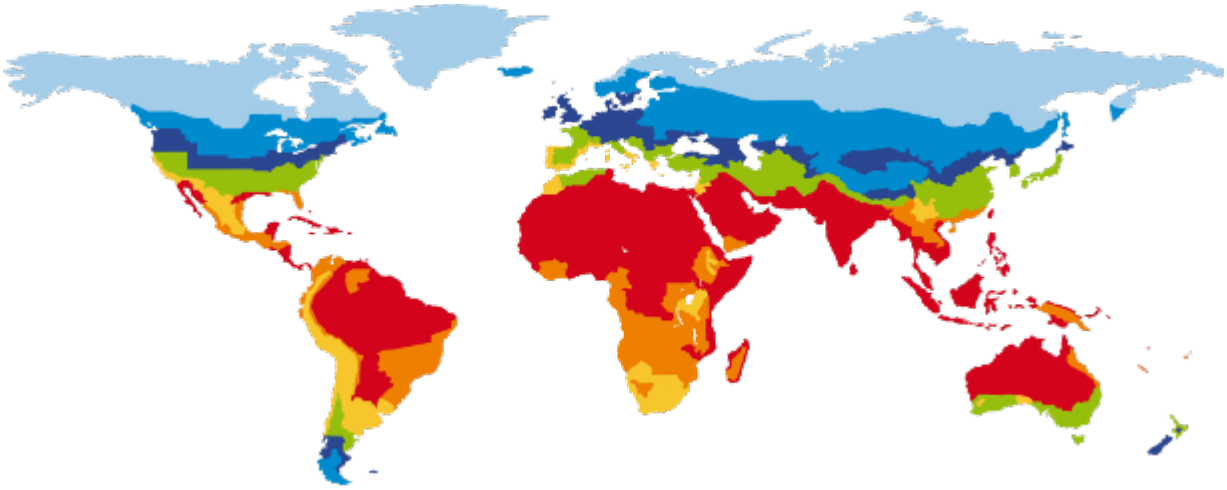


Figure 1: World climate map according to the Passive House Institute (PHI) [2]

DGNB offers the PHI climate map with certain U-Values as an alternative solution for the regions and countries where no mandatory regulations exist. The following 7 climatic zones are considered as the most influential zones:

- Arctic
- Cold
- Cool, temperate
- Warm, temperate
- Warm
- Hot
- Very hot

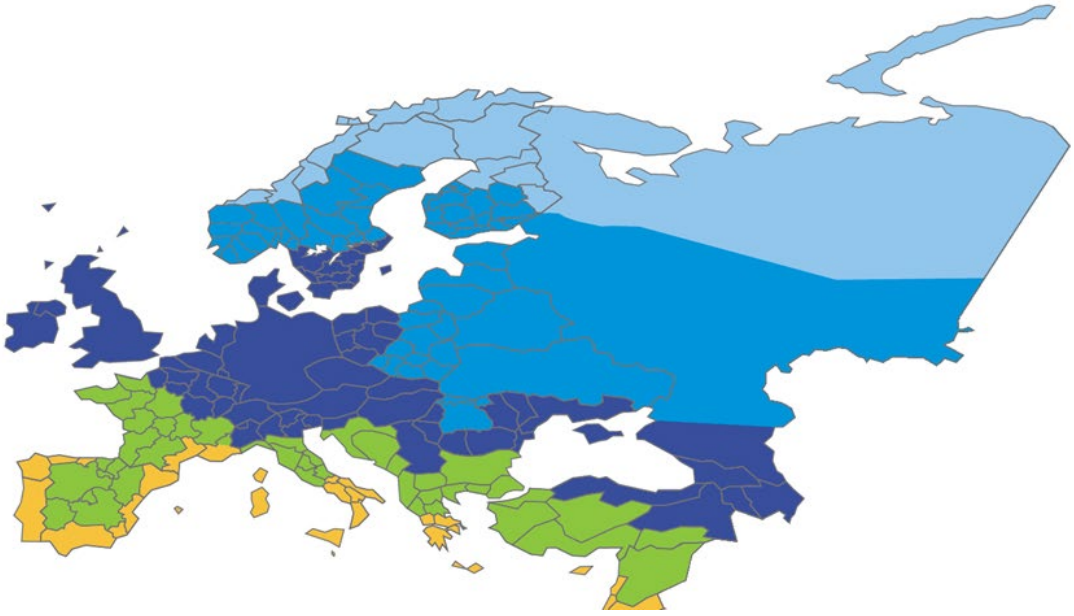


Figure 2: Climate map of Europe (source: PHI

Table 2: Optional **U - Values** (minimum requirement) for the various climatic zones

[2] https://cms.passivehouse.com/media/filer_public/95/19/9519f0a1-5000-4699-9aed-f5d13aadd0b3/hw_climate-zones-list_and_map_en.pdf

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	Climate Zones:						
	Arctic	Cold	Cool, temperate	Warm, temperate	Warm	Hot	Very hot
Heat transfer W/(m²·K)							
Opaque exterior components	0.25	0.30	0.35	0.50	0.75	0.75	0.50
Transparent exterior components	0.90	1.30	1.70	2.00	2.30	2.30	2.00
Curtain wall	0.90	1.30	1.70	2.00	2.30	2.30	2.00
Glass roofs, skylights etc.	1.50	2.00	2.80	3.00	3.30	3.30	3.00
Transmission heat loss H'_T Residential (alternatively) W/(m²·K)							
Freestanding A_N < 350 m² of the façade area	0.35	0.40	0.45	0.60	0.90	0.90	0.60
Freestanding A_N > 350 m² of the façade area	0.45	0.50	0.55	0.80	1.20	1.20	0.80
Semi-detached	0.40	0.45	0.50	0.70	1.10	1.10	0.70
Other	0.50	0.60	0.70	1.05	1.50	1.50	1.05
Heat transfer (indoor air temperature between 12 °C and 19 °C) Logistic/Production W/(m²·K)							
Opaque exterior components	0.40	0.50	0.55	0.80	1.20	1.20	0.80
Transparent exterior components	1.65	2.35	3.00	3.50	4.00	4.00	3.50
Curtain wall	1.70	2.40	3.30	3.70	4.10	4.10	3.70
Glass roofs, skylights etc.	1.90	2.50	3.40	3.90	4.25	4.25	3.90

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible documentation include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements

Indicator 1: Potential analysis of the building envelope

- Technical planning report with examination of all relevant points

Indicator 2: Transmission and diffusion via envelope surface components:

- Declaration by the specialist planner that there are non-critical amounts of condensation water in the envelope surface components, documentation of the vapour diffusion if necessary.
- List of the heat transfer coefficients for: Opaque exterior components, Transparent exterior components, Curtain wall, Glass roofs, strip lights, skylights (according to the mentioned norms in method)

Indicator 3: Transmission via thermal heat bridges

- Declaration by the specialist planner that the structural minimum heat insulation for thermal heat bridges has been complied with, documentation via isothermal calculations if necessary.
- Details of the selected thermal heat bridge correction factor ΔU_{WB}.
- Catalogue of the thermal heat bridges in accordance with EN ISO 10211.

Indicator 4: Airtightness of the building envelope

- Documentation of the airtightness measurement results. Assessment of the air exchange rate n_{50} in h-1 and, if applicable, calculation of the air exchange from external surfaces q_{50} in m³/(h m²) at a pressure difference of 50 Pa in accordance with EN ISO 9972 or EN 13829..
- Documentation of the joint permeability Q in accordance with EN 12207 and details of the class calculated on the basis of the EPC.
- The details must be taken from the relevant technical data sheet for the windows and doors as test bench values.

Indicator 5: Summer heat protection:

- Documentation of the solar transmittance parameter S in accordance with DIN EN 13363 or ISO 52022-3:2017 and/or ISO 52022-1:2017, and/or simplified calculation as given in method.
- Dynamic thermal simulation with calculation boundary conditions in accordance with standards described in method and criterion ENV1.1.

Indicator 5.3: Agenda 2030 bonus: Thermal comfort climate adaptation

- Results of the thermal simulation/calculation which are done using climate data predictions for 2030 and 2050 based on climate data mentioned in method.

Indicator 6: Quality control measurements

A representative number of measurements shall be taken in each case.

- For each indicator, the confirmation of the testing institute or the experts must be submitted; with proof that the measurements have been carried out and that the corresponding requirements have been met.
- If necessary, improvements are required to meet the requirements, the effectiveness of which must then be verified by appropriate measurements. Measurement results, measurement protocols, any intermediate measurements etc. are not to be submitted.

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- ISO 13788:2012 Hydrothermal performance of building components and building elements - Internal surface temperature to avoid critical surface humidity and interstitial condensation - Calculation methods Berlin: Beuth Verlag. May 2013
- EN ISO 10211. Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations Berlin: Beuth Verlag. March 2018
- ISO 14683:2017 Thermal bridges in building construction - Linear thermal transmittance - Simplified methods and default values.
- DIN EN 15026. Hygrothermal performance of building components and building elements – Assessment of moisture transfer by numerical simulation. Berlin: Beuth Verlag. July 2007
- ISO 52022-3:2017 Energy performance of buildings -- Thermal, solar and daylight properties of building components and elements -- Part 3: Detailed calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
- ISO 52022-1:2017 Energy performance of buildings -- Thermal, solar and daylight properties of building components and elements -- Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
- DIN EN 13363-1:2007-09 Solar protection devices combined with glazing - Calculation of solar and light transmittance - Part 1: Simplified method; Beuth Verlag. Sep. 2007
- Sustainable Development Goals icons, United Nations/globalgoals.org
- World climate map according to the Passive House Institute (PHI): https://passiv.de/en/03_certification/01_-certification_components/02_certification_criteria/01_transparentcomponents/01_transparentcomponents.html
- EN ISO 9972. Thermal performance of buildings - Determination of air permeability of buildings - Fan pressurization method. Berlin: Beuth Verlag. December 2018
- ISO 13789:2017 Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method
- EN ISO 6946. Building components - Thermal resistance and heat transfer coefficient - Calculation method. Berlin: Beuth Verlag. March 2018
- ISO 10077-2, Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 2: Numerical method for frames.
- N 15727:2010 - Ventilation for buildings - Ducts and ductwork components, leakage classification and testing - prepared by CEN/TC 156/WG 3.
- ANSI/ASHRAE Standard 55 : 2020 - Thermal Environmental Conditions for Human Occupancy - American National Standards Institute on December 30, 2022.

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TEC1.4

Building technology

Objective

Our objective is to create a building concept with the best possible use of passive systems and the integration of renewable energies into the required technical systems. In addition to this, the aim is to ensure that a building can be adapted to changing conditions of use or technical innovations with as little effort as possible and potentially to integrate technical systems into the district.

Benefit

Reducing the level of mechanisation in the building can make the building operation less prone to malfunctions. The use of resilient building technology and renewable energy sources reduce the risk of cost increases and external dependencies and are generally designed for longevity.

Outlook

The criterion will be further developed to assess the appropriateness of technology use as to its meaningfulness and its contribution to the energy and resource transition.

Contribution to overarching sustainability goals



Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Healthcare buildings** **Logistics** **Production**	**2.5%**	**2**
Shopping centre **Department store** **Consumer market** **Assembly buildings**	**2.3%**	**2**

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EVALUATION

In order to promote the reduction of the primary energy demand required for the technical systems, the use of passive systems is rewarded in Indicator 1. The systems for heating and cooling distribution are assessed in Indicator 2. In order to assess the prerequisites for future adaptation of the technical systems with minimal effort, the 'Accessibility of Technical Building Equipment' (Indicator 3) and 'Integrated Systems' (Indicator 4) indicators are available. The latter assesses the extent to which the existing systems can be expanded and integrated into higher-level systems and into the district. Via three Circular Economy Bonuses, the use of renewable energies from the district as well as the provision of storage capacities to the neighbourhood and the integration of technical systems and infrastructure into the neighbourhood can be rewarded with 10 points each. In the criterion, 100 regular points can be awarded. A maximum of 130 points including bonuses can be achieved.

NO.	INDICATOR	POINTS
1	**Passive systems**	**Max. 40**
1.1	**Planning for a passive building concept**	**Max. 15**
	Planning of a passive building concept to reduce the energy demand by means of ■ a highly compact building structure ■ balanced proportion of window areas, taking shading measures into account ■ structural solar protection that prevents direct exposure to sunlight for the windows during the spring/summer months ■ as large a proportion of naturally lit rooms as possible ■ use of high-mass components as thermal mass ■ passive cooling ■ effective natural ventilation.	+3 each
1.2	**Implementation of a passive building concept**	**Max. 25**
	■ Implementation of a passive building concept to reduce the energy demand for each of the areas mentioned in 1.1	+5 each
2	**Adaptability of the distribution system to suit operating temperatures to enable the use of renewable energy**	**Max. 15**
2.1	**Heat distribution and transfer system**	**1–7.5**
	■ Design of the heat transfer for an average heating water temperature ≥ 50°C	1
	■ Design of the heat transfer for a medium heating water temperature > 35°C and < 50°C or split devices	4
	■ Design of the heat transfer for an average heating water temperature ≤ 35°C	7.5
	Please note: If the total demand for thermal energy (heating) is 100% covered by renewable energies, the full number of points can be credited in the indicator once the approach has been checked for plausibility (see innovation area). If there is no heating in the building, this indicator is considered fulfilled and the full number of points may be awarded.	
2.2	**Cooling distribution and transfer system**	**1–7.5**
	■ Design of the cold transfer for an average cooling water temperature ≤ 14°C	1

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- Design of the cold transfer for a medium cooling water temperature > 14°C and < 19°C or split devices — 4
- Design of the cold transfer for an average cooling water temperature ≥ 19°C — 7.5

Please note: If the total demand for thermal energy (cooling) is 100% covered by renewable energies, the full number of evaluation points can be awarded in the indicator once the approach has been checked for plausibility (see innovation area).
If there is no cooling in the building, this indicator is considered fulfilled, and the full number of evaluation points may be awarded.

re 2 INNOVATION AREA — **as in 2**

Explanation: If systems are used that are fed 100% from renewable energy sources, Indicators 2.1. and 2.2 are considered to be fulfilled.

---

3 Accessibility of the building technology — **Max. 10**

3.1 Technical facilities/generation — **5**

Good accessibility of all components of the system technology for retrofitting and subsequent replacement. Mounting openings, doors and corridors are available in sufficient size and number. Transport and exchange of components possible without structural measures. — 5

3.2 Shafts/routes/distribution — **Max. 5**

- Vertical shafts/routes of all sub-sections sufficiently accessible — 2.5
- Vertical shafts/routes of all technical facilities sufficiently accessible and retrofits are possible without major disruptions to building operations. — 5

---

4 Integrated systems — **Max. 15**

4.1 Condition and expandability of a system integration — **5**

- Planning/implementation according to DIN EN ISO 16484-1 — 0
- Open and standardised protocols in existing networks — +5

4.2 Integrated functions in a higher-level system — **Max. 10**

Possible functions are (points per element type) — +2 each

- Sun protection/glare protection, lighting, heating, ventilation, cooling, energy management, presence detection, lifts

The list of possible functions may be supplemented.

4.3 CIRCULAR ECONOMY BONUS – Technical integration — **Max. 10**

Planning the integration of technical systems/media into the district/the immediate environment

4.3.1 Planning of an integral district-based energy concept with the aim of utilising synergies in relation to the district/the immediate surroundings is in place. This concept contains at least three of the following elements: — +5

- Analysis of existing energy potentials and possible interconnections with existing energy infrastructure in the surrounding area

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- Preparation of district-based energy balance sheets for the building for heating, cooling and electricity, comparison and ecological evaluation of the emissions of at least three decentralised and/or centralised heat supply variants
- Economic evaluation (investments and operating costs) of different supply variants
- Analysis of the provision of renewably generated energy to the district/surroundings with the inclusion of possible consumers

4.3.2 Implementation of an integral district-based energy concept with the aim of utilising synergies in relation to the neighbourhood/the immediate environment has been carried out. +5

4.4 CIRCULAR ECONOMY BONUS – Electricity grid-friendly **Max. 20**

4.4.1 **District solution for renewable energy** +10

Explanation: In the building, energy generated in the surrounding district/immediate environment is constantly used to cover the energy demand related to the building and/or its use. Alternatively, energy generated in the building or on the property from renewable energy sources is released to the district/immediate surroundings.

4.4.2 **Energy system feeding into the grid** +10

Explanation: The building provides storage capacities to a not insignificant extent in terms of grid efficiency or uses integrated energy and load management.

5 Use of renewable energy sources and energy generation — Max. 20

5.1 Use of renewable energy sources — 5–10

- The share of renewable energy sources in the regulated final energy demand (final energy calculated according to the rules of the local energy code) is at least 85%. 5
- The share of renewable energy sources in the regulated final energy demand (final energy calculated according to the rules of the local energy code) is at least 95%. 10

5.2 Generation of renewable energy at the building — 5–10

- Renewable energy is generated at the building or in the immediate vicinity. For photovoltaic systems or solar thermal energy, at least 60% of the roof area suitable for solar installation must be covered with appropriate modules. In addition to this, for newly constructed car parks, at least 60% of the suitable area is also used for the generation of renewable energy. Residential buildings can alternatively demonstrate compliance via a minimum installed output of at least 0.06 kilowatt peak per m² of built-up plot area. 5
- Renewable energy is generated on the building or in the immediate vicinity. For photovoltaic systems or solar thermal energy, at least 80% of the roof surface suitable for solar installation must be covered with appropriate modules. In addition to this, for newly constructed car parks, at least 80% of the suitable area is also used for the generation of renewable energy. Residential buildings can alternatively demonstrate compliance by means of a minimum installed output of at least 0.08 kilowatt peak per m² of built-up plot area. 10

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SUSTAINABILITY REPORTING

The following information can be used for reporting in accordance with the ‘Level(s) – Common EU framework of core environmental indicators’ and for EU Taxonomy/ESG verification.

NO.	KEY METRICS/KPIS	UNIT
KPI 1	Design temperatures of the heat transfer for an average heating water temperature	[°C]
KPI 2	Design temperatures of the cooling transfer for an average cooling water temperature	[°C]
KPI 3	Degree of coverage of final energy demand from the direct district/surroundings	[%]
KPI 4	Share of renewable energy sources in final energy demand	[%]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Technical systems are among the components of a building that are subject to the most rapid change; at the same time, they have a significant influence on the functional efficiency of a building. The fundamental approach to technology along with the selection of the appropriate building technology – particularly in the field of technical building equipment – therefore play an important role in the sustainability of a building.

System integration, high adaptability of the technical systems (i.e. good adaptability to changing conditions), and integration into the district are key criteria and can significantly influence acceptance among the users of a building and its service life, as well as the costs incurred during operation. The goal must therefore be to plan and construct buildings today in such a way that future changes can be made as easily as possible.

II. Additional explanation

-

III. Method

The technical systems are to be examined for the following elements

- Sewage, water, gas installations
- Heat supply systems
- Ventilation systems
- Power installations
- Telecommunications and information technology equipment (ICT)
- Conveyor systems
- Building automation

As a rule, indicators that cannot be assessed due to the conditions of the building's technical systems are considered to be met, due to sufficiency. Individual exceptions may be possible and will be indicated.

The factors that essentially characterise the use, the integration of the building technology into the building, the adaptability of the technical systems, and the integration of the building technology into the district are examined.

Indicator 1: Passive systems

The implementation of passive systems and measures should already be examined in the early planning and design phase. The aim is to reduce the overall energy demand for operating the building.

- Compactness of the building structure: The ratio of the building envelope area to the volume describes the compactness of the building. The more compact a building, the lower the transmission heat losses. The aim is to achieve a compact design, with large square structures and as few projections as possible.
- Window area ratio: The windows in the building envelope should be dimensioned to allow a sufficient supply of daylight, should allow high solar gains in winter, and achieve the lowest possible solar gain in summer. This can be achieved, for example, by designing the proportion of the window area in relation to the floor area at between 20% and 30% in combination with external shading (proportion of area > 90% as a minimum requirement). In addition, glazing with a high total energy transmittance (g > 50%) and with a high light transmittance (τ_v >= 72%) in combination with effective external shading should be aimed for.

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- The higher the position of the windows (in relation to the floor height), the greater the depth of penetration.
- Measures should be taken to provide natural lighting to interior rooms, e.g. via courtyards or skylights

Structural solar protection: The glazed areas facing NW, W, SW, S, SE, E to NE are shaded by means of structural solar protection. Direct radiation in the spring/summer months is shielded. Advantage: The effect of structural solar protection is not dependent on use and is usually more robust and therefore low-maintenance.

- Façade greening: Reduction of solar gains through façade greening. Façade greening can be credi-ted as structural solar protection; the prerequisite is that it is already present and effective at the time of acceptance of the building.
- Storage mass: In buildings of solid construction (effective heat capacity $\geq$ 130 Wh/(km²) according to DIN EN ISO 13786), the thermal mass (walls, ceilings, floor) can be used as buffer storage, e.g. for short warm weather periods or by means of night ventilation in summer. The prerequisite is that use is not prevented by fixtures, curtain walls, or furnishings.
- Passive cooling: Systems for room cooling in which energy is used exclusively to convey the cooling medium.
- Effective ventilation measures: Ventilation measures taking into account thermal buoyancy or natural pressure differences, e.g. shaft ventilation or cross ventilation, provided that this reduces the use of mechanical systems.

If these measures are implemented, this will be evaluated positively.
Points can only be awarded in Indicator 1.2 if these points have also been awarded in Indicator 1.1.

Indicator 2: Adaptability of the distribution system to suit operating temperatures to enable the use of renewable energy

- Heating distribution and transfer system (heat carrier/heating medium: water)
- Cooling distribution and transfer system (refrigerant/cooling medium: water)

A positive assessment is made if the integration of renewable energies is possible. If necessary to answer the questions on heating and cooling distribution, the building can be divided into different areas. The questions are then to be applied to each area individually. If several different systems are installed in the different areas, the result per area is to be determined according to energy expenditure. The overall result can be determined on an area-weighted basis. The calculation must be presented clearly. The objective is to maintain operating temperatures that can be realised via renewable energy heating and cooling systems. In the case of separate grids, the result is determined on an energy-weighted basis.

The following example is intended to illustrate the above:

System 1 cooling ceiling (FL 16°C/RL 19°C): 30 kWh/(m²a) -> average operating temperature = 17.5°C
System 2 recirculating air cooler (FL 8°C/RL 14°C): 10 kWh/(m²a) -> average operating temperature = 11.0°C
Overall performance: 40 kWh/(m²a)

Are separate cold water networks available?

- If ‘Yes’ → performance-weighted evaluation: 3/4 System 1 + 1/4 System 2
  This results in the following evaluation: 4 points*0.75 + 1 point*0.25 = 3.25 points
- If ‘No’ → overall assessment according to system 2

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If the building does not have a cold transfer system, 7.5 points are scored. If there is documentation regarding the retrofit of a cooling system, this is evaluated according to the temperature levels.

Cooling systems required for dehumidification are not taken into account.

If split units with heat transfer media (refrigerants) other than water are used, points can also be scored. Natural refrigerants should be favoured. The use of non-natural refrigerants should be technically justified. Also the adaptability to accommodate future systems is to be justified in detail.
Natural refrigerants include, for example, hydrocarbons, carbon dioxide, ammonia, water, and air.

Innovation area:
If 100% of the heating is covered by renewable energies (according to the national energy building code), 7.5 points are awarded. This also applies in the same way to cooling.

Indicator 3: Accessibility of the building technology

The accessibility of all technical system components for retrofitting and subsequent replacement is evaluated. The dimensions and weight of the largest or heaviest component present, including the means of transport, are decisive when carrying out a replacement. The height and width of corridors and doors and, if applicable, the dimensions of the staircase or the dimensions and load-bearing capacity of the lift must be taken into account. Guidance on the space requirements of technical control centres is provided in the VDI 2050 series of guidelines. At least 80% of the net room area of all technical control centres must be considered.

Indicator 4: Integrated systems

The integration of existing systems into a building automation system is rated positively. The projects with a limited amount of networked building technology (low-tech) also receive the maximum number of evaluation points when implemented. This is to be justified in detail.

Indicator 4.1: Condition and expandability of a system integration
Open and standardised protocols should be used for existing networks for communication across sub-sections and systems.

Indicator 4.2: Integrated functions in a higher-level system
Relevant previously existing functions that are integrated into a superordinate system are evaluated. The selection of factors is to be justified and their relevance to the building is to be explained.

Indicator 4.3: Integration of the technical systems/media into the district/the immediate environment
This indicator assesses whether an energy concept exists that addresses integration into the district/surroundings. Points are awarded depending on the scope of the concept and the supply variants identified. In addition, the actual implementation of elements of the concept is positively evaluated.

Indicator 4.4: Integration of the energy infrastructure into the district
CIRCULAR ECONOMY BONUS – District solution for renewable energy
The bonus is awarded if the building consistently uses energy generated from renewable energy sources in the surroundding district or in the immediate vicinity to cover the energy demand relating to the building and/or its use. Here, at least 10% of the building-related final energy demand (this includes used electricity, heating, cooling, ventilation, humidification) must be covered. The building and the property do not count as part of the immediate environment.

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Alternatively, a positive assessment is made if energy generated from renewable energy sources in the building or on the property is supplied to the district/immediate environment and amounts to at least 10% more than the building-related final energy demand.

CIRCULAR ECONOMY BONUS – Energy system feeding into the grid

It is viewed as a positive if the building provides significant storage capacities (approx. 10% in relation to the final energy demand of the building) in terms of grid efficiency, or uses an energy and load management system integrated within the district.

Indicator 5: Use of renewable energy sources and energy generation

Indicator 5.1: Use of renewable energy sources

The proportion of the planned final energy demand met by renewable energy sources as per the national building code is positively assessed if at least 85% can be demonstrated. The points between 85% and 95% can be interpolated.

Indicator 5.2: Generation of renewable energy at the building

Renewable energy is generated at the building or on the property. For photovoltaic systems or solar thermal energy, at least 60% (for more points at least 80%) of the roof surface suitable for solar installation must be covered with appropriate modules. In addition to this, for newly constructed car parks (as an addition), at least 60% (for more points at least 80%) of the suitable area is also used for renewable energy generation. For the installation of energy-generating systems in car parks, it must be ensured that there is no degradation of the ecosystem quality of the outdoor areas; this must be assessed on the basis of a (simplified) ecological site analysis. Alternatively, the use of the façade for photovoltaics can also be credited. The energy yield must be at least equal to the yield from the roof area (and/or parking space). This is possible if the roof surface (and/or parking spaces) cannot be used. This must be justified.

Residential buildings can alternatively demonstrate compliance via a minimum installed capacity of 0.06 (for more points 0.08) kilowatt peak per m² of built-up plot area.

If alternative technologies – such as wind power, geothermal energy, or wastewater heat, but not including heat pumps – are used to generate renewable energy directly at the building or on the property, at least the equivalent final energy amount as defined above for photovoltaics must be verified.

If a green roof obligation is in force and implemented, this value can be reduced by 50%. For newly constructed residential buildings (or basic roof renovations), it is also possible to calculate the scope of the minimum use on the basis of the installed output of a system, rather than as a minimum module area in square metres. The requirement is deemed to be met if the photovoltaic system has a minimum installed output of 0.06 kilowatt peak per square metre of the built-up plot area.

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APPENDIX B - DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be comprehensively and plausibly documented on the basis of the evidence documents submitted.

Indicator 1: Passive systems

Indicator 1.1: Planning for a passive building concept

- Presentation of the energy concept and identification of passive measures
- Plausibility check of the selected evaluation approach

Indicator 1.2: Implementation of the passive building concept

- Photographic documentation of the entire building, constructive solar protection, façade greening, rooms with use of storage masses
- Calculation of the window area proportion
- Data sheets (characteristic values of the glazing, shading device)
- Calculation of the storage mass
- Planning documents with description of the ventilation concept (entry of air volume flows, if applicable)

Indicator 2: Adaptability of the distribution system to suit operating temperatures to enable the use of renewable energy

- Design of the heat and cold transfer (e.g. planned flow and return temperatures) by means of corresponding excerpts from the planning documents
- Acceptance protocol with confirmation of temperatures

Indicator 3: Accessibility of the building technology

- Height and width of corridors and doors and, if applicable, dimensions of the staircase, e.g. by means of excerpts from the plans
- Dimensions and load capacity of the lift, e.g. by extracts from the data sheet
- Photographic documentation of the assembly openings
- Proof of accessibility of the vertical shafts/routes, e.g. by means of photo documentation

Indicator 4: Integrated systems

- Commissioned services for system integration, e.g. by means of excerpts from the contracts
- Excerpts from the formulated overall concept for the technical building equipment
- Plausibility check of the selected evaluation approach and its relevance

Indicator 5: Use of renewable energy sources and energy generation

- Energy performance certificate and underlying calculations
- Roof surface area plan/façade plan with determination of the solar usable area proportion
- Plan and area layout for car parking spaces
- Photographic documentation

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APPENDIX C - LITERATURE

I. Version

Change log based on 2026 version

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals Icons, United Nations/globalgoals.org
- VDI Guideline VDI 2050: Requirements for technical control centres. Verein Deutscher Ingenieure e. V.
- Climate Change Act Baden-Württemberg (KSG BW)
- Ordinance of the Ministry of the Environment on the Obligations to Install Photovoltaic Systems on Roofs and Parking Areas (Photovoltaic Obligation Ordinance - PVPf-VO)
- ISO 13786: Thermal performance of building components — Dynamic thermal characteristics — Calculation methods. April 2018
- ISO 16484-1: Building automation and control systems (BACS) — Part 1: Project specification and Implementtation. 2011-03
- German building code: Gebäudeenergiegesetz – GEG: „Gesetz zur Einsparung von Energie und zur Nutzung erneuerbarer Energien zur Wärme- und Kälteerzeugung in Gebäuden“
- Energy Performance of Buildings Directive – EPBD (2024/1275/EU) from 08.05.2024

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TEC1.5

Ease of cleaning building components



Objective

Our objective is to implement structural and technical measures to reduce the cost and effort required for cleaning.

Benefits

The ease with which a building structure can be cleaned has a significant effect on the cost and environmental impact of a building during its use. Surfaces that can be easily cleaned require fewer cleaning agents and result in lower cleaning costs.

Outlook

This criterion does not currently address the ease of maintenance of the building structure. If suitable evaluation methods are available, these will be addressed in the criterion.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Healthcare buildings** **Logistics** **Production**	**1.3%**	**1**
Consumer market **Shopping centre** **Department stores** **Assembly buildings**	**1.2%**	**1**

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EVALUATION

The type and scope of structural and technical measures implemented to improve the ease of cleaning of the building are evaluated using a total of seven indicators. The feasibility of and the reduction in the cost and effort required to clean the façade are represented by Indicators 1 and 2. Indicator 3 evaluates the ease of cleaning of floor coverings and enables alternative measures to be recognised via the innovation area. Increased ease of cleaning as a result of dirt traps, an unobstructed floor plan and durable, easily accessible surfaces are evaluated using Indicators 4 to 6. The creation of a concept to ensure ease of cleaning is addressed by Indicator 7. A maximum of 100 points can be awarded. No bonuses are available in this criterion.

