Miljöbyggnad
4.0

MILJÖ
BYGGNAD

SWEDEN
GREEN BUILDING
COUNCIL

CONTENT

Methodology

Manual

www.sgbc.se

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1. INTRODUCTION

Miljöbyggnad is an environmental certification scheme for new buildings and surrounding property. The building is assessed against fifteen indicators spanning energy and climate, indoor environment, outdoor environment and circularity. The performance and environmental characteristics of the building and property determine whether the building is awarded Bronze ●, Silver ● or Gold ●.

Certification entails an assessment of the building's performance by an independent third party, separate from the project organisation and its management.

The Miljöbyggnad certificate is valid from the date of issue of the preliminary certification until verification and the final back report is completed.

Miljöbyggnad 4.0 consists of two parts:

› Methodology › New Build manual

The *Methodology* section describes the process and implementation of the certification.

The *Manual* section describes the indicators included in the certification. The indicators include purpose, what is assessed, rating criteria, instructions and reporting as well as back reporting requirements.

2. OVERVIEW OF MILJÖBYGGNAD

Areas, aspects, indicators and criteria

	Aspect	Indicators	EU taxonomy criteria and summary
Energy and climate	Power requirements	1. Heat output demand	**A1-7.1-SC 1** Testing or reliable process for airtightness.
		2. Solar heat load	
	Energy	3. Energy use	**A2-7.1-DNSH 1** Energy use does not exceed BBR (Boverket´s Building Regulations) requirements. Energy declaration. **A1-7.1-SC 1** Energy use is at least 10 percent lower than BBR requirements. Energy declaration.
	Climate impact	4. Climate impact	**A1-7.1-SC 1** Full LCA for the building.
Indoor environment	Moisture	5. Moisture	
	Sound	6. Sound	
	Thermal climate	7. Winter thermal climate	
		8. Summer thermal climate	
	Phasing out of hazardous substances	9. Phasing out of hazardous substances	**A1-7.1-DNSH 5** Pollution prevention and control.
Outdoor	Climate risks	10. Climate risks	**A1-7.1-DNSH 2** Climate risk and vulnerability analysis. **A2-7.1-SC 2** Customisation solutions.
	Ecosystem services	11. Ecosystem services	**A1-7.1-DNSH 6** Regards to ecosystems and biodiversity diversity.
Circularity	Circular construction	12. Flexibility and demountability	**A1-7.1-DNSH 4** Building design meets requirements regarding flexibility and demountability.
		13. Circular material flows	
		14. Waste management	**A1-7.1-DNSH 4** Construction and demolition waste meets waste management requirements.
	Building materials	15. Logbook containing building materials	

Criteria for compliance with EU taxonomy requirements. Fulfillment is required for the Gold ● rating in Miljöbyggnad certification.

A2-7.1-DNSH 1	The building is not intended for the extraction, storage, transportation or production of fossil fuels.
A1-7.1-DNSH 3	Domestic water flows. Maximum flow rate requirement (not applicable to residential units).
A1-7.1-DNSH 3	In order to avoid impacts from the construction site, the activity meets the criteria set out in Appendix B. Risks of environmental degradation related to the preservation of water quality and avoidance of water stress are identified and addressed.
A1-7.1-DNSH 5	As the new building is located on a potentially contaminated site (previously developed land), a study has been carried out in the area to detect potential contamination.
A1-7.1-DNSH 5	Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works.
A1-7.1-DNSH 6	Investigation of the need for an EIA.

3. BASIC PRINCIPLES

Miljöbyggnad follows a number of basic principles and must:

- contribute to the fulfillment of the 2030 Agenda for Sustainable Development and the EU Taxonomy for Sustainable Finance
- be cost-effective and demonstrate sustainability benefits
- be easy to understand, explain and implement
- drive knowledge development
- have limited scope
- be based on science-based indicators
- involve quality control of documents
- include what the property owner has control over
- include verification in finished building
- have only mandatory indicators and optional stand-alone taxonomy
- EU taxonomy criteria cover the whole building as well as the outdoor environment of the property for certification.

New buildings and renovation are provisionally certified. The certification is based in whole or in part on project planning documentation, which is verified no later than three years after the building is put into service.

This ensures that the performance of the finished building corresponds to the ratings achieved from the preliminary certification.

Miljöbyggnad certification is a process that results in a certification decision for the building and a Miljöbyggnad plaque. The certification is valid provided that no major changes are made to the building or operations that affect the certification.

Certified and provisionally certified buildings are published on the SGBC website. The certification process is described on the SGBC website.

The criteria are formulated as functional requirements in order to be technology-neutral and not to guide the choice of building technology, technical installation systems or products in the building.

4. REGISTRATION

Certification starts with the registration of the property, including the building(s) to be certified, in SGBC's digital tool, which is available on the website. Certificates are issued per building. The date of approved registration, known as the registration date, determines which criteria apply to the building.

The Technical Board's interpretations and clarifications are published on the SGBC website. They must be applied if they were published before the date of registration.

A registration is valid for three years from the date of registration. This means that the application for certification must be submitted to the SGBC within three years.

The project registration date is valid throughout the certification process.

5. MANUAL VERSIONS

Each manual has a version number (e.g. 4.0). The four indicates that it is the fourth generation of the manual, the zero indicates that it is the first version within the current generation. Updates within the same generation (4.X) will not entail significant tightening of criteria, however clarifications may be added.

6. EU TAXONOMY

The EU Taxonomy for Sustainable Finance will allow investors to direct their investments towards more sustainable technologies and towards sustainable companies, thus contributing to making Europe climate neutral by 2050. This manual incorporates the requirements of Chapter 7.1 of the Delegated Act on the Climate Objectives (Climate change mitigation, Annex I and Climate change adaptation, Annex II), published on 9 December 2021. Criteria affected by taxonomy requirements are indicated by  in the overview of each indicator. Next to each criterion linked to taxonomy, it is clear whether the criterion is a "significant

contribution" (SC) or a "do no significant harm" (DNSH) criterion. It is also clear from which chapter of the taxonomy the criterion is derived, e.g. criterion A1-7.1-SC 2 is a significant contribution in Environmental objective 1, chapter 7.1, criterion 2.

In order to comply with the EU taxonomy, all DNSH criteria must be met. In addition, one of the environmental objectives' criteria for significant contribution, A1-7.1-SC 1 and A2-7.1-SC 2, must also be met. The certificate indicates which criteria have been met.

The EU taxonomy for sustainable finance must be met to attain the Gold ● rating level in Miljöbyggnad.

