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 the impact on this land and soil is necessary not just from an ecological standpoint; against a backdrop of increasing infrastructure costs, financial aspects must also be considered. Sparing use of land that minimises the impact on this land at a local level, results in lower development, waste water charges and an improved microclimate.

Contribution to high-priority sustainability goals

	CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS (SDGS) OF UNITED NATIONS (UN)		CONTRIBUTION TO THE GERMAN SUSTAINABILITY STRATEGY	
Significant			11.1.a	Land use
Moderate	15.3	Soil quality protection	11.1.b/c	Land use
Low	11.5	Impact of catastrophes		

Outlook

Reducing land use is an important national sustainability goal. For this reason, this criterion will be retained in later versions and will focus more heavily on achieving overriding objectives.

Share of total score

	SHARE	RELEVANCE FACTOR
Office **Education** **Residential** **Hotel** **Consumer market** **Department stores** **Logistics** **Production**	**2.4%**	**2**
Shopping centre	**3.4%**	**3**
Assembly buildings	**3.8%**	**3**

EVALUATION

In order to achieve the objective of reducing the excess use of land for building purposes, the extent of the land rededication is assessed by determining the previous use of the land on which the building is being built. To limit soil sealing on undeveloped land, achieving a low soil sealing factor and implementing compensatory measures is reflected positively in the evaluation. A circular economy bonus can be earned if the building is built on contaminated land or if considerable work must be undertaken in order to dispose of the original building that is subject to contamination, meaning that the land quality will be significantly improved compared to its previous state. 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**	
1.1	**Extent of rededication**	**0–80**
1.1.1	Outer development area – undeveloped For building purposes, land is used that has already been allocated to the settlement and circulation area by means of the land-use plan and for which there is a 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”).	10
1.1.2	Inner development area – undeveloped For building purposes, land is used that is within an existing settlement structure ("Inner area" in accordance with the local zoning codes e.g. “zoning ordinances” or “land use ordinances”).	40
1.1.3	Brownfield For building purposes, brownfield within an existing settlement structure ("Inner area" in accordance with the local zoning codes e.g. “zoning ordinances” or “land use ordinances”).	80
1.1.4	**CIRCULAR ECONOMY BONUS – BROWNFIELD REDEVELOPMENT** Significant improvement of contaminated site Explanation: The existing land is significantly improved if the soil on the plot is properly disposed of, the soil being categorised using either national (local)contaminant classification or classification described in Appendix B, the term contaminated site refers to that site where hazardous substances, as defined in Article 3 of Regulation (EC) No 1272/2008[1], are present in a level that pose a significant risk to the environment and human health, or if building components/building materials from existing building fabric that have been found to be highly contaminated are properly disposed of. Munition can be also considered as a potential hazardous event in the areas with the relevant historical backgrounds (e.g. WWII battlefields). Significant improvement of land with low-level contamination as a result of the project Significant improvement of land with significant contamination as a result of the project	+10 +5 +10

[1] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

2	**Soil sealing factor and/or compensatory measures**	
2.1	**Soil sealing factor and/or compensatory measures**	**Max. 20**
2.1.1	Soil sealing factor	(+)0–20
	■ 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
2.1.2	Implementation of compensatory measures	**+**10

SUSTAINABILITY REPORTING AND SYNERGIES

Sustainability reporting

The soil sealing factor of the total developed and undeveloped area is a good key performance indicator (KPI) to report.

NO.	KEY PERFORMANCE INDICATORS (KPIS)	UNIT
KPI 1	Soil sealing factor of the total developed and undeveloped area	[%]
KPI 2	Investigation of potentially contaminated sites according to ISO 18400-203:2018 corresponds EU Taxonomy indicator “Pollution prevention and control”	[yes/no]

Synergies with DGNB system applications

- **DGNB DISTRICT:** The soil sealing factor is determined in accordance with the requirements of criterion ENV1.7 from the schemes for urban districts and business districts.

APPENDIX A – DETAILED DESCRIPTION

I. Relevance

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II. Additional explanation

Land is repurposed rather than "consumed". This is generally reflected in the fact that the type and extent of the land cover change. The criterion assesses whether and to what extent the type of land use changes as a result of the project.
In particular, the reuse of land as part of circular flow land use management, as well as urban re-densification, urban infill and other brownfield development measures will be reflected positively in the evaluation.