NO.	INDICATOR	POINTS
1	**Accessibility of the exterior glass surfaces**	**Max. 15**
1.1	**Feasibility of façade cleaning**	**Max. 15**
	■ Façade cleaning is possible using equipment (exterior glass surface proportion in %; 1% ≙ 0.1 point).	(+) 0–10
	■ Cleaning is possible without equipment (exterior glass surface proportion in %; 1% ≙ 0.15 point).	(+) 0–15
2	**Exterior and interior components**	**Max. 10**
2.1	**Cost and effort required to clean exterior components** Measures have been implemented to reduce the cost and effort required to clean the exterior façade.	**5**
2.2	**Cost and effort required to clean interior components** Measures have been implemented to reduce the cost and effort required to clean the interior components (e.g. glazed separating walls, parapets, railings). This also includes measures to eliminate the need for cleaning.	**5**
3	**Floor covering**	**Max. 20**
3.1	**Ease of cleaning**	
	Office **Education** **Consumer market** **Shopping centre** **Residential** **Hotel** **Healthcare buildings** **Logistics** **Production** **Assembly buildings**	**Max. 20**
	■ Partially (only circulation areas are patterned, mottled or structured)	10
	■ Fully (patterned, mottled or structured).	15
	■ The selected floor covering demonstrably results in reduced life cycle costs for cleaning.	+5
	Department stores	**Max. 20**
	■ At least 50% of the floor covering of sales areas is tolerant to slight contamination.	10
	■ At least 80% of the floor covering of sales areas is tolerant to slight contamination.	15
	■ The selected floor covering demonstrably results in reduced life cycle costs for cleaning.	+5
3.2	**INNOVATION AREA** Improvements to the ease of cleaning of the floor covering via innovative solutions.	**As in 3.1**

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4	**Dirt trap at building entrances**	**Max. 15**
4.1	**Dirt trap at building entrances I**	
	Office **Education** **Consumer market** **Shopping centre** **Department stores** **Hotel** **Logistics** **Assembly buildings** **Production** **Residential**	
	■ There are dirt traps at every main entrance.	**5**
4.2	**Dirt trap at building entrances II**	
	Office **Education** **Consumer market** **Shopping centre** **Department stores** **Hotel** **Logistics** **Production** **Assembly buildings**	**5–10**
	■ All dirt traps comply with the three-step principle (approx. 2.4 m).	5
	■ All dirt traps comply with the five-step principle (approx. 4 m).	10
	Residential	**5–10**
	■ All dirt traps comply with the two-step principle (approx. 1.6 m).	5
	■ All dirt traps comply with the five-step principle (approx. 4 m).	10
5	**Unobstructed floor plan**	**Max. 20**
5.1	**Obstacle prevention**	
	Office **Education** **Consumer market** **Shopping centre** **Department stores** **Hotel** **Logistics** **Production** **Assembly buildings**	**Max. 20**
	■ Radiators at a suitable height (floor clearance ≥ 15 cm).	2.5
	■ No radiators.	5
	■ Railing supports for staircases/balustrades, if any, are laterally mounted (no support points on the steps/floor).	+5
	■ WCs and sinks are attached to the walls.	+2.5
	■ Partition walls for booths are designed without support points on the floor or as partition walls with a wall/floor connection wherever possible.	+2.5
	■ Freestanding supports are positioned at a distance of at least 20 cm from the surrounding components (for this point, 10% of all supports can be ignored for the evaluation).	+5
	■ Lighting is integrated into the ceiling and does not need to be cleaned.	+2.5
	■ Closets are available and can be used in place of shelves and cabinets.	+2.5
	Residential	**Max. 20**
	■ Radiators at a suitable height (floor clearance ≥ 15 cm).	2.5
	■ No radiators	5
	■ Railing supports for staircases/balustrades, if any, are laterally mounted (no support points on the steps/floor).	+5
	■ WCs and sinks are attached to the walls.	+5
	■ Freestanding supports are positioned at a distance of at least 20 cm from the surrounding components (for this point, 10% of all supports can be ignored for the evaluation).	+5
6	**Surfaces**	**Max. 10**
6.1	**Surfaces that are frequently used and difficult to access**	**10**
	Measures have been implemented to make frequently used surfaces (work surfaces, handles, doorknobs, light switches, lift buttons, etc.) easier to clean, with the aim of improving hygiene, and making hard-to-access surfaces (hanging lights, solar shading, shelves, cabinets, ledges, corners) easier to clean.	

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7	**Concept to ensure ease of cleaning**	**Max. 10**
7.1	**Consideration in the planning process** Potential and necessary measures for ensuring ease of cleaning are taken into account during the planning process.	**5**
7.2	**Cleaning concept** A detailed concept to ensure ease of cleaning is available.	**5**

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SUSTAINABILITY REPORTING

The following aspects can be used for communication as key performance indicators (KPI):

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Proportion of exterior glass surfaces that can be cleaned without equipment	[%]
KPI 2	Proportion of floor coverings (interior) with high tolerance to contamination	[%]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The ease with which a building structure can be cleaned has a significant effect on the cost and environmental impact of a building during its use. Surfaces that can be easily cleaned require fewer cleaning agents and result in lower cleaning costs. The objective must therefore be to minimise cleaning operating expenses while ensuring a long material lifespan.

II. Additional explanation

Building structures that are cleaned according to schedule and that enable cleaning measures to be carried out easily are evaluated positively.

III. Method

Indicator 1: Accessibility of the exterior glass surfaces

This indicator evaluates how easily the exterior glass surfaces can be cleaned. The surfaces to be considered include windows and façade surfaces as well as PV systems. Exterior glass surfaces that can be cleaned without the use of equipment are rated more highly due to the lower expected cleaning costs. This is generally the case for inward-opening window casements, or situations where the distance from the top of the standing surface to the top of the glass surface is approximately 4 m.

Points can also be awarded for façade surfaces that can be cleaned using technical equipment, such as a telescopic pole from the fixed base or through a façade inspection and maintenance conveyor a cleaning bridge. The use of cherry pickers or climbing harnesses is not permitted here.

The percentage of the total area must be rounded up or down to the nearest whole percentage point in accordance with the rules for commercial rounding of figures.

Indicator 2: Exterior and interior components

This indicator evaluates whether measures have been implemented on the exterior façade or on the interior components to reduce the cost and effort required for cleaning.

Solutions that use alternative structural and technical solutions to make cleaning easier or that eliminate the need for cleaning are evaluated positively. Measures can be applied here that, for example, reduce the use of cleaning agents, shorten the duration of the cleaning process or increase the intervals between cleaning processes. The implementation of structural measures against dirt (e.g. functioning drip edges or eaves) or the creation of dirt-repellent surface properties (e.g. lotus effect) is evaluated positively.

Indicator 3: Floor covering

This indicator evaluates whether the floor covering is tolerant to slight contamination.

- Tolerant: Patterned, mottled or structured.
- Partially tolerant: Only circulation areas are patterned, mottled or structured.
- Not tolerant: Not patterned, mottled or structured.

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If the floor covering cannot be clearly assigned to one of these categories, the lowest evaluation must be selected in each case. The overall evaluation is carried out on an area-weighted basis, and all circulation areas and 80% of the usable area must be included. However, it is possible to address large sub-areas separately depending on the type and colour of the floor covering.

In addition, demonstrable reduction of life cycle costs as a result of appropriate selection of the floor covering (e.g. lower cleaning frequency due to the floor covering selected or the use of carpet tiles) is evaluated positively.

Indicator 4: Dirt trap at building entrances

This indicator evaluates whether a sufficiently long dirt trap is in place at the main entrances. Dirt traps include grating or suitable plastic or natural fibre mats (if sufficiently protected against moisture when located externally) in front of and directly behind the entrance door.

It must be ensured that adequate dirt traps are in place in front of and/or behind all main entrances. This concerns both the main and the secondary uses of the building. Staff access, delivery access and secondary access routes do not need to comply with these requirements.

If no other option is available due to structural constraints, the dirt trap can then also be installed inside the building (as a structural measure if possible).

If it is not possible to implement the required length of dirt trap as a structural measure, non-structural systems can also be credited if their positioning and maintenance is included in the service agreement for the FM service provider.

Indicator 5: Unobstructed floor plan

This indicator evaluates whether the room layout and fittings have been implemented with the fewest possible obstructions. Individual components are evaluated in terms of their ease of cleaning. If there are no bannisters or freestanding supports, the points for this indicator can be awarded in full.

Indicator 6: Surfaces

The implementation of measures to make frequently used surfaces (work surfaces, handles, doorknobs, light switches, lift buttons, etc.) and hard-to-access surfaces (hanging lights, sun protection, shelves, cabinets, ledges, corners) easier to clean is viewed positively.

Indicator 7: Concept for ensuring ease of cleaning

Cleaning costs have a significant impact on the operating costs. Appropriate planning to increase the ease of cleaning can significantly reduce these costs, improve the quality of use and management of the building and ensure the longevity of systems and components.

Ease of cleaning has already been considered and determined during the planning phase.

A detailed plan for ensuring ease of cleaning includes, among other things, the selection of suitable material, system and design solutions, the accessibility of components that require frequent cleaning and the availability of appropriate utility connections and storage rooms.

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IV. Usage-specific description

Residential

Indicator 3: Floor covering

The area reference specified in the ‘Method’ section is not used in this scheme. The floor coverings in communal areas (circulation areas such as entrance areas, corridors and stairways outside of the residential units) must be taken into account.

Department stores

Indicator 3: Floor covering

In the case of department stores, only the sales areas are considered.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible documentation include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements

Indicator 1: Accessibility of the exterior glass surfaces

- Formulated cleaning concept.
- Representation of the accessibility of the window surfaces, e.g. via photo documentation.
- List of the exterior glass surfaces, broken down by cost and effort required for cleaning.
- Calculation of the resulting evaluation points awarded.
- Product data sheets indicating the type of surface protection.

Indicator 2: Exterior and interior components

- List of the exterior components and documentation of the solutions used to reduce the cost and effort required for cleaning.
- List of the interior components and documentation of the solutions used to reduce the cost and effort required for cleaning.

Indicator 3: Floor covering

- List and evaluation of the floor coverings installed with regard to their tolerance to contamination
- Specification/documentation of the lifetime of the floor covering

Indicator 4: Dirt trap at building entrances

- Representation of the dirt traps using floor plans with dimension specifications.

Indicator 5: Unobstructed floor plan

- Representation via floor plans/photo documentation/manufacturer documentation

Indicator 6: Surfaces

- Short written justification for the levels selected.
- Appropriate documentation, e.g. via excerpts from the floor plans and photo documentation.
- List of areas with classification of the floor covering and the surfaces.

Indicator 7: Concept for ensuring ease of cleaning

- Confirmation by the building owner regarding the submission of a concept to ensure ease of cleaning.

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APPENDIX C – LITERATURE

I. Version

Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

Fundamental sources chosen from the available lists of substances and material data:

- Sustainable Development Goals icons, United Nations/globalgoals.org

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TEC1.6

Circular construction

Objective

Our goal is to ensure the careful and efficient management of natural resources. We do this by promoting solutions that enable existing resources to be reused with minimal loss. Guided by a commitment to use minimal primary resources in the construction and maintenance of buildings, we pursue a strategy that aims to increase material efficiency; the objective is to enable materials to be recycled with effectively no losses, while significantly reducing the quantity of materials used. The criterion thus aims to address one of the DGNB's key concerns: to create a genuine 'circular economy' that enables stakeholders and users to minimise the consumption of natural resources, or ideally, eliminate the consumption of natural resources entirely. The intended result is to ensure that the resources used will still be available to the next generation to the greatest possible extent after the desired benefit has been achieved.

Benefit

Building owners who reduce the use of materials in their buildings can benefit from reduced costs even during the construction phase. The users can also expect positive effects during the operating phase – in some cases with significantly lower expenditure for modernisation work and measures to improve the quality of life, as well as maintenance, repair, and, in particular, conversion measures. The long-term objective of this criterion is to enable buildings to be seen as 'raw material and component stores' and planned as a sound long-term investment. This requires in-depth knowledge of materials used in buildings.

Contribution to overarching sustainability goals



Outlook

The recycling streams for material categories are constantly changing, e.g. due to process and operating costs, achievable prices, and the relevant margins. Recycling logistics and processing facilities for many material streams are still in development or being tested. Achievable recycling rates are thus subject to ongoing adjustment.

Share of the total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Healthcare buildings** **Logistics** **Production**	**3.8%**	**3**
Shopping centre **Department stores** **Consumer market** **Assembly buildings**	**3.5%**	**3**

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EVALUATION

Circular construction can best be achieved if the potentials at the site are addressed at an early stage and targets are set in conjunction with the building owners, with circular design options explored during the design phase. The actual performance achieved depends on the construction, e.g. through the use of circular products, components, or elements. At the overall building level, proper documentation using digital documentation tools (e.g. Level(s) template for building component catalogue/bill of quantities (BoQ) or DGNB Building Resources Passports) is important. Additional bonus points can be awarded if the data documentation format complies with the relevant Level(s) requirement. When obtaining the abovementioned data, it is also particularly important to actually achieve good 'circularity quotas' of aggregated key metrics at the building level. Alternatively, if the data is not of a high enough quality to assess the circularity of the entire building, an indicator evaluating circularity at the product/component level is also available.

A total of 100 regular points can be awarded, or a maximum of 105 points including bonus (excluding the variable Indicator 1.3). In addition, the criterion also specifies whether a previous deconstruction is relevant for evaluation of the project. If a previous deconstruction is applicable, an additional 20 points can be awarded as a variable bonus (see Indicator 1.3); a maximum of 125 points is therefore available in total.

NO.	INDICATOR	POINTS
1	**Considering construction and deconstruction circularity during the planning process**	**Max. 10**
1.1	**Integration of circularity targets at the conceptual design phase**	**10**
	During an early project phase (establishing basic principles, definition of needs, site assessment, preliminary planning or design planning), the relevant targets or Key Performance Indicators (KPIs) for deconstruction and/or construction circularity are determined and incorporated into the decision-making process for the project.	10
1.2	**CIRCULAR ECONOMY BONUSES – Potential circularity of the site or the surrounding area**	+ 5
	The potentials of the site and the surrounding area with regard to circular construction are assessed to appropriately preserve the building stock and use it as a source and store of materials, products and components (where applicable).	
1.3	**CIRCULAR ECONOMY BONUSES – Variable indicator: pre-demolition**	**Max. 20**
	This variable indicator only applies if pre-demolition on the site is relevant before the construction of the project.	
1.3.1	**Justification of the need for deconstruction and planning of deconstruction**	
	In order to avoid deconstruction as far as possible, a detailed justification of the need for deconstruction is available. If demolition is planned, a pre-demolition audit must be carried out.	+ 10
1.3.2	**Implementation of demolition**	
	When performing deconstruction, valuable components and products must be actively offered to potential buyers. An inventory detailing material masses and estimated transport distances must be provided. Measures to optimise recycling and disposal must be clearly demonstrated.	+ 10
1.3.3	**Alternative forms of documentation via DGNB system for deconstruction**	
	If a DGNB deconstruction certification is carried out, compliance with defined resource and material-related indicators must be demonstrated.	20

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2	**Optimizing circularity – Design phase**	**Max. 10**
2.1	**Circularity variants comparison**	**5**
	Variants of design concepts considering circularity have been developed in at least three thematic fields (see method) of circularity and incorporated into the decision-making process for the project.	5
2.2	**Design for deconstruction**	**5**
	There is a conceptual design or detailed description illustrating how the building is designed to be more resource-efficient, compatible, adaptable, flexible and dismantlable to enable conversion, alteration, re-construction, reuse and recycling after its service life.	5

3	**Evaluating circularities – Implementation and documentation (as built)**	**Max.20**
3.1	**Data collection via the format of Building Resources Passport for description of circular properties**	**20**
	For the completed buildings, measurable key metrics have been determined for the current contribution to the circular economy and reliable information to support future circularity. Key metrics and information are determined in accordance with the specifications as follows (see method).	
	Pre-use circularity data (current)	
	■ Material origin	+5
	■ Construction and demolition waste (on-site)	+5
	Post-use circularity data (potential)	
	■ Detachability (ease of disassembly)	+5
	■ Material recovery	+5
	Alternatively: Data collection in Level(s) format	**Max. 15**
	Data on circularity properties is collected and, at least, compiled in an inventory following the Level(s) templates at Level 2. (see method).	

4	**Scoring circularity properties at building level (as built)**	**Max. 80**
4.1	**Pre-use circularity quotas: Material origin**	**5–20**
	Proportion (by weight) of all reused, recovered (recycled) and renewable raw materials currently used in the building, including the mass share of reused materials, mass share of recovered materials without thermal recovery, and mass share of renewable raw materials.	
	■ Proportion (by mass) ⩾ 20%	5
	■ Proportion (by mass) ⩾ 50%	20
4.2	**Pre-use circularity quotas: Construction and demolition waste**	**5–20**
	Proportion (by weight) of the non-hazardous construction and demolition waste generated on the construction site that is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials (see method).	
	■ Proportion (by mass) ⩾ 50%	5
	■ Proportion (by mass) ⩾ 90%	20
4.3	**Post-use circularity quotas: Material recovery**	**10–40**
	Proportion (by weight) of all materials in the building with potential circular reuse paths (defined according to the current state of the art) at its end-of-life phase: reusable and recyclable materials as well as compostable materials (mass %, without thermal recovery)	
	■ Proportion (by mass) ⩾ 20%	10
	■ Proportion (by mass) ⩾ 80%	40

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5	**Use of circular products at component level (as built)**	**Max. 20**
5.1	**Circular products/components with good quality of pre-use material origin**	
	Products/components that meet the requirements of the pre-use material origin assessment (see method) are permanently installed in the building or associated external areas. Specific points can be achieved depending on the demonstrated circularity class.	
	■ Per product made with reused or repurposed secondary material	+3
	■ Per product made with recycled secondary material in closed loops	+2
	■ Per product made with recycled secondary material in open loops	+1
	■ Per product made with renewable primary raw material	+1
5.2	**Circular products/components with good potential for post-use recovery**	
	Products/components that meet the requirements of post-use material recovery assessment (see method) are permanently installed in the building or associated external areas. Specific points can be achieved depending on the demonstrated circularity class.	
	■ Per product in its end-of-life phase that can be potentially directly reused or reused after appropriate preparation	+3
	■ Per product in its end-of-life phase that can be recycled in closed loops (pure-stream recycling)	+2
	■ Per product in its end-of-life phase that can be recycled in open loops (mixed-stream recycling)	+1

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPIS	UNIT
KPI 1	Area share of existing building preserved	[%]
KPI 2	Mass of materials accrued during deconstruction	[kg]
KPI 3	Percentage by mass of materials produced during deconstruction that were reinstalled directly on site/in the building	[%]
KPI 4	Building resource passport is available (machine-readable and evaluable)	[yes/no]
KPI 5	Circularity index: Material origin (pre-use) – closed-loop recycling implemented	[%]
KPI 6	Circularity index: Material recycling (potential) – post-use pathways	[%]
KPI 7	Total mass of construction and demolition waste	[kg/m² GFA]
KPI 8	Quota achieved for circular recycling paths for construction and demolition waste	[%]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The central element of the approach is to provide the best possible basis for transitioning from a linear economy to a circular economy from the beginning of the project starting with site analysis, through to planning, design, implementation, and documentation. This should include any relevant previous deconstruction, if applicable. The large-scale use of resources in the construction and real estate sector must be minimised and diverted into closed-loop cycles with minimal losses. The criterion anticipates upcoming regulatory developments and prepares the stakeholders accordingly.

Due to the high average life expectancy of structures and building components, many of the materials installed today will only become demolition materials or potential waste in 50 or 100 years. The construction sector therefore acts as a large-scale man-made material store. As such, it is an important resource for future construction materials and should not serve as temporary landfill for future waste. The aim of improving degradability and recyclability is to conserve natural resources and prevent waste, in particular by reducing the quantity and harmfulness of waste.

II. Additional explanation

-

III. Method

This criterion is divided into five overarching indicators considering construction and de-construction circularity at three different phases of the projects:

Indicator 1: Considering construction and deconstruction circularity – Planning process
Indicator 2: Optimizing circularity – Design phase
Indicator 3 to 5: Evaluating circularities at building level and component level – Implementation and documentation (as built)

Indicator 1: Considering construction and deconstruction circularity planning process

Indicator 1.1: Integration of circularity targets during the conceptual design phase

The objective of Indicator 1.1 is to consider and present waste management targets transparently from an early project phase – covering pre-demolition (if applicable), construction and post-use deconstruction – adapted to the respective context or the time and scope of planning, and to integrate them into the decision-making process. When setting ambition levels or targets for waste management and outcomes in the project, they should be considered within the proper context of the EU waste hierarchy and the EU List of Wastes (or other relevant local standards for the specific region).

If the following strategies are recognized as part of the project's circularity targets during the early planning phases (phases 2–3), the relevant results can be submitted as evidence.

- Pre-demolition auditing (if applicable)
- Material-efficient design concept
- Good construction practice
- Design concept for future demolition
- Waste management plan
- Buildings as material bank

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- Building resource passport
- Other alternative targets considering reduction, reuse, and recycling of materials

As part of waste management and circular economy strategies, a range of different circularity KPIs can be defined:

- Primary raw materials avoided
- Material origin
- Construction and demolition waste
- Pollutant load
- Material compatibility
- Detachability
- Material separability
- Material recovery (potential)

Indicator 1.2: CIRCULAR ECONOMY BONUS – Potential circularity of the site or the surrounding region
The potential of the site and the surrounding region (approx. 50 km radius) for circular construction is recorded as part of a site analysis. This includes, for example, consulting appropriate databases and platforms to identify components for reuse, contacting authorities to identify planned deconstruction projects, or contacting construction projects directly on site. The aim is to utilise resources from the circular economy or locally available building materials with minimal processing, sourced locally or from the surrounding area and can be used in the building and its external facilities (within the system boundary of the project). Research results can be submitted as evidence.

Indicator 1.3: CIRCULAR ECONOMY BONUSES – Variable indicator: pre-demolition
The variable indicators are to be applied and form part of the criterion (the system boundary) if the following conditions apply or a (partial) deconstruction is to be carried out on the basis of the DGNB deconstruction certificate[1]:

- (Partial) deconstruction is planned or has already been carried out.
- The building owner of the new building commissions the (partial) deconstruction.

If a DGNB deconstruction certification is carried out, this can be submitted as alternative evidence for Indicators 1.3. The provisions of the indicator must be observed.

If at least one of the following statements is true, deconstruction will not be considered in the context of new building certification (and the corresponding variable indicators can be ‘deactivated’ or the ‘points without deconstruction’ can be credited):

- At the time of acquisition, a (partial) deconstruction has already been completed. This was not the responsibility of the current owner.
- The building owner acquires a plot of land with a partially deconstructed building and no further deconstruction activities are required.
- A (partial) deconstruction has taken place at least two years before the building application.

Variable Indicator 1.3.1: Justification of the need for deconstruction and planning of deconstruction
Justification for the deconstruction: In order to avoid deconstruction as far as possible, a detailed justification of the need for deconstruction is required. In particular, an explanation must be provided as to why deconstruction is preferred to the continued use of the existing building fabric.

Technical reasons must be given the highest priority (fire protection, pollutants, load bearing, etc.) In this case, examination reports or excerpts from expert assessments are required as evidence.

[1] DGNB system for deconstruction: https://www.dgnb.de/en/certification/buildings/deconstruction

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If other reasons are cited, a detailed comparison of ecological (LCA, life-cycle assessment) and economic aspects (LCC, life-cycle cost) of the deconstruction (or partial deconstruction) and preservation options must be drawn up. Selective demolition should be considered wherever possible; this involves the careful removal of specific materials or sections of a building or structure.

If a deconstruction takes place or has taken place outside the control of the commissioning party of the new construction, corresponding proof that the variable indicator can be ignored must be provided. When planning a demolition, a pre-demolition **audit** must be **carried out**; the following aspects should be considered:

- Inventory of potentially reusable components and construction products, fixtures and furniture
- Estimation of the masses to be generated during deconstruction
- Survey and systematic recording of hazardous substances

Variable Indicator 1.3.2: Implementation of demolition
Search for purchasers of valuable elements from deconstruction: A list of all possible buyers (e.g. new construction projects in the region, subsequent new construction at the site, component exchanges, etc.) has been compiled for valuable items listed in the inventory. In addition, a proactive search has been carried out and contact made with potential buyers (e.g. offer, removal planning, and handover of components).

Inventory of the masses and transport distances actually generated during deconstruction: After deconstruction, an inventory has been drawn up showing all the masses actually generated. In addition, the actual transport distances for recycling or disposal have been documented after deconstruction.

Optimisation of recycling and disposal routes: Measures to optimise recycling and disposal routes have been implemented. As proof of the optimisation, the recycling and disposal routes actually used have been compared with the recycling and disposal routes that are usually chosen according to the current state of the art.

Implementation of the hazardous substance removal concept: The majority of the recommendations for removal methods formulated in the hazardous substance removal concept, or equivalent measures defined during the deconstruction process, have been implemented. If no hazardous substances have been found, the full number of evaluation points can be credited for the indicator.

Method analogous to DGNB deconstruction certificate.

Variable Indicator 1.3.3: Alternative forms of documentation via a DGNB deconstruction certificate
If a DGNB deconstruction certification is carried out, the fulfilment of defined, resource- and material-related indicators must be demonstrated: PRO1-R (Indicator 1), ECO2-R (Indicator 2), ENV1-R and TEC1-R (Indicator 1/estimates), ENV2-R (Indicator 1), ECO2-R: Indicator 3 (search for buyers), ENV1-R Indicator 1.2 (inventory), TEC1-R Indicator 2 (optimisation), ENV2-R Indicator 3 (implementation of hazardous substance removal concept).

Indicator 2: Optimizing circularity – Design phase

Indicator 2.1: Circularity variants comparison

In later project phases (approval phase, execution phase, works planning), circular concepts and variants are developed and incorporated into the decision-making process for the project.

Variants are evaluated and compared on a qualitative or quantitative basis with regard to their effectiveness in the circular economy. At least three different topics of circularity aspects should be considered in the variants comparison.

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Possible topics for variants and design concepts (non-exhaustive list, taken from DGNB brochure entitled 'In Focus: Circular building' (2024))[2]:

Protecting resources and valuing existing resources:

- Avoid resource consumption
- Preserve existing buildings
- Use existing buildings as a source and store of materials

Make intensive use of recyclable materials, operate without waste:

- Use of recycled materials
- Minimise the generation of waste

Secure value in the long term:

- Consider the environmental and health-related aspects of materials
- Ensure long-term usability and recyclability
- Ensure durability and intensive use over the entire service life
- Prepare relevant information adequately and ensure its long-term availability

Alternative: All other topics relating to material reduction, reuse, and recycling are worth considering

Alternatively, points can be achieved by demonstrating the use of circularity balance sheets or circularity indices for optimisation during the early design phase or in subsequent project phases. The tool based on the DGNB Building Resource Passport provided for Indicator 3.1 can also be used for variants comparison. Variants comparison or the use of tools evaluate construction circularity qualitatively or quantitatively in parallel with regard to climate impact and costs analysis. For this purpose, e.g. life cycle assessments and/or life cycle cost calculations during the design phase, and/or adequate qualitative assessments regarding pollutants and hazardous substances are carried out.

Indicator 2.2: Design for deconstruction

There is a conceptual design/detailed description illustrating how the building can be reused, converted, and deconstructed after its service life. The instructions/concept should show which measures can be used to implement conversions, alterations, and deconstruction. For alteration and conversion, reference can be made to criterion ECO2.1 and corresponding documentation can be provided. The deconstruction concept should at least show which measures can be used to recycle or reuse the supporting structure, building envelope (including roof), interior walls, and interior fittings. The following questions should be answered in the concept:

- **Design intent:** What is the intended purpose of detachability, e.g. maintenance, reuse, recycling, adaptability, taking into account factors such as the expected service life of components vs the total service life of the building?
- **Ease of disassembly and dismantling:** Is it possible to ensure that the building materials can be easily separated by type (consideration of connecting materials)? Are individual component layers/elements easily accessible and replaceable with little effort? Is deconstruction quick and uncomplicated? What are the component connection methods: e.g. bolts, screws, snap-fits, clips, magnets etc.?
- **Ease of reuse:** Does the design of the components enable the individual elements to be reused and recycled? For example, are standardised solutions or modular systems that allow reuse and repurposing used?

[2] DGNB Brochure 'In Focus: Circular building' (2024): https://www.dgnb.de/filestorages/Downloads_unprotected/publikationen/-dgnb_brochure_focus-on-circular-building_en.pdf

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- **Ease of recycling:** Have impurities that impede/prevent the recycling of building materials been avoided or are homogeneous/single-material elements used (mono-materiality)? Do established recycling processes for the materials used already exist?

This indicator is based on the principles of 'Level(s) Indicator 2.4 Design for Deconstruction' and the requirements for transitioning to a circular economy under the 'EU Taxonomy for construction and real estate activities'. It also references ISO 20887 and other relevant standards for assessing the disassembly or adaptability of buildings, including how they are designed to be more resource-efficient, adaptable, flexible and dismantlable to facilitate reuse and recycling.

Indicator 3: Evaluating circularities – Implementation and documentation (as built)

Indicator 3.1: Data collection via the format of Building Resources Passport for description of circular properties[3].

For completed buildings, structured, measurable and transparent information and key metrics are required to describe construction circularity. This can be expressed in two separate partial circularity indices: pre-use and post-use circularity. Pre-use circularity refers to the construction phase and describes the current contribution to the circular economy, with sub-indicators such as material origin, construction and demolition waste. Post-use circularity describes how constructions can be dismantled, reused and recycled to make a potential contribution to the circular economy in the future; this includes sub-indicators such as detachability, separability and material recycling, etc. List of circularity KPIs taken from the DGNB report entitled 'DGNB Quality Standard for Circularity Indices for Buildings' (2024))[4]:

Material origin

The topic of material origin is considered in all circularity assessment methods, which take into account current contributions to the circular economy. Documenting material origin supports the reduction of primary and non-renewable resource use and thus increases the proportion of secondary materials in a building. Mass-based quotas are therefore assessed on a higher level according to the proportion of secondary and primary raw materials. Data collection for this indicator can be carried out using the DGNB tool. The nine material groups[5] for this criterion are defined as follows:

- concrete, natural stone, agglomerated stone; bricks, tiles, ceramic
- bio-based materials (wood and wood-based materials)
- glass and mineral insulating materials
- plastic
- metals
- gypsum
- bituminous mixtures
- electrics and electronics
- mixed materials.

Construction and demolition waste (on-site)

This factor has been included in this quality standard because waste generated by demolition and construction activities can play an important role in resource conservation. Many countries have regulations requiring the declaration of waste streams, meaning that this is typically addressed in construction projects without additional effort.

[3] DGNB offers an Excel-based tool featuring visualizations designed to facilitate the calculation process and the systematic documentation of results.
[4] DGNB Report 'DGNB Quality Standard for Circularity Indices for Buildings' (2024): https://www.dgnb.de/en/sustainable-building/circular-building/circularity-indices
[5] Note: Material groups slightly deviate from the groups defined under the criterion ENV1.3

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This aspect is also relevant under the EU taxonomy, which, under the 'Do No Significant Harm' (DNSH) criterion, stipulates that evidence of the level of reuse or recycling of non-hazardous construction and demolition waste must always be provided.

Detachability

To classify the detachability of buildings, the nature of connections, recovery effort and resulting damage are assessed. The ability to recover building materials is seen an intrinsic element of future contributions to the circular economy, as the effort required to recover a building provides an important indication not only of the economic viability of selective recovery, but also of the proportion of resources that can be returned to material cycles. In addition, the potential for the immediate reuse of entire components or building materials can be demonstrated and supported by assessing detachability. Detachability is also referred to as ease of disassembly or recoverability.

Buildings comprise different levels with individual service lives, which should be taken into account during planning. In terms of circularity, detachability is particularly relevant for the structural levels whose components, products and materials have shorter service lives or more frequent replacement cycles. The detachability categories defined in the DGNB report 'DGNB Quality Standard for Circularity Indices for Buildings' are applied:

- Loose/click connection, very little effort for recovery, removable without damage
- Inserted/plugged/screwed in, little effort for recovery, removable without damage
- Fixed in place/permanently installed, medium effort for recovery, mainly detachable without damage
- Fixed in place/permanently installed, major effort or extremely complex for recovery, repairable or irreparable damage
- Cannot be dismantled.

When considering detachability or ease of disassembly, material separability is another important aspect, partly because of its relevance to the economic viability of selective recovery, but also because of the proportion of resources that can be returned to the material cycle – see also detachability.

In addition to the deconstruction concept, a detachability evaluation for the project must be provided as part of the 'as-built' documentation (e.g. implemented drawings, pictures, protocols). The following aspects must be addressed as a minimum:

- Documentation of connection methods and proposed dismantling procedures, referring to the components list for the shell/core (Appendix 1), at least at Tier 3 level.
- Accessibility of relevant areas, i.e. physical accessibility for disassembly to be documented
- Material selection and characteristics, including technical documentation on durability, service life, separability and recycling potential in terms of compatibility with circular economy principles.

Material recovery

Material recovery (or material recycling) describes the potential for building materials, products and components to follow typical end-of-life pathways according to the current state of technology. This is important for assessing the future circularity of the resources used. To determine future material recovery potential, assumptions can be made regarding the typical path of subsequent use according to the current status of technology in keeping with the applicable life cycle assessment guidelines for the EoL phase. Additional assessment levels may also be considered, such as those applied to building materials or components; this may be particularly relevant for high circularity classes.