Note that some DNSH criteria appear separately outside the indicator structure. See the overview. According to The Swedish Construction Federation's assessment, Swedish legislation addresses the following criteria:

- A3-7.1-DNSH 2 - on the assessment of the impact of the construction process on the aquatic environment.
- A5-7.1-DNSH 3 - on establishment on contaminated land.
- A5-7.1-DNSH 4 - on noise, dust and hazardous emissions from the construction process.

7. BUILDINGS ELIGIBLE FOR MILJÖBYGGNAD CERTIFICATION

Miljöbyggnad can be used for most building types and activities. The certification scheme can be advantageously used as a tool for guidance and quality assurance during the project planning and design of buildings, and also as a guidance instrument during construction production.

To be eligible for Miljöbyggnad certification, the building must include spaces that are intended to be heated to more than 10 °C, A_{temp}. There must also be occupancy rooms, but not necessarily permanent occupancy rooms.

The different project types of Miljöbyggnad

- New construction
- Refurbishment
- Extension
- Combinations of the above
- Three-dimensional property

New construction

A building that has been in service for less than three years.

Refurbishment

Buildings undergoing refurbishment must meet the requirements of BBR 1:2242 significant renewal, i.e. extensive refurbishment that can be equated with new production. Assessment is based on the New Build Manual. For indicator 5, assessment is based on advance arrangement. The Climate Impact and Ecosystem Services indicators are excluded during refurbishment .

For refurbishment , advance arrangement is required to ensure that indicators can be achieved. The aim is to provide the applicant with the necessary conditions at an early stage to support preparation of their application. Forms and accompanying instructions are available on the SGBC website.

Indicators assessed according to the New Build Manual are provisionally certified and verified using the same New Build Manual.

Extension

When certifying an extension, assessment is based on the New Build Manual. An extension can be certified separately provided that the energy use of the extension can be specified through metering.

Three-dimensional property

Building elements registered as three-dimensional property can be certified separately. This applies provided that the property is registered in the land register and that the energy use can be specified through metering.

Building with confidential information

When certifying a building where parts of the building or information about the building are confidential, the audit procedure and documentation management can be adapted to the current requirement.

Management is ensured at an early stage through dialogue with the SGBC certification department.

Definition of “building”

Building means what is commonly understood as a building.

In exceptional cases, what is perceived as several buildings may be granted one registration. The preconditions for this are that the parts:

- have one (1) energy declaration
- are built together
- have uniform technical building conditions
- have a common technical supply system
- have a common indoor climate. Common indoor climate means that there must be internal openings and passages between the buildings.

Buildings that share a garage, for example, do not have a common indoor climate.

8. RATING OF ROOMS, INDICATORS AND BUILDING

Miljöbyggnad has three rating levels for rooms, indicators, aspects, areas and building. These rating levels are Bronze ●, Silver ● and Gold ●.

- In principle, bronze corresponds to government regulations and building practice in new construction. For refurbishment , Bronze complies with the Swedish Work Environment Authority's and the Public Health Agency of Sweden's rules as well as the Swedish Environmental Code's self-assessment for building management.
- Silver represents a higher level of performance and ambition than Bronze.
- Gold corresponds to best performance with available and commercial technology and/or targeted cooperation between the client, designers and contractors. Gold must be achievable, but not without effort. For a Gold rating, the building must also meet all the DNSH criteria of the EU taxonomy and one of the taxonomy's environmental objectives A1-7.1-SC 1 or A2-7.1-SC 2.

Regardless of the activity or type of project, all indicators must achieve at least a Bronze ● rating to be certified and to maintain the certificate.

Aggregation

The building rating is based on the indicator ratings. Some indicators have multiple criteria, with the lowest result achieved counting as the indicator rating. The indicator rating is aggregated in three or four increments depending on whether the indicator is a room or building indicator.

- From room rating to indicator rating (for room indicators).
- From indicator rating to aspect rating.
- From aspect rating to area rating.
- From area rating to building rating.

A rating tool is available on the SGBC website.

From room rating to indicator rating

The indicator rating is aggregated based on all assessed rooms on all assessed floors. The indicator rating can be increased by one increment from the lowest room rating if at least half of the assessed room area has a higher rating.

From indicator rating to aspect rating

The aspect rating is based on the lowest indicator rating.

From aspect rating to area rating

The area rating is based on the lowest aspect rating, which may be increased by one increment if at least half of the aspect ratings are higher.

From area rating to building rating

The building rating is based on the lowest area rating.

Refurbishment and extension

The indicator rating is based on the lowest rating (new build or refurbishment) and it may be increased by one increment, if the higher rated part has the same or larger area.

9. CRITICAL ROOM

This section presents the selection of rooms for Solar Heat Load, Winter Thermal Climate and Summer Thermal Climate.

Selection of critical rooms

Critical rooms are those with the lowest rating/performance for each indicator.

Residential buildings

In residential buildings, no distinction is made between occupancy rooms and permanent occupancy rooms. The terms include rooms for daily interaction, rooms for cooking and rooms for resting. Hallways, walk-in closets, wet rooms, etc. are not assessed.

The BBR contains rules on the design of the housing and the possibility of separating room functions. These rules are taken into account, and the most critical solution is assessed.

Non-residential buildings

In non-residential buildings, rooms are categorised on two levels:

- **Occupancy rooms**
  Rooms for permanent or temporary occupancy. For example, offices, open-plan offices, activity-based offices, classrooms, reception areas, hotel rooms, kitchens, meeting rooms, conference rooms, group rooms, flexible workplaces, waiting rooms, lobbies, public areas, foyers, dining rooms, restaurants, break rooms, cafés, sports halls, etc.
- **Non occupancy rooms**
  Rooms not intended for occupancy. For example, technical rooms, wet rooms, storage rooms, corridors, etc.

10. PRELIMINARY CERTIFICATION

Preliminary certification involves checking that the project planning corresponds to the rating criteria for the requested rating for each indicator and any optional taxonomy criteria. This can be carried out before, during or after the start of construction.

Review of, for example, reported calculations, descriptions and drawings. This must be based on a document corresponding to the system document or a later document, such as a tender document or construction document.

Once the application is approved according to the requested rating, the building is awarded preliminary certification and a plaque.

11. VERIFICATION

Verification means checking that the finished building meets the requested rating for each indicator. This must be carried out no later than three years after the building is put into service.

Review of reported verification of, for example, window properties, measurement protocols, declarations, test protocols and check of complete documentation.

If the finished building does not correspond to what was reported in the preliminary certification, the calculations, simulations and similar may need to be updated depending on the extent of the changes and also whether it is deemed to affect the indicator rating.