III. Method

This criterion relates to the building once it is complete. How much land a project uses can generally only be influenced in the project development and design phase. Once the planning application has been submitted and approved, there are no further opportunities to make changes.

Indicator 1.1: Extent of rededication
This only takes into consideration the (building) plot. Land used for extracting raw materials (e.g. quarries) or for production buildings for producing building materials and products is not taken into consideration. To assess the plot of land, its previous use must be determined by consulting land registry records or the cadastre. In addition, previous contamination due to hazardous waste and other legacy contamination, munition, etc. must be checked in existing expert reports.

The following aspects are taken into account when assessing the indicator:

- The land's previous use is determined using excerpts from land registry records or the cadastre.
- Previous contamination of the plot (e.g. due to hazardous waste and other legacy contamination, munition, etc.) is determined using existing expert reports.

The type, scope and direction of the actual change of land use is recorded and assessed using the measurement regulations. When assessing the direction, developing semi-natural land will be reflected negatively in the evaluation, and developing land subject to low-level to significant contamination will be reflected positively in the evaluation.

In addition, measures to develop brownfield sites, as opposed to developing greenfield sites, will be reflected positively in the assessment.

The actual use of the land (in the plot area) is not the same as the developed or impervious/sealed land area. The evaluation is based on the actual use as defined in the cadastre.

Undeveloped land is land for which **greenfield development** measures have already been allocated to the circulation and settlement area by means of a land use plan and for which planning permission exists in the form of a legally valid land-use plan, and that has not yet been developed.

Undeveloped land is also land that has been allocated **brownfield development** measures within an existing settlement structure ("Inner area")and that has not yet been developed. This includes urban infill and re-densification measures.

Developed land is land within an existing settlement structure ("Inner area") that has already been assigned to the category "Building area", "Business operation area" or "Circulation area" and that has previously been in use predominantly as a building, industrial and commercial or circulation area; this type of land includes brownfield sites.

Indicator 1.1.4: Circular economy bonus – brownfield redevelopment (significant improvement of contaminated land)
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 contamination as a result of the project" or "Significant improvement of land with significant 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 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 on the basis 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, especially 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. The following percentages are to be used for calculations involving partially sealed land:

- Water-bound cover (paths and roads, squares and other large, open plots, entrances and 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 with regarding to 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.

Crediting 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 particular rainwater management and infiltration measures, green roofs and walls and landscaping.

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.

Indicator 1.1.4: Circular economy bonus – brownfield redevelopment (significant improvement of contaminated land)

- 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[2] and industrial activities[3] that are damaging the capacity of soil to continue to perform in full its broad variety of crucial functions.

*However, 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 reuse with defined technical protection measures for groundwater
- 3 Residential waste, landfill class I
- 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

[2] 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.

[3] 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.

Phenols	≤ 100 mg/l	≤ 50 mg/l	≤ 0.2 mg/l
Lead	≤ 2 mg/l	≤ 1 mg/l	≤ 0.2 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.umweltdaten.landsh.de/nuis/upool/gesamt/jahrbe97/tasi/tasiabfa.htm

* more information regarding the types of soil contamination:

http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR5_en.pdf

Alternatively, Investigation of potentially contaminated sites can be done according to ISO 18400-203:2018 Soil quality-sampling.

Indicator 2.1: Soil sealing factor 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 in question, 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

APPENDIX C – LITERATURE

I. Version

Change log based on version 2018

PAGE	EXPLANATION	DATE
all	General: scheme “Assembly buildings” has been added	16.09.2021
208	KPI 2: new KPI regarding soil contamination, corresponds EU Taxonomy indicator “Pollution prevention and control”	16.09.2021

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
- Technical instructions for recovery, treatment and other disposal of municipal waste, *Landesportal* Schleswig-Holstein, Ministry of Energy Transition, Agriculture, Environment, Nature and Digitalization. https://www.umweltdaten.landsh.de/nuis/upool/gesamt/jahrbe97/tasi/tasiabfa.htm
- 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