In order to determine the above-mentioned circularity indices, relative data must be collected, structured and managed appropriately for the purposes of future maintenance, recovery and reuse.

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This is also an important requirement of the EU Taxonomy, which requires such information to be stored in a digital format and made available to investors and clients on request. In addition, the operator ensures the long-term preservation of this information beyond the useful life of the building by using information management systems provided by national tools, such as national cadastre or land registry systems.

A Building Resource Passport (BRP) can be used as a basic tool for managing such data and information. As a tool that is based on practical application and the market, a BRP provides transparent documentation and aggregated data at the building level and also enables consolidated circularity assessments to be carried out.

For evaluating Indicator 3, a DGNB tool is developed in accordance with the DGNB Building Resource Passport specifications for the completed building. This identifies structured and measurable information and key metrics for the current level of circularity and resource use, as well as applicable information on future circularity.

Alternatively: Data collection in Level(s) format
Points can be awarded for circularity data collected and compiled at minimum in an inventory, in accordance with the Level(s) template. For each Excel tool listed below, five points can be awarded if the minimum requirements for data inputs and data quality are met according to the Level(s) methodology. If all three tools are applied, then a total of 15 points can be credited.

- Tool ‘Level(s) Indicator 2.1 Bill of Quantities, materials and lifespans’ is applied.
- Tool ‘Level(s) Indicator 2.2 Construction and Demolition waste and materials’ is applied.
- Tool ‘Level(s) Indicator 2.4 Design for deconstruction’ is applied.

Indicator 4: Scoring of circularity properties at building level (as built)

For the completed building, the key metrics/circularity sub-indicators are derived from data collected using the structured format of the DGNB tool (see Indicator 3.1). A higher proportion of circularity results in a better circularity score.

Indicator 4.1: Pre-use circularity quotas: Material origin
The mass-based proportions of recovered, recycled and renewable or non-renewable primary materials used in a building provide information on the actual contributions already made to circularity. A more detailed categorisation and subdivision of shares into **reused**, **recovered (recycled)** or **renewable raw materials** in a building highlights the quality of positive contributions to circularity and any current efforts being made to implement it. An indication of any primary materials avoided can also be provided. For further details and definitions see **Appendix 2** (also ‘DGNB Building Resource Passport’). The following activities are considered as positive contributions to circularity assessment:

- Reused materials
- Repurposed materials
- Recycled (closed-loop)
- Recycled (open-loop)
- Primary raw materials, renewable

Points can be awarded for this indicator, if at least 20% of the materials (pre-use) by mass, originate from the abovementioned sources (or activities).

Indicator 4.2: Pre-use circularity quotas: Construction and demolition waste (on-site)
Construction and demolition waste (CDW) is one of the largest waste streams generated worldwide and in the EU (accounting for approximately 25–30% of all EU waste). The vast majority of CDW is inert, meaning that construction and demolition activities present opportunities to divert CDW away from landfill and back into the construction material loop.

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Legal requirements to report on CDW show that average recovery rates for CDW across the EU (excluding excavation waste) stand at only 50%, even though some Member States have achieved rates > 90%.

The aim of this indicator is to assess construction and demolition waste index quotas and to examine the implementation of the previous Indicators 1 and 2 during the planning and design phase. It also aims to evaluate the quality of systematic planning for the reuse, recycling or recovery of elements, materials and wastes via the segregated collection of CDW during construction, renovation and demolition activities.

This indicator measures the proportion (by weight) of the non-hazardous construction and demolition waste (demolition activities that take place prior to the construction of the project) generated on the construction site that is prepared for reuse, recycling and other material recovery, including backfilling operations that use waste to substitute other materials (naturally occurring materials that fall under category 17 05 04 of the European Waste List are excluded from overall consideration; accordingly, only the non-hazardous waste categories 17 05 06 and 17 05 08 from group 17 05 are to be included). All construction and demolition waste generated on site is treated in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol[6] (alternatively, other comparable international/national standards can apply). See soil categories and definitions in **Appendix 2** of this document. The benchmarks for assessment are set according to the average performance of CDW management across the EU, as well as the EU-Taxonomy requirements. (Interpolation applied.)

- 50% (by mass) of the CDW – the average recovery rate across the EU
- 70% (by mass) of the CDW – EU-Taxonomy CCA (Climate Change Adaptation) Compliance, DNSH to CE (Circular Economy)
- 90% (by mass) of the CDW – EU-Taxonomy CE Compliance, Substantial Contribution to CE

For this indicator the following activities are considered a positive contribution to circularity:

- Reuse
- Recycling (closed-loop)
- Recycling (open-loop)
- Backfilling

Indicator 4.3: Post-use circularity quotas: Material recovery

To determine future material recovery potential (the potential to reuse and recycle materials), assumptions may be made regarding the typical path of subsequent use according to the current state of technology in accordance with the applicable life cycle assessment guidelines for the End-of-Life phase in accordance with the environmental product declarations in EN standard 15804 or other compatible local regulations and standards[7].

This indicator measures the proportion of all materials in the building with circular end-of-life pathways (defined based on the current state of the art and according to local situation in the project country): reusable and recyclable materials as well as compostable materials (mass %, without thermal recycling). The waste material end-of-use recovery categories defined in the DGNB report ‘DGNB Quality Standard for Circularity Indices for Buildings’ as well as the Level(s) Indicator 2.4 ‘Design for deconstruction’ are applied. Proportions of all materials that can be assigned to the following hierarchies can be viewed positively in this indicator:

- **Direct reuse:** Materials are retained in their current form and are used for the same purpose or production process
- **Preparing for reuse:** This involves checking, cleaning, or repairing products or components to enable their reuse without further processing.

[6] EU Construction and Demolition Waste Management Protocol, Annex F (2016): https://ec.europa.eu/docsroom/documents/-20509/).
[7] Local standards to be agreed with the DGNB during the system adaptation process.

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- **Pure stream recycling (high-quality, including upgrading, upcycling, closed-loop recycling):** Materials are broken down and recycled using material recycling processes that result in material properties of the same quality (also referred to in some cases as upcycling). Example: A special production technique is used to optimise the quality of a steel beam, e.g. by adding an alloy; evaluation/evidence of the enhanced (residual) value of a material.
- **Mixed stream recycling (recycling with processing effort, open-loop recycling):** Materials are broken down and recycled using material recycling processes that result in material properties of a lower quality (also referred to in some cases as downcycling). Example: Recycling of brick fragments into planting substrate/concrete recycled into aggregate/steel recycled into concrete steel reinforcements.

Indicator 5: Use of circular products at component level (as built)

If the BoQ (bill of quantities) methodology is not available to assess the circularity properties at the building level, circularity can still be evaluated at the product and component level. Groups at Tier 3 and Tier 4 of the hierarchy (see **Appendix 1**) can be considered as the component level.

When applying the procedure for evaluating circular products at component level, a maximum total of 20 points can be achieved, depending on the demonstrated circularity class. A prerequisite is that no hazardous substances are contained in the installed products.

Indicator 5.1: Circular products/components with good quality of pre-use material origin

The pre-use material origin circularity of products/components can be evaluated according to the methodology specified in DGNB report 'DGNB Quality Standard for Circularity Indices for Buildings' (2024). Points are awarded based on the demonstrated category of circularity class. When the assessment factor is greater than 0.50, it can be considered a positive contribution to the circular economy.

- Per product made with reused or repurposed secondary material, 3 points can be given
- Per product made with recycled secondary material in closed loops, 2 points can be given
- Per product made with recycled secondary material in open loops, 1 point can be given
- Per product made with renewable primary raw material, 1 point can be given

Table 1: Pre-use material origin circularity categories from the 'DGNB Quality Standard for Circularity Indices for Buildings'

Circularity class		Description	Assessment factor	Points per Product
Secondary	Reused	(Reuse), existing building stock = 100%	1.00	+3
	Repurposed	(Remanufacture/repurpose)	1.00	+3
	Recycled, in closed loops	(Recycling) = post-consumer recycled content, same quality	0.75	+2
	Recycled, in open loops	(Recycling) = post-consumer recycled content, reduced quality	0.50	+1
Primary	Primary raw material, renewable	(Renewable), certified (high-quality, with reforestation) or comparable (e.g. rapidly renewable)	0.75	+1
		(Renewable)	0.50	
	Circularity classes above 0.50 should be targeted to achieve a positive contribution to the circular economy			
	Primary raw material, non-renewable	(Not renewable)	0.00	None

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Indicator 5.2: Circular products/components with good potential for post-use recovery

The post-use material recovery circularity of products/components can be evaluated according to the methodology specified in DGNB report 'DGNB Quality Standard for Circularity Indices for Buildings' (2024). Products permanently installed in the building and/or its external facilities with a post-use circularity assessment factor greater than 0.5 can be considered a positive contribution to post-use circularity (including post-use pathways of direct reuse, preparing for reuse, pure-stream recycling and mixed-stream recycling – for definitions, see Indicator 4.3). Points are awarded as follows:

- Per product in its end-of-life phase that can be potentially directly reused or reused after certain preparation, 3 points can be awarded
- Per product in its end-of-life phase that can be recycled in closed loops (pure-stream recycling), 2 points can be awarded
- Per product in its end-of-life phase that can be recycled in open loops (mixed-stream recycling), 1 point can be awarded

The waste recovery hierarchy set out in the EU Waste Framework Directive as well as the methodology applied in Level(s) Indicator 2.4 are also relevant.

Table 2: Post-use material recovery circularity categories from the 'DGNB Quality Standard for Circularity Indices for Buildings'

Circularity Class	Description	Assessment Factor	Recovery Coefficient from Level(s)	Points per Product
Reuse	Including preparation for reuse	1.00	1	+3
High-quality closed-loop recycling	High-quality, including upgrading, upcycling, closed-loop recycling	0.80	0.75	+2
Material recycling	Recycling without effort, closed-loop recycling with effort	0.70	0.75	+2
	Recycling with processing effort, open-loop recycling	0.60	0.5	+1
	Circularity classes above 0.50 should be targeted to achieve a positive contribution to the circular economy			
	Recycling/reprocessing with reduced quality, other material recycling	0.40	0.25	None
Energy recovery	Renewable/biogenically certified and demonstrably low in pollutants	0.40	0.15	None
	Non-renewable/biogenic, renewable/not biogenically certified	0.20	0.15	None
	Energy disposal	0.00	0.15	None
Backfilling	Non-hazardous material	0.20	0.01	None
Disposal in landfill	Non-hazardous waste (LC 0-II), incl. landfilling of inert waste	0.20	0.01	None
Disposal	Hazardous waste (LC III-IV), disposal after processing	0.00	0.00	None

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APPENDIX 1

The following components on the Tier 3/4 level, can be considered in the evaluation of indicator 5

Tier 1	Tier 2	Tier 3	Tier 4
System boundaries of building parts			
Shell	Foundations (substructure)	Piles	(i) Permanent piles and caisson; (ii) Pile caps
		Basements	(i) Concrete blinding; (ii) Raft footings; (ii) Column bases; (iv) Wall footings; (v) Strap beams; (vi) Tie Beams; (vii) Substructure walls; (viii) Substructure columns; (ix) Lowest floor slabs (Considering ground floor slab); (x) Lowest floor beams (Considering ground floor slab); (xi) Lift pit wall; (xii) Lift pit slab; (xiii) Vertical waterproof tanking; (xiv) Drainage blanket; (xv) Sleeves
		Retaining walls	(i) Vertical waterproof tanking; (ii) Drainage blanket; (ii) Drains and skin wall; (iv) Skin wall; (v) Retaining wall; (vi) Retaining wall foundation; (vii) Fireproofing to steel structure; (viii) Sleeves
	Loadbearing structural frame	Frame (beams, columns and slabs)	(i) Structural internal walls; (ii) Columns; (ii) Upper Floor Beams; (iv) Staircases
		Upper floors	(i) Slabs
		External walls	(i) Structural external walls
		Balconies	(i) Balconies beams; (ii) Balconies slab
		Ground floor slab	(i) Slab blinding; (ii) Bottom slab
	Non-load bearing elements	Ground floor slab	(i) Slab blinding; (ii) Bottom slab
		Internal walls, partitions and doors	(i) Non-structural internal walls; (ii) Non-structural internal partitions; (iii) Acoustic insulation; (iv) Shop fronts; (v) Toilet cubicles; (vi) Moveable partitions; (vii) Cold rooms; (vii) Internal doors; (ix) Internal windows; (x) Roller shutters; (xi) Fire shutters; (xii) Sundry concrete work
		Stairs and ramps	(i) Balustrades; (ii) Railings; (iii) Handrails; (iv) Staircases not forming part of the structure; (v) Catwalk not forming part of the structure, cat ladders
	Facades	External wall systems	(i) Non-structural external walls and features;
			(ii) Acoustic insulation; (iii) Thermal insulation;
			(iv) Curtain walls.
			(v) Gondolas
		Cladding and shading devices	(i) Facade cladding; (ii) Roller shutters
		Façade openings (including windows and external doors)	(i) Facade cladding; (ii) Roller shutters; (iii) External windows (v) External shop fronts; (vi) Fire shutters;
			(iv) External doors;
		External paints, coatings and renders	(i) External wall finishes except cladding

Core	Roof	Structure	(i) Roof beams; (ii) Roof slabs
		Weatherproofing	(i) Roof finishes; (vi) Roof hard landscaping.
			(ii) Acoustic insulation; (iii) Thermal insulation; (iv) Waterproofing element; (v) Skylights; (vii) Roof soft landscaping
	Fittings	Sanitary fittings	(i) Sanitary appliances; (ii) Faucets
		Ceilings	(i) External false ceilings; (ii) Internal false ceilings
		Wall and ceiling finishes	(i) Internal wall finishes; (iii) Internal ceiling finishes; (iv) External ceiling finishes
			(ii) Internal wall cladding;
		Floor finishes, coverings and coatings	(i) External floor finishes (under cover); (ii) Internal floor finishes
	In-built lighting system	Light fittings	(i) Lighting devices
		Control systems and sensors	(i) Light control devices; (ii) Light sensor devices
	Energy system	Heating plant and distribution	(i) Seawater system; (ii) Heating water system; (iii) Steam and condensate system; (iv) Fuel oil system; (v) Unitary air-conditioning system; (vi) Water treatment; (vii) Window air conditioners; (viii) Split-type air conditioners; (ix) Air-curtains; (x) Electric underfloor heating; (xi) Local electrical heating units
		Cooling plant and distribution	(i) Seawater system; (ii) Chilled water system; (iii) Cooling water system; (iv) Water treatment; (v) Condensate drain system; (vi) Unitary air-conditioning system; (vii) Window air conditioners; (viii) Split-type air conditioners; (ix) Air-curtains; (x) Fans
		Electricity generation	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system
		Electricity distribution	(i) Uninterruptible power supply; (ii) Standby system; (iii) Renewable Energy generation system
	Ventilation system	Air handling units	(i) Air handling units (AHU)
		Ductwork and distribution	(i) Kitchen ventilation system; (ii) Fume and smoke extraction system.
			(iii) Distribution system
	Sanitary systems	Cold water distribution	(i) Cold water supply; (ii) Irrigation water supply; (iii) Cleansing water supply; (iv) Flushing water supply; (v) Water treatment equipment
		Hot water distribution	(i) Hot water supply
		Water treatment systems	(i) Wastewater treatment equipment; (ii) Grey water supply
		Drainage system	(i) Rainwater disposal; (ii) Soil and waste disposal; (iii) Planter drainage disposal; (iv) Kitchen drainage disposal; (v) Sump pits; (vi) Surface water drainage; (vii) Storm water drainage; (viii) Foul and wastewater drainage;

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			(ix) Filtration plant
	Other systems	Lifts and escalators	(i) Lifts / elevators; (ii) Platform lifts; (iii) Escalators; (iv) Travellators | moving walkways; (v) Conveyors
		Firefighting installations	(i) Fire hydrant and hose reel system; (ii) Wet risers; (iii) Sprinkler system; (iv) Deluge system; (v) Gaseous extinguishing system; (vi) Foam extinguishing system; (vii) Audio/visual advisory system; (viii) Automatic fire alarm and detection system
		Communication and security installations	(i) Security and alarm; (ii) Close circuit television; (iii) Communal aerial broadcast distribution and the like; (iv) Telecoms and data installations
		Building automation	(i) Distributors; (ii) Cables and lines (iii) Monitoring and control systems
External works			(i) Non-structural external walls and features; (ii) External wall finishes except cladding; (iii)

APPENDIX 2

Technical terms, codes and definitions used in the criterion

List of Waste Code	Waste Name
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05	dredging spoil containing hazardous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07	track ballast containing hazardous substances
17 05 08	track ballast other than those mentioned in 17 05 07

Terms	Definitions
Inert waste	According to the 2016 EU Construction & Demolition Waste Management Protocol, it means waste that does not undergo any significant physical, chemical or biological transformations (e.g. concrete, bricks, masonry, tiles). Inert waste will not dissolve, burn or otherwise react physically or chemically, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health.
Hazardous waste	According to the 2016 EU Construction & Demolition Waste Management Protocol, further defines hazardous CDW as debris that has hazardous properties and that may prove to be harmful to human health or the environment. This comprises contaminated soil and dredging spoil, materials and substances that may include adhesives, sealants and mastic (flammable, toxic or irritant), tar (toxic, carcinogenic), asbestos-based materials in the form of respirable fibre (toxic, carcinogenic), wood treated with fungicides, pesticides etc. (toxic, ecotoxic, flammable), coatings of halogenated flame retardants (ecotoxic, toxic, carcinogenic), equipment with PCBs (ecotoxic, carcinogenic), mercury lighting (toxic, ecotoxic), systems with CFCs, insulation containing CFCs, containers for hazardous substances (solvents, paints, adhesives, etc.) and the packaging of likely contaminated waste. **Hazardous Properties (HP):** HP1 Explosive HP2 Oxidising HP3 Flammable HP4 Irritant – skin irritation and eye damage HP5 Specific Target Organ Toxicity (STOT)/Aspiration Toxicity HP6 Acute Toxicity HP7 Carcinogenic HP8 Corrosive HP9 Infectious HP10 Toxic for reproduction HP11 Mutagenic HP12 Release of an acute toxic gas

	HP13 Sensitising HP14 Ecotoxic HP15 Waste that can exhibit a hazardous property listed above, not directly displayed by the original waste
Non-hazardous waste	According to the Waste Framework Directive, it means a waste that does not display one or more of the **hazardous properties (HP)** listed above (Annex III of the Directive).
Reuse	means any operation by which products or components are used again for the same purpose for which they were conceived. *Example: bricks are used again as bricks in masonry veneer*
Repurpose	Materials are retained in their current form and are used for a new or different purpose or production process *Example – bricks are used to surface a garden path*
Recycling, closed-loop	Materials are broken down and recycled using material recycling processes resulting in material properties of the same standard (also referred to in some cases as upcycling) *Example – scrap metal is melted down to form a new beam; plastics are recycled chemically to recover raw materials*
Recycling, open-loop	Materials are broken down and recycled using material recycling processes resulting in material properties of a lower standard (also referred to in some cases as downcycling) *Example – recycling of brick fragments as planting substrate; concrete recycling*
Material recycling	The open-loop and closed-loop recycling of materials
Material recovery	means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy *Example - Backfilling is one way to re-use non-hazardous CDW, specifically in public and earthmoving works.*
Energy recovery	Energy recovery to generate thermal energy with a complete loss of thermal qualities and value
Primary raw material, renewable	(Renewable), certified and/or high-quality material also with reforestation or comparable (e.g. rapidly renewable) *Example – certified wood/wooden products, rapidly renewable e.g. straw as natural insulator*
Backfilling	any recovery operation where suitable waste is used for reclamation purposes in excavated areas or for engineering purposes in landscaping or construction instead of other non-waste materials which would otherwise have been used for that purpose

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Landfill	means a waste disposal site for the deposit of the waste onto or into land (for instance underground), including: ■ internal waste disposal sites (for instance own waste disposal carried out by the producer of waste at the place of production), and ■ a permanent site (older than one year) which is used for temporary storage of waste, But excluding: ■ facilities where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere, and ■ storage of waste prior to recovery or treatment for a period less than 3 years as a general rule, ■ storage of waste prior to disposal for a period less than 1 year
Mixed CDW	mixture of different fractions of Construction and Demolition waste
Detachability	The potential to remove in its entirety a component/element/constituent of a material installed in a building (also referred to as ease of disassembly or recoverability).
Material separability	The ability to separate materials/components/elements or their individual constituents and thus keep material flows separate based on individual origins.
Product leasing	The manufacturer remains the owner of the product. The owner of the product acquires rights of use via product leasing.
Post-consumer recycled content	Recycled material after use by a consumer. In other words, products already installed in the building whereby material is fed into a recycling process for the manufacture of new products.
Intended use	Use of a product in accordance with the manufacturer's specifications, instructions, and information
Unmixed	A (partial) material that can be removed from the material (type) composite without foreign matter (e.g. due to adhesions).

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APPENDIX B – DOCUMENTATION

I. Required documentation

The following documentation represents a selection of the possible means by which to provide evidence. Based on the submitted evidence documents, the selected evaluation of the individual indicators must be plausibly documented.

Indicator 1.1: Definition of relevant circularity targets and focal points
Protocols, target-setting by the commissioning party
Presentation of project-specific circularity strategies and focal points, setting target quotas for selected circularity KPIs

Indicator 1.2: CIRCULAR ECONOMY BONUSES - Potential circularity of the site or the surrounding region
Results of a site analysis according to upcoming, ongoing, or completed (reverse) construction projects, contacting authorities, excerpts from project-specific use of platforms or databases

Indicator 1.2: Preservation or use of existing buildings
Presentation of area conservation (plans, area calculation)
Presentation of component preservation and materiality of preservation in relation to the entire building project

Indicator 1.3: CIRCULAR ECONOMY BONUSES - Variable indicator: Pre-Demolition
Inclusion in the system boundaries: Confirmation from owners/builders

Indicator 1.3.1: Justification of the deconstruction need and planning of deconstruction
Justification formulated by the owner
Excerpt from inventory of potentially extendible components and products, fixtures, furnishings
Evaluation of the inventory
Material flow balance deconstruction (estimate) with project-specific estimate of transport distances and material recovery/disposal
Expert opinion on hazardous substances and register of harmful substances, drawn up by a competent person
Excerpt from the hazardous substances' removal concept

Indicator 1.3.2: Implementation of demolition
List of all possible buyers for the items of value listed in the inventory
Evidence of proactive search and contact with potential buyers
Inventory of actually accrued masses and transport distances and material recovery/disposal routes
Proof of optimisation of the material recovery and/or disposal routes (comparison with the usual state of the art)
Index to prove optimisation according to deconstruction certificate TEC1-R Indicator 2
Proof of implementation of the hazardous substance removal concept (confirmation by owner or implementing company)

Variable indicator 1.3.3: Alternative forms of documentation via DGNB system for deconstruction
Alternative forms of documentation via DGNB deconstruction certificate with fulfilment of the indicators specified in the method

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Indicator 2.1: Circularity variants comparison
Presentation of variants/concepts with reference to the service phases and assessment
Alternative: Use of tools for the creation of circularity balance sheets, indices, etc. in the context of planning or execution, with reference to/issue of optimised building resource passports
Presentation of the comparison of climate impacts and costs and pollutant assessments for the variants

Indicator 2.2: Design for deconstruction
Detailed concept and documentation on future deconstruction measures, change of use, conversion of the specific building providing certain technical guidance and action plan for redesigning and/or deconstruction with purpose description, technical steps for implementation and possible result/outcomes.

Indicator 3.1: Data collection via the format of Building Resources Passport for description of circular properties
Completed excel based DGNB tool provided by the DGNB (ENV1.3/TEC1.6/BRP)

Data collection on building design details, documented into the “manual” or similar paper, where all relevant measures (as-built) from the deconstruction concept will be documented, e.g. pictures of connections, accessibility of service areas, drawings and protocols, material lists (as built) and other relevant documents incl. guidelines on future dismantling processes and technical solutions.

Alternatively: Data Collection in Level(s) Format
Optional: Additional Tool sheets from Level(s) or other relevant building resource passport documentation
Excerpts from the underlying data structure for a plausibility check

Indicator 4: Scoring circularity properties at building level
Completed the tool provided by DGNB (scoring can be automatically present, if inputs are valid)
Evidence of compliance with specific target quotas (see table below).
If necessary, own or statistical evaluations

Indicator 5: Use of circular products at component level
It is advisable to specify in the call for tenders that the specific circularity properties of products have been included, or the products have been assessed by the manufacturer/supplier in the DGNB Navigator.

The following documentation can be used as a reference for submission of proof evidence.

CIRCULAR PROPERTY	CIRCULARITY ATTRIBUTE	REQUIRED DOCUMENTATION
Post-consumer recycled content	Mass share of recycled material after consumption (post-consumer recycled material)	Manufacturer confirms that the product consists exclusively of renewable raw materials to which no chemical substances have been added or the molecular structure of which has not been artificially altered. **or** Manufacturer confirmation shows the proportion of post-consumer recycled material.

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	Any chemical substance in the recycled material after consumption (post-consumer recycled material) is reported	Manufacturer confirms that the product consists exclusively of renewable raw materials to which no chemical substances have been added or the molecular structure of which has not been artificially altered. **or** Manufacturer confirms that no post-consumer recycled material has been added to the product.
Ease of maintenance and repair	The product does not require maintenance or repair if the intended use of the product is observed.	Designation of the characteristics of the product due to which no maintenance or repair is to be expected within the service life of the product.
	The product has been designed in such a way that maintenance or repair is possible throughout its service life.	Designation of the characteristics of the product on the basis of which maintenance or repair is verifiably possible within the useful life of the product. It need only be possible to maintain or repair damage that affects the intended use of the product. Example: Broken glass in a window impairs the intended use. The question can therefore only be answered positively if the glass can be replaced.
	Spare parts are provided by the manufacturer or an authorised representative during the product's service life.	Manufacturer's confirmation that spare parts will be kept available throughout the product's service life.
Biodegradability	The product is biodegradable and can be safely returned to the natural cycle.	Required documentation: In the event of a positive evaluation: Manufacturer confirms that the product consists exclusively of renewable raw materials to which no chemical substances have been added or the molecular structure of which has not been artificially altered.
Dismantling capability	The product is designed to be installed and dismantled non-destructively using reversible connections.	Installation instructions for the product describing at least one method of attachment with a detachable fastener. Due to cross-reference to the Building Resource Passport: The type of connection must be stated for each reversible connection type: i.e. loose, click connection, plugged or screwed.

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Detachability	Mass fraction of the product whereby the product components can be removed from the product without contamination via reversible compounds.	Plausible explanation that the product does not have any multiple product components or Manufacturer's declaration with plausible explanation (if necessary, also verifiable via maintenance/repair instructions) as to which product components can be removed from the product, specifying the reversible connections. Manufacturer's confirmation of contamination-free removal for each product component Comprehensible calculation of the mass fraction: Mass (in kg) of all product components that are installed in the product so as detachable / Mass (in kg) of the total product
	Mass fraction of the product whereby individual materials used in the product can be removed from the product, unmixed and without contamination, for the purpose of reuse or recycling	Manufacturer's declaration with comprehensible explanation of which materials/material types can be removed from the product by type (unmixed), specifying the type(s) of connection and the possibility of separation Manufacturer's confirmation of the contamination-free removal of the individual materials/material types Comprehensible calculation of the mass fraction: Mass (in kg) of all materials/material types that can be removed from the product by type (un-mixed)/mass (in kg) of the total product
Products with a long service life	Special measures were taken during product design to increase the service life.	Plausible manufacturer's declaration that the product has a service life of more than 50 years without life-extending measures. **or** Manufacturer's declaration specifying the life-extension measures with which the service life of comparable products is plausibly exceeded the current general standard state of art.
	The product has been specially designed to allow maintenance work to be carried out in order to extend its service life.	Plausible manufacturer's declaration, specifying the specific maintenance measures that enable the service life of the product to be extended. According to EN 13306, the combination of all technical and administrative measures as well as management measures during the life cycle of a property that serve to maintain or restore its functional condition so that it can fulfil the required function
Reusability/ recyclability	The product is designed for reuse in unmodified condition or with minimal modifications.	Comprehensible manufacturer's declaration, with designation of the implemented measures in the product design, in order to enable re-use of the product

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	The product has been specially designed to be able to upgrade it to the current state of the art.	Plausible manufacturer's declaration, specifying the concrete measures (e.g. also in the product design) so that the product can be upgraded to the current state of the art,
	The manufacturer/industry association has set up a special collection system to collect products already installed in the building after the end of life in order to forward them for recycling or re-use.	Manufacturer's declaration, with the following contents: Plausible explanation that the manufacturer has set up an already-established collection system through which the return of products is currently practised. Specify the requirements for the product so that it can be taken back (e.g. unmixed removal without foreign adhesions) Explanation as to how the returned products will be processed, specifying the main steps for returning the product or product materials to the material cycle and estimating the proportion of material losses Designation/estimation of the product masses over a self-selected period of more than one year that have already been incorporated into new products via the collection system
	The manufacturer offers product leasing.	Product brochure, manufacturer's website, or similar, in which product leasing is offered for the product and the conditions can also be viewed Manufacturer's declaration specifying the essential aspects of the contractual arrangement of leasing contracts Manufacturer provides a sample lease agreement for the product.
Re-use/re-purpose	Mass fraction of the product made from recycled or **re-used** materials/(sub)components/(sub)products	Manufacturer's declaration specifying the materials/components re-used and recycled, and traceable derivation of the mass proportion of the materials/components re-used and recycled.

APPENDIX C – LITERATURE

I. Version

Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Act to Promote Closed Substance Cycle Waste Management and to Ensure Environmentally Compatible Waste Management (German Recycling Act - KrWG) in the version dated 24.04.2012
- Revision Directive 2008/98/EC on waste: https://ec.europa.eu/environment/pdf/waste/framework/guidance_-doc.pdf
- Definitions of recycling forms: www.wecobis.de/service/lexikon/recycling-lex.html
- Sustainable Development Goals Icons, United Nations/globalgoals.org
- Buildings As Material Banks (BAMB2020): www.BAMB.eu
- DGNB system for deconstruction: https://www.dgnb.de/en/certification/buildings/deconstruction
- DGNB Brochure "In Focus: Circular building" (2024) https://www.dgnb.de/filestorages/Downloads_unprotected/-publikationen/dgnb_brochure_focus-on-circular-building_en.pdf
- DGNB Report "DGNB Quality Standard for Circularity Indices for Buildings" (2024) https://www.dgnb.de/-en/sustainable-building/circular-building/circularity-indices
- DGNB Building resource passport https://www.dgnb.de/en/sustainable-building/circular-building/building-resource-passport
- Level(s) indicator 2.1: Bill of Quantities, materials and lifespans: User manual (Version 1.1; Jan. 2021, JRC, Unit B.5) https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents
- Level(s) indicator 2.2: Construction and Demolition waste and materials: User manual (Version 1.1; Jan. 2024, JRC, Unit B.5) https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents
- Level(s) indicator 2.4: Design for deconstruction: User manual (Version 2.0; Aug. 2021, JRC, Unit B.5)
- EU Construction and Demolition Waste Management Protocol (2016): https://ec.europa.eu/docsroom/documents/20509/
- Referenced to the supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council (also known as the EU Taxonomy Regulation): contributing substantially to the transition to a circular economy, C(2023) 3851 Annex 2, Brussels, 27.6.2023 - https://eur-lex.europa.eu/resource.html?uri=cellar:-41bc9b06-1515-11ee-806b-01aa75ed71a1.0001.02/DOC_3&format=PDF
- Referenced to the supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council (also known as the EU Taxonomy Regulation): contributing substantially to climate change adaptation, C(2021) 2800 Annex 2, Brussels, 4.6.2021 - https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=PI_-COM:C(2021)2800

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TEC3.1

Mobility infrastructure

Objective

Our objective is to conserve natural resources, to reduce traffic-related emissions into the air, water and soil, to increase user comfort through a sustainable mobility infrastructure, and to strengthen efficient, affordable mobility services.