Ratings at indicator, aspect, area and building level can be both increased and decreased relative to preliminary certification.

If verification is not received or the Bronze ● rating is not achieved on any indicator, the certificate and plaque are revoked.

12. BACK REPORTING

Back reporting means checking that the performance of the building is maintained after the verification. The relevant indicators are listed in the manual and, in the case of refurbishment , also the approved advance arrangement. Back reporting takes place every three years after verification. Back reporting must comply with Chapter 7.7 of the EU Taxonomy of Sustainable Finance, which is updated every three years.

13. SURVEY

A survey is an alternative to measurement for Gold ● for the indicators Sound, Winter Thermal Climate and Summer Thermal Climate.

The indoor environment survey is available on the SGBC website.

It requires that at least 80 percent of responding users are satisfied, i.e. have indicated in survey responses that the result is very good, good or acceptable.

Miljöbyggnad uses a simplified survey with questions directly linked to the indicators to be verified.

In non-residential buildings, a response rate of 75 percent is required, and in apartment buildings a response rate of 70 percent is required.

In workplaces, the survey is submitted to users who are at the workplace on a typical day, and then collected that same day.

The survey must be conducted no earlier than one year after moving in.

The survey consists of a section for non-residential buildings and a section for residential buildings. For single-family houses, a self-declaration form is used instead, which is answered jointly by members of the household. In premises with fewer than five employees, the survey is replaced by a user declaration based on the questions in the survey.

Questions can be added but not removed. Where there are no permanent workplaces, e.g. in classrooms, the questions can be rephrased to 'the part of the building where you spend most time'. In schools, staff respond to the survey.

There are established survey methods that are widely used, such as the Stockholm indoor environment survey for apartment buildings, the Örebro survey for offices, schools, preschools, hospitals and care facilities, and the EcoEffect survey for apartment buildings, offices, schools and universities. These can be used but must be modified first.

Instructions and questions

- In apartment buildings, the survey must be distributed to all households. In large buildings, a random sample of 30 households is taken. One person per household can respond to the survey.
- In one- or two-family buildings, the members of the households must respond to the survey together.
- In premises with five or fewer employees, the survey is responded to jointly.
- In workplaces, the survey is distributed to everyone with a personal workplace in the building. If the workplace is large, a representative sample can be drawn from the different operations, floors, etc.
- For commercial buildings, the survey is distributed to all employees who have worked in the building for at least one year.

The survey questions are usually answered by staff - not students, patients, customers or equivalent.

14. INDICATORS

1 Heat output demand

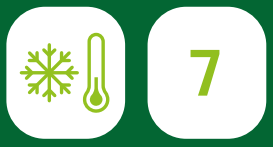
2 Solar heat load

3 Energy use

4 Climate impact

5 Moisture

6 Sound



7 Winter thermal climate

8 Summer thermal climate

9 Phasing out of hazardous substances

10 Climate risks

11 Ecosystem services

12 Flexibility and demountability

13 Circular material flows

14 Waste management

15 Logbook containing building materials

INDICATOR 1

HEAT OUTPUT DEMAND

Purpose

The purpose is to promote buildings that are designed and constructed to maintain a low heat demand during the coldest periods of the year.

What is assessed

Heat demand in W/m², A_{temp} at DVUT (Dimensioned Winter outdoor temperature).

Global objectives and Sweden's environmental objectives

Global objectives				Sweden's environmental objectives			
	Sustainable energy for everybody		Sustainable cities and communities		Limiting climate impact		Good built-up environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings	• ≤ 25 * F_{geo}. **A1-7.1-SC 1** • The airtightness of critical parts of the structure (e.g. joints in airtight layers, connections and penetrations) is checked and compared with the prescribed airtightness. *Or* • Certificate of airtightness test.	• Bronze rating is met. • ≤ 20 * F_{geo}.	• Silver rating is met. • ≤ 15 * F_{geo}. • Calculation of significant thermal bridges.
Non-residential buildings	• ≤ 30 * F_{geo}. **A1-7.1-SC 1** • The airtightness of critical structural parts (e.g. joints in airtight layers, connections and penetrations) is checked and compared with the prescribed airtightness. *Or* • Certificate of airtightness test.	• Bronze rating is met. • ≤ 24 * F_{geo}.	• Silver rating is met. • ≤ 18 * F_{geo}. • Calculation of significant thermal bridges.

Instruction

The rating criteria must be adapted to the geographical location of the building with Fgeo in accordance with Boverket's (The Swedish National Board of Housing, Building and Planning) geographical adjustment factors.

The heat demand is calculated as heat losses due to heat transmission, air leakage and ventilation for those parts of the building heated to 10°C or more (A_{temp}).

Heat gains from solar and internal loads (lighting, electrical equipment, people, etc.) must not be included, and heat output for domestic hot water preparation is not included.

The heat demand is calculated as:

$$\frac{P_{transmission} + P_{ventilation} + P_{luftläckage}}{A_{om}} \quad W/m^2, A_{om}$$

The total heat demand must be distributed over the building envelope area, A_{om}. See BBR for definition of A_{om}.

The SGBC website provides tools for calculating heat demand. It is also possible to use energy calculation programs that are adapted so that the calculation takes place without solar radiation, without internal loads, with the ventilation in operation and with a sufficiently long inward swing.

If the building contains both non-residential premises and residential housing, the rating requirements are weighted according to the respective A_{temp}.

Indoor air temperature

The air temperature used for the calculation must be that intended for operation, but at least 21°C. If a higher air temperature is required to meet winter thermal climate requirements, the higher air temperature must be selected. Note that air temperature must be used in this indicator, not operational temperature.

DVUT

The location's dimensioned winter outdoor temperature, DVUT, must be used. The calculation tool includes a table for different locations and time constants.

The time constant depends, among other things, on the insulation, airtightness and specific heat capacity of the building. If DVUT with a time constant higher than one day is used, the calculation is reported.

U-values and thermal bridges

For the indicator ratings Bronze ● and Silver ●, geometric thermal bridges can be approximated with a standard flat rate of at least 30 percent of the transmission losses Σ(Ui - Ai). Ai is calculated according to BBR.

For Gold ●, significant geometric thermal bridges are calculated and reported. For example, external wall corners, window and door jambs, columns in external walls, connections of intermediate floors and intermediate walls in external walls, foundation plinths, connection of external wall and roof, and balcony connection. Geometric thermal bridges ψ value is calculated with calculation tools.