Benefit

Sustainable and smart transport infrastructure enables users to choose the most suitable means of transport for their individual needs. If the conditions are established at the building for the comfortable use of diverse and sustainable mobility solutions, a reduction in pollutant loads and other negative effects arising, in particular, from motorised private transport, can be expected. Furthermore, the users' satisfaction with the site and the building is increased, affordable mobility is expanded, and the health-promoting activities of cycling and walking are encouraged.

Contribution to overarching sustainability goals



Outlook

Mobility is currently in a transitional phase (e.g. as a result of electromobility, autonomous driving, new mobility solutions). Development is being closely monitored and the evaluation criteria will be adjusted as required.

Share of total score

	SHARE	WEIGHTING FACTOR
Consumer market **Shopping centre** **Department stores** **Assembly buildings**	**3.5%**	**3**
Logistics **Production** **Office** **Education** **Residential** **Hotel** **Healthcare buildings**	**2.5%**	**2**

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EVALUATION

As the starting point and destination of routes, the building is central to the mobility of its users, because it is here that the choice of everyday modes of transport is made. The aim is to increase the use of alternative modes of transport, while ensuring that the building features good infrastructure and parking facilities for various modes of transport. The appropriateness of this infrastructure can promote the use of sustainable modes of transport. This requires that the alternative mobility infrastructure be available upon completion of the building. A qualitative-quantitative method is used to assess the existence of corresponding solutions on the basis of the following indicators: cycling infrastructure, rental systems, infrastructure for alternative fuel technologies and ease of use in the building. A maximum of 100 regular points can be credited, or 115 points with bonuses.

NO.	INDICATOR	POINTS
1	**Mobility concept in the planning process**	**Max. 10**
	■ A mobility concept is available in which goals for sustainable mobility are formulated.	+5
	■ Future transport demand is considered in the mobility concept	+5
2	**Infrastructures**	**Max. 30**
2.1	**Pedestrian infrastructure**	**10**
	■ Routes: clear, safe and barrier-free routes for all user groups. Signage is recognisable and comprehensible (for all user groups depending on the usage profile).	+5
	■ Sufficient storage space/options for mobility aids such as walkers, prams, scooters, etc. are available near the entrance	+5
2.2	**Cycling infrastructure**	**20**
	The bicycle parking spaces provided for in the mobility concept or created in accordance with the building regulations have the following characteristics:	
	■ At least 80% of the parking facilities are clearly assigned to the building, located close to the entrance, are easily accessible, illuminated, and include anti-theft measures.	+5
	■ Weather protection is available for the parking facilities/spaces (100% for residential, at least 80% for all other schemes).	+5
	■ Lighting is available for the parking facilities/spaces (100% for residential, at least 80% for all other schemes).	+5
	■ Adequate anti-theft parking spaces for cargo bikes and special bikes are provided.	+5
2.3	**Motorised individual transport (MIT)**	**10**
	■ Legal, organisational, and structural conditions for future joint use by car-sharing providers have been created for the parking spaces located on the property.	+5
	■ At least 80% of the parking spaces belonging to the building are not permanently allocated to specific users or user groups, so that the existing parking spaces can be used efficiently.	+5
2.4	**AGENDA 2030 BONUS – MOBILITY MANAGEMENT CONCEPT** A professionally developed mobility management concept is included in the Mobility Concept.	**+5**

3	**Infrastructure for alternative smart (electrical) mobility**	**Max. 35**
3.1	**Cycling and electric bikes**	**Max. 15**
	■ At least two charging stations are available and 50% of all bicycle parking spaces are pre-fitted for installation of a charging station.	+5
	■ Charging stations are available for 50% of the bicycle parking spaces (interpolation applied, but at least two charging stations).	1–15
3.2	**Motorised individual transport (MIT)**	**Max. 15**
	■ At least two charging stations are available and 50% of all car parking spaces are pre-fitted for installation of a charging station.	+5
	■ For non-residential buildings, 30% of the parking spaces are equipped with charging stations (interpolation applied, but at least two charging stations).	1–15
	■ For residential buildings, 50% of the parking spaces are equipped with charging stations (interpolation applied, but at least two charging stations).	1–15
3.3	**Integration of the charging or refuelling points**	**5**
	■ Integration of the charging stations within the building energy management system	+2.5
	■ Integration of the charging stations within a networked charging management system	+2.5
3.4	**AGENDA 2030 BONUS – CLIMATE PROTECTION TARGETS** Vehicle to grid: Preliminary setup for **bidirectional** charging and discharging of electric vehicles is available	**+10**

4	**Rental systems**	**Max. 10**
4.1	**Mobility Sharing**	**Max.10**
	Parking spaces for mobility sharing (car, scooter, bike sharing, etc.) are available in sufficient numbers and in the immediate vicinity of the entrance (maximum 350 m), easily accessible at or within the building, or the building is located within the service area of a free-floating provider. Alternatively, the building or its users are involved in a district mobility concept that includes the organisation and promotion of sharing systems.	
	■ 5 points can be assigned per solution. Each combination of solution and form of solution (station-based/free floating) can only be counted once (e.g. only one station-based car-sharing provider).	

5	**Comfort of use**	**Max. 15**
5.1	**User comfort in the building and for user groups**	**Max. 15**
	■ Shower facilities available	+5
	■ Changing and drying rooms, as well as storage facilities are available	+5
	■ Maintenance facilities for bicycles are available	+5
	■ Residential buildings: In addition to regular bicycle parking spaces, there are also parking spaces for children's trailers, cargo trailers, etc.	+5

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Re 1–5	**INNOVATION AREA** If measures are implemented that demonstrably contribute to encouraging the users of the building to make regular and extensive use of environmentally friendly means of transport (non-motorised modes of transport, public transport or rental systems) when travelling to and from the building, these can also be positively assessed in accordance with the target formulation of the criterion and the assessment of the other indicators. Positive assessment is also possible in the area of electromobility or technical integration (e.g. ‘green logistics’, which enables low-emission or zero-emission delivery in inner cities; parking facilities and charging stations for cargo bikes).		**as per 1–5**

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPIS	UNIT
KPI 1	Number of parking facilities for bicycles with defined minimum qualities (clearly assigned to the building, located close to the entrance, easily accessible, illuminated, and featuring anti-theft measures)	[Number]
KPI 2	Number of parking spaces for motorised individual transport	[Number]
KPI 3	Proportion of bicycle parking spaces with charging stations	[%]
KPI 4	Proportion of parking spaces for motorised private transport with charging stations	[%]
KPI 5	Number of different mobility sharing solutions in the immediate vicinity	[Number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Mobility is currently a key factor in site selection for buildings. The availability of various modes of transport and an efficient transport system increases user comfort and convenience. The correspondingly high acceptance and uptake by users have a positive effect on the evaluation of a site and thus on the choice of site for a property.

II. Additional explanation

Mobility doesn't begin outside a building – appropriate measures should be implemented inside the building too. This is done using a mobility concept. The mobility concept serves as the basis for dimensioning and designing the mobility infrastructure in and around the building. A wide range of mobility options and a user-friendly approach help to increase user acceptance.

A wide range of mobility options means providing access to alternative modes of transport, such as public transport, rental systems or mobility platforms, as well as meeting a range of individual mobility requirements, such as the use of electric vehicles in the form of electric cars, electric scooters or electric bikes.

User-friendliness covers, among other things, routes within a building, easy accessibility of storage rooms for mobility aids such as walkers, prams, two-wheelers, e- scooters (personal mobility devices), and also the user comfort in the building, including shower facilities, changing and drying rooms, and storage facilities.

III. Method

Indicator 1: Mobility concept in the planning process

This indicator assesses the existence of an overarching mobility concept that examines use-specific requirements, local conditions and goals, the usual local mobility, and the planned building use. It also assesses the need for and potential for efficient and environmentally friendly alternative fuel technologies (electric, hydrogen, natural gas, etc.) – together with the necessary charging infrastructure for the district, and in particular for the building location – and identifies project-specific measures and use requirements. A positive assessment is given if a mobility concept is available that addresses at least the following points:

- The mobility concept describes as a fundamental goal both the reduction of private motorised vehicles and the associated infrastructure, as well as the availability of more attractive sustainable transport options.
- The mobility concept defines goals to encourage cycling and walking, as well as the use of public transport. The target values in the concept are based on a forward-looking demand assessment, taking into account the principles of avoiding unnecessary traffic and shifting necessary traffic to the most environmentally compatible means of transport possible (i.e. first of all the sustainable transport network or shared means of transport, or locally emission-free means of transport) and targeting a lower share of motorised transport in the modal split compared to neighbouring areas and similar spatial categories.
- Alignment with the municipal or district transport/mobility concept (if available)
- The target values for the distribution of traffic volume across the district and the building (modal split) form the basis for the design of mobility management measures and the dimensioning of parking facilities.

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When dimensioning car and bicycle parking facilities, a distinction must at least be made between parking spaces for permanent users (overnight parkers, employees, students, residents) and short-term parkers (visitors, customers). Parking facilities for short-term parkers must be accessible and usable for the corresponding user groups. In addition, the need for parking facilities for mobility aids in the area of pedestrian traffic must be assessed (walkers, prams, senior mobility scooters, e-scooters, balance bikes).

- Documentation: Calculation of the required parking spaces for bicycles and where applicable for mobility aids, maximum number of vehicle parking spaces
- Documentation: Textual and graphic representation of the route connections (including, in particular, barrier-free routes) and intersections of all modes of transport, as well as the connections to the surrounding road and path network including distances of the routes to be covered in metres up to the road boundary
- Documentation: Prerequisites regarding the existing technical infrastructures, e.g. capacity of the electricity grid

It is considered positive if future transport demand is taken into account in the mobility concept. As a minimum requirement, this includes statements on the following points:

- Consideration of both the current and the expected future utilisation structure (age, household structure, phase of life, income, type of district, structure in the commercial/industrial area, topography)
- Demand analysis taking into account future scenarios (e.g. due to changes in the world of work, the choice of means of transport, and the addition of new mobility solutions)
- Resilience/adaptability in the face of external disturbances or changing requirements, changes regarding accessibility

Indicator 2: Infrastructures

Indicator 2.1: Pedestrian infrastructure

This indicator assesses the entrance layout and routes.

- Routes: The routes for pedestrians from the street boundary to the (main) entrance are as direct as possible and lead exclusively via paths where pedestrian traffic has priority or can use a clearly distinct, separate infrastructure (e.g. not exclusively via the roads of car parks).
- Parking facilities: Here, the assessment of parking facilities for mobility aids such as walkers, senior mobility scooters, prams, e-scooters, etc. near the entrance is carried out. These should be available in sufficient numbers as per the mobility concept.

Indicator 2.2: Cycling infrastructure

This indicator assesses parking spaces, maintenance facilities, weather protection and lighting.

- Parking facilities: Available in sufficient quantity and quality in accordance with local guidelines/ and standards. The figure based on reference values should be adjusted where, in individual cases, the result is clearly disproportionate to the requirements derived from the actual or expected number of bicycles used by users and visitors to the building.

Alternatively, the following recommendations for determining space requirements can be used:

- Instructions for planning bicycle parking facilities and Technical Guidelines TR 6102 from the German Cyclist's Association (ADFC) 1
- 'Bicycle Parking Manual' by the Danish Cycling Federation2
- 'Making Buildings Fit for Sustainable Mobility' report from the European Cyclists´ Federation (ECF)3
- Other comparable international or local guidelines, standards, etc.

[1] https://www.adfc.de/fileadmin/user_upload/Expertenbereich/Politik_und_Verwaltung/Download/TR6102_0911_Empfehlenswerte_Fahrrad-Abstellanlagen.pdf
[2] https://www.celis.dk/Bicycle_Parking_Manual_Screenversion.pdf
[3] https://ecf.com/system/files/Making_Buildings_Fit_For_Sustainable_Mobility.pdf

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The parking facility is illuminated, easily accessible, close to the entrance, and equipped with anti-theft systems for bicycles.

- 'Anti-theft' means that the bicycle parking facility has a fixing point for locking both the frame and wheel. If the parking facilities are located in a lockable room that is only accessible to a limited group of users, the connection requirement may be omitted.
  For bicycle parking facilities for short-term parkers (e.g. retail customers), "close to the entrance" means an average distance of < 15 m that can be covered on foot, while for permanent users it refers to an average distance of < 35 m that can be covered on foot to the nearest entrance door or, in the case of indoor bicycle garages, to the nearest staircase.
- "Easily accessible" means: Any ramps shall not exceed a gradient of 10% and shall have a minimum width of 1.10 m. Doors leading to bicycle parking facilities should be easy to open with a bicycle in hand, any lifts required for accessibility to the parking facilities must be sufficiently sized for bicycle transport.
- Weather protection: An assessment is conducted to determine whether the parking facilities/spaces are weather-protected.
- Lighting: The adequacy of lighting for the parking facilities/spaces is evaluated.
- Cargo bikes: For points to be awarded, it should be noted that the turning radii of cargo bikes and non-standard bicycles must also be taken into account when designing the access routes.

Indicator 2.3: Motorised individual transport

This indicator assesses various characteristics of the implementation of the mobility concept (Indicator 1) with regard to motorised individual transport. The following are viewed positively:

- The reduced parking space requirement is met in a parking facility/mobility hub, whereby its joint use with other user groups not associated with the building is contractually ensured.
- The creation of legal, organisational, and structural conditions for shared use by car-sharing customers.

As a bonus (Indicator 2.4), a positive assessment is given if a professionally developed mobility management concept is available that also contains recommendations for the future users of the building. This includes provisions and recommendations on the following points:

- Information materials for future users (e.g. accessibility information, how the mobility solutions on the site work, and responsible contact persons)
- Incentive systems encouraging users to travel sustainably (e.g. provision of employee travel pass ticket, work bicycle, promotion of carpooling or the use of sharing systems)
- Innovative concepts: e.g. in terms of parking space use, building local systems, collaborative solutions with neighbours through shared or combined use of vehicles, parking spaces or shuttle services, sustainable logistics, etc.
- Measures, implementation plan, and financing as well as communication of the key aspects of the mobility concept and mobility management concept.

Indicator 3: Infrastructure for alternative smart (electrical) mobility

The aim is to maintain a comprehensive network of charging infrastructure for alternative fuel technologies so that every user (residents, workers, visitors, etc.) has the opportunity to charge their electric vehicle in or near the building. This is assessed separately for cycling and motorised traffic. The evaluation is based on the number of charging stations implemented for motorised individual transport (MIT) and electric bikes in and at the building. The supply of the charging infrastructure must be demonstrated, taking into account the appropriate electrical load capacity (if necessary, in consultation with the energy supplier). It must be noted and justified if the maximum number of charging and/or refuelling stations cannot be achieved. Points can be allocated in consultation with the DGNB. In this context, load management should be taken into account, subject to technical and economic feasibility.
The following aspects are evaluated:

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- Provision and installation of infrastructure in and around the building in the form of charging stations, or pre-fitting of charging stations, for car parking spaces
- Provision and installation of infrastructure in and around the building in the form of charging stations, or pre-fitting of charging stations, for electric bike parking spaces

Please note:

- Recommendations for the qualitative and quantitative planning of electrical systems in buildings with regard to electric mobility are provided in VDI 2166 Sheet 2. These recommendations also make reference to the relevant European Standards.
- Integration of charging stations into the building energy management system should be included in the planning process as early as possible (e.g. in order to use electricity generated within the building).
- Networked charging management can include charging stations outside the property.
- The parking space layout and sizing must allow for unimpeded charging.
- Implemented charging stations should be protected against extreme events (e.g. flooding).

Indicator 3.4: AGENDA 2030 BONUS – CLIMATE PROTECTION TARGETS

V2G (Vehicle to Grid) refers to infrastructure pre-equipped for the bidirectional charging and discharging of electric vehicles and must be verified.

Indicator 4: Rental systems

- Points are awarded for rental systems that meet the accessibility criteria mentioned in the indicator. Cargo bikes and bike sharing are treated as different solutions.
- Points can also be awarded for participation in a district system that includes the promotion and use of mobility sharing.

Indicator 5: Comfort of use

This indicator assesses shower facilities and rooms with storage facilities.

Innovation area

If measures have been implemented to encourage building users to frequently and extensively use environmentally friendly forms of transportation (non-motorised modes of transport, public transportation or rental systems) to travel to the building, these measures can also be evaluated positively in accordance with the objectives of the criterion and the evaluation of the other indicators. This also applies in the section of electromobility (e.g. ‘green logistics’ => low-emission or zero-emission delivery in inner city locations).

IV. Use-specific description

None

APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

Indicator 1: Mobility concept in the planning process

- Mobility concept with adherence to the specifications regarding its contents

Indicator 2.1: Pedestrian infrastructure

- Photographic documentation with explanation
- Excerpts from planning documents in conjunction with site plans
- Floor plan excerpt with entrance situation and storage possibilities. Indication of the calculated area and number of aids to be accommodated there in relation to the number of building occupants

Indicator 2.2: Cycling infrastructure

- Parking facilities documentation: In a sufficient quantity and quality in accordance with regional building regulations or corresponding implementation regulations
- A requirement for the evaluation is the documentation that the bicycle parking infrastructure contains an appropriate number of bicycle parking spaces.
- Documentation on the number and location of the bicycle parking spaces, e.g. via floor plans and photo documentation

Indicator 2.3: Motorised individual transport

- Contract or excerpt on use/participation in district car park
- Documentation for future shared use by car-sharing customers: Contract agreement with provider and proof of fulfilment of prerequisites (e.g. accessibility, routes etc.)
- Concept without parking spaces with proof as to how mobility works (reference to concept under indicator 1)

Indicator 2.4: Mobility management (bonus)

- Mobility management concept with evidence of the key points described in the method

Indicator 3: Infrastructure for alternative smart (electrical) mobility

- The concept requires a rough calculation of power requirements and proof of availability with the public supplier for the necessary electrical power, e.g. by means of an electrical planning concept and proof of coordination
- Confirmation of feasibility and plan for possible retrofitting (e.g. building services plan, statement by electrical planner etc.)
- Proof by means of site plan, photographic documentation
- Documentation on the charging stations (see also VDI 2166 sheet 2. Planning of electrical installations in buildings – Advice for electric mobility)
- If applicable, mobile management strategy (reference to indicator 1)
- Proof of performance of the integration into roaming-capable billing systems
- Pre-equipment for bidirectional charging and discharging of electric vehicles (AGENDA 2030 BONUS)

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Indicator 4: Rental systems

- Documentation by means of a screenshot of the provider's business area, photographic documentation, site plan
- Evidence of participation in a district mobility concept with promotion and organisation of sharing systems (contracts, plans, etc.)

Indicator 5: Comfort of use

- Documentation via site plan, photo documentation

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APPENDIX C – LITERATURE

I. Version

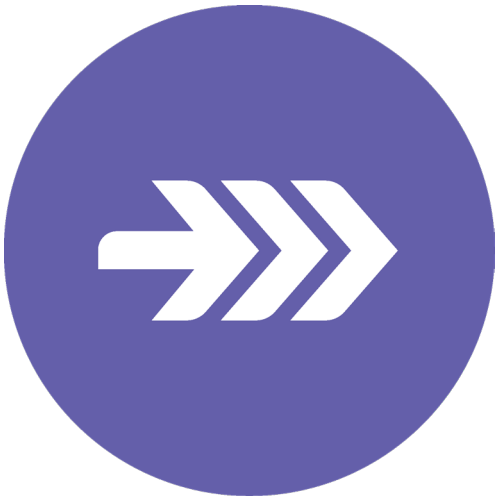
Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Building Electric Mobility Infrastructure Act (GEIG)
- **VDI** Guideline VDI 2166, Sheet 2: Planning of electrical installations in buildings - Advice for electromobility. Verein Deutscher Ingenieure e. V. October 2015.
- VDI-Richtilinien im DGNB Zertifizierungssystem. Paragraph 4.3 “TEC3.1: Möbilitätsinfrastruktur” Verein Deutscher Ingenieure e.V. June 2012 (this book is written in both German and English).
- DIRECTIVE (EU) 2018/844 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency
- Instructions for planning bicycle parking facilities and Technical Guidelines TR 6102 from the German Cyclist’s Association (ADFC): https://www.adfc.de/fileadmin/user_upload/Expertenbereich/Politik_und-_Verwaltung/Download/TR6102_0911_Empfehlenswerte_Fahrrad-Abstellanlagen.pdf
- Bicycle Parking Manual by the Danish Cycling Federation: https://www.celis.dk/Bicycle_Parking_Manual_-Screenversion.pdf
- “Making Buildings Fit for Sustainable Mobility” report from the European Cyclists´ Federation (ECF): https://ecf.com/system/files/Making_Buildings_Fit_For_Sustainable_Mobility.pdf

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Process quality

The six process quality criteria aim to increase the **planning quality** and the **construction quality assurance**.

PRO1.1	Quality of project preparation
PRO1.4	Sustainability aspects in tendering and contracting
PRO1.5	Documentation for sustainable management
PRO1.6	Procedure for urban and design planning
PRO2.1	Construction site/construction process
PRO2.3	Commissioning and monitoring

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PRO1.1

Quality of project preparation

Objective

Our objective is to ensure that the quality of the building is as high as possible through an optimised and transparent planning process, by defining the relevant conditions at an early stage (‘pre-planning phase’).

Benefit

The requirements of building owners with regard to the building, and the resulting planning objectives are clearly set out in the form of requirements planning and the specifications used for the planning process. Project preparation has a direct influence on the subsequent quality of the building. Greater public participation can also make an important contribution to broader acceptance of decisions, more balanced solutions and better decision-making. This helps to reduce conflicts, and encourage local residents to identify more strongly with their living environment.

Contribution to overarching sustainability goals



Outlook

New planning methods with Building Information Modelling (BIM) can have an impact on future preparatory design processes. The DGNB monitors these and, if necessary, considers future changes to design processes.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Department stores** **Logistics** **Production** **Healthcare buildings** **Assembly buildings** **Shopping centre**	**2.1%**	**2**

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EVALUATION

To ensure that the quality of the building is optimal, three indicators are used to assess the extent to which the relevant conditions have already been established at an early stage. Indicator 1 assesses the extent and quality of requirements planning. The bonus in Indicator 2 rewards the implementation of a participation process. Indicator 3 recognises the integration of a detailed description of sustainability requirements in the specifications. A maximum of 100 regular points can be awarded, or 115 points with bonuses

NO.	INDICATOR	POINTS
1	**Requirements planning**	**Max. 70**
1.1	**Basic**	**Max. 20**
	■ The Declaration of Sustainability from the DGNB has been used within the context of requirements planning and demonstrably discussed with the building owners.	20
	■ Consideration of the European framework for sustainable buildings Level(s) (see methods): Checklists based on Level 1, at least for macro-objective 1 (Greenhouse gas emissions and air pollutant emissions throughout the building life cycle), macro-objective 2 (Resource-efficient and circular material life cycles), macro-objective 4 (Healthy and comfortable spaces) are available and have demonstrably been discussed with the commissioning parties.	20
	■ Alternative, or other project-specific framework equivalent to the aspects covered by the two abovementioned methods	20
1.2	**Requirements planning**	**Max. 50**
	■ A requirements plan regarding objectives and targets according to Annex 1a is available and has been agreed with the commissioning parties.	20
	■ A requirements plan with objectives and specifications, as well as qualitative requirements according to Annex 1b is available and has been agreed with the commissioning parties.	40
	■ A requirements plan with objectives and specifications, as well as qualitative and quantitative requirements according to Annex 1c is available and has been agreed with the commissioning parties and forms the basis for subsequent planning.	50
1.3	**AGENDA 2030 BONUS – FEASIBILITY STUDY** This bonus can be credited if a feasibility study is carried out that serves to facilitate demonstrably sustainable concepts.	**Max. 5**
2	**AGENDA 2030 BONUS – PARTICIPATION** One of the two following stages (Stage 2 ang Stage 3) of a participation process is carried out in one or more phases, involving all relevant stakeholders. Note: Stage 1 (Information) is already included in Indicator 5.1 in criterion PRO2.1.	**Max. 10**
	■ Participation process in the requirements analysis	
	Stage 2: Consulting	7
	Stage 3: Co-determination	10
	■ Participation process in the design phase	
	Stage 2: Consulting	7
	Stage 3: Co-determination	10
	■ Participation process in the implementation phase	
	Stage 2: Consulting	7
	Stage 3: Co-determination	10

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3	**Specification**	**Max. 30**
3.1	**Sustainability requirements in the specifications**	
	■ Specifications have been drawn up, with detailed requirements regarding the building's sustainability. Ecological, economic, sociocultural and functional aspects have been taken into consideration, as well as technical aspects and the planning and construction process.	20
	■ In addition, responsibilities and the design method have been defined in the requirements specification, and the design phases essential for implementation have been identified and coordinated within the planning team.	30

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SUSTAINABILITY REPORTING

NO.	KEY METRICS/KPIS	UNIT
-		

APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Requirements planning is used to establish the requirements, objectives, and constraints of the building owner and other important participants. In this way, it is possible to identify all the issues the architect is expected to solve. Requirements planning is not identical to the architect's fundamental planning; rather, it serves to formulate requirements on the part of the building owner at the start of a construction project. Requirements planning goes far beyond simply determining the amount of space required. It forms the basis for objective focused planning which takes the requirements of the building owner into consideration without restricting the freedom of the planners. Transparent communication of the construction project and the opportunity for participation are significant factors in gaining acceptance of the construction project by the public.

II. Additional explanation

-

III. Method

Indicator 1: Requirements planning

This indicator assesses whether and to what extent requirements planning has been carried out. The Declaration of Sustainability and the checklists in the European reporting framework Level(s) based on Level 1 of macro-objective 1 (Greenhouse gas emissions and air pollutant emissions throughout the building life cycle), macro-objective 2 (Resource-efficient and circular material life cycles), and macro-objective 4 (Healthy and comfor-table spaces) take other topics (such as sufficiency, resource conservation, etc.) into account. Use of the Declaration and the level(s) checklists is evaluated positively. Evidence must be provided that these have been discussed with the commissioning parties.

The scope of requirements planning may vary depending on the project. In ISO 9699:1994-12 Performance standards in building – Checklist for briefing – Contents of brief for building design (or DIN 18205: 2016-11 Brief for building design) checklists are provided, which provide a basis for requirements planning. The objective should always be for the building owner to consider these requirements at an early stage, and project-specific features should be given appropriate consideration. Requirements planning must be started during the project initiation phase and completed no later than service phase 2 ‘Preliminary planning’ according to the German Fee Structure for Architects and Engineers (HOAI). At the end of the requirements planning process, a requirements plan is produced, which forms the basis for subsequent planning. Alternatively, the process can be completed using the checklists in Annex 1.

Indicator 1.3: AGENDA 2030 BONUS – FEASIBILITY STUDY

As part of a feasibility study, the qualities and potential of the project are developed and presented on the basis of a careful analysis, against which representative solutions are then compared. If these adopt a sustainable approach, this bonus can be credited. For example, a sufficiency strategy can be explored, which can then result in a reduced land requirement. However, approaches with regard to alternative materials or cooperation within the district can also be investigated. The feasibility study thus forms a sound basis for further design decisions.

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Indicator 2: AGENDA 2030 BONUS – PARTICIPATION

Various measures are implemented to inform, consult with or involve all those affected by the new construction project, or for the (re)design of the outdoor areas. The affected parties may vary depending on the project and must be identified for each phase. The immediate neighbours, the users, or their representatives and stakeholders should be addressed.

The participatory processes are evaluated according to the degree of influence afforded to the involved parties, and are divided into 3 stages accordingly. Each stage addresses how sustainability is promoted at the site and how this aligns with the needs of all users. The DGNB criteria can serve as a guide.

- Stage 1: Information (covered by Indicator 5.1 in criterion PRO2.1)
- Stage 2: Consulting
  All relevant affected parties are informed about the planning objectives, content, and processes, as well as their effects on the surrounding area, and can submit their comments. They are consulted about their wishes and concerns, for example through workshops, consultation events, etc.
- Stage 3: Co-determination/participation
  In addition to the consultation in stage 2, all relevant stakeholders are actively involved in defining objectives and the development or implementation of the plan, thus influencing the decisions, e.g. through workshops and planning sessions, etc.

These opportunities for involvement are assessed for the three different phases: requirements analysis, conception, and implementation:

- Participation process in the requirements analysis
- Participation process in the design phase
- Participation process in the implementation phase

Because the stages build on one another, evaluation points are awarded for each stage. Evidence must be provided showing which stage was applied at which project phase.

- Stage 1: Information
- Stage 2: Consulting
  Minutes and photographic documentation, e.g. of the discussion event, demonstrating that the relevant parties were consulted
- Stage 3: Co-determination/participation
  Minutes and photographic documentation demonstrating the active involvement of the participants, together with a record of outcomes and changes relative to the original proposals

Indicator 3: Specification

The requirements specification sets out the planning targets defined during the early project phase. The design methodology (e.g. BIM) is also specified. To better achieve the objectives, the requirements specification can specify the phase of a project in which essential steps for achieving the objectives should be implemented.

For the evaluation, particular attention is paid to ensuring that concrete objectives are set for the different sustainability aspects. Such specifications can be based on the criteria of the DGNB certification system or the ‘Sustainable Construction’ guidelines of the BMVBS. In addition to the objectives, the requirements specification should also define and describe the responsibilities.

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ANNEX 1

Annex 1a Requirements description

A description of the requirement in terms of this criterion should include the following points:

1. Description of the requirement

Typical/possible contents:

- Main objectives of the project
- Size
- Quality
- Financial framework
- Time frame
- Current planning status of the project
- Future changes

Annex 1b Small-scale requirements planning

Small-scale requirements planning in terms of this criterion should include the following thematic blocks:

1. Description of the requirement

Typical/possible contents:

- Main objectives of the project
- Size
- Quality
- Financial framework
- Time frame
- Current planning status of the project
- Future changes

2. Financial framework and time frame

Typical/possible contents:

- Schedule
- Budgets
- Costs
- Financial and time-related risks

3. Priorities

Typical/possible contents:

- Added value
- Time
- Costs
- Quality

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4. Plot and surrounding area

Typical/possible contents:

- Access
- Traffic
- Parking

5. The building as a whole

Typical/possible contents:

- Characteristics of the structural shell
- Dimensions
- Volume
- Number of floors
- Building sections
- Energy
- Flexibility for future uses

6. Accessibility

Typical/possible contents:

- Disabled access, equipment, workplaces

7. Individual rooms

Typical/possible contents:

- Characteristics
- Relationship to other spaces

Annex 1c Extensive requirements planning

An extensive requirement planning in terms of this criterion should include the following thematic blocks:

1. Description of the requirement

Typical/possible contents:

- Main objectives of the project
- Scale
- Quality
- Financial framework
- Time frame
- Current planning status of the project
- Future changes

2. Financial framework and time frame

Typical/possible contents:

- Schedule
- Budgets
- Costs
- Financial and time-related risks

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3. Priorities

Typical/possible contents:

- Added value
- Time
- Costs
- Quality

4. Participation

Typical/possible contents:

- User participation
- Public participation

5. Effects on users and the public

Typical/possible contents:

- Suitability of rooms and systems
- Safety
- Comfort
- Health
- Aesthetics
- Image

6. Effects on the environment

Typical/possible contents:

- Ecology
- Control of undesirable effects

7. Plot and surrounding area

Typical/possible contents:

- Access
- Transport
- Parking

8. The building as a whole

Typical/possible contents:

- Characteristics of the structural shell
- Dimensions
- Volume
- Number of floors
- Construction stages
- Energy
- Flexibility for future uses

9. Accessibility

Typical/possible contents:

- Disabled access, equipment, workplaces

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10. Individual rooms

Typical/possible contents:

- Space requirement plan with qualitative requirements, in the form of a room specification sheets. The target area ratio of UA to GFA is to be specified as a planning requirement based on guide values.
- Requirements shall be defined for the individual rooms with regard to the following features, as a minimum requirement:
- Spatial changeability
- Room height/light
- Lighting
- Indoor climate
- Surfaces
- Loads on ceilings

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ANNEX 2 - Verification template

Indicator 1: Requirements planning

Confirmation for PRO1.1: Requirements planning

We hereby confirm that, as part of the planning process for the project entitled

[project name] _____,

with agreement number _____,

requirements planning has been undertaken in line with the scope and quality of one of the evaluation levels below.

PLEASE TICK WHERE APPROPRIATE	DESCRIPTION	POINTS
□	A requirements plan regarding objectives and targets according to Annex 1a is available and has been agreed with the commissioning parties, by the end of service phase 2 “Concept design” in accordance with the German Fee Structure for Architects and Engineers (HOAI) at the latest.	20
□	A requirements plan with objectives and specifications, as well as qualitative requirements according to Annex 1b is available and has been agreed with the building owner, by the end of service phase 2 “Concept design” in accordance with the German Fee Structure for Architects and Engineers (HOAI) at the latest.	40
□	A requirements plan with objectives and specifications, as well as qualitative and quantitative requirements according to Annex 1c is available and has been agreed with the commissioning parties, by the end of service phase 2 “Concept design” in accordance with the German Fee Structure for Architects and Engineers (HOAI) at the latest.	50

A brief description of the methods employed as part of the project preparation (market analysis, environmental compatibility study, schedules of accommodation, expert site reports, cost estimates, capital budgeting, etc.) must be included with the documentation submitted for the purposes of the conformity assessment.

Date Signature Building owner Stamp

The auditor hereafter confirms that they have checked that the information contained in the relevant documents is a true and fair representation of the reality.

Date Signature Auditor Stamp

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APPENDIX B - DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

Indicator 1: Requirements planning

- The requirements planning or other documents which show the scope (see Appendix 1) and when the requirements planning is implemented (e. g. extracts from records).
- Appendix 2, incl. a brief description of the methods employed (market analysis, environmental impact assessment, schedules of accommodation, expert site reports, cost estimates, capital budgeting, etc.). The DGNB reserves the right to request individual pieces of documentation on a random basis at a later date as part of the conformity assessment.
- Proof of the implementation of a consultation on the basis of the Declaration of Architectural Sustainability (excerpt from the minutes, confirmation by the building owner)
- Processed checklists of the afore-mentioned level(s) indicators and evidence of discussion with the commissioning parties
- Bonus: Submission of the feasibility study with presentation of the sustainability approach

Indicator 2: AGENDA 2030 BONUS - Participation

- Stage 2: Consulting
  Minutes and photographic documentation, e.g. of the discussion event, in which the consultation of the involved parties is evident.
- Stage 3: Co-determination/participation
  Minutes, photographic documentation in which the active influence of the involved parties is evident, and documentation of the results/changes compared to the initial status

Indicator 3: Specification

- Specifications setting out the concrete objectives for the sustainability aspects and responsibilities

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APPENDIX C - LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals Icons, United Nations/globalgoals.org
- Architecture Declaration of Sustainability from DGNB (https://static.dgnb.de/fileadmin/phase-sustainability/-downloads/Declaration-Sustainability-Architecture.pdf)
- DIN 18205. Requirements planning in the construction sector. Berlin: Beuth Verlag. April 2016-11
- ISO 9699. Performance standards in building - Checklist for briefing - Contents of brief for building design, December 1994
- RBBAU guidelines for the execution of federal construction tasks. German Federal Ministry of Transport, Building and Urban Development (Bundesministerium für Verkehr, Bau und Stadtentwicklung, BMVBS). March 2009
- Guide to Sustainable Construction. German Federal Ministry of Transport, Building and Urban Development (Bundesministerium für Verkehr, Bau und Stadtentwicklung, BMVBS). April 2013
- European Reporting Framework Level(s) (2021): (https://susproc.jrc.ec.europa.eu/product-bureau//product-groups/412/documents)

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PRO1.4

Sustainability aspects in tendering and contracting



Objective

Our objective is to integrate sustainability aspects into the tendering phase at an early stage, to ensure that all decisions take a holistic approach.

Benefit

Integrating sustainability aspects into the tender phase improves the quality of the building and ensures that decisions regarding product quality are no longer based exclusively on economic considerations.

Contribution to overarching sustainability goals



Outlook

Ideally, this criterion can be dropped in a few years once the topics addressed in the criterion have become standard practice.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Department stores** **Logistics** **Production** **Healthcare buildings** **Assembly buildings** **Shopping centre**	**2.1%**	**2**

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EVALUATION

Indicator 1 assesses the extent to which sustainability aspects are integrated into the tender process at an early stage. The Circular Economy Bonus – Recycled Materials can be included in the assessment, with 10 additional points available. In this criterion, 100 points can be awarded, or a maximum of 110 points including bonus points.

NO.	INDICATOR	POINTS
1	**Sustainability aspects in the tender phase**	**Max. 100**
1.1	Extent of integration of sustainability aspects in the tender phase	**Max.100**
	■ Selected sustainability aspects with regard to the impact on health or environment, or alternatively relevant technical aspects for improving sustainability have been integrated into the tender specifications in the form of general preliminary remarks.	10
	■ Requirements with regard to the environmental and health compatibility of construction products have been integrated into the tender in the form of general preliminary remarks.	50
	■ Requirements with regard to the environmental and health compatibility of construction products have been specified for each trade and, in selected cases, have also been integrated into the tender at an individual service item level. In the case of a functional tender, the tender must be supplemented with a list of specific recommendation or exclusion criteria for the selection of construction products.	75
	■ In addition to requirements with regard to the environmental and health compatibility of construction products, technical aspects (such as durability, ease of cleaning and maintenance, or deconstructability) have been formulated for specific trades and, in selected cases, have also been integrated into the tender at an individual service item level. In the case of a functional tender, the tender must be supplemented with a list of specific recommendation or exclusion criteria for the selection of construction products.	100
1.2	**CIRCULAR ECONOMY BONUS – RECYCLED MATERIALS** No exclusion of mineral-based recycled materials in the tender. Explanation: Bonus can also be awarded if the tender sets out requirements for mineral-based construction products that explicitly recommend or require the reuse or use of recycled/secondary (post-consumer) materials.	**+10**

SUSTAINABILITY REPORTING

Sustainability reporting

NO.	KEY METRICS/KPIS	UNIT
-		

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The decisive factor for sustainability is the built result. It is important that sustainability aspects are addressed from target-setting through to implementation.

II. Additional explanation

Only by considering sustainability aspects early and integrating them into the tender can an appropriate choice of materials be ensured. This corresponds to the assessment of materials or their impact in terms of their environmental, socio-cultural sustainability and circular economy potential (see ENV1.2, ENV1.3, SOC1.2 and TEC1.6). The procedures described here therefore form the basis for the selection and use of sustainable materials and construction products.

III. Method

Indicator 1: Sustainability aspects in the tender phase

Checks are performed to determine whether sustainability aspects have been integrated into the tender process. The extent of the checks depends on the number of points being targeted. For this purpose, informative excerpts from the invitation to tender shall be submitted.

Indicator 1.2: CIRCULAR ECONOMY BONUS – RECYCLED MATERIALS

The criterion requires that mineral-based recycled materials are not excluded from the tender process. Additional bonus points can be awarded if the tender explicitly includes requirements or recommendations for the reuse of mineral-based construction products or for the use of recycled and secondary (post-consumer) materials.

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APPENDIX B – DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be documented comprehensively and plausibly on the basis of the submitted documents.

Indicator 1: Sustainability aspects in the tender phase

- Overview of all tenders with a note identifying where sustainability aspects have been integrated
- Excerpts from the tender documents, such as exemplary service item texts, additional technical preliminary remarks, or special contractual conditions, from which the required integration of the sustainability aspects is evident
- For general contractor tenders: Excerpt identifying the sought after qualities or exclusion of material or product characteristics, alternatively invitation to tender for subcontractors

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APPENDIX C – LITERATURE

I. Version

Change log based on the version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals Icons, United Nations/globalgoals.org
- German Construction Tendering and Contract Regulations (Vergabe- und Vertragsordnung für Bauleistungen, VOB)
- VDI 6026 Sheet 1 Documentation in building services - Contents and format of planning, execution and review documents

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PRO1.5

Documentation for sustainable management

Objective

Our objective is to digitally document the construction planning as accurately as possible to reflect the as-built condition and ideally commence building operation immediately upon completion. In addition to good documentation of the constructed building, the criterion also focuses on the transition to the operational phase and on preparations for ongoing data collection during operation. If all relevant building information is available in a structured format, owners and operators can use it to manage and plan efficiently. The long-term objective is to ensure the building is fully documented in digital form at all times.

Benefits

Today, it is generally recognised that data is invaluable. Good documentation is therefore invaluable in its own right. Having all the relevant information available is key to ensuring that the building can be operated efficiently. Through high-quality digital building planning, the successful operation of the building can be considered at an early stage. The building's longevity increases in proportion to the quality of the digital documentation. The model data can be used to create the building components catalogue, life-cycle assessment and Building Resource Passports.

Contribution to overarching sustainability goals



Outlook

This criterion will gain more importance in the coming years as good digital data and documentation becomes increasingly important for sustainable building construction and operation. Ideally, this criterion will no longer be needed in a few years' time, once the addressed topics have become standard practice.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Shopping centre** **Department stores** **Logistics** **Production** **Assembly buildings** **Healthcare buildings**	**2.1%**	**2**

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EVALUATION

A total of four indicators are used to evaluate the documentation for sustainable management requirements. Indicator 1 focuses on digital documentation of the building at the later construction stages and as-built as well as Buildings in Use documentation that is provided to the building owner. Indicator 2 aims to enhance the sustainability documentation of the building with a focus on building materials and their ease of recovery and recycling. Indicator 3 aims to encourage the use of BIM in the planning and sustainability aspects of the buildings. And Indicator 4 focuses on maintenance, inspection, operation, and care instructions for the buildings. A maximum of 100 regular points can be awarded, or 120 including bonuses.

NO.	INDICATOR	POINTS
1	**Documentation**	**Max. 50**
1.1	**Design files (later execution stage/as-built)**	**20**
	■ The design and model documents correspond to the building as built (in the later execution stage/as-built) and have been submitted to the building owner digitally in an open data format (see also Annex 1, Building design documentation).	+10
	■ The relevant evidence and calculations, e.g. energy performance calculations, sound insulation report, room acoustics report, fire protection concept, static calculation, technical report, thermal simulation, daylight simulation, etc., that reflect the building as built have been prepared appropriately for operation and provided to the building owner in digital format (see also Annex 1).	+10
1.2	**Buildings in Use files**	**30**
	■ Checklist and documents of the building operation documentation (Annex 2) are complete and have been provided to the building owner and the operating company	+20
	■ Data availability is ensured by storing all as-built documents for at least the five-year warranty period with the storage location recorded and provided to the operating company.	+10
2	**Sustainability documentation**	**Max. 20**
2.1	**Information on building material**	**Max. 15**
	■ A building components catalogue including LCA data, environmental product information, information on responsible resource extraction and circular properties (at the layer or component level) reflecting the as-built condition is available and has been provided to the building owner and the operating company.	10
	■ A digital building model including LCA data, environmental product information, information on responsible resource extraction and circular properties (at the layer or component level) reflecting the as-built condition is available and has been provided to the building owner and the operating company.	15
2.2	**Information on ease of recovery and recycling of the building**	**5**
	■ Documentation collected on the ease of recovery and recycling of the building materials by the construction management team (as built) has been provided to the building owner.	5

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3	**BIM**	**Max. 20**
3.1	**Planning with BIM**	**Max. 15**
	■ Planning has been carried out using BIM and a copy of the up-to-date partial model has been provided to the facilities management company and to the owner (5 points for each relevant partial model, e.g. for different building or technical components).	+5
	■ Planning has been carried out using BIM and a copy of the up-to-date complete model has been provided to the facility management firm and to the owner.	15
3.2	**Sustainability optimisation using BIM**	**5**
	■ Variant calculations for sustainable optimisation of the building structure have been carried out and documented using BIM.	5

4	**Maintenance, inspection, operation, and care instructions**	**Max. 10**
4.1	**Preparation and provision of maintenance, inspection, operation and care instructions**	**10**
	■ Provision of maintenance, inspection, operation and care instructions to the appointed service provider(s)/executive party/parties.	+2.5
	■ Preparation of maintenance and inspection schedules for building components that are subject to mandatory servicing, testing and inspection along with structural and technical components.	+2.5
	■ The life-cycle greenhouse gas and energy balances are integrated in suitable documentation or BIM model to enable operational monitoring for all balances.	+5

5	**CIRCULAR ECONOMY BONUS – Data basis for ‘urban mines’** The Building Resource Passport is part of a superordinate database for compiling databases for ‘urban mines’.	**5**

6	**AGENDA 2030 BONUS – Digital footprint** The footprint of digital storage has been significantly reduced (e.g. due to cleansed data volume and by the proven sustainability of the operator).	**5**

7	**CIRCULAR ECONOMY BONUS – Digitalisation from existing building** Explanation: Additional digitisation of existing structures has been carried out (e.g. surrounding infrastructure or building elements).	**5**

8	**AGENDA 2030 BONUS – Sustainability review** A BIM model-based building sustainability review, e.g. using the DGNB criteria catalogue, has been carried out.	**5**

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SUSTAINABILITY REPORTING

Sustainability reporting

Not available.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
-		

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Complete documentation of the building and the digitalisation of the associated information are important in ensuring that the building has an efficient, economical and long life cycle. Sustainability documentation for building materials and their recovery is also considered important. BIM is seen as a tool that can help with the optimisation of the building at an early stage as well as documentation in the long term. Maintenance, inspection, operation and care instructions and documents for the building also play a key role in ensuring that the building is operated efficiently.

II. Additional explanation

The project design phase is crucial for the later documented substance and the usability and quality of the data. Detailed design documents and calculations confirm the design intent and provide an important basis for any future modernisation, renovation and revitalisation work. They must therefore be kept up to date. For an efficient and resource-efficient operational phase, it is necessary that documents and plans are available in a clear and consistent structure so that an independent third party can readily understand the documentation. The operators should be equipped to evaluate maintenance from a life cycle assessment perspective.

III. Method

Indicator 1: Documentation

Indicator 1.1: Design files (later execution stage/as built)

This indicator assesses whether all planning documents (preferably in 3D) have been updated prior to or upon construction completion and prepared where necessary, e.g. plans as PDF and models as IFC (industry foundation classes). All plans must be derived from the model as far as possible. In addition, the handover of planning documentation to the building owner (on a digital storage medium or via a digital data environment in an open electronic format) and its completeness are checked. Other documents including relevant evidence and calculations, e.g. energy performance calculations, sound insulation report, room acoustics report, fire protection concept, static calculation, technical report, thermal simulation, daylight simulation, etc., that reflect the building as built are prepared appropriately for operation and are provided to the building owner in digital format. A checklist for this purpose can be found in Annex 1.

Indicator 1.2: Buildings in Use files

This indicator assesses whether the ‘Building documentation for existing buildings in operation’ checklist (Annex 2) is documented for use and whether the information and specifications it contains are conducive to efficient building operation. This documentation provides the operator of the building with various information relevant building operation. The documentation should capture all information essential to the successful operation of the building and demonstrate its value for ongoing use. The size of the documentation package will vary depending on the complexity of the building. One of the purposes of this is to explain the technical interfaces between the building fabric and building services, as well as the specific features of individual elements and components. It is essential to ensure that the data is available for as long as possible, and at least over the five-year warranty period, and that the data storage location is stated.

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Indicator 2: Sustainability documentation

Indicator 2.1: Information on building material

This indicator assesses the integration of LCA data (as per ENV1.1), building environmental product information (as per ENV1.2), information on responsible resource extraction (as per ENV1.3), circular properties (at the layer or component level) (as per TEC1.6) is determined reflecting the as-built condition. This is documented in the form of a building components catalogue (e.g. in an Excel table) or model, preferably based on tools with an open interface and updatable database for long-term quality assurance, consolidating the component information from the criteria ENV1.1, ENV1.2, ENV1.3 and TEC1.6.

Indicator 2.2: Information on ease of recovery and recycling of the building

Documentation collected on the ease of recovery and recycling of the as-built structure by the construction management team (as built) has been provided to the building owner.

Indicator 3: BIM

Indicator 3.1: Planning with BIM

This indicator assesses whether planning has been carried out using BIM and whether the current model has been provided to the facility management firm and to the owner. If only a partial model of the building has been generated with BIM and then provided to the facilities management company and the owner; partial credit can be given if its relevance can be verified.

Indicator 3.2: Sustainability optimisation using BIM

Points can be awarded under this indicator if BIM model-based comparative studies have been carried out to sustainably optimise the building or its resource and energy performance and this has been documented accordingly. The comparative calculations should be made as early as possible during the project.

Indicator 4: Maintenance, inspection, operation, and care instructions

Indicator 4.1: Preparation and provision of maintenance, inspection, operation and care instructions

Complete documentation of the building-related maintenance, inspection, operation, and care instructions can make an important contribution to the efficient operation of the building, and thus contributes to reducing life cycle costs. Documentation can also be provided in the form of provisional documents with the assurance that these documents will be completed no more than six months after completion of the building work.

Most building components require regular care and maintenance. The level of effort required varies according to the component. These activities should therefore be carried out by various parties at defined intervals. A precise description of these maintenance, inspection, operation, and care instructions assigned to the responsible party is necessary for the smooth operation of a building. However, these documents not only need to be produced but also managed and archived. In addition to a list of building components that are subject to mandatory servicing, testing and inspection as well as structural and technical components, the maintenance and inspection planning should include a cost plan for the building's projected service life based on a detailed life cycle cost calculation, and the duration after which elements and building components need to be replaced should be specified, along with the estimated costs.

Documents or a BIM model for the life cycle greenhouse gas and energy balance are prepared to support energy monitoring. This provides a basis for updating and optimising building and facilities management as circumstances change. In this way, LCAs can be used to optimise maintenance or develop and monitor a climate action roadmap covering operational and building-related emissions over the life cycle (DGNB BIU system).

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Indicator 5: CIRCULAR ECONOMY BONUS – Data basis for ‘urban mines’

Points can be awarded if the Building Resource Passport is part of an overarching database, e.g. for ‘urban mines’ (data basis for local or global platforms and tools as well as other initiatives at the public federal or municipal level).

Indicator 6: AGENDA 2030 BONUS – Digital footprint

This bonus is achieved if the documentation concept includes ensuring that the digital repository has the smallest possible environmental footprint. This can be achieved with a significantly streamlined data volume combined with demonstrated sustainability credentials of the server operator or data centre, e.g. by sourcing electricity from purely renewable energy sources. This must be verified on a case-by-case basis.

Indicator 7: CIRCULAR ECONOMY BONUS – Digitalisation from existing building

This bonus is achieved for an additional comprehensive digitisation of existing building fabric, e.g. of surrounding infrastructure or entire building sections. Here, not only the structural frame and the interior fit-out but also the technology must be taken into account. Comprehensive digitalisation is essential for circular construction and a sustainable and economical building life cycle. If only one existing building area is surveyed and subsequently handed over, partial points may be awarded where relevance is plausible.

Indicator 8: AGENDA 2030 BONUS – Sustainability review

This bonus is granted for a data-driven integration of sustainability information and the subsequent implementation of a model-based evaluation of sustainability criteria, such as the DGNB system.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

Indicator 1: Documentation

Design files (later execution stage/as built)

For verification by the DGNB certification body, confirmation of receipt of the documents from the building owner and if applicable from the operating company is sufficient. Preliminary documents may also be submitted as evidence, with confirmation that these documents will be completed within 6 months of building completion. Evidence documentation includes:

- Confirmation that design files and supplementary verifications and calculations correspond to the realised status of the building (as built), e.g. by confirmation from the specialist planners regarding their quality check
- Proof that the technical building plans of the individual specialist planning disciplines have been submitted digitally to the building owner (Annex 1)
- Proof that the building model (or the individual sectoral planning models) has been submitted digitally to the building owner in an open electronic format (e.g. ifc)
- Documented representation of project-related sustainability evaluations and other calculations, e.g. thermal simulation (thermal heat storage capacity or conductivity), GEG calculation, sound insulation evidence, room acoustic evidence, fire protection concept, static calculation, daylight simulation, etc. (Annex 1)

Buildings in use files

Evidence documentation includes:

- Evidence of proof of receipt by the service provider of the documents and the digital building model
- Checklist of building operation documentation (Annex 2) is complete and handed over to building owner and operating company
- Proof of ensuring the availability of the revision documents throughout the warranty period with indication of the data storage location
- Documented preparation of handover of the inspection documents to the building owner and operating company after the warranty period

Indicator 2: Sustainability documentation

Information on building material

- Complete building components catalogue, e.g. in the form of the level(s) material passport or as a summary of the component/product characteristics according to the ENV1.1, ENV1.2, ENV1.3 and TEC1.6 criteria
- Complete digital building model including component/product parameters according to ENV1.1, ENV1.2, ENV1.3 and TEC1.6 criteria
- If possible, additional plausible evidence that the material data including EPD data records (e.g. GWP, AP, PEI, etc.) are included in the building model or in another open and editable data format with an open interface to a building modelling software package with indication of their respective installation locations, e.g. through confirmation by the technical planners

Information on ease of recovery and recycling of the building

Collected documentation on the ease of recovery and recycling of the actually executed structure from the construction supervision (as built) is handed over to the building owner.

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Indicator 3: BIM

Planning with BIM

Confirmation by the client/building owner that the facility manager and owner have an up-to-date copy of the BIM model.

Sustainability optimisation using BIM

Simulations for optimisation using BIM, e.g. of structural or resource calculations (model-based)

Indicator 4: Maintenance, inspection, operating, and care instructions

Preparation and provision of maintenance, inspection, operation and care instructions

The documentation includes:

- Use, maintenance and care instructions that have been produced
- Maintenance agreements that have been concluded
- Maintenance and inspection schedule that has been drawn up, including the maintenance and inspection cycles, and the qualifications that must be held by the people/companies appointed to undertake the work
- Proof that LCA operation monitoring (life cycle greenhouse gas and energy balance) is possible on the basis of the sufficient documents or BIM model, e.g. through confirmation of the documentation/ model quality check and the interfaces by the implementation planners, the client side or the operating company.

Indicator 5: CIRCULAR ECONOMY BONUS – Data basis for ‘urban mines’

- Reduced or complete building resource passport, e.g. as an external file or via proof and confirmation from relevant sources that the data is part of an overarching database

Indicator 6: AGENDA 2030 BONUS – Digital footprint

- Plausible demonstration that the environmental footprint of the digital storage is greatly reduced, see also method
- Evidence that the final as-planned or as-built model is reduced to the necessary data basis or evidence of outsourcing of data already available in databases and linkable to the model (to prevent duplication of data volumes)

Indicator 7: CIRCULAR ECONOMY BONUS - Digitalisation from existing building

- Evidence of the digitisation of existing building fabric, e.g. through confirmation by the specialist planners, relevant files or digitalisation etc.

Indicator 8: AGENDA 2030 BONUS - Sustainability review

- A plausible presentation of an applied sustainability calculation is required.

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals icons, United Nations/globalgoals.org
- ECO 2-B Risk Management and Long-term Asset Value. DGNB System – Criteria catalogue Buildings in Use Version 2020. DGNB e. V. Stuttgart
- ISO 29481-1:2016: Building information models - information delivery manual, International Organization for Standardization (ISO), Geneva, 2016
- ISO 19650-1:2018: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling , International Organization for Standardization (ISO), Geneva, 2018
- Handbook for the introduction of Building Information Modelling by the European Public Sector. EU BIM.
- ISO 20887:2020: Sustainability in buildings and civil engineering works — Design for disassembly and adaptability — Principles, requirements and guidance , International Organization for Standardization (ISO), Geneva, 2020

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ANNEX 1

Indicator 1.1. Design files (later execution stage/as-built) - Checklist for building design documentation

Name of property: _____

Address: _____

	Description Optional	Digital documents ✓	Analogue documents ✓	not available ✓	not known ✓	**Storage location of the documents**
1	**Legal documentation/plans**					
	Land-use plan	O	O	O	O	
	Building approval (incl. exemptions and conditions)	O	O	O	O	
	Documents relating to the protection of historical monuments and approvals	O	O	O	O	
	Energy performance certificate	O	O	O	O	
2	**Construction documentation/plans**					
	Floor plans of all floors	O	O	O	O	
	Longitudinal and cross sections	O	O	O	O	
	Views	O	O	O	O	
	Plans essentially correspond to the current state	O	O	O	O	
	Plans correspond to the actual condition (continuous updating after completion of the construction project incl. changes on the construction site)	O	O	O	O	
3	**Technical documentation/plans**					
	Sewage, water, gas installations	O	O	O	O	
	Heat supply systems	O	O	O	O	
	Ventilation systems	O	O	O	O	
	Power installations	O	O	O	O	
	Communications, security, safety and protection systems	O	O	O	O	
	Transport	O	O	O	O	

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	Description	Digital documents	Analogue documents	not available	not known	Storage location of the documents
	Use-specific installations	O	O	O	O	
	Building automation and central operating technology	O	O	O	O	
4	**Fire protection documentation/plans**					
	Fire protection concept	O	O	O	O	
	Plans with escape routes/fire compartments/preventive fire protection	O	O	O	O	
5	**Area calculations**					
	Gross floor area	O	O	O	O	
	Net floor area	O	O	O	O	
	Usable building area (based on EPC)	O	O	O	O	
6	**Principles for energy optimisation of the building envelope**					
	Key structure and energy data of exterior components (u-values)	O	O	O	O	
	Airtightness of building envelope (blower door test)	O	O	O	O	
	Thermal bridge calculations	O	O	O	O	
7	**Constructional and technical documentation with ongoing updating during operation**					
	Room book with structural and technical inventory lists	O	O	O	O	
	Operating instructions, including operating and maintenance instructions of the equipment manufacturers	O	O	O	O	
	Documentation of maintenance and servicing work and intervals	O	O	O	O	
	Documentation of system and function descriptions	O	O	O	O	

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	Description	Digital documents	Analogue documents	not available	not known	Storage location of the documents
8	**Structural design**					
	Structural calculation for the supporting structure (with test approval, if a test is carried out)	O	O	O	O	
	Position plans for the load-bearing construction	O	O	O	O	
	Execution plans for the load-bearing construction	O	O	O	O	
	Payload plans (or further information on the payloads per building level)	O	O	O	O	
	Assembly planning of the individual systems	O	O	O	O	
	Installation part plans (and/or also technical data sheets/calculations for installation parts)	O	O	O	O	
	Material specification of tensile/ compressive strengths for all load-bearing components in the building (Structural components, e.g. via technical report, material (acceptance) test certificates, technical data sheets, performance declarations)	O	O	O	O	
	Material specification of gross density for all load-bearing components in the building (Structural components, e.g. via technical report, material (acceptance) test certificates, technical data sheets, performance declarations)	O	O	O	O	
9	**Physical documentation/plans**					
	Sound insulation certificate	O	O	O	O	
	Room acoustics certificate	O	O	O	O	
	Thermal simulation	O	O	O	O	
	Daylight simulation	O	O	O	O	

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ANNEX 2

Indicator 1.2. Buildings in Use files

Name of property: _____

Address: _____

	Description	Digital documents ✓	Analogue documents ✓	not available ✓	not known ✓	Storage location of the documents
1	**Legal as-built documentation/plans**					
	Land-use plan	O	O	O	O	
	Building approval (incl. exemptions and conditions)	O	O	O	O	
	Documents relating to the protection of historical monuments and approvals	O	O	O	O	
	Energy performance certificate	O	O	O	O	
2	**Structural as-built documentation/plans**					
	Floor plans of all floors	O	O	O	O	
	Longitudinal and cross sections	O	O	O	O	
	Views	O	O	O	O	
	Plans essentially correspond to the current state	O	O	O	O	
	Plans correspond to the actual condition (continuous updating after completion of the construction project incl. changes on the construction site)	O	O	O	O	
3	**Technical as-built documentation/plans**					
	Sewage, water, gas installations	O	O	O	O	
	Heat supply systems	O	O	O	O	
	Ventilation systems	O	O	O	O	
	Power installations	O	O	O	O	
	Communications, security, safety and protection systems	O	O	O	O	
	Transport	O	O	O	O	

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	Description	Digital documents	Analogue documents	not available	not known	Storage location of the documents
	Use-specific installations	O	O	O	O	
	Building automation and central operating technology	O	O	O	O	
4	**Fire protection documentation/plans**					
	Fire protection concept	O	O	O	O	
	Plans with escape routes/fire compartments/preventive fire protection	O	O	O	O	
5	**Area calculations**					
	Gross floor area	O	O	O	O	
	Net floor area	O	O	O	O	
	Usable building area (based on EPC)	O	O	O	O	
6	**Principles for energy optimisation of the building envelope**					
	Key structure and energy data of exterior components (u-values)	O	O	O	O	
	Airtightness of building envelope (blower door test)	O	O	O	O	
	Thermal bridge calculations	O	O	O	O	
7	**Structural design**					
	Static calculation for the supporting structure (with test approval, if a test is carried out)	O	O	O	O	
	Position plans for the load-bearing construction	O	O	O	O	
	Execution plans for the load-bearing construction	O	O	O	O	
	Payload plans (or further information on the payloads per building level)	O	O	O	O	
	Assembly planning of the individual systems	O	O	O	O	
	Installation part plans (and/or also technical data sheets/calculations for installation parts)	O	O	O	O	
	Material specification of tensile/ compressive	O	O	O	O	

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	strengths for all load-bearing components in the building (Structural components e.g. via technical report, material (acceptance) test certificates, technical data sheets, performance declarations)					
	Material specification of gross density for all load-bearing components in the building (Structural components e.g. via technical report, material (acceptance) test certificates, technical data sheets, performance declarations)	O	O	O	O	
8	**Physical documentation/plans**					
	Sound insulation certificate	O	O	O	O	
	Room acoustics certificate	O	O	O	O	
	Thermal simulation	O	O	O	O	
	Daylight simulation	O	O	O	O	

PRO1.6

Procedure for urban and design planning

Objective

Our goal is to create sustainable buildings that people will enjoy using for a long time. Sustainability and building *_Baukultur_ are mutually dependent and inseparable. Against this background, the DGNB's objective is to increase the design quality of our built environment.

*_Baukultur_ encompasses all elements of the built environment and goes far beyond the architectural design of buildings. It includes, for example, urban and town planning, transport and infrastructure planning by engineers and, in particular, integrated public art. As an extended concept of culture, the identity of the _Baukultur_ is also rooted in the history and traditions of a country or region.

Benefit

Planning competitions allow the building owner to identify the most suitable designer and design that best fits their requirements by means of a clear, structured and transparent process. The competitive aspect boosts design quality and allows the building owner to choose the most fitting option from the wide range of solutions offered. Competitions produce higher-quality design and thus safeguard architectural diversity.

Outlook

The criterion is one of the core topics addressed by the DGNB and will therefore always be an essential component of the DGNB certification system. No significant tightening of requirements within the criterion is planned in the coming years.

Contribution to overarching sustainability goals



Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Department stores** **Logistics** **Production** **Healthcare buildings** **Shopping centre** **Assembly buildings**	**2.1%**	**2**

EVALUATION

This criterion evaluates the design procedures used to achieve a high quality of architecture and design in the building and the extent to which these contribute to the building's acceptance and long-term. Design variant analysis, concept award, multiple commissioning, and planning competitions are considered, as well as the subsequent commissioning of the award-winners, including the specialist planning team and the implementation of the prize-winning design. The incorporation of recommendations by an independent design committee, such as awards in the form of an architecture prize or the 'DGNB Diamond' (currently available only in Germany and Denmark), can also be credited. A maximum of 100 regular points can be achieved in the criterion.