Ventilation

The average ventilation flow of the building during a typical winter week is used in the calculation. Ventilation for activity-based equipment, such as commercial kitchens, laboratories, industry or medical treatment, need not be included. In general, the same demarcation rules between operational and building-related ventilation are used as in the energy section of BBR.

The recovery efficiency used in the calculation is adjusted for defrosting and any imbalance in supply and exhaust air flow.

For exhaust air heat pump systems, the ventilation loss is calculated as follows:

$$P_{vent,\ FVP} = (Q_{frånluft} * Cp_{luft} * \rho_{luft} * DT_{frånluft\ över\ förångare}) + P_{el\ till\ kompressor}$$

Air leakage

The air leakage rate at normal pressure difference between indoors and outdoors is calculated as at least 5 percent of the designed air leakage rate in $l/s.m^2$ A_{temp} at 50 Pa pressure difference or according to EN ISO 9972:2015.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- U-values of the thermal shroud, indoor air temperature, sub-areas, envelope area, thermal bridges, ventilation flows, heat recovery and air leakage. Reported by printout from the indicator calculation tool on the SGBC website.
- If DVUT with a time constant higher than 1 day is used, the calculation must be reported.
- If the heat demand is simulated with energy calculation software, it must be stated that calculation conditions are met.
- If an exhaust air heat pump is used, calculation of efficiency is reported.
- Calculation of thermal bridges if these amount to less than 30 percent of the transmission losses.
- For Gold ●, calculation of thermal bridges is reported.

Verification

- Photographic documentation of airtightness in critical structural parts or certificate of airtightness test.

The heat demand of the building at DVUT is verified with the measured output signature based on verified measured values during the heating season. Operations and indoor temperature must be normal.

The output signature must cover measurement points over a long period (at least two months). The number of measurement points must be justified, as well as the time interval if values other than hourly values are used. Alternatively, output signatures established with at least eight different measurement values are accepted. There must be a difference of at least 1.5°C in the average outside temperature between the points, and each point must represent a period of at least one week.

The output signature determines the heat demand with one of the following alternatives:

- The directional coefficient of the output signature during the heating season is multiplied by the difference between DVUT and indoor temperature. Adjustment for domestic hot water and internal heating is not required.
- The heat demand is read at DVUT in the output signature. The heat demand must be adjusted for domestic hot water and internally generated heat contributing to the heating. The minimum supplement for internal heating must be 5 W/m^2, A_{temp}. Supplement lower than 5 W/m^2, A_{temp} is accepted if it can be substantiated with quality assured data linked to the measurement plan.

Back reporting

Any refurbishment and whether these are deemed to affect the rating.

INDICATOR 2

SOLAR HEAT LOAD

Purpose

The purpose is to promote buildings that are designed and constructed to limit excess temperatures and the output demand for comfort cooling during the summer months, and to ensure good daylight transmittance.

What is assessed

The solar heat load figure in W/m² floor area during the summer months.

Global objectives and Sweden's environmental objectives

Global objectives		Sweden's environmental objectives
Good health and well-being	Sustainable cities and communities	Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential	≤ 38	• Bronze rating is met. • ≤ 29. • LT value ≥ 0,6.	• Silver rating is met. • ≤ 18.
Non	≤ 40	• Bronze rating is met. • ≤ 32. • LT value ≥ 0,6.	• Silver rating is met. • ≤ 22.

Instruction

Solar heat load (SHL) refers to the solar heat that passes through windows and contributes to the heating of the room. The solar heat load index is defined as the solar heat supplied to the room per square metre of floor area.

Façades facing between 90 and 270°, i.e. east to west via south, are included in the assessment. Moveable shading devices are assumed to be enabled when calculating g_{syst}.

In non-residential buildings, calculations are based on shading devices installed and in operation when the building is put into service.

In residential buildings, calculations are based on exterior and intermediate shading devices installed and in operation on the commissioning date. In residential buildings, it is not a requirement that internal sunscreens are fitted when the building is put into service. Residents must be informed about the type of internal sunscreens that meet the criteria. The LT value for all windows in occupancy rooms must exceed 0.6. If this is not met, an approved daylight calculation according to BBR must be presented for the room concerned.

Simplified method

A simplified method is used for vertically mounted windows and glazing. Solar heat load is calculated using a simplified method based on the highest solar radiation during a normal year, between the spring and autumn equinoxes. The maximum solar radiation on the outside of a vertical window is approximately 800 W/m² in a normal year, regardless of location in Sweden.

For rooms with windows facing one direction:

$$SVL = 800 \cdot g_{svst} \cdot \frac{A_{glas}}{\cdot} \text{ W/m}^2$$

Rooms with windows facing two directions are exposed to the sun for a longer period of time, which can affect the size of the SHL. For these rooms, the highest of the solar heat load figures calculated from the relationship above and below is used:

$$SVL = 560 \cdot g_{syst} \cdot \frac{A_{glas\ S\ el\ \ddot{O}\ el\ V}}{A_{rum}} + 560 \cdot g_{syst} \cdot \frac{A_{glas\ S\ el\ \ddot{O}\ el\ V}}{A_{rum}} \text{ W/m}^2$$

Definitions

g_{syst} = weighted g-value for windows and shading. gsyst includes g-values for glazing and external, internal or intermediate shading devices. Projecting building elements such as balconies, eaves or similar can be accommodated.

A_{glas} = glass area (m²) in windows, doors and glazing units (excluding frames, arches and profiles).

A_{rum} = floor area of the room (m²), including the area under kitchen units, wardrobes and equivalent. In rooms without doors, solar heat can be distributed to the area of adjacent rooms.

Simulation

If the building is shaded by buildings, solar radiation other than 800 or 560 W/m² against vertical surface can be used. The calculation is made at the highest solar heat gain between the spring and autumn equinoxes in a normal year. The time does not have to coincide with the day when the outside temperature is highest. Consideration may be given to shaded buildings not yet built, but not to vegetation.

Choice of floor and room for assessment

The calculation and results of the critical assessed rooms of the building are clearly separated from any other assessed rooms. Instruction and aggregation of rating according to paragraph ”Selection of critical rooms”. Selection is made as follows:

- Rooms on the top floor with occupancy rooms must be assessed.
- Rooms on an additional floor must be assessed if they deviate significantly from the top assessed floor in terms of operations, floor plan or window solution and which, at the same time, are deemed to affect the indicator rating. Small houses are exempt from this point.
- Only occupancy rooms are included in the assessment.

On each assessed floor, the number of rooms must be assessed so that 20 percent of A_{temp} is achieved. In some cases, 20 percent cannot be achieved on an assessed floor.