NO.	INDICATOR	POINTS
1	**Exploration of different design variants or planning competition**	**Max. 85**
1.1	**Prior exploration of different design variants**	**10**
	Different design variants have been explored (no planning competition).	10
	Alternatively:	
1.2	**Concept tendering**	**Max. 30**
1.2.1	Type and scope of the procedure	+Max. 10
	A concept tendering process has been carried out	5
	A concept tendering process has been carried out with special focus on the topic of 'Sustainable Building'	10
1.2.2	Quality assurance	+Max. 20
	Competent decision-making committee	+10
	Quality assurance after completion of the procedure	+10
	Alternatively:	
1.3	**Multiple commissioning**	**Max. 40**
1.3.1	Scope of the procedure	+Max. 15
	Multiple commissioning has been carried out	10
	Multiple commissioning has been carried out with a special focus on the topic of 'Sustainable Building'	15
1.3.2	Quality assurance	+Max. 10
	Competent decision-making committee or involvement of such a committee	10
1.3.3	Implementation of an award-winning design	+Max.15
	Prize winner commissioned and winning design implemented to at least	
	■ Service phase 3 'Developed design'	5
	■ Service phase 5 'Technical Design'	10
	■ Service phase 8 'Construction'	15
	Alternatively:	
1.4	**Planning competition**	**Max. 85**
1.4.1	Scope and quality of the planning competition	+Max. 20
	■ Planning competition has been held	15
	■ Planning competition has been held, with special consideration of the topic of 'Sustainable Building'	20

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1.4.2	Type of competition held	+Max. 35
	■ Cooperative process	15
	■ Open competition (single-stage or two-stage) or restricted competition with preliminary application procedure (single-stage or two-stage; with preliminary application procedure)	35
1.4.3	Implementation of an award-winning design	+Max. 20
	Prize winner commissioned and winning design implemented to at least	
	■ Service phase 3 ‘Developed design’	10
	■ Service phase 5 ‘Technical design’	15
	■ Service phase 8 ‘Construction’	20
1.4.4	Commissioning of the planning team	+Max. 10
	Prize winner's specialist design team commissioned to at least	
	■ Service phase 3 ‘Developed design’	5
	■ Service phase 5 ‘Technical design’	7.5
	■ Service phase 8 ‘Construction’	10

Please note: Indicators 1.4.2–1.4.4 can only be counted if a planning competition has been implemented according to Indicator 1.4.

re 1	**INNOVATION AREA** Explanation: Other procedures can also be recognised in consultation with the DGNB. If the quality and scope correspond to the procedures presented above, the respective points can be credited according to the evaluation logic applied above.	**as in 1**

2	**Recommendations by an independent design committee**	**Max. 15**
2.1	The project has been presented to a design committee of the municipalities and chambers of architects.	+5
2.2	Design recommendations by the design committee have been implemented.	+10

	Alternative to Indicator 1 and 2:	
3	**Award in the form of an architecture prize**	**Max. 100**
3.1	**Recognition or award**	**Max. 100**
3.1.1	Recognition for good design and architectural quality	40
3.1.2	Award for the completed project (Architecture Award, DGNB Diamond)	100

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SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPIS	UNIT
KPI 1	Planning competition, recognition for good design and architectural quality or award for the completed project	[yes/no]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

An architectural competition makes a valuable contribution to ensuring the quality of the project, particularly when attention is paid to an integrative and interdisciplinary approach by specifying appropriate participation requirements for integrated planning teams and the composition of the judging panel.

II. Additional explanation

Competitions promote creativity and innovation and enable the development of alternative solutions; at the same time, they also function as efficient procedures for optimising quality and economic efficiency. In order to realise the quality of the winning design and remain faithful to it, the competition team should be part of the integral planning team and should be involved throughout the design and construction process through as many service phases as possible.

III. Method

The evaluation is based on the following indicators:

Indicator 1: Exploration of different design variants or planning competition

Indicator 1.1: Prior exploration of different design variants

Buildings that have not been subject to a competition procedure, that have not been awarded an architectural prize, or have not been recognised by an independent committee (e.g. own designs produced by the planning departments of building authorities) can score points under this indicator, provided at least two design variants were planned and documented in the preliminary planning phase. The scope of the design variants should comply with the specifications for this indicator on the required documentation.

Indicator 1.2: Concept tendering

The concept procedure offers municipalities, in particular, the opportunity to permanently safeguard the architectural quality of the built environment. In order to achieve this, the quality of urban and architectural planning should be given adequate consideration within the framework of the evaluation criteria.

Indicator 1.2.1: Type and scope of the procedure

If it can be proven that a concept tendering process has been carried out, this will be viewed positively. In order to create transparency and ensure quality, the following principles must be regulated and observed during implementation:

- Equal treatment of all participants
- Clear and unambiguous description of objectives and requirements for the design concept
- Embedding architectural quality in the evaluation criteria and requirement for a design concept
- Ensuring appropriate remuneration for the architects involved
- Preliminary assessment as well as competent and knowledgeable decision-making committee
- Transparent and well-reasoned decision
- Quality assurance after completion of the procedure

If questions regarding sustainability aspects have already been taken into account, e.g. based on the criteria of the DGNB certification system, the higher score can be applied.

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Indicator 1.2.2: Quality assurance

A competent and knowledgeable decision-making committee is crucial in ensuring the quality of the process. To this end, the committee should include persons with specific expertise with regard to the evaluation of the respective criteria. Likewise, the committee should include independent experts who can provide proof of their technical qualifications. If the decision is presented to the public in a transparent manner and contractual regulations ensure the implementation of the concept quality, this is evaluated positively.

Indicator 1.3: Multiple commissioning

In the case of tasks of manageable complexity, the development of solution proposals can take place within the framework of multiple commissioning. Usually, three to seven participants are assigned to work on the project.

Indicator 1.3.1: Scope of the procedure

The following points have a positive impact on the evaluation when met:

- Implementation of multiple commissioning with appropriate remuneration and contractual commitment
- Consideration of the requirements of sustainable building in accordance with the DGNB certification system in the task definition

Indicator 1.3.2: Quality assurance

For quality assurance purposes, the architectural associations recommend the appointment of an expert panel to optimise the task and make decisions. If this is done, the corresponding points can be awarded.

Indicator 1.3.3: Implementation of an award-winning design

If the building essentially corresponds to the award-winning design idea in terms of scope and quality and the associated architectural firm has been commissioned, this will be assessed positively.
Exception: If it is documented that the respective firm has waived the contract (and consequently another firm takes over the implementation), the full number of points can still be awarded here.

Indicator 1.4: Planning competition

The objective of the evaluation is to determine the extent to which, and to what level of quality, planning competitions have been carried out.

Indicator 1.4.1: Scope and quality of the planning competition

Has a planning competition or a comparable competition, including the evaluation and selection of the entries by a judging panel, been conducted as per UIA[1] or similar guidelines?

(1) Comparable competitions are, for example, competitions in the European Union. Comparative planning or variant studies within a design are not a substitute for the planning competition.

(2) In the case of industrial and commercial buildings, planning competitions covering only partial areas of planning, such as façade design, can also be credited.

If a planning competition is arranged and held with a particular focus on ‘sustainable construction’ and with qualified panel members and experts (multidisciplinary composition) with experience in the field of sustainable construction, this will be evaluated positively.

The task description should set out the essential requirements with regard to sustainable building based on selected criteria from the DGNB certification system and entries should include documentation demonstrating compliance with these requirements. These documents should be verified in the competition entry.

[1] https://www.uia-architectes.org/en/competitions/

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As an example, the '*Systematik für Nachhaltigkeitsanforderungen in Planungswettbewerben – SNAP Empfehlungen*' (available in German only) or a comparable system can be used.

Indicator 1.4.2: Type of competition held
Which competition procedure was chosen? Preference is given to methods with as few restrictions as possible.

Indicator 1.4.3: Implementation of an award-winning design
Does the building essentially correspond in terms of scope and quality to the award-winning competition submission and has the associated architectural firm been commissioned?

Indicator 1.4.4: Commissioning of the planning team
A competition is typically developed within interdisciplinary planning teams, which are responsible for the overall quality of the project. In order to encourage participation in the competition, the commissioning of this specialist planning team is supported and positively evaluated.

Indicator 2: Recommendations by an independent design committee
The presentation of the project to a municipal or architectural association design advisory board (or similar) is positively evaluated in this indicator. The project team and the building owner receive recommendations for the design and architectural enhancement of the building as part of the presentation of the project to an architectural committee. Implementation of these recommendations can be positively credited. The recommendations and their implementation must be documented and submitted.

Alternatively:
Indicator 3: Award in the form of an architecture prize
The recognition or award of the completed project through an architecture prize or the DGNB Diamond is positively assessed.

Please note: The award of the DGNB Diamond or the corresponding recognition for good design and building quality takes place at the earliest when the DGNB certificate is awarded (Gold or Platinum). The recommendation of the DGNB Commission for Design Quality regarding an award is sufficient for recognition within the framework of DGNB certification. Whether or not it is possible to start the evaluation process for 'DGNB Diamond' Award in the respective country must be confirmed by DGNB.

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APPENDIX B - DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be comprehensively and plausibly documented on the basis of the evidence documents submitted.

Indicator 1: Exploration of different design variants or planning competition

Indicator 1.1: Prior exploration of different design variants

- Commissioning of a variant study for the entire building by the commissioned planning office
- Presentation of the developed variants
- At least two studies of variants from three of the following areas should be submitted in each case:
  - Development of the building (entrance situation)
  - Views (façade-relevant topics)
  - Cubature/ building volume
  - Materiality
  - Urban planning variants
  - Floor plan variants

Indicator 1.2: Concept tendering

Indicator 1.2.1: Type and scope of the procedure

- Excerpt from the documents for the concept tendering or the confirmation of the commissioning party, etc.
- Additional documents such as minutes of meetings may be submitted to provide clarification.
- Evidence of consideration of the topic of "sustainability”

Indicator 1.2.2: Quality assurance

- Evidence of the composition of the decision-making committee, including the qualifications of the participants
- Evidence of transparent decision-making (committee publications, minutes, etc.)
- Evidence of further implementation (confirmation, statements, contracts, etc.)

Indicator 1.3: Multiple commissioning

Indicator 1.3.1: Scope of the procedure

- Proof of multiple commissioning (e.g. excerpt from contracts, confirmation from the commissioning party)
- Additional documents such as minutes of meetings may be submitted to provide clarification.
- Evidence of consideration of the topic of "sustainability”

Indicator 1.3.2. Quality assurance

- Evidence of the composition of the decision-making committee, including the qualifications of the participants
- Evidence of transparent decision-making (publications of the decision-making committee, minutes, etc.) and its involvement in the process
- Proof of further implementation (contracts etc.)

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Indicator 1.3.3: Implementation of an award-winning design

- Documentation of the implementation of the awarded design and the demonstrable commissioning of the corresponding firm, designating the corresponding service phases by means of excerpts from the signed contracts
- If applicable, documentation/comparison of competition design and photos of the realised building
- Publications of the design in trade journals or the like.

Indicator 1.4: Planning competition

Indicator 1.4.1: Scope and quality of the planning competition

Implementation of a planning competition:

- Excerpt from the competition announcement issued by the planning competition with details of the competition guidelines taken into account, the competition criteria, the spatial programme, and a list of the panel members
- Additional documents such as minutes of meetings may be submitted to provide clarification.

Indicator 1.4.2: Type of competition held

- Information regarding the type of competition procedure used by means of excerpts from the competition announcement, the pre-check report, or the judging panel report

Indicator 1.4.3: Implementation of an award-winning design

- Documentation of the implementation of the award winner's design and the demonstrable commissioning of an award-winner designating the corresponding service phases by means of excerpts from the signed contracts
- If applicable, documentation/comparison of the prize-winner’s competition design and photos of the realised building.
- Publications of the design in trade journals or the like.

Indicator 1.4.4: Commissioning of the planning team

- Documentation of the commissioning of the award-winner’s specialist planning team by means of the submission of excerpts from the signed contracts

Indicator 2: Recommendations by an independent design committee

- Minutes of the meeting of the design committee with information regarding the composition of the independent committee.
- Comparison of the planning status before and after the meeting, with notes on the implemented recommendations.
- Opinions: If individual recommendations have not been implemented, a statement on this must be submitted by the building owner or the architect.

Indicator 3: Awarded in the form of an architecture prize

- Documentation of the recognition with details regarding the panel and justification
- Documentation of the awarding of the architecture prize with details regarding the panel and justification
- Supplementary: Publication on the award
- List of persons on the expert panel with details regarding their profession or qualification
- DGNB Diamond or DGNB Recognition: Submission of the Design Quality Commission's recommendation

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APPENDIX C - LITERATURE

I. Version

Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals Icons, United Nations/globalgoals.org
- *Systematik für Nachhaltigkeitsanforderungen in Planungswettbewerben*: https://www.nachhaltigesbauen.-de/fileadmin/pdf/veroeffentlichungen/SNAP_1_Empfehlungen-korr.pdf

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PRO2.1

Construction site/ construction process

Objective

Our objective is to minimise negative impacts on the local environment during the construction phase. To achieve this, it is necessary to raise awareness and train those carrying out construction work on construction sites with regard to relevant environmental issues.

Benefit

Trained persons usually incorporate findings into their daily work and also contribute to more environmentally friendly follow-up construction sites.

Contribution to overarching sustainability goals



Outlook

No tightening of requirements is foreseen. Ideally, this criterion can be dropped after a few years once the topics addressed in the criterion have become standard practice.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Department stores** **Logistics** **Production** **Healthcare buildings** **Shopping centre** **Assembly buildings**	**2.1%**	**2**

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EVALUATION

In order to minimise the impact on the local environment, four indicators are used to assess the extent to which measures to reduce noise (Indicator 1), dust (Indicator 2), negative impacts on soil and groundwater (Indicator 3), and waste (Indicator 4) have been implemented on the construction site and the extent to which those carrying out the construction work on site have been trained in these areas. Measures to reduce noise and dust pollution that extend beyond the proposed topics can alternatively be recognised via the corresponding innovation areas. The Circular Economy Bonus – Waste Avoidance on the Construction Site rewards innovative waste-avoiding concepts, construction methods, and technologies with 10 additional points. 100 points can be achieved in the criterion, with a maximum of 105 points recognised including bonuses.

NO.	INDICATOR	POINTS
1	**Low-noise construction site**	**Max. 12.5**
1.1	**Low-noise construction site concept** A concept that is specific to the relevant trades has been formulated	**+5**
1.2	**Training for the contractors** Training provided to the relevant trades	**+2.5**
1.3	**Reviewing the implemented work** Verification or proof of implementation	**+5**
Re 1	**INNOVATION AREA** Alternative innovative concepts, procedures, and technologies that significantly reduce noise pollution for construction site workers and the surrounding area can also be credited.	**as in 1**
2	**Low-dust construction site**	**Max. 12.5**
2.1	**Low-dust construction site concept** A concept that is specific to the relevant trades has been formulated	**+5**
2.2	**Training for the contractors** Training provided to the relevant trades	**+2.5**
2.3	**Reviewing the implemented work** Verification or proof of implementation	**+5**
Re 2	**INNOVATION AREA** Alternative innovative concepts, processes, and technologies that significantly reduce dust exposure for construction site workers and the environment can also be credited.	**as in 2**

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3	**Soil and groundwater protection on the construction site**	**Max. 12.5**
3.1	**Soil and groundwater protection concept** A soil protection concept has been formulated for the relevant construction site installations, such as containers and construction machinery; the concept is integrated accordingly into tender specifications	**+5**
3.2	**Training for the contractors** Training provided to the relevant trades	**+2.5**
3.3	**Reviewing the implemented work** Verification or proof of implementation	**+5**
Re 3	**INNOVATION AREA** Alternative innovative concepts, processes, and technologies that significantly contribute to soil and groundwater protection can also be credited.	**as in 3**
4	**Low-waste construction site**	**Max. 12.5**
4.1	**Concept for a low-waste construction site** A concept has been formulated to prevent waste on the construction site	**+5**
4.2	**Training for the contractors** Training for those involved in the construction process focussing on the issues of waste prevention and sorting or commissioning of waste logistics specialists	**+2.5**
4.3	**Reviewing the implemented work** Verification or proof of implementation	**+5**
4.4	**CIRCULAR ECONOMY BONUS – Waste prevention on the construction site** Innovative/new concepts, construction methods or technologies that significantly reduce the amount of waste generated are used on the construction site.	**5**
5	**Communication**	**Max. 15**
5.1	**External communication**	**10**
5.1.1	Signage and information Residents will be informed about the construction project and the construction site by means of signage. This includes construction information, routes, and, if applicable, the designation of responsible persons and contact persons.	+5
5.1.2	Communication with residents Regular provision of information to those concerned, detailing what measures apart from signage have been taken to inform and involve residents and users. Contact person for complaints: A contact person is available for the residents. In the event of changes, information will be provided in a timely manner.	+5
5.2	**Internal communication** Exchange of information All relevant information on the project is made available to those involved in the construction.	**5** 5

The exchange of information between the construction site and the planners is ensured by a defined flow of information. Relevant information on construction progress, such as design changes, tasks, product releases, and acceptance dates, is continuously communicated to all those involved in the construction process. Complete and up-to-date lists of distributors, designers, and construction companies (including all subcontractors) are available.

All relevant information on the project is made available to those involved in the construction via a digital information and communication platform. In addition to using the digital information platform to exchange information between the construction site and the designers, relevant information on construction progress, such as design changes, tasks, product releases, and acceptance dates is continuously communicated to all those involved in the construction process via the information platform. Complete and up-to-date lists of distributors, designers, and construction companies (including all subcontractors) are available on the platform.

6	**Resource protection**	**Max.30**
6.1	**Water consumption**	15
6.1.1	Water consumption data transparency Measurement and documentation of water consumption on the construction site	+2.5
6.1.2	Water conservation concept Creation of a concept to reduce drinking water consumption	+5
6.1.3	Training for the contractors Targeted training of those involved in the construction process on water consumption issues	+2.5
6.1.4	Reviewing the implemented work Verification or proof of implementation	+5
Re 6.1	**INNOVATION AREA** Alternative innovative concepts, processes, and technologies that significantly reduce water consumption at the construction site can also be credited.	**as in 6.1**
6.2	**Energy consumption**	**15**
6.2.1	Data transparency regarding energy consumption on the construction site Energy consumption and the associated CO_2 emissions are recorded for evaluation and transmitted to the DGNB. In addition to consumption data, the disclosure also includes information on the energy sources. The collection and transmission of the relevant data forms part of the commission (performance specification).	+2.5
6.2.2	Concept for the reduction of energy consumption Creation of a concept for the reduction of electricity consumption	+5
6.2.3	Training for the contractors Targeted training of those involved in the construction process on energy consumption issues	+2.5
6.2.4	Reviewing the implemented work Verification or proof of implementation	+5

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Re 6.2	**INNOVATION AREA** Alternative innovative concepts, processes, and technologies that significantly reduce energy consumption at the construction site can also be credited.	**as in 6.2**

7	**Ventilation and mould prevention**	**Max. 5**
7.1	**Ventilation and mould prevention** Creation and implementation of a ventilation programme adapted to the building situation to ensure the sufficient drying of the building components. If mould is not a problem on the site due to its location, points can be awarded for this.	**5**

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SUSTAINABILITY REPORTING

Sustainability reporting

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPIS	UNIT
KPI 1	Water consumption on the construction site, total	[m³]
KPI 2	Electricity consumption of the construction site, total	[kWh]
KPI 3	Consumption of other energy sources (diesel, natural gas etc.) on the construction site	[kWh], [l] or [kg]
KPI 4	Greenhouse gas emissions of all energy sources used on the construction site, total	[kg CO2e]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Construction sites and construction processes pollute the local environment with noise, dust, and dirt. The general minimisation of the impact on the local environment through dust and noise promotes the health and well-being as well as general acceptance among all those who are directly affected by the construction site and protection of the construction site workers.

Furthermore, avoiding waste and closing material cycles makes a fundamental contribution to sustainability and climate protection. It is therefore important to promote the high-quality recycling of construction waste and, in particular, the minimisation of mixed waste. Additionally, a ventilation concept for the construction site ensures moisture removal and mould prevention.

II. Additional explanation

Indicator 1: Low-noise construction site

Noise has a significant impact on the quality of life of humans and animals. Permanent exposure to noise can lead to overstimulation of the nervous system and consequently to health problems. In densely built-up areas with high infrastructure standards, construction noise is the most significant noise source after traffic noise. Every construction site should be designed, set up, and operated in such a way that construction noise does not exceed the general noise level of the surroundings or is reduced by suitable measures.

Indicator 2: Low dust construction site

‘Dust’ refers to solid particles suspended in gases or air or their residue. Dust is usually generated on construction sites during the working and processing of building materials through a variety of different activities. Depending on the material composition of the dust particles and the dust particle size, inhalation or absorption through the mucous membranes can lead to health impairments or even serious (consequential) damage. Measures to prevent dust therefore protect all people who work on a construction site or live and work adjacent to one. They also aim to protect the environment from substance-related damage.

Indicator 3: Soil and groundwater protection on the construction site

Soil and groundwater must be protected against the infiltration of harmful substances and mechanical damage. Under normal working conditions, work processes can produce gaseous, liquid, and solid substances that may infiltrate the soil and groundwater. The aim must therefore be to protect the existing soil from chemical and mechanical impacts caused by the construction project and to restore it to its original condition as far as possible after completion. Natural soil layers are to be protected in particular.

Indicator 4: Low-waste construction site

When buildings are constructed, renovated, converted, or demolished, building rubble, excavated material, residual material, packaging, and wood waste will accumulate. The European Commission specifies construction and demolition waste as one of the priorities in the waste stream[1].

[1] European Commission – Construction and demolition waste

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The EU Waste Framework Directive[2] aims to promote the reuse, recycling, and material recovery of non-hazardous construction and demolition waste, while also encouraging selective demolition practices and reducing waste generation in construction and demolition activities.

In Germany, local waste regulations specify how construction waste is to be handled, i.e. it should be prevented or recycled. Unavoidable waste and waste which cannot be recycled must be dealt with in an environmentally friendly manner. The objective is to separate the waste materials on the construction site – a necessary step for recycling that effectively recovers the materials' value. Separation eliminates mixed waste, making it the most commercially viable and environmentally responsible – that is to say, the most sustainable – solution for unavoidable waste materials. If local regulations exist for handling construction waste, they should be adhered to.

Indicator 5: Communication

To ensure the construction measures are accepted by the local neighbourhood and to avoid conflicts that could even lead to construction activities being halted, it is crucial that residents and local businesses are informed about the construction project and its progress. Communication and the flow of information within the construction site must also be ensured to ensure that the construction process runs smoothly. Projects without residents or local businesses in direct proximity must inform the public via local media such as official gazettes for review.

Indicator 6: Resource protection

The aim is to be highly economical with the resources used and to establish transparency regarding the materials used.

Indicator 7: Ventilation and mould prevention

Ventilation is required to prevent mould, which is harmful to health and causes a considerable reduction in the quality of the construction project. It is therefore important to ensure that mould does not form during the construction project.

III. Method

Indicator 1: Low-noise construction site

A construction site-related noise prevention concept shall be drawn up and implemented. The noise prevention concept should address the use of low-noise machines approved by appropriate eco-labels (e.g. in accordance with the Blue Angel requirements RAL-UZ 53). A schedule for works involving excessive noise should also be drawn up and taken into consideration during protected periods. Training on the noise protection concept on the construction site is to be provided, and its implementation must be checked. Noise emissions can be checked using mobile non-calibrated measuring devices.

Indicator 2: Low-dust construction site

The machines and equipment used must be equipped with an effective suction system. Any dust produced must be collected as comprehensively as possible at the point of origin and disposed of safely. The scattering of dust onto unpolluted work areas should be prevented as much as technically possible. Deposits of dust must be avoided. Damp or wet processes or suction processes may be carried out to remedy any issues. Training must be provided on the construction site covering the dust prevention concept and its implementation must be checked.

[2] Waste Framework Directive

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Indicator 3: Soil and groundwater protection on the construction site

Natural soil layers are particularly worthy of protection. Valuable soil or biotopes on the construction site may be protected, for example, using fenced-off protection areas that people cannot access. Valuable topsoil layers can be shifted and the piled-up soil (excavated soil) can be used for planting during the construction phase. A review is performed to determine whether measures need to be implemented to maintain and protect the water quality of the surrounding bodies of water and groundwater. Training on the concept for the protection of soil and groundwater on the construction site is to be provided and its implementation must be checked.

In order to protect soil and groundwater from the infiltration of harmful substances, substances that pollute soil, water and the environment must be avoided. In this case, the designation ‘environmental hazard’ described in chemical regulations can be referred to as an exclusion criterion for tender documents.

In accordance with chemical regulations, materials that are hazardous to the environment must be identified by the GHS symbol (GHS09 – Environmental hazard) shown below. This must appear on the container and the safety data sheet as a minimum.



Environmentally hazardous building materials should be avoided. This applies in particular to areas of the construction site at the edges of water bodies and in water protection zones.

For hazardous but unavoidable construction materials, such as uncured epoxy resins, measures must be taken at the construction site to ensure that these substances do not pollute the environment.

Indicator 4: Low-waste construction site

In addition to complying with the statutory minimum requirements of the local waste regulations, if they exist, a concept must be developed to minimise construction site waste. Training must be provided on the construction site and its implementation checked (waste prevention and the separation of waste by type).

Indicator 4.4: CIRCULAR ECONOMY BONUS – Waste prevention on the construction site

Explanation of innovative/new concepts, construction methods or technologies that significantly reduce the amount of waste generated are used on the construction site.

Indicator 5: Communication

Indicator 5.1: External communication

A prerequisite for the fulfilment of this indicator is a coherent communication concept. This includes providing residents with relevant information about the construction site and the construction process, and any disruptions. The information should not be static; instead measures should be taken that enable the regular involvement of residents (e.g. information events, flyers, website, notice board or display). Ideally, a contact person should be available to residents.

Indicator 5.2: Internal communication

It must also be demonstrated that a communication strategy exists for internal communication on the construction site, to ensure that all employees receive important information and can access it at any time.

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Indicator 6: Resource protection

The consumption of water and energy is monitored throughout the construction period. In addition, a concept must be developed that explains the goals and the improvement process for the conservation of energy and water. Training on the concept is to be provided on the construction site.

Indicator 6.1: Water consumption data transparency

The submission of the actual water consumption data to the DGNB is evaluated. All consumption that takes place on the construction site is to be communicated. A declaration of commitment to “submit final water consumption data” by the operator of the GFA must be enclosed with the project documents as part of the submission for certification.

Indicator 6.2: Data transparency regarding energy consumption on the construction site

The submission of the actual final energy consumption to the DGNB and the associated CO_2 emissions are evaluated under this indicator. As part of the submission for certification, the project documents must be accompanied by a declaration of commitment from the operator of the GFA to “submit final energy consumption data”. The overall energy consumption indicators shall cover the following areas:

- Electricity for the equipment on the construction site
- Temporary heating
- Construction site ventilation (if present)
- Other relevant energy loads

Indicator 7: Ventilation and mould prevention

A ventilation programme tailored to the building situation has been drawn up and implemented in order to ensure that the building components are sufficiently dry, and to prevent mould formation. Recommendations for preventive measures for mould formation are:

- Check storage of moisture-sensitive materials
- Check materials for moisture damage and spore formation before installation
- Be wary of accumulations of condensation water
- Avoid water damage
- Ventilation programme

If mould is not a risk on the site due to its location, points can be awarded here with appropriate justification.

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APPENDIX B - DOCUMENTATION

I. Required documentation

The documentation to be submitted is listed below and represents a selection of the types of evidence that can be provided. The submission of alternative documentation is possible provided the chosen assessment of the individual indicators is documented comprehensively and plausibly.

Construction site setup plans:
The plans shall demonstrate the contents that provide information on waste disposal concepts, noise protection measures, measures for the protection of soil and groundwater, and communication measures at the construction site. As a general rule, tender, offer, and documentation documents are required, which concern the following measures:

- Noise protection measures
- Measures to protect against dust
- Measures to protect soil and groundwater
- Waste-reducing measures on the construction site
- Measures to improve communication
- Resource protection
- Mould prevention

Indicator 1: Low-noise construction site

- Tender and bidding documents
- Formulated noise prevention concept
- Measurement records of the sound power level during the construction phase
- Photographic documentation
- Inspection records
- List of construction machines used in accordance with appropriate eco-labels (e.g. in accordance with the Blue Angel requirements RAL-UZ 53) or other comparable labels. Additionally, documentation of the noise level in relation to the requirements.
- Proof of training/instruction of the relevant construction site personnel

Indicator 2: Low-dust construction site

- Tender and bidding documents
- Inspection records
- List of low-dust construction machinery and equipment used
- Proof of training/instruction of the relevant construction site personnel

Indicator 3: Soil and groundwater protection on the construction site

- Tender and bidding documents
- Soil protection concept for the protection of natural soil layers
- Concept for the protection and conservation of groundwater and surrounding bodies of water
- Construction site setup plans, especially for paths, access roads, etc.
- Inspection records
- Requirements for handling construction chemicals that are hazardous to soil and water
- Photographic documentation of the storage of environmentally hazardous substances
- Proof of training/instruction of the relevant construction site personnel

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Indicator 4: Low-waste construction site

- Tender and bidding documents
- Construction site setup plans:
- Formulated waste disposal concept
- Inspection records
- Photographic documentation
- Proof of training/instruction of the relevant construction site personnel

or

- Contract with a waste logistics company
- Declaration/explanation issued by the waste logistics company

Indicator 5: Communication

Indicator 5.1: External communication

- Documentation of the measures implemented to inform the public (e.g. invitation and documentation of the information event held, photographic documentation of the construction sign, offer to visit the construction site, etc.)
- Screenshots of digital measures or links to the content
- In each case, a copy of the draft letter, the emails sent, or the alternative form of communication used to send the information
- Minutes of the individual meetings
- Inspection records
- Proof of a contact person, depending on the implementation:
  - Letterbox: Image; proof of emptying and requests
  - Mailbox: Proof of retrieval and response to messages
  - Hotline: Evidence, documentation of the requests

Indicator 5.2: Internal communication

- Confirmation of auditor with name and information regarding the communication platform

Indicator 6: Protection of resources

Indicator 6.1: Water consumption

- Communication of the actual water consumption that occurs on the construction site
- Formulated concept
- Proof of training/instruction of the relevant construction site personnel

The submission must be accompanied by data on the operator's water consumption and the GFA. In addition, the actual consumption values over the entire construction process must be proactively submitted to the DGNB in the required format for recognition of a positive assessment of the indicator.

Indicator 6.2: Energy consumption

- Transmission of the actual electricity consumption that occurs on the construction site
- Formulated concept
- Proof of training/instruction of the relevant construction site personnel

Indicator 7: Ventilation and mould prevention

Documentation must be submitted to demonstrate that a ventilation programme tailored to the context of the building has been implemented to ensure that the relevant building components are sufficiently dry and mould is avoided. If mould is not a problem in the site due to its location, an explanatory document for the same.

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APPENDIX C - LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals Icons, United Nations/globalgoals.org
- Construction and demolition waste: https://environment.ec.europa.eu/topics/waste-and-recycling/construction-and-demolition-waste_en#law (accessed on 17.04.2025)
- Directive 2008/98/EC of the European Parliament and of the council of 19 November 2008 on waste and repealing certain Directives: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0098-20180705
- EU Taxonomy: Construction and Real estate activities-Substantial contribution to circular economy, European Commission, Brussels, June 2021: https://ec.europa.eu/sustainable-finance-taxonomy/activities-/activity/350/view

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PRO2.3

Commissioning & monitoring

Objective

Our objective is to bring the completed building into operation promptly, ensuring the planned features are delivered. In addition, the building operation should be optimised from the outset and the building should perform as designed, with minimal deviations from the design intent.

Benefit

Systematic commissioning ensures that the intended operational performance of the building operation is achieved. It leads to risk minimisation and is a relevant component of the efficient use of energy sources. Technical monitoring ensures that the systems are configured correctly before acceptance and in the long term; this is verified via data collection.

Contribution to overarching sustainability goals



Outlook

Building monitoring is becoming increasingly important, as it can be used to provide factual mathematical evidence of climate-neutral operation. In addition, there is often great potential for saving energy through targeted monitoring and optimising the building services accordingly.

Share of total score

	SHARE	IMPORTANCE FACTOR
Office Education Residential Hotel Consumer market Department stores Logistics Production Healthcare buildings Shopping centre Assembly buildings	2.1%	2

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EVALUATION

Indicators 1 to 5 assess the implementation of technical monitoring (plant monitoring) during the various service phases of design and execution. Indicator 6 is used to reward the commissioning management. At least the following technical components are considered: heating system, ventilation, air conditioning, refrigeration, building automation, lighting, hot water supply,. A maximum of 100 regular points can be awarded. Note: Indicator 5 ‘Commissioning of fully comprehensive technical monitoring’ represents an alternative to Indicators 1–4.