Administration procedures

Instructions are provided for the inspection and maintenance of shading devices.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Site plan with any shaded areas of existing or planned buildings (if surrounding buildings are included in the calculations)
- Assessed floor with rooms marked on floor plans showing the cardinal points
- Justification for the choice of floor, rooms and for any rooms excluded
- Glazed areas in assessed rooms marked on façade drawings
- Floor area, share of A_{temp}, glazed areas and its g-value in assessed rooms, type of shading device with g-value
- Calculation by g_{syst}, program, screenshot of results or data from supplier
- Day for simulation if solar intensity other than 800/560 W/m^2 is used
- Supporting document for calculation assumptions in assessed rooms
- Supporting document for LT value for all windows in occupancy rooms. If this is not met, an approved daylight calculation according to BBR is reported for the relevant room
- Calculated SVL and room ratings for assessed rooms and aggregation of indicator ratings
- Administration procedures for the inspection and maintenance of shading devices

During verification

- Checking that calculation assumptions are consistent with preliminary certification. If this is not the case, calculations may need to be updated.
- Verification of glass and shading devices; for example, delivery receipts, delivery notes, order confirmations or photos.
- In residential buildings with internal shading devices, information on shading devices received by residents is reported.

Back reporting

Any refurbishment and whether these are deemed to affect the rating.

INDICATOR 3

ENERGY USE

Purpose

The purpose is to promote buildings that are designed, constructed and managed for low energy use.

What is assessed

Annual energy consumption of the building in kWh/m², A_{temp} according to BBR as well as the measurement plan and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives				Sweden's environmental objectives	
	Sustainable energy for everybody		Sustainable cities and communities		Limiting climate impact

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings	**A2-7.1-DNSH 1** • The energy requirements of BBR are met. • Energy declaration with radon measurement below 200 Bq/m³. • Measurement plan. • Administration procedures for monitoring energy use. • Valid oVK.	**A1-7.1-SC 1** • Bronze rating is met. • 80 percent of BBR energy requirements.	• Silver rating is met. • 70 percent of BBR energy requirements. • Energy declaration with radon measurement below 100 Bq/m³. • > 5% of the building energy is locally generated, renewable and flowing.
Non-residential buildings	**A2-7.1-DNSH 1** • The energy requirements of BBR are met. • Energy declaration with radon measurement below 200 Bq/m³. • Measurement plan. • Administration procedures for monitoring energy use. • Valid oVK.	**A1-7.1-SC 1** • Bronze rating is met. • 70 percent of BBR energy requirements.	• Silver rating is met. • 60 percent of BBR energy requirements. • Energy declaration with radon measurement below 100 Bq/m³. • > 5% of the building energy is locally generated, renewable and flowing.

Instruction

The annual energy use of the building is calculated and compared with the energy requirements of BBR. The BBR version applicable to the building permit is used to determine the indicator rating.

Energy calculations are made according to the current version of Boverket's (Swedish National Board of Housing, Building and Planning's) regulations and general advice on determining the building's energy use during normal use and a normal year (BEN).

The energy use of common garages is allocated according to the A_{temp} of the buildings.

Domestic hot water use according to BEN does not include heat losses from HVAC. Therefore, HVAC losses are added to the calculated domestic hot water energy use. Calculated values for HVAC are accepted.

In residential buildings and non-residential buildings, energy requirements are weighted according to A_{temp}.

Note that verification requires radon measurement with requirement levels and a valid OVK (Obligatory Ventilation Control) without notes about serious defects and deficiencies. It is recommended that these requirements are actively addressed at an early stage during project planning and construction.

Residential buildings

For electric underfloor heating in wet rooms, a flat rate of 5 kWh/m² per year is accepted during the verification stage if measured values are missing. This applies provided that the underfloor heating is thermostatically controlled.

Non-residential buildings

Additions for hygienic outdoor air flow according to BBR can be made. The qaverage used in the energy calculation converted to the specific outdoor air flow rate during the heating season (excluding increased air flows for airborne heating or cooling) must be used.

Measurement plan

When the building is in operation, it must be possible to separately measure the energy use of the building as follows:

- room heating
- domestic hot water
- comfort cooling
- building electricity
- business electricity.

For Silver ● and Gold ●

- heating of ventilation air.

Separate energy meters for each energy item are not necessary. Take the opportunity to place sub-meters for energy (heat quantity) complemented by flow meters for e.g. hot water.

Single flat rate surcharges are accepted if they are deemed to be less than 3 kWh/m², A_{temp}. The items must be based on constant outputs and predictable operating times. The total flat rate allocation may not exceed 20 percent of the total energy use of the building.

The metering plan describes the location of the meters, the type of meters and the control system for reading. The measurement plan shows that measurement is possible according to the sub-items above.

Administration procedures

Includes procedures for regular reading of meters according to the metering plan, processing into operational statistics and analysis of results. Follow-up is carried out at least:

- annually for Bronze ●
- monthly for Silver ● and Gold ●.

New renewable flowing locally generated building energy

Definitions and demarcation according to Boverket (The Swedish National Board of Housing, Building and Planning) and BEN.

Renewable flowing energy:

- solar energy from solar thermal collector or solar cells
- wind and hydro energy.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- BBR energy requirements with possible corrections. Calculation of the airflow addition must be reported and justified.
- Energy calculation program used.
- Input data for energy calculation. This includes building location, internal loads, climate shield, ventilation, heating and comfort cooling.
- Calculation results separated by heating, ventilation air heating, hot water use, HVAC, comfort cooling, building electricity and resulting electricity to operations.
- Energy use for any garages.
- Distribution and control losses as well as safety margin.
- Measurement plan.
- Administration procedures for these have been developed.

For Gold ●

- Energy supplied from locally produced, renewable and flowing building energy
- Supporting document showing that renewable flowing locally produced building energy is new at the time of construction of the building.

Verification

Measured energy use is reported during verification. Energy use for heating must be normalised annually. In Miljöbyggnad, corrections to measured energy use according to BEN may be made and documented.

- Energy use in kWh/m^2 based on measurement over a 12-month period. Measurement period is shown in the report.
- Energy use is compared to BBR requirements introduced during preliminary certification.
- Verification of the building's energy use is done with a valid energy declaration based on measured values. The energy declaration must be accompanied by a summary of measured values (not normal year corrected) divided into main categories according to the measurement plan for the time period to which the energy declaration relates.
- Administration procedures.
- Valid OVK without notes on serious defects and deficiencies.
- Radon measurement with long-term measurement in accordance with the Swedish Radiation Protection Authority's recommended method has been carried out and the value is reported in the energy declaration and is below 200 Bq/m^3.

For Gold ●

- Radon measurement with long-term measurement in accordance with the Swedish Radiation Protection Authority's recommended method has been carried out and the value is reported in the energy declaration and is below 100 Bq/m^3.
- Renewable, flowing, locally produced building energy is verified with energy data.

Back reporting

The administration procedures for self-monitoring of energy use form the basis for back reporting. When back reporting, it must be demonstrated that administration procedures are being followed and that performance on the relevant indicator is maintained.

INDICATOR 4

CLIMATE IMPACT

Purpose

The purpose is to declare and reduce the climate impact of the building.

What is assessed

Climate calculation and climate impact of the constructed building in kg CO_2e/m^2 GFA.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
12 HÅLLBAR KONSUMTION OCH PRODUKTION Sustainable consumption and production 13 BEKÄMPA KLIMATFÖRÄNDRINGARNA Fighting climate change	Limiting climate impact

Betygskriterier

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• The climate impact of the building from life cycle module A1–A5 is reported in accordance with Boverket's (The Swedish National Board of Housing, Building and Planning) regulations for climate declarations.	• Bronze rating is met. • Maximum climate impact for life cycle module A1–A5 according to Table 4.1.	• Silver rating is met. • Maximum climate impact for life cycle module A1–A5 according to Table 4.1. **A1-7.1-SC 1** • The climate impact of the building throughout its life cycle.

The above rating criteria also apply to buildings exempted from the Climate Declaration Act.

Instruction

Climate calculation and climate declaration must be carried out in accordance with Boverket's (Swedish National Board of Housing, Building and Planning) handbook on climate declaration.

Maximum climate impact

The limit value for Silver ● corresponds to a 10 percent lower climate impact than the median for the building type. The limit value for Gold ● corresponds to a 20 percent lower climate impact than the median, except for single-family houses where Gold corresponds to a 15 percent lower climate impact than the median, see Table 4.1.

Limit values are developed based on the report Reference values for climate impact in the construction of buildings (Malmqvist et al, 2021) and adjusted for the current system limit according to the Climate Declaration Act.

Table 4.1. *Maximum climate impact for different building types*

Climate impact A1–A5 [kg CO_2e/m^2 GFA]	SILVER ●	GOLD ●
Apartment buildings	290	260
Small houses	120	110
Offices	280	250
Schools	270	240
Preschools	220	200
Other building types	370	330

If the building consists of several building types, a value is weighted based on the area of each building type.

The climate impact of the building throughout its life cycle

Calculation of carbon dioxide emissions for the entire life cycle of the building is made according to EN 15978:2011, with a calculation period of 50 years. It divides the building life cycle into stages and modules. Production phase A is divided into modules for product phases A1–A3 and construction stages A4–A5. Use stage B is divided into modules B1–B7.

The final handling stage C is divided into modules C1–C4. D means impacts beyond the system limit of the building and is not included in the life cycle assessment for Miljöbyggnad.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Climate calculation according to Boverket's (Swedish National Board of Housing, Building and Planning) regulations on climate declarations per part of the life cycle (A1–A3, A4 and A5)
- Reporting of coverage ratio.

For Gold ●

- Climate calculation per part of the life cycle (A–A3, A4, A5, B1–B7 and C1–C4)
- Description of assumptions made for life cycle modules B1–B7 and C1–C4.

Verification

- Climate declaration for finished building according to Boverket's (Swedish National Board of Housing, Building and Planning) regulations on climate declarations.

INDICATOR 5

MOISTURE

Purpose

The purpose is to promote buildings that are designed and constructed with clear responsibilities and sufficient skills to reduce the risk of future problems caused by moisture and water damage.

What is assessed

Skills and responsibilities, documentation and methodology, checks and measurement during project planning and production and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
Good health and well-being	Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	**Skills and responsibilities** Project planning • The project planning team includes person(s) with moisture expertise to meet BBR's moisture safety requirements. • One member of the project planning team is appointed as the person responsible for requirements documentation of moisture safety work (moisture safety description) during project planning. Production • The contractor appoints a person as moisture safety officer, who is responsible for moisture safety during production.	• Bronze rating is met. **Skills and responsibilities** Project planning • A moisture expert appointed by the developer is actively involved in the project. Production • The moisture expert is responsible for both reviewing and supervising the work.	• Silver rating is met. **Skills and responsibilities** Project planning • A certified moisture expert appointed by the developer actively participates in the project's moisture work. Production • The moisture safety officer has the necessary training and/or experience.

Residential buildings and non-residential buildings	**Documentation and methodology** Project planning • Moisture safety project planning is carried out according to BBR 6:53. • All moisture safety requirements are documented in the project. • The moisture safety description refers to moisture safety requirements in BBR. • Industry Safe Water Installation rules are met. Production • The contractor draws up a moisture safety plan for production based on an updated moisture safety description and results from the moisture safety project planning. • Industry Safe Water Installation rules are met.	**Documentation and methodology** Project planning • Industry standard ByggaF templates or equivalent are used. Production • Moisture safety work is documented according to industry standard ByggaF or equivalent.	
Residential buildings and non-residential buildings	**Checks and measurement** Project planning • Drying times for concrete and screeds are accounted for and fit within the project schedule. • Functional and performance requirements in industry rules for wet rooms and pipe installations are met. • Person designated as responsible for moisture safety work during project planning specifies checkpoints to be included during inspection rounds. • Administration procedures for checking moisture safety are in place. Production • Moisture measurement in concrete is performed according to BBR. • Functional and performance requirements in industry rules for wet rooms and pipe installations are met. • Administration procedures for checking moisture safety are in place.	**Checks and measurement** Project planning • The moisture expert determines the minimum number of work preparations and recorded moisture inspection rounds that are carried out during the construction phase and in which they participate. • Industry rules for wet rooms and pipe installations are met. Production • Moisture measurement in concrete is carried out according to RBK and by RBK authorised moisture inspector. • Industry rules for wet rooms and pipe installations are met. • How watertight flat roofs, roof terraces, courtyard floors and similar building elements are must always be tested, irrespective of whether a superstructure is installed. Methodology for tightness testing according to AMA Hus 21, YHB.2132 or equivalent.	

Instruction

Skills and responsibilities

The person appointed as responsible for moisture safety work in the project planning group is responsible for documenting the moisture safety project planning and ensuring that the necessary information is transferred to the moisture safety officer in production. Skills and experience requirements are determined in the project based on complexity. The appointed person has a good understanding and documented experience of moisture risks and methods described in industry standard ByggaF.