NO.	INDICATOR	POINTS
1	**Technical monitoring during the planning phase**	**Max. 25**
1.1	Development of a monitoring concept, including energy monitoring.	25
2	**Technical monitoring during the construction phase**	**Max. 5**
2.1	Updating of the monitoring concept	5
3	**Trial operation**	**Max. 20**
3.1	Trial operation is carried out before acceptance and handover.	20
4	**Technical monitoring during the first phase of use**	**Max. 20**
4.1	Commissioning of control system monitoring for operational optimisation	20
	Alternative to Indicators 1–4:	
5	**Comprehensive technical monitoring or commissioning management**	**Max. 70**
5.1	Installation of a comprehensive external technical monitoring programme or a full commissioning management system (see Appendix A)	70
6	**Building performance**	**Max. 30**
6.1	A significant improvement in the energy efficiency of the building services can be evidenced by confirmation from the building owner.	15
6.2	A significant improvement in the energy efficiency of the technical building equipment can be verified via energy calculations [kWh] or [kg/CO_2*a].	30
re 1–6	**INNOVATION AREA** Explanation: Here, supplementary or alternative procedures may be permitted which likewise result in the preliminary tests, functional tests, briefings and reports.	**as in 1–6**

SUSTAINABILITY REPORTING

Not available.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
-		

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Technical monitoring is intended to provide transparency and is essentially aimed at operational efficiency. This ensures that the building's operation is managed efficiently and sustainably. In long-term monitoring, the influence of user behaviour can also be taken into account. Since this concept is not always included as a standard service in many projects, the exact service components must also be contractually agreed.

II. Additional explanation

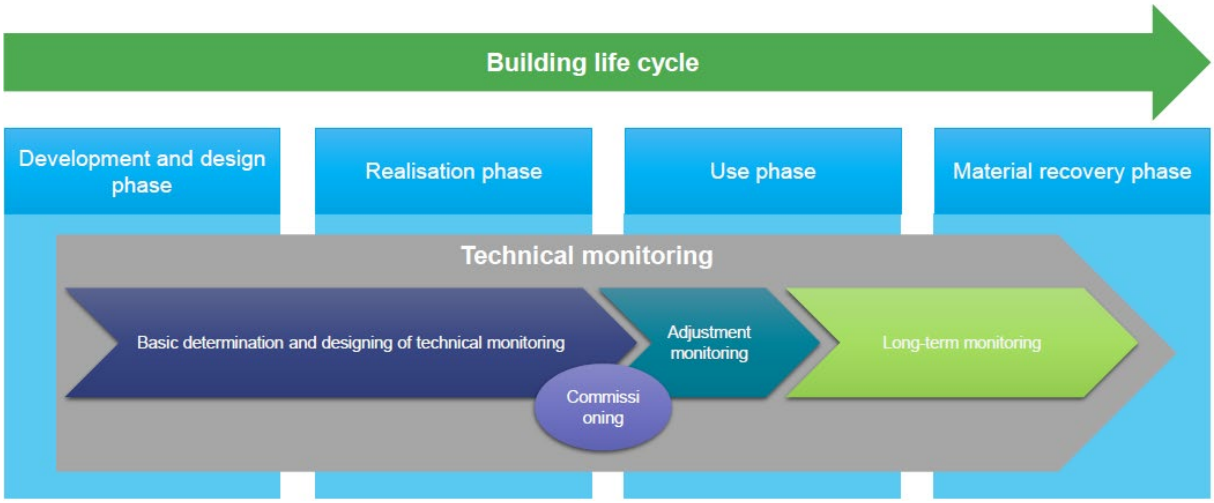


Figure1: Technical monitoring during the life cycle (VDI 6041)

III. Method

Indicator 1: Technical monitoring during the planning phase

Technical monitoring (TMon) is defined as a tool for recording, storing, visualising, and evaluating status and process variables of buildings and building services systems. TMon is divided into system monitoring, energy monitoring, and building and comfort monitoring. For certification, energy monitoring must be required as a minimum.

Test values and target values have been derived for the project and the corresponding systems and these have been agreed with the specialist planners. This is documented in a monitoring concept, including a functional description. An monitoring concept is used. The monitoring concept includes information on:

- Measurement and metering concepts for the individual trades (energy monitoring)
- Specifications for data collection
- Roles and responsibilities
- Functional description.

A schedule including services that fall under TMon is also drawn up. The schedule must include the following:

- the number, timing, and duration of trial operations
- any necessary input from the other project participants.

The documents must be made available to the specialist planners.

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The technical monitoring specifications must be included in the work and services specifications to ensure that the achievement of the target values and the verification in accordance with the monitoring concept are part of the contractual scope of work and services when the contract is awarded.

Indicator 2: Technical monitoring during the construction phase

During the construction phase, changes to the target values, the measurement and evaluation concepts, and other updates are tracked in the monitoring concept and functional tests are performed. Necessary specifications must also be defined with regard to data provision and data transfer from the building automation system or other measurement systems.

Indicator 3: Trial operation

During trial operation, the systems that have already been commissioned are tested for a fixed period of time focusing on the system performance (according to the agreed functional description) and the properties defined under Indicators 1 and 2. The trial operation must be carried out for building monitoring before acceptance and handover in accordance with the relevant engineering standards. The target values specified in the monitoring concept must be achieved and verified accordingly. In the event of non-compliance with the functions described in the monitoring concept and non-achievement of the target values, the trial operation must be repeated.

Indicator 4: Technical monitoring in the first phase of use

In order to ensure long-term building performance, an adjustment monitoring process is commissioned for the project. Opportunities for optimisation are identified through continuous monitoring of the technical systems in the building operation.

The adjustment monitoring must be commissioned for at least two years after completion. Alternatively, a technical monitoring strategy can be defined. The requirements from the Buildings in Use (BIU20 or BIU25) certification system apply here.

Indicator 5.1 Commissioning of comprehensive technical monitoring

Comprehensive technical monitoring is commissioned. In this case, not only the basic services, but all additional services described above for the associated service phases are commissioned.

Alternative: Commissioning management

Commissioning management is in place for the project. This ensures the commissioning and acceptance of the building services across all trades. The aim is to ensure that all building services systems function individually and in combination, according to the design intent, and meet the requirements for building services operation. All essential technical components have demonstrably been subjected to a functional test.

Compared to the acceptance and commissioning procedures traditionally used in Germany up until now, commissioning management (CxM) requires significantly more extensive services, which commence during the design phase and extend beyond that into the operational phase. For the implementation of the commissioning management, a body – independent where possible – should be appointed, which may consist of one or more persons. This body coordinates the commissioning of all systems and provides corresponding data to the responsible technical monitoring office.

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The commissioning manager must have the following powers and authority:

- Authority to issue instructions to:
  - All contractual partners involved in the construction regarding commissioning coordination
  - All contractual partners regarding the adjustment of operating parameters
- Authority over
  - Defining the client's requirements for the installation
  - Communicating applicable regulations and requirements
- Delegated authority for
  - Notifying defects
  - Receiving defect rectification notifications
  - Conducting site inspections (if required)
  - Declaring acceptance or rejection (if required)

For a manageable number of trades and systems that function almost independently of one another, individual commissioning is considered sufficient. With the increasing number and complexity of technical trades and systems, as well as the integral interaction between the various systems, consideration in isolation is not sufficient.

The CxM consists of four different phases:

- Determination of planning context
- CxM planning
- CxM implementation
- CxM completion

These are tendered and implemented as per VDI guideline 6039.

Indicator 6: Building performance

Indicator 6.1 A significant improvement in the energy efficiency

A management system provides the necessary basis for maintaining the building's performance. As part of this process, a continuous improvement process is integrated into ongoing building operation and thus key performance areas including energy, CO_2 emissions, water, waste quantities, operating costs, and indoor comfort are regularly reviewed. Together with the future users and the operating team, targets are set for each key area, and regular data collection and analysis can be used to determine whether additional improvement measures need to be implemented.

In order to receive points under this indicator, either a memorandum of understanding committing to future implementation of certification for each building in operation or evidence of the implementation of an adequate management system (e.g. ISO 9001, 14001, 50001) must be submitted.

Indicator 6.2 A significant improvement in the energy efficiency

A significant improvement in energy performance has not only been confirmed by the building owner, but can also be demonstrated quantitatively. Particularly in the initial phases of use, there are often significant discrepancies between the planned and actual building performance. Therefore, energy consumption during the start-up phase must be documented and compared against performance following adjustments. Possible units of measurement include kilowatt hours (kWh) or kg CO_2 but recording of heating temperatures and room temperatures is also conceivable here.

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APPENDIX B - DOCUMENTATION

I. Required documentation

The documentation below represents a selection of the types of evidence that can be provided. The selected evaluation of the individual indicators must be comprehensively and plausibly documented on the basis of the evidence documents submitted.

- Commissioning of the services
- Monitoring concept
- Meter concept incl. meter scheme
- Updated monitoring concept
- Technical Monitoring Guideline
- Target definitions with regard to consumption, temperatures, etc.
- Commissioning plan
- Excerpts of commissioning protocols and contract documents with an independent body for the implementation of commissioning management
- Protocols of the trial operations
- Documentation of the scope and number of tests
- List of the functional tests carried out and associated protocols (for all systems such as the heating system, ventilation, façade dampers, etc.) with results
- Contractual agreements for regulation monitoring
- Memorandum of understanding regarding the performance of Buildings in Use certification or implementation of the management system
- Proof of commissioned services for technical monitoring, e.g. submission of a recognised DGNB service

Commissioning management must be carried out by an external third party, in contrast to the exclusive functional test, for the acceptances. The auditing company (independent third party) may not:

- be identical to one of the companies involved in the construction of the technical building equipment installations ("executing companies") or
- be identical to one of the companies commissioned with commissioning, adjustment, or operational optimisation (architect, technical building equipment designer).

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APPENDIX C - LITERATURE

I. Version

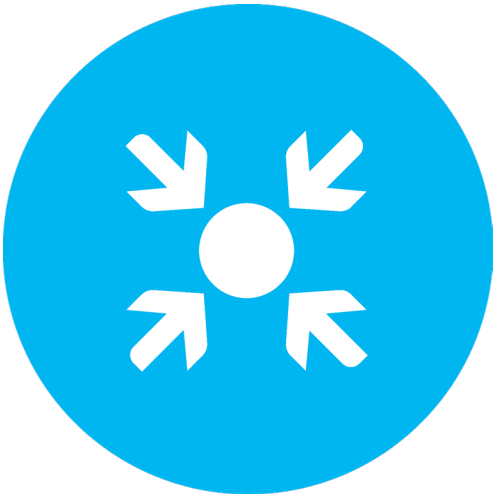
Change log based on version 2026

PAGE	EXPLANATION	DATE

II. Literature

- DIN 18380. German construction contract procedures (VOB) - Part C: General technical specifications in construction contracts (ATV) - Installation of central heating systems and hot water supply systems Berlin: Beuth Verlag, April 2010
- VDI 6039. Managing of building commissioning - Methods and procedures for building-services installations. Düsseldorf: Verein Deutscher Ingenieure e. V. June 2011
- VDI 6041. Facility management - Technical monitoring of buildings and building services Verein Deutscher Ingenieure, July 2017
- VDI 6070. Sheet 1 "Room book - General requirements and fundamentals", Düsseldorf: Verein Deutscher Ingenieure e. V., 2023.
- AMEV-Empfehlung 158 „Technisches Monitoring“, 2020, URL: https://www.amev-online.de/AMEVInhalt/Planen/Monitoring/TechnischesM/ (February 2023)
- REHVA Guidebook 29-2019 "Quality Management for Buildings”
- ISO- 50001:2018-12 Energy management systems - Requirements with guidance for use, https://www.dinmedia.de/de/norm/din-en-iso-50001/289820323, September 2024

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Site quality

The three site quality criteria assess the **impact of the project** on its **environment** and vice versa.

SITE1.1	Local environment
SITE1.3	Transport access
SITE1.4	Access to amenities

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SITE1.1

Local environment

Objective

The aim of the criterion is to obtain relevant strategic knowledge about the specific site conditions at an early stage, both at the time of planning and for the entire expected service life. On the one hand, natural hazards – events that are caused by nature and can have potentially harmful effects on people, infrastructure and the environment – are examined, and on the other hand anthropogenic influences such as noise and air pollution are considered.

Benefit

By recording and understanding the impacts at the site – including, where projections over the anticipated service life – damage potential can be assessed and appropriate measures planned at an early stage. As a rule, the earlier measures are coordinated and planned, the easier it is to integrate them into the construction project and the more cost-effective and unobtrusive they are. Furthermore, future costs for retrofitting, repairs or interruptions to use can be minimised. The criterion supports the value retention and future viability of the property. Its results serve as the basis for the ECO2.6 ‘Climate resilience’ criterion.

Contribution to overarching sustainability goals



Outlook

The content is coordinated with the DGNB System for Districts and Buildings in Use. In the medium term, alongside the generally applicable indicators, additional geographically differentiated assessment principles may be incorporated as required, taking into account climate change and existing legal requirements and standards, and current best practice.

Share of total score

	SHARE	IMPORTANCE FACTOR
Office **Education** **Residential** **Hotel** **Logistics** **Production**	**2.5%**	**4**
Consumer market **Shopping centre** **Department stores** **Assembly buildings** **Healthcare buildings**	**2.2%**	**4**

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EVALUATION

The evaluation of criterion SITE 1.1 is based on three main indicators. The first indicator assesses the quality of the physical risk analysis to be carried out at the site. The second indicator measures whether there is an increased risk from hazard sources at the site that can affect the users, the operation, or the property. The third indicator measures whether other external influences at the site can have a negative impact on the users. The transparency achieved through these three indicators forms the basis for strategic decision-making and the implementation of appropriate adaptation measures that can protect the building and its users from potential physical risks and external influences arising from the environment and changes in the climate. In this criterion, 100 points can be awarded, or 105 points with bonuses.

NO.	INDICATOR	POINTS
1	**Performance of a climate risk analysis**	**Max. 55**
1.1	**Performance of an analysis**	**10**
1.1.1	■ Performance of an analysis according to the state-of-the-art research /science/ standards	10
1.2	**Environmental and climate risks**	**20**
1.2.1	All hazards listed in Table 1 must be assessed. If a hazard is irrelevant, it may be excluded with appropriate justification. The data sources for the assessment of hazards may vary according to location: ■ Regional data sources – Hazards according to historical extreme weather events in the area and consultation of available national or regional reports, risk maps, weather databases, climate change projections, experts or insurance analysts or ■ European data sources – Hazards according to the European Environment Agency[1] or latest ESPON reports/hazard maps[2] or (for EU Countries) ■ Global data sources – Data from internationally recognised sources[3]	20
1.3	**Reference period** The reference period for the analysis is forward-looking and takes into account future climate developments at the site. It shall cover at least the following and an analysis expert should confirm which reference period is appropriate:	**Max. 5**
	■ 10–25 years	1
	■ 26–50 years	2.5
	■ The entire life expectancy or (economic) useful life of the building	5
1.4	**Scope of the evaluation**	**5**
	■ Evaluation of the probability of occurrence of the environmental and climate risk	+2.5
	■ Evaluation of the impact on the planned building, operation, users and/or property (vulnerability)	+2.5
1.4.1	**AGENDA 2030 BONUS – Climate action goal** **Consideration of environmental conditions and third-party adaptation solutions** Consideration of environmental conditions and third-party adaptation solutions in the local and regional environment (e.g. retention basins, dykes, dams)	**5**

[1] European Environment Agency Report Climate change, impacts and vulnerability in Europe 2016 and/or Urban Adaptation Map Viewer
[2] ESPON reports / hazard maps https://www.espon.eu/
[3] Internationally recognised sources like UNDRR's Prevention Web https://www.preventionweb.net/knowledge-base/hazards

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1.5	**Climate-related risks based on future climate projections as per EU Taxonomy**	**Max. 10**
1.5.1	To analyse the physical climate risks on the site, risks listed in Table 2 have been screened and a climate risk and vulnerability analysis conducted at building level based on future climate developments.	+5
1.5.2	To assess the probability of occurrence and the extent of damage, climate models from the latest report of the Intergovernmental Panel on Climate Change (IPCC [...] Assessment Report) were used for future reference periods. The scenario assumed is:	+Max. 5
	■ RCP 8.5 (worst-case scenario)	+2.5
	In addition this, climate models based on the following have been used:	
	■ RCP 6.0 Scenario	+2.5
	■ RCP 4.5 Scenario	+2.5
	■ RCP 2.6 Scenario	+2.5
1.6	**Utilisation of results**	**5**
	The physical risk and vulnerability analysis was carried out at an early stage so that the results of the analysis could be incorporated into the planning and adaptation solutions could be implemented directly in the construction.	5

2	**Evaluation of climate risks at the site**	**Max. 10**
2.1	Evaluation of the physical risks arising from the environment and climate change at the site, both now and in the future. If the only physical risks and vulnerabilities that could affect the site's operation, users, and asset value identified have been classified as 'low' or below, this point can be considered fulfilled. If at least a moderate physical risk is identified, appropriate adaptation measures should be identified to significantly mitigate the risk or vulnerability. The design and implementation of appropriate adaptation measures and resilience to physical risks are assessed in criterion ECO 2.6.	**10**

3	**Assessment of other external influences**	**Max. 35**
3.1	**Outdoor noise**	**Max. 10**
	Noise levels are specified in accordance with Table 1 or with comparable local minimum requirements for noise protection or country-specific noise maps.	
	The highest value recorded, e.g. on the noise map, is used for assessment under this indicator.	
	■ < 75 dB(A) (noise level range IV and V in accordance with Table 1)	2
	■ < 65 dB(A) (noise level range II and III in accordance with Table 1)	5
	■ < 55 dB(A) (noise level range I in accordance with Table 1)	10

COLUMN LINE	1	2	3	4	5
	NOISE LEVEL RANGE	RELEVANT EXTERNAL NOISE LEVEL	ROOM TYPES		
			BEDROOMS IN HOSPITALS AND SANATORIA (CONVALESCENT HOMES)	COMMON ROOMS IN APARTMENTS, OVERNIGHT ROOMS IN ACCOMMODATION SITES, CLASSROOMS AND SIMILAR	OFFICE ROOMS 1) AND SIMILAR
			REQUIRED $R'_{W,RES}$ OF THE EXTERNAL BUILDING COMPONENT IN DB		
1	I.	up to 55	35	30	-
2	II.	56 up to 60	35	30	30
3	III.	61 up to 65	40	35	30

4	IV.	66 up to 70	45	40	35
5	V.	71 up to 75	50	45	40
6	VI.	76 up to 80	2)	50	45
7	VII.	> 80	2)	2)	50

1) The requirements do not apply to external building components of rooms, which only make a minor contribution to the interior noise level, and are operated in order to carry out activities in the room.

2) The requirements to be determined here vary depending on local conditions.

Table 1 – Airborne sound insulation minimum requirements for external building components – Source: German DIN 4109-89 Table 8

3.2 Outdoor air quality **Max. 15**

Compliance with legally required limit values for air quality parameters:

In the surrounding area, the particulate matter (PM_{10}) and nitrogen dioxide (NO_2) limit values are exceeded with the following frequencies in one year:

+Max. 5

- PM_{10} exceeded on no more than 35/365 days 2
- PM_{10} not exceeded 5

- $PM_{2.5}$ not exceeded + 5

+Max. 5

- NO_2 exceeded on no more than 18 three-hours-intervals (over the one-hour-daily maximum value) 2
- NO_2 not exceeded 5

3.3 Radon **10**

3.3.1
- Radon ground air concentration has been accurately assessed +5
- Based on the measurement data, it has been determined that the reference value of 300 becquerel/m³ in indoor air is not exceeded with above-average frequency or this is not to be expected.

+5

The radon concentration in the indoor air can be determined based on the requirements of the relevant local standards.

SUSTAINABILITY REPORTING

The following information can be taken as key metrics/KPIs from the application of the criterion.

NO.	KEY METRICS/KPIS	UNIT
KPI 1*	Climate risk analysis or future-oriented climate risk analysis performed	[yes/no]
KPI 2	Weighted outdoor noise level	[dB(A)]
KPI 3	Days on which air quality limit values are exceeded	[days/ year]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The following benefits can be achieved for owners, municipalities and/or users:

- Transparency concerning physical risks and external influences at the site that may affect the users, the operation, and the property value now and in the future
- Transparency as a basis for implementing appropriate adaptation measures
- Increased security or risk minimisation for the users, the operation and the property value through appropriate adaptation measures
- Avoidance of follow-up costs for subsequent protection (e.g. temporary flood protection measures, technical retrofitting, deconstruction of buildings and/or infrastructure) through the early integration of adaptation measures into the design process and direct implementation (construction phase)
- Increasing the quality of risk management
- Cost minimisation through needs-based building insurance
- Basis for developing future-proof real estate

II. Additional explanation

Buildings have always served to protect people from dangers and external influences caused by weather and climate. These hazards are changing as a result of climate change and its consequences, both in terms of the probability of their occurrence and the potential extent of damage. In addition, the impact of climate change varies from region to region. In light of this, there is no universal solution for every site. Therefore, given the long timescales involved in the construction sector, transparency with regard to the risks arising at the site is essential to ensure that buildings are future-proof and sustainable. These risks – arising from the natural environment and climate change – may affect the building, its users, its operation, and the property value over its lifetime. The analysis of physical risks forms the basis for adaptive and sustainable planning, as well as the implementation of appropriate adaptation measures to establish optimal protection.

The need for adaptation measures is continuously growing, as climate and weather-related damage and losses have increased sharply in recent decades. According to recent research available to the Intergovernmental Panel on Climate Change (IPCC), this trend will continue, and extreme weather events and climatic changes will become more frequent unless significant reductions in greenhouse gas emissions are achieved. Although the consequences of climate change can be mitigated by reducing greenhouse gases and taking adaptation measures, damage and losses are still occurring. The World Meteorological Organization (WMO) reports in the Atlas of Mortality and Economic Losses from Weather, Climate, and Water Hazards that these were responsible for nearly 75% of all economic losses in the last 50 years alone (1970–2019). The Münchener Rückversicherungsgesellschaft (Munich Reinsurance Company) estimates losses totalling 280 billion US dollars worldwide in 2021. Physical risks arising from the environment and climate change are the most significant and complex risks to which builders and owners of existing properties are already exposed today. Similarly, in the future, it will be difficult to completely avoid urban growth in high-risk regions due to a limited availability of land. Figure 1 shows changes in the frequency and total number of recorded events.

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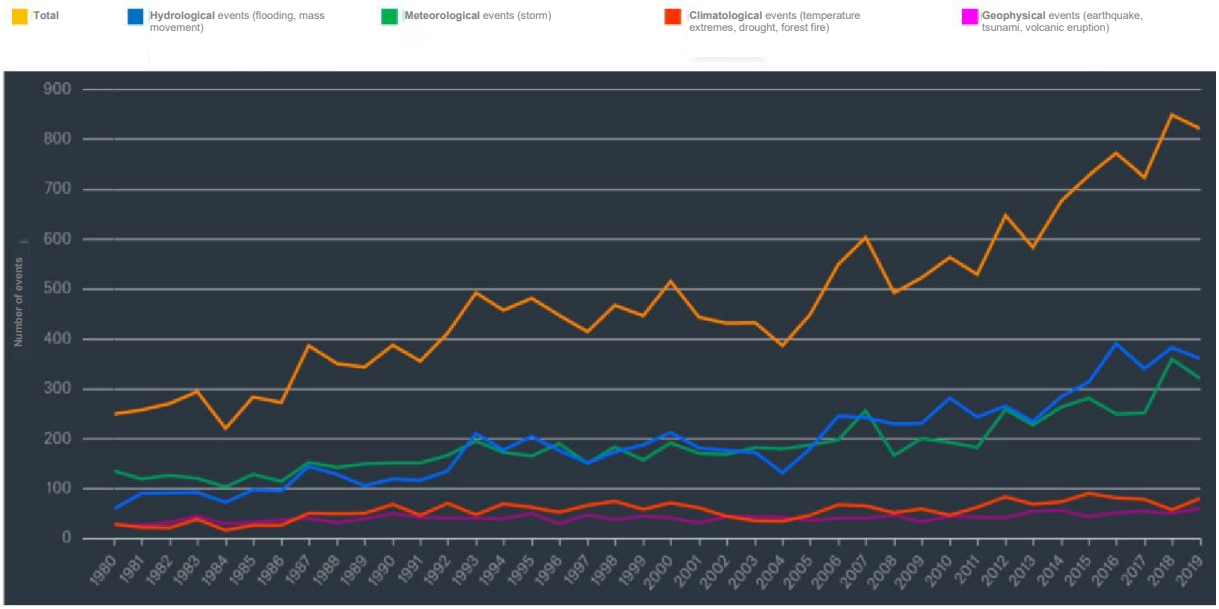


Figure 1: Changes in the frequency of risks arising from the natural environment and climate change. Source: Munich RE: Natural disaster risks. As at: 01/2021 | https://www.munichre.com/en/risks/natural-disasters.html

III. Method

Evaluation:
For the evaluation of the local environment, the physical risks arising from the environment and climate change are analysed. The assessment of risks is highly dependent on the robustness of the analysis. Therefore, two main indicators are used for the evaluation:

1. Evaluation of the analysis on the basis of individual quality parameters
2. Assessment of the physical risks (probability of occurrence and extent of damage) arising from the environment and climate change that may affect the users, the operation/use and the value of the building at the site (result of the analysis)

Other external factors that may negatively affect the users (air quality, external noise and radon) are also assessed.

Procedure:
As a preparatory measure, the scope of the study should be defined, including the system elements to be considered. For the first step, the hazards examined in the analysis (Indicator 1.2) and the future scenarios and climate projections to be considered (Indicator 1.5) are selected. For the second step, hazards that cannot negatively affect the building, the users, the operation, and the property value may then be excluded from the analysis as part of a scoping process. The hazard may be excluded either because (A) it does not occur at the site or (B) the hazard does not in itself have a significant adverse effect on the relevant system elements. The scoping procedure must be adequately justified (e.g. no tsunamis in Alpine areas, no avalanches on the coast, or minimally increased costs for plant and tree irrigation or the hazard is already addressed by legal requirements or valid standards). The third step is to analyse the physical risks and vulnerabilities at the planned building. Indicators 1.1–1.6 determine the quality parameters that should be considered in the analysis.

Step 1: Selection of hazards to be investigated and reference period
Step 2: Scoping of the relevant hazards
Step 3: Comprehensive analysis of the physical risks with consideration of the quality parameters
Step 4: Assessment of the risks and external influences at the site

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Indicators 1 to 3 are assessed using the following sub-indicators:

Indicator 1: Performance of a climate risk analysis

The purpose of this indicator is to assess various quality parameters of the analysis of physical risks and vulnerabilities at the site or building. Before conducting an analysis, the system elements of the scope of study should be defined.

Indicator 1.1: Performance of an analysis

Indicator 1.1 assesses whether the physical risk analysis for the site was carried out according to the current research, science or standards. The analysis can be based on latest scientific peer-reviewed publications, regional or national standards, open-source databases, etc.

Indicator 1.2: Environmental and climate risk

Indicator 1.2 assesses the hazards examined in the analysis. For Indicator 1.2.1, the hazards listed in Table A should be assessed. All hazards listed in Table A must be assessed. If a hazard is irrelevant, it may be excluded with appropriate justification**.** The data sources for assessment of hazards may vary according to location:

Regional data sources – Hazards according to historical extreme weather events in the area and consultation of available national or regional reports, risk maps, weather databases, climate change projections, experts or insurance analysts and/or European data sources – Hazards according to European Environment Agency[4] or latest ESPON reports or hazard maps[5] (for EU Countries) or Global data sources – Data from internationally recognised sources[6]

Indicator 1.2.1: Table 1 of hazards

Table 1: Hazards table

NATURAL HAZARDS	DESCRIPTION
Extreme temperature	Extreme temperatures are significantly higher or lower than the average temperature of a regional climate. Summers can be significantly hotter or colder than average, and winters can be colder or warmer than average. It should be considered a heat wave if there is a 7-day period with above-average maximum temperatures, and a cold wave is a 7-day period with below-average minimum temperatures.
Fluvial flooding (river flooding)	Flooding caused by a river. This occurs when excessive rainfall and/or snow melt in the catchment area exceeds the river capacity.
Coastal flooding	The flooding of areas by water from a sea, an ocean or another large body of open water. These types of flood are most commonly linked to storm surges. Storm surges are caused when high winds from hurricanes and other storms push water onshore. The risk of coastal flooding is highest when a storm surge coincides with high tide and/or with river flooding (at the delta).
Pluvial flooding (heavy rain)	Pluvial flooding in urban areas results from the combination of intense precipitation and a high proportion of impermeable surfaces. Where water cannot infiltrate into the ground, a high volume of surface run-off may exceed the capacity of the drainage system and cause flooding.

[4] European Environment Agency Report Climate change, impacts and vulnerability in Europe 2016 and/or Urban Adaptation Map Viewer
[5] ESPON reports/hazard maps https://www.espon.eu/
[6] Internationally recognised sources like UNDRR's Prevention Web https://www.preventionweb.net/knowledge-base/hazards

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Drought	Broadly speaking, drought refers to a temporary shortfall in precipitation over an extended period of time relative to the needs of vegetation. Droughts can be classified in different ways depending on the impacts considered, e.g. meteorological droughts, hydrological droughts, agricultural droughts or socioeconomic droughts. Droughts are to be distinguished from aridity, a permanent climatic feature, and from water scarcity, a situation where the water demands (for society, economy and nature) are greater than the available water resources (rivers, reservoirs, groundwater, etc.)
Wildfires	The risk of wildfires is growing due to more frequent occurrence of heatwaves and droughts.
Volcanic eruption	Volcanic activity is defined as any type of volcanic event near an opening/vent in the Earth's surface including volcanic eruptions of lava, ash, hot vapour, gas, and pyroclastic material.
Earthquake	An earthquake is defined as a sudden movement of a block of the Earth's crust along a geological fault and associated ground shaking. Severe earthquakes can destroy buildings and other structures, trigger tsunamis and landslides, and kill people and animals. To assess the relevance of earthquake risk, the ground acceleration at the site can be checked using sources such as GSHAP[7] or other relevant sources[8]. If the expected ground acceleration at the site for a 475-year event (or 10% probability of exceedance in 50 years, e.g. according to GSHAP) is < 0.8 m/s² this is classified as a low hazard; if the expected ground acceleration at the site is >= 0.8 m/s² this is classified as a moderate or high hazard.
Avalanches	Avalanches are defined as large masses of snow or ice which break loose from mountain slopes and slide or rush down into a valley. Avalanches that cause significant injury and damage to property and the environment are classified as natural disasters.
Storm	A storm is defined as wind with speeds of at least 20.8 m/s (74.9 kph) or 9 on the Beaufort Scale. Direct storm damage primarily affects roof coverings and other objects that can be carried by the wind; in heavily forested areas, damage also occurs due to uprooted or snapped trees
Landslide/subsidence	A landslide is regarded as the flow of large masses of earth and rock, mostly triggered by heavy rainfall (prolonged or heavy rainfall) and the resulting infiltration of water between previously stable soil layers.
Storm surge/tsunami	Storm surges and tsunamis represent a serious environmental risk in some regions of the world.
Hurricane	Hurricanes, typhoons and tropical cyclones are essentially the same weather phenomenon. They are all large tropical storm systems that revolve around an area of low pressure and produce heavy rain and high wind speeds.
Hailstorm	Thunderstorms that produce hail (i.e. balls or irregular lumps of ice ≥ 5 mm in diameter).
Other hazards not mentioned	

[7] GSHAP Map online
[8] OpenQuake Map Viewer

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Indicator 1.3: Reference period

Indicator 1.3 assesses the reference period of the analysis. The reference period begins no later than at the time of the analysis. The categories assigned under Indicator 1.3 is determined solely by the end point of the reference period. To earn points, the reference period must extend from the time of the analysis at least ten years into the future. For the assessment of the total expected service life/economic life of the building, the maximum rates for the service life of buildings as mentioned below should be used unless an alternative assessment is more appropriate:

A) Residential use:
   - Dwellings: 80 years

B) Commercial use:
   - Commercial and office buildings: 60 years
   - Department stores, shopping centres, hotels, agricultural properties, clinics, rehabilitation facilities, nursing homes, storage and logistics properties, production properties, and multi-storey car parks: 40 years
   - Leisure properties (such as sports facilities), self-service and specialist markets, consumer markets and petrol stations: 30 years.

The reference period (regardless of use) may be limited to the year 2100.

Indicator 1.4: Scope of the evaluation

Indicator 1.4.1 determines whether the analysis has assessed the probability of occurrence of each hazard. The probability of occurrence should be categorised. The categorisation must be consistent and offer three categories (low, moderate/medium, high).