The moisture safety officer is responsible for coordinating moisture safety during production and also the moisture safety plan and ensures that it is followed during the construction phase. Skills and experience requirements are determined in the project based on complexity. The moisture safety officer has a good understanding of moisture risks and methods described in industry standard ByggaF.

For Silver ● and Gold ●

The moisture expert possesses solid expertise in moisture-related issues, with at least five years of documented experience of moisture safety work and basic knowledge of building technology, building physics and the construction process. Skills and experience requirements are determined in the project based on complexity.

For Gold ●

The moisture expert is a certified moisture expert.

The moisture safety officer has attended training to be a moisture safety officer for production, for example ”Moisture safety officer for production” at Fuktcentrum or equivalent. Alternatively, the moisture safety officer can demonstrate five years of experience in the role of moisture safety officer in production.

Moisture safety description

The moisture safety description contains the project’s prerequisites regarding moisture and what is required of the various parties. It is adapted to the complexity of the project, indicator ratings and updated on an ongoing basis. The moisture safety description is drawn up at the start of detailed project planning at the latest and contains moisture safety requirements, critical structures, work procedures and required checks.

Prior to the construction phase, the moisture safety description is updated and communicated to the moisture safety officer who implements the requirements and solutions in the moisture safety plan.

ByggaF provides an annex (template) for moisture safety description.

Moisture safety plan for production

The moisture safety plan describes how the moisture safety program and/or moisture safety description is applied in production and how critical steps and measures according to the moisture safety plan are handled. It describes the moisture safety measures that the contractor is obliged to implement during the construction phase. It describes the checks to be carried out and how they are documented. Depending on the indicator rating, the moisture safety plan includes reconciliations and reports with the moisture expert.

ByggaF provides an annex (template) for a moisture safety plan.

Moisture safety documentation

Moisture safety documentation means the complete documentation of the project as stated in the moisture safety description.

Industry regulations

Industry regulations apply to:

- Safe Water Installation
- GVK - The Flooring industry's wet room checks, BBV - The Building ceramics industry's regulations for wet rooms
- MVK - The Paint industry's wet room checks, RBK - The Council for Building Expertise.

Administration procedures

Procedures for checking the occurrence of moisture and water damage leading to indoor environmental problems may include, for example, inspections, measurements, procedures for handling information from users and operating staff.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Documentation with responsibilities for moisture safety work according to the criteria above
- Current moisture safety description including annexes
- Projected drying times for screeds and concrete
- Administration procedures for these have been developed.

For Silver ● and Gold ●

- Evidence that the moisture expert has the required skills
- The documentation is established according to ByggaF.

For Gold ●

- Diploma and CV of a certified moisture expert
- Evidence that the moisture safety officer has the required skills.

Verification

- Documentation of any moisture or water damage observed during the period up to verification according to administration procedures
- Any test protocols and/or certificates of compliance with industry rules depending on the rating
- Protocols from moisture surveys
- Administration procedures

- Supporting document to show the skills of any RBK-authorized person
- Complete moisture safety documentation that includes moisture safety work during the period leadingup to verification.

The above can be replaced by a final certificate from a certified moisture expert that summarises the project's moisture safety work, supplemented with relevant extracts that substantiate the information in the final certificate.

For Bronze ●, Silver ● and Gold ●

- Certificates from relevant professional organisations
- Safe Water Installation Certificate.

Back reporting

The administration procedures for moisture safety checks provide the basis for back reporting. For back reporting, evidence must be provided that administration procedures are followed and that performance on the relevant indicator is maintained.

INDICATOR 6

SOUND

Purpose

The purpose is to promote buildings that are designed, constructed and managed for a good sound environment.

What is assessed

The sound environment according to BBR and the Swedish sound standards and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
Good health and well-being	Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings	• The sound expert is involved in the project. • Requirements for the four acoustic parameters under the heading instruction and BBR. • Administration procedures are in place.	• Bronze rating is met. • At least two out of four acoustic parameters fulfill sound classification B or higher according to SS 25267.	• Silver rating is met. • The four acoustic parameters assessed fulfill at least sound classification B in SS 25267. • Approved survey or statement from a sound expert.
Non-residential buildings	• The four acoustic parameters that are assessed to meet sound classification C according to SS 25268:2007+T1:2017. *Or* • The parameters meet the basic requirements according to SS 25268:2022 or later. *Regardless of the above* • The sound expert is involved in the project. • Administration procedures are in place.	• Bronze rating is met. • At least two out of four acoustic parameters fulfill sound classification B or higher according to SS 25268:2007+T1:2017. *Or* • 50 percent of the rooms covered by extended requirements meet extended requirements according to SS 25268:2022 or later.	• Silver rating is met. • The four acoustic parameters meet sound classification B according to SS 25268:2007+T1:2017. *Or* • 80 percent of the rooms covered by extended requirements fulfill standard SS 25268:2022 or later limits for "extended requirements". *Regardless of the above* • Approved survey or statement from a sound expert.

Instruction

In Miljöbyggnad, the sound environment is assessed using the following acoustic parameters:

- indoor sound pressure level from installations
- airborne sound insulation/sound level difference
- impact sound level
- indoor sound pressure level from external sound sources
- room acoustics (SS 25268:2022 only).

The selection of parameters is based on which are deemed to have the greatest impact from users at the Silver ● rating level.

The rating criteria for residential buildings are based on requirement levels in BBR and SS 25267. For non-residential buildings, the criteria are based on SS 25268. The criteria must be met in the rooms specified in the BBR or in the sound standard. The standard does not provide sound requirements for all room types or activities in non-residential buildings. If they are not available, the sound expert determines and presents the sound requirements to be met based on requirements for similar rooms or activities in the standards.

Sound expert

Skills and experience requirements are determined at the project level depending on the complexity, but at least two years of experience of building acoustic design for simple projects and at least five years of experience in building acoustic design for more complex projects. Sound experts specify the appropriate requirements for those rooms and activities not included in the standard. The requirements must be based on similar rooms or activities in the standard.

Sound description

A document is prepared by the project sound expert. It includes the project requirements, what needs to be done, by whom, when and how it will be followed up and documented.

The scope and level of detail vary with the size of the project. Possible headings are:

- description of the project, organisation, building and activities
- sound requirements and conditions per acoustic parameter
- sound-critical constructions, parts or work steps
- proposals or requirements for technical solutions or execution
- follow-up during project planning; for example, when and how often the sound expert consults with the relevant project planner and when, and to what extent, documents must be reviewed
- monitoring during the construction phase; possible product checks, execution, checks and documentation of critical designs and critical operations. Reconciliations with the sound expert.