Indicator 1.4.2 determines whether the analysis also assesses the extent of damage (vulnerability) in addition to the probability of occurrence. The extent of damage must relate to the impairment of the building, the users, and the operation of the building. It may also refer to the impact on the value of the property.

Indicator 1.4.3, AGENDA 2030 BONUS – Climate action goal, determines whether the analysis takes into account environmental conditions and third-party adaptation measures in the local and regional environment.

Indicator 1.5: Climate-related risks based on future climate projections as per the EU Taxonomy

For Indicator 1.5.1, to assess the climate risks at the site, the physical risks listed in Table 2 are screened for the projected service life of the building. A climate risk analysis is then conducted for the identified risks and a vulnerability analysis carried out in order to assess the materiality of the risk. For the climate projections, data incorporating scenarios of future climatic developments is used (RCP2.6, RCP4.5, RCP6.0, RCP 8.5).

Table 2: Climate-related risks

	TEMPERATURE	WIND	WATER	SOLIDS
CHRONIC	Changing temperature (air, freshwater, marine water)	Changing wind patterns	Changing precipitation patterns and types (rain, hail, snow/ice)	Coastal erosion
	Heat stress		Precipitation or hydrological variability	Soil degradation
	Temperature variability		Ocean acidification	Soil erosion

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	Permafrost thawing		Saline intrusion	Solifluction
			Sea level rise	
			Water stress	
ACUTE	Heat wave	Cyclone, hurricane, typhoon	Drought	Avalanche
	Cold wave/frost	Storm (including blizzards, dust, and sand storms)	Heavy precipitation (rain, hail, snow/ice)	Landslide
	Wildfire	Tornado	Floods (coastal, fluvial, pluvial, ground water)	Subsidence
			Glacial lake outburst	

Indicator 1.5.2 assesses whether climate models from the latest report of the Intergovernmental Panel on Climate Change (IPCC)[9] are used to assess the probability of occurrence and the extent of damage. It also assesses whether other scenarios besides the worst-case scenario have been used. In accordance with the precautionary principle, it is recommended that at least the worst-case scenario (in this case RCP 8.5 or scenarios based on it, in particular SSP (GHG emissions scenarios)) be taken as a basis. Furthermore, if a hazard has already occurred at the site or in the surrounding area in the past, this hazard should also be analysed in the context of further scenarios. The scenarios RCP 6.0, RCP 4.5 and RCP 2.6 are available. Here too, the scenarios based on the RCP (SSP) may be used. The data for climate models was collected within the framework of the Coupled Model Intercomparison Project (CMIP) Phase 5 and 6 (global) and the Coordinated Regional Downscaling Experiment (CORDEX) (regional, e.g. for Europe) and is available for download on various websites. Visualising and analysing this data requires software or programming skills and expertise. Regionalised climate models with the highest possible resolution can be obtained from the national weather services. For Europe, data can also be downloaded from the Copernicus Climate Data Centre[10].

In addition to this, the European climate adaptation platform Climate-ADAPT provides country profiles for member states of the EU and countries in the EEA. The European Environment Agency (EEA) Hazard Report for Europe is also available as an additional resource. These resources include information on meteorological observations, climate change impact and vulnerability assessments, climate projections and services, and adaptation portals and platforms. The information can serve as a starting point when searching for detailed information.

Visualisations of data in interactive online tools offer a simplified overview of changes in important climate parameters. Depending on the hazards being assessed and the appropriateness of the level of detail, these publicly available tools can, in part, provide a sufficient basis for conducting a climate risk analysis. These include the **Climate Impact Online Portal**[11], the **interactive IPCC Atlas**[12], **Copernicus interactive atlas**[13] and the European Climate Data Explorer[14].

If possible, the highest resolution data and tools should always be used.

Indicator 1.6: Utilisation of results

Indicator 1.6 assesses whether the analysis was carried out at an early stage, allowing its results to be incorporated into the planning of the building and adaptation measures to be implemented directly in the building. The implementation of adaptation measures forms part of the requirements for adaptation to climate change in the EU Taxonomy.

[9] Intergovernmental Panel on Climate Change (IPCC) https://www.ipcc.ch/
[10] Copernicus Climate Data Centre https://cds.climate.copernicus.eu/
[11] Climate Impact Online Portal https://www.climateimpactsonline.com/index_en.html?language_id=en
[12] Interactive IPCC Atlas https://interactive-atlas.ipcc.ch/
[13] Copernicus Interactive Atlas https://atlas.climate.copernicus.eu/atlas
[14] European Climate Data Explorer European Climate Data Explorer

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Indicator 2: Evaluation of climate risks for the site

The purpose of this indicator is the comprehensive assessment and presentation of climate risks (the categorised physical risks) arising from the natural environment and changes in the climate. The result of the risk analysis assessed in Indicator 1 is used here as the basis for evaluation.

If only physical risks and vulnerabilities classified as 'low' or less have been identified at the site, Indicator 2.1 is considered to be fulfilled. If at least a moderate physical risk is identified, appropriate adaptation measures should be identified to significantly mitigate the risk or vulnerability. The design and implementation of appropriate adaptation measures and resilience to physical risks are assessed in criterion ECO 2.6.

Indicator 3: Assessment of other external influences

Indicator 3.1: Outdoor noise

Outdoor noise consists of the surrounding noise sources of road traffic noise, commercial and industrial noise, and noise from rail and air traffic. Noise level maps or measurements showing the noise immissions on the site of the new building serve as the basis for the calculation and the award of points. The value is classified according to the 'relevant outdoor noise level' according to DIN 4109-89, Table 8 (requirements for airborne sound insulation of external building components). The noise level used for the evaluation should be the highest noise level on the property.

Air traffic noise reduction factor (RfF): Aircraft noise is measured and mapped throughout Europe as part of the noise mapping of environmental noise (EU Directive 2002/49/EC). These noise maps may be used for this purpose. The award of points and the associated gradations of the protection zones are based on the noise protection zones prescribed in Germany. To this end, the location of the district must be assessed and classified in terms of noise pollution from air traffic.

Indicator 3.2: Outdoor air quality

Air quality at the site is assessed in relation to the main source of pollution: traffic. To this end, it is determined whether the legal limit values for particulate matter (PM10, PM2.5)[15] and nitrogen dioxide (NO_2) are complied with at the site. At the same time, the planned building must not worsen the immission situation in the surrounding area to such an extent that the limit values are expected to be exceeded.

(1) Assessment of the initial situation based on the limit values as per the table below
(2) Change due to planning – an assessment is performed on the basis of an immission projection. Procedure outlined in greater detail in the 'Evaluation' section.

[15] Directive 2008/50/EC

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Table 3: Limit values for air pollutants

AIR POLLUTANTS	[µG/M³]	DESCRIPTION
Particulate matter PM10 annual average	40	Immission limit value for the protection of human health, averaged over a calendar year
Particulate matter PM10 daily average	50	24-hour average immission limit value for the protection of human health with 35 permissible exceedances per calendar year
Particulate matter PM2.5 annual average	20	Immission limit value for the protection of human health, averaged over a calendar year
Nitrogen dioxide NO_2 annual average	40	Immission limit value for the protection of human health, averaged over a calendar year
Nitrogen dioxide NO_2 Max. 1 h value	200	In case of 18 permitted exceedances in a calendar year (an average limit value over one hour, measured over three consecutive hours)

Indicator 3.3: Radon

Radon is a radioactive gas that has no smell, colour or taste. Radon is produced from the natural radioactive decay of uranium, which is found in all rocks and soils. Radon can also be found in water. Even a low soil gas concentration can be sufficient to cause an elevated indoor concentration in a house. Therefore, when constructing a building with recreation areas or workplaces, suitable measures must be taken to prevent or significantly impede the entry of radon from the ground beneath the building. This is considered fulfilled if the moisture protection measures required according to the generally recognised engineering standards are complied with. In radon precautionary areas, more extensive measures must be implemented.

Essentially, there are two ways to estimate where radon can occur in buildings and at what level:

- The possible radon concentration in houses can be deduced from the radon occurrence in the soil air and the gas permeability of the soil.
- Based on measured indoor radon concentration values, the frequency of exceedances can be inferred. However, this variant requires a very large number of measurements.

The level of radon concentrations in buildings varies greatly. In buildings such as homes, schools, offices, radon levels can range from 10 Bq/m³ to more than 10,000 Bq/m³. There is no indication of a threshold below which radon would be harmless. For every 100 Bq/m³ of indoor air with a long-term radon concentration, the risk of lung cancer increases by about 16%. Therefore, the radon concentration should be reduced in all dwellings as far as reasonably practicable.[16]

NOTE: If the radon concentration in the soil or indoor air is already determined as part of the physical risk analysis at the site, the result can be used here. No additional testing of radon levels is necessary.

[16] WHO https://www.who.int/news-room/fact-sheets/detail/radon-and-health

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APPENDIX B - DOCUMENTATION

I. Required documentation

Indicators 1 and 2:
The written analysis of physical risks at the site and vulnerabilities at the building serves as evidence for Indicators 1 and 2. Reference must be made to the relevant sections on a separate document to be submitted or an extract from the section. The arrangement on the separate document is orientated consecutively along all indicators specified in this criterion (SITE 1.1). Alternatively, comments can be used to mark the relevant points in the analysis document demonstrating the fulfilment of the indicator. If analysis for the site was carried out according to the state-of-the-art research/science/standards like latest scientific peer-reviewed publications, regional/national standards, open-source databases etc., the relevant sources must be cited, and appropriate documentation provided.

The results of the analysis (probability of occurrence) shall also be tabulated on a separate sheet for each hazard. Alternatively, the summary from the analysis or the adaptation concept from criterion ECO2.6 can be used, if all analysed risks are identifiable from it.

The analysis of physical risks is structured as follows or in a similar way:

1. Cover sheet with information on the project, the date of creation, and the creator or author of the analysis
2. Table of contents
3. Summary indicating the main results of the analysis. All hazards listed in Table A must be assessed. If a hazard is irrelevant, it may be excluded with sufficient explanation.
4. Analysis of the physical risks
    a. Tabular presentation of the hazards examined and corresponding risk categorisation based on either their probability of occurrence or materiality
    b. Information on analysis methodology, assumptions, data, and climate models
    c. Description of the site including graphical representations by means of maps on which the surroundings and location can be viewed
    d. Individual sections addressing the risks identified as at least moderate:
        i. Brief description of the hazard itself
        ii. Description and graphical representation of the development of the probability of occurrence over the years and the impact on the building, the users, operation, and/or the property asset
        iii. Cartographic representation: Location of the project area on risk maps
        iv. If applicable, demonstration of how building features already planned or implemented will remedy the impacts or probabilities of occurrence mentioned above
        v. If applicable, identification of (further) adaptation solutions to increase resilience and minimise the probability of occurrence and the extent of damage (vulnerability)
5. Result of the analysis

Further specifications from the methodology for the individual indicators.

Indicator 3:
If air quality, outdoor noise and radon were not part of the previous risk analysis, a document locating and assessing the project area on risk maps can serve as evidence for Indicator 3. The results of the corresponding measurements, as specified in the methodology, forms the data basis

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APPENDIX C - LITERATURE

I. Version

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PAGE	EXPLANATION	DATE

II. Literature

- Regulation (EU) 2020/852 Taxonomy Regulation, long name: Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088
- Delegated Regulation (EU) 2021/2139 Annex 1 & 2 to the Taxonomy Regulation, Long name: Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives
- WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970 - 2019) (WMO-No. 1267), 2021, ISBN: 978-92-63-11267-5
- ESPON reports / hazard maps: https://www.espon.eu/
- DRAFT COMMISSION NOTICE - on the interpretation and implementation of certain legal provisions of the EU Taxonomy Climate Delegated Act establishing technical screening criteria for economic activities that contribute substantially to climate change mitigation or climate change adaptation and do no significant harm to other environmental objective, 19.12.2022
- Climate ADAPT: https://climate-adapt.eea.europa.eu/en/countries-regions/countries
- Munich RE: https://www.munichre.com/de/risiken/naturkatastrophen-schaeden-nehmen-tendenziell-zu.html
- Climate risk management-concepts, instruments, results: https://www.giz.de/en/worldwide/32322.html
- European Environment Agency Report: Climate change, impacts and vulnerability in Europe 2016 and/or Urban Adaptation Map Viewer
- UNDRR's Prevention Web: https://www.preventionweb.net/knowledge-base/hazards
- Global Seismic Hazard Assessment Program (GSHAP): GSHAP Map online
- OpenQuake Map Viewer: OpenQuake Map Viewer
- Intergovernmental Panel on Climate Change (IPCC): https://www.ipcc.ch/
- Copernicus Climate Data Centre: https://cds.climate.copernicus.eu/
- Climate Impact Online Portal: https://www.climateimpactsonline.com/index_en.html?language_id=en
- Interactive IPCC-Altas: https://interactive-atlas.ipcc.ch/
- Copernicus interactive atlas: https://atlas.climate.copernicus.eu/atlas
- European Climate Data: Explorer European Climate Data Explorer
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
- Radon, WHO: https://www.who.int/news-room/fact-sheets/detail/radon-and-health

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SITE1.3

Transport access

Objective

Our objective is to promote various forms of sustainable mobility for the building users and to ensure that sustainable transport infrastructure is created.

Benefits

Sustainable, intelligent transport infrastructure allows users to choose the most appropriate means of transport for their individual needs. If a wide variety of mobility provisions are offered, it can be assumed that the use of motorised private transportation, and hence the associated amount of pollution and other negative effects will be reduced. Furthermore, user satisfaction with the site and the building will increase, affordable mobility will expand and more people will be encouraged to take up healthy, active modes of travel such as walking and cycling.

Contribution to overriding sustainability goals



Outlook

Mobility is currently undergoing radical change (e.g. electric vehicles). Current and future developments are being monitored and considered.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Logistics** **Production**	**1.3%**	**2**
Assembly buildings **Healthcare buildings** **Consumer market** **Shopping centre** **Department stores**	**1.7%**	**3**

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EVALUATION

Mobility is intrinsically linked to the building and its infrastructure, both as a starting point and destination for journeys. A key consideration, alongside ease of access, is the quality of the transport links for alternative modes of transport. A qualitative-quantitative method is used to evaluate the proximity and type of modes of transport available under the indicators for motorised private transportation, public transport, cyclists, pedestrian traffic and the barrier-free design of bus stops.

Innovative mobility elements can be achieved using the innovation area indicator. The total number of points available therefore exceeds 100 points; however, no more than 100 regular points can be awarded in total or 105 including bonuses. Depending on the use, the content of the indicators can be applied accordingly.

Measurement of the distance: If there is a considerable obstruction (river, motorway, rails, etc.) between the building and the destination, the real distance (walking/driving path) must be used. The real distance must be determined and related to the building access (e.g. MPT: access to parking facilities on site; pedestrian access/public transport: Main entrance, averaged distance in case of several equivalent entrances). Digital tools can be used for this purpose.

NO.	INDICATOR	POINTS
1	**Motorised private transportation**	**Max. 25**
1.1	**Surrounding area:**	**15**
	■ Access to a trunk road	+5
	■ Access to a highway	+5
	■ Access to a main road	+5
1.2	**Building-related**	**10**
	The parking spaces allocated to the building are integrated into a higher-level or overarching parking concept with parking facilities that are used to a significant extent by user groups from several buildings in the district.	10
2	**Public transport**	**Max. 25**
2.1	**Stops**	**5**
	Direct distance 350 m	5
2.2	**Access to the nearest railway station, which is served at least hourly in each direction during peak hours.**	**Max. 5**
	■ ≤ 20 minutes walking distance	1
	■ ≤ 15 minutes walking distance	2.5
	■ ≤ 10 minutes walking distance	5
2.3	**Public transport frequency at stops from 2.1 or 2.2**	**Max. 5**
	■ Every 15 minutes max.	1
	■ Every 10 minutes max.	2.5
	■ Every 5 minutes max.	5
2.4	**Building-related**	**10**
	■ Access to passenger information (permanent notice or digital display)	+5
	■ A map of the surrounding area is displayed, showing the location of bus stops and distances in minutes; alternatively, signage is provided	+5

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3	**Cycle traffic**	**Max. 15**
3.1	**Bicycle paths (radius of 500 m from the main entrance)**	**Max. 5**
	■ Partially mixed with vehicular traffic	2.5
	■ Not mixed with vehicular traffic/shared space or bicycle lane	5
3.2	**Access**	**Max. 5**
	■ Regional access and continuity	2.5
	■ National access (> 10 km) and continuity	5
3.3	**Building-related**	**5**
	Access road within the boundaries of the property leads directly to the building/parking facilities	5
4	**Pedestrian traffic**	**Max. 15**
4.1	**Pedestrian path network (radius of 350 m from the main entrance)**	**Max. 5**
	■ Up to 50% of walking routes covered	2
	■ More than 80% of walking routes covered	3
	■ All walking routes covered	5
4.2	**Crossing possibilities (350 m radius from the main entrance)**	**Max. 5**
	■ 80% of the roads are safe for pedestrians to cross, and the crossing points are safely accessible (via pedestrian facilities or mixed surfaces) from the building entrance.	3
	■ All roads are safe for pedestrians to cross, and the crossing points are safely accessible (via pedestrian crossings or shared surfaces) from the building entrance.	5
4.3	**Signage**	**Max. 5**
	■ Extensive signage	3
	■ Extensive signage and extensive navigation maps	5
5	**Barrier-free design of stops**	**Max. 20**
5.1	**Barrier-free access to nearby public transport stops**	**Max. 10**
	Height differences and clearances ≤ 3 cm, access points marked, weather protection	
	■ Covers up to 80% of the route connecting the barrier-free building entrances and bus stops within a 350 m radius	5
	■ Covers the entire route that connects the barrier-free building entrances and bus stops within a 350 m radius	10
5.2	**Barrier-free design of the path to the building and the area surrounding it**	**10**
	No visual obstructions, tactile guiding elements, dedicated drop-offs and crossings (separate from cycle paths), no steps	10

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6	**AGENDA 2030 BONUS – Use of existing charging infrastructure** Public charging infrastructure for motorised private transportation (MPT) is available in the vicinity of the building (within a maximum radius of 350 m around the main entrance).		5
Re 1–5	**INNOVATION AREA** Explanation: The evaluation examines whether innovative mobility elements have been introduced that are tailored to the specific conditions of the building and compensate for difficulties in terms of transport access and mobility infrastructure. If additional mobility elements such as shuttle services, company bicycles or employee travel passes are offered to the building users, or other effective means of achieving the same objectives are made available, such as district-based mobility management, company mobility management (car and bike sharing schemes and their integration with the public transport network) and innovative developments in the surrounding public transport network, points can be awarded in accordance with the evaluation scheme in indicators 1–5. ■ For each innovative mobility element		As in 1–5 +5

SUSTAINABILITY REPORTING

The elements listed below are useful key performance indicators (KPIs) for reporting purposes.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Number of access links to roads for motorised private transportation	[number]
KPI 2	Number of nearby public transport stops (< 350 m), stations (< 10 minutes)	[number]
KPI 3	Number of nearby cycle paths (< 500 m)	[number]
KPI 4	Number of nearby pedestrian path networks that cover all walking routes	[number]
KPI 5	Fully barrier-free public transport stops	Yes/no
KPI 6	Number of innovative mobility elements	[number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

The objective is to conserve resources and increase user comfort by means of a sustainable mobility infrastructure. The following benefits for companies, municipalities and users can therefore be achieved:

- Easy accessibility for all, regardless of the mode of transport
- Improved environmental quality, i.e. through reduced environmental impact from individual motorised transportation
- Better quality of life
- Improved accessibility, especially for pedestrians and cyclists, as well as road users with restricted mobility

II. Additional explanation

Mobility is currently an important factor in site selection. The presence of different modes of transport, integrated into the transport network efficiently and conveniently, lead to a high level of acceptance and use among building users.

The concept of mobility is defined as an integrated approach to motorised and non-motorised transportation with the objective of giving equal priority to both, from the design phase to the implementation phase, and ultimately the use phase.

III. Method

The mobility infrastructure (in conjunction with TEC3.1) supports facilities for electric vehicles and car sharing as well as measures to encourage cycling and pedestrian traffic.

Indicator 1: Motorised private transportation

- The building must be accessible to motorised private transportation; the type of roads depends on the site and the scheme. Parking spaces for employees, visitors and other users are also necessary. It is advantageous if the parking spaces allocated to the building are integrated into an overarching parking concept.

Indicator 2: Public transport

- A well-developed public transport network within easy reach of the site with frequent services across different forms of transport ensures that the building is accessible and helps to reduce the number of people arriving in motorised private transportation.
- The building’s contribution is evaluated by assessing the availability of passenger information, routes and signage.

Indicator 3: Cycle traffic

- The situation is similar for the cycle path network: It should allow for access from beyond the immediate area, be separate from vehicular traffic and be uninterrupted as far as possible.
- The building’s contribution is evaluated based on the access route: The evaluation examines whether there is an access route directly to the building/bicycle parking facilities that suitable for cycling.

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Indicator 4: Pedestrian traffic

- The mobility infrastructure elements should be designed to encourage people to travel on foot. These include a well-developed pedestrian path network, safe crossing options that take the most direct route where possible, and signage displaying directions.

Indicator 5: Barrier-free design of stops

- Ensuring barrier-free design at adjacent public transport stops and for access to the building and areas in the immediate vicinity ensures that travel to and from the building is easy for all.

Indicator 6: AGENDA 2030 BONUS – Use of existing charging infrastructure

- This bonus can be applied if there is public charging infrastructure for motorised private transport in the vicinity of the building. A radius of 350 metres around the main entrance is taken into account.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

DESCRIPTION	SHORT CODE
Documentation of the (planned) stops on an overall plan with mapping of the distances and, if necessary, photos	A
Description and calculation of the service frequency of the individual stops and routes; the service frequency must be proved by means of suitable documents (e.g. timetables); alternatively, documents from transport companies/operators on the planned service frequency	B
Documentation of the stops on an overall plan with meaningful photos which demonstrate the quality of the individual stops	C
Overall site plan with a description of the relevant elements	D
Overall plan of the planning area showing the roads and streets	E
Proof by means of suitable planning documents	F
Proof in the form of photo documentation, clear representation in the site plan	G
Documents from transport companies/operators on planned services	H
Proof in the form of screenshots, printouts or written confirmation by the facility manager	I
Overall plan with routing and signage locations; if necessary, photo documentation of the implementation of the measures	K
Documentation of signage in the form of suitable documents (e.g. plans, photo documentation, etc.)	L
Rough estimation of journey times, or travelling times for public transport	M
Timetables	N

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INDICATORS	PRE-CERTIFICATE	CERTIFICATE
1. Motorised private transportation	D, E	D, E
2. Public transport	A, B, C	A, B, C, G, H, I, M, N
3. Cycle traffic	D, E, F, K	D, E, F, K
4. Pedestrian traffic	D, E, F, K, L	D, E, F, K, L
5. Barrier-free design of stops	F, G	F, G
6. AGENDA 2030 BONUS - Use of existing charging infrastructure	D, G	D, G
Innovation area (innovative mobility elements)	F, G	F, G

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- Sustainable Development Goals icons, United Nations/globalgoals.org.
- EN 13816: Local public transport quality standard. European Committee for Standardization, July 2002: https://de.scribd.com/document/324645289/En-13816-Standard-Service-Quality-Definition-Targeting-and-Measurement
- Collection of Cycle Concepts 2012, Danish Cycling Embassy, 2012

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SITE1.4

Access to amenities

Objective

Our objective is to optimally cater to the day-to-day needs of building users by providing easily accessible social and commercial infrastructure in the vicinity, thereby achieving social acceptance for the building. We also seek to ensure that the building is integrated into its urban context by opening up a wide range of uses to the public.

Benefits

The building users' satisfaction with the site can be increased by ensuring that there are facilities nearby that cater to their day-to-day requirements. Districts become livelier when their pavements and cycle paths are used. This also has the effect of reducing the use of motorised transportation and the associated noise pollution and harmful emissions. Furthermore, the value retention of buildings within lively districts is greater.

Contribution to overriding sustainability goals



Outlook

The weighting and evaluation are expected to remain the same.

Share of total score

	SHARE	WEIGHTING FACTOR
Office **Education** **Residential** **Hotel** **Logistics** **Production**	**1.3%**	**2**
Consumer market **Shopping centre** **Department stores** **Assembly buildings** **Healthcare buildings**	**1.1%**	**2**

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EVALUATION

The distances between the building's site and relevant social and commercial infrastructure facilities are assessed and categorised as "nearby and easily accessible" if they fall within a certain radius. Measurement of the distance: If there is a sizable obstruction (river, motorway, rails, etc.) between the building and the destination, the real distance (walking/driving path) must be used. The evaluation also examines what kind of infrastructure is available for users within the building itself. A maximum of 100 points can be awarded for this criterion, or 110 including bonus. The maximum number of points achievable for Indicator 1 is 35 (even though the individual subpoints total 55).

NO.	INDICATOR	MAX. WALKING TIME/JOURNEY TIME BY PUBLIC TRANSPORT [MIN.]	MAX. WALKING DISTANCE [M]	POINTS
1	**Social infrastructure**			**Max. 35**
1.1	**Within the district/surrounding area**			**35**
	■ **Education 1**			
	Kindergarten	5	350	+10
	■ **Education 2**			
	Higher education	15	1300	+5
	■ **Leisure**			
	For each aspect met: art and culture (cinema, theatre, galleries), library, district centre, community centre, youth centre, senior citizens' centre, fitness studio near the workplace, etc. (Alternatively: a fitness programme open to the public is offered in the building and can be used by third parties)	10	700	+5
	■ **Playgrounds**	5	350	+10
	■ **Sports facilities**			
	Gymnasium and sports hall, outdoor sports area with an athletics track, indoor or outdoor swimming pool	10	700	+5
1.2	**Opportunity to use rooms within the building and outdoor facilities**			**20**
1.2.1	Opportunities for facility rentals and the use of space within the building: Third parties may temporarily hire rooms in the building (e.g. office rooms, meeting rooms, multipurpose conference rooms, etc.) **Shopping centre**: The passageways in the building are open to the public outside normal business hours.			+10
1.2.2	Opportunities to use spaces in the building's outdoor areas: The outdoor areas surrounding the building can be used by the public both during and outside of normal business hours.			+10

NO.	INDICATOR	MAX. WALKING TIME/JOURNEY TIME BY PUBLIC TRANSPORT [MIN.]	MAX. WALKING DISTANCE [M]	POINTS
2	**Commercial infrastructure**			**Max. 35**
2.1	**Within the district/surrounding area**			**Max. 35**
	■ **Local supply 1** Full-range supplier (supply of everyday goods)	10	700	+15
	■ **Local supply 2** Small retail outlets (bakery, butcher, drug store, etc.)	10	700	+5
	■ **Local supply 3** Weekly market	10	700	+5
	■ **Food and catering** Restaurant, café, bakery, etc.	10	700	+5
	■ **Other services** Bank, post office, hairdresser, fitness studio, wellness facilities, etc.	10	700	+5
	■ **Medical services 1** General practitioner	10	700	+10
	■ **Medical services 2** Specialists, pharmacy, etc.	10	700	+5
3	**Infrastructure associated with the building/variety of uses**			**Max. 30**
3.1	**Variety of uses within the building**			**Max. 30**
	Infrastructure listed under 1.1 or 2.1 in the building itself ■ Points as in 1.1 and/or 2.1			
3.2	**CIRCULAR ECONOMY BONUS – FACILITIES THAT CATER TO PEOPLE'S DAY-TO-DAY NEEDS AND PROVIDE MEETING POINTS FOR INTERACTION** Explanation: Bonus points can be awarded if amenities or provisions are not part of the standard requirements but have been provided or built for the building's users and third parties, such as allotment gardens and beehives (urban farming), or the exchange of skills or services with others in the community is encouraged (by means of temporary trading spaces/pop-up shop premises, repair cafés, community meeting places, etc.)			**10**

SUSTAINABILITY REPORTING

The number of social and commercial infrastructure facilities in the vicinity determined in Indicators 1 and 2 is a useful key performance indicator (KPI) for reporting purposes. The number of social and commercial facilities/amenities in the building itself is also a useful KPI to report.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Number of nearby social infrastructure facilities	[number]
KPI 2	Number of nearby commercial infrastructure facilities	[number]
KPI 3	Number of social or commercial infrastructure facilities in the building itself	[number]

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APPENDIX A – DETAILED DESCRIPTION

I. Relevance

If a building and its surrounding area offer varied uses for the public, this fosters communication, a sense of community and, in turn, general acceptance of the building.

II. Additional explanation

It should be possible for the property's users to have their recreational, day-to-day, and educational needs, etc. met within a relatively limited radius (compact city concept). An adequate supply of infrastructure encourages people to undertake everyday journeys on foot or by bicycle, for example. The more open a building is to its environment and the people around it, the better its accessibility will be rated. Measures that could be used to increase accessibility include open spaces around the building that can be used by the public, cafeterias or rooms that are available for rental to third parties (office units, conference rooms, auditoriums, sports facilities, etc.) Opening the building up in this way allows the building to be used more extensively and for a longer period than when it is just used for its actual function during its normal operating hours.

III. Method

This method is a quantitative method in which maps must be used to determine whether the property is located within the catchment area of the infrastructure facility in question. The facilities should be accessible to the general public – for sports facilities, for example, through membership of a club or similar (purely educational or business facilities are not to be evaluated).The following indicators are evaluated:

Indicator 1: Social infrastructure

The social infrastructure is divided into infrastructure for education, leisure, and playgrounds and sports facilities.

Indicator 2: Commercial infrastructure

The commercial infrastructure is divided into local supply infrastructure, medical services, and other services. Pedestrian accessibility of all infrastructure facilities is generally desirable but cannot always be attained in reality. Accessibility of an infrastructure facility using public transport is therefore also included in the evaluation. This means that a property that has good public transport links can still benefit from facilities further afield.

Indicator 3: Infrastructure associated with the building/variety of uses

A building with a variety of uses is one that offers as many different uses as possible in addition to its core use, such as rental of spaces to third parties or other uses such as a canteen, exhibitions, library, services. The ground floor area is a focal point since it is particularly well suited for public use (accessibility, visibility, urban design function). It can be combined with the adjacent storeys. The building's outdoor area (e.g. restaurant with outdoor seating area, street furniture) also helps to activate the urban environment.

IV. Usage-specific description

Depending on the scheme, different indicators can be used; the relevance of each of these indicators must then be explained.

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APPENDIX B – DOCUMENTATION

I. Required documentation

Examples of possible evidence include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

DESCRIPTION	SHORT CODE
Plausible declaration of intent that infrastructure will be implemented in the property/surrounding area	A
Photos of the implemented measures (and localisation in the overall plan)	B
Urban design concept including use and open space concept, which must be continually updated and deals with the content specified in the indicator. Identification of all planned infrastructure facilities in the surrounding area/district.	C
Site plan with mapping of the maximum permitted distance for each use category. Identification of all planned infrastructure facilities in the surrounding area/district and existing infrastructure facilities in the surrounding area.	D
Depending on the property: Excerpt from the written text and drawings defining the specifications for the rooms in the building that are available for rental to third parties, which clearly contain the following information: ■ Location of the rooms available for hire (floor plans) ■ Information on the rooms' function, accessibility, opening times, etc.	E
Depending on the property: Excerpt from the written text and drawings defining the range of uses available to the public in the building, which clearly contains the following information: ■ Location of the uses available to the public (floor plans) ■ Infrastructure/integration of the outdoor facilities associated with the uses (site plan) ■ Description of the type of uses available to the public, with information on accessibility, opening times, etc. ■ Tenancy agreements ■ Photo documentation	F

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INDICATORS	PRE-CERTIFICATE	CERTIFICATE
1. Social infrastructure	A, C	B, C, D, E, F
2. Commercial infrastructure	A, C	B, C, D, E, F
3. Infrastructure associated with the building/variety of uses	A, C	B, C, D, E, F

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APPENDIX C – LITERATURE

I. Version

Change log based on version 2025

PAGE	EXPLANATION	DATE

II. Literature

- LEIPZIG CHARTA zur nachhaltigen europäischen Stadt [Leipzig Charter on Sustainable European Cities, German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (ed.), 2007: https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Nationale_Stadtentwicklung-/leipzig_charta_en_bf.pdf
- Sustainable Development Goals icons, United Nations/globalgoals.org.

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