Choice of room for assessment

The most critical rooms for each acoustic parameter are selected for verification. Critical rooms are identified by the sound expert based on use, sound requirements, noise exposure, construction solutions and design. The size of area subject to measurement and calculation is selected according to the relevant standard.

Verification

Verification must be carried out according to standard SS 25267/SS 25268. For Gold ●, compliance with the verification by measurement section is required.

Deviations and exemptions

Deviations from the sound requirements of the standards are accepted in rooms where the activity has specific requirements pertaining to security, confidentiality, accessibility or specific hygiene and health requirements. The sound expert must justify any deviations.

Noise from helicopters and emergency vehicles is excluded.

Exceptions are allowed for verification of room acoustics when spaces are unfurnished. Verification of façade insulation with respect to outdoor noise can be carried out with an examination of the façade and window type together with tightness testing. Exemptions are also granted for indoor sound pressure levels from external sources where one measurement in the critical space, together with calculation and product verification combined with leakage testing, is sufficient.

Administration procedures

Administration procedures include, for example, monitoring measurement, user surveys or complaint handling procedures.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Sound expert's CV. If more than one sound expert is involved, it must be clear who was responsible for what, and all CVs must be attached.
- Administration procedures for these have been developed.

Verification

- Verification of the rating criteria is done by measurement or inspection and checks, or by a combination of these, see the relevant sound standard.
- Statement from a sound expert regarding whether or not the sound classifications are met.
- Administration procedures.

For Gold ●

- Survey or an opinion from a sound expert.

Back reporting

The administration procedures for monitoring the sound environment provide the basis for back reporting. For back reporting, evidence must be provided that administration procedures are followed and that performance on the relevant indicator is maintained.

INDICATOR 7

WINTER THERMAL CLIMATE

Purpose

The purpose is to promote buildings that are designed, constructed and managed for a good thermal climate during the winter.

What is assessed

The thermal climate based on PPD index at DVUT and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
Good health and well-being	Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• PPD ≤ 15 percent. • Administration procedures for winter thermal climate checks.	• Bronze rating is met. • PPD ≤ 10 percent.	• Silver rating is met. • Approved survey or measurement.

Instruction

Operational temperature limits for users or activities can be found in climate manuals, such as the Energy and Environmental Technology Association's R1 or in the annex to the standard EN ISO 7730:2006.

Simulation is carried out using the local design winter outdoor temperature, DVUT, at the time constant of one day and without heat input from the sun and internal loads.

Operating temperature is calculated at the point in the occupied zone where the risk of discomfort is greatest, usually 1.0 metre inside the centre of the largest window and between 0.6 and 1.7 metres above the floor. The calculation is made using simulation programs.

The following calculation assumptions are used in the simulation:

- the geometry of the space
- U-values for external walls and for any roof and foundation construction (if relevant)
- thermal capacity of the structures (if relevant)
- relevant thermal bridges
- location, size, U-value of windows
- size, location and surface temperature of space heaters
- the air temperature of the room
- supply air flow and supply air temperature. For hot air systems, the design supply air temperature and supply air flow rate are used.

If data for the activity and users are unknown, the following can be used: 1.0 clo, (insulation value of users' clothes) 1.2 met (users' metabolic activity level) and air velocity 0.15 m/s in the occupied zone and relative humidity RH = 30 percent.

The report confirms that the required heat output is installed in the room to ensure the desired room air temperature at the design winter outdoor temperature.

Measurement

Any measurement of the thermal climate for Gold ● is made according to EN ISO 7726. Also see the guidelines of the Energy & Environment Technical Association, R1 Guidelines for the specification of indoor climate requirements. Measurement is compared with accepted ranges in R1.

Choice of floor and room for assessment

The calculation and results of the critical assessed rooms of the building are clearly separated from any other assessed rooms. Instruction and aggregation of ratings according to "Methodology". Selection is made as follows:

- Rooms on the top floor with occupancy rooms must be assessed.
- Rooms on an additional floor must be assessed if they deviate significantly from the top assessed floor in terms of operations, floor plan or window solution and which, at the same time, are deemed to affect the indicator rating. Small houses are exempt from this point.
- Only occupancy rooms are included in the assessment.

On each assessed floor, the number of rooms must be assessed so that 20 percent of A_{temp} is achieved. In some cases, it is not possible to achieve 20 percent on an assessed floor.

Security, confidentiality, accessibility or specific hygiene and health requirements may be reasons to exempt rooms from assessment. If this is the case, this must be justified in the application. In some rooms, the activity may mean that the criteria are not applicable, for example rooms intended for high physical activity or rooms with high internal loads. These rooms can also be exempted from assessment and this must be justified in the application.

Administration procedures

Administration procedures for winter thermal climate checks. Procedures for checking the thermal climate in winter may include, for example, function checks of the heating system, control measurements of temperatures, user surveys or procedures for handling complaints.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Assessed floor plans with assessed rooms marked on floor plans. The corresponding windows are marked on the façade drawings.
- Justification for the choice of floors and rooms and, where appropriate, justification for floors or rooms excluded
- Calculation program used and version
- Input to calculation programs
- Internal height, width and length of the room
- U-values for external walls and for any roof and foundation construction (if relevant)
- Thermal capacity of the structures (if relevant)
- Relevant thermal bridges
- Window area and U-values
- Size, location and surface temperature of space heaters
- Room air temperature
- Supply air flow and supply air temperature
- Clo and met, i.e. the insulation value of the users' clothing and the users' metabolic activity level, respectively
- Simulation day
- Relative humidity and air speed in the occupied zone
- Supporting documentation to show that heat output at calculation is installed in the room
- Calculation results for each assessed critical room
- PPD and room rating
- Floor area and its proportion of the floor A_{temp}
- Operational temperature

- Aggregate indicator rating
- Administration procedures for these have been developed.

Verification

- Checking that calculation assumptions are consistent with preliminary certification. If this is not the case, calculations may need to be updated.
- Verification of glass and space heating, such as delivery receipts, delivery notes, order confirmations or photos.
- Administration procedures.

For Gold ●

- Survey questionnaire with results or measurement results of PPD.

Back reporting

The administration procedures for checking the thermal climate in winter provide the basis for back reporting. For back reporting, evidence must be provided that administration procedures are followed and that performance on the relevant indicator is maintained.

INDICATOR 8

SUMMER THERMAL CLIMATE

Purpose

The purpose is to promote buildings that are designed, constructed and managed for a good thermal climate during the summer.

What is assessed

The thermal climate based on the PPD index on a critically hot and sunny day or assessment based on indicator 2 as well as administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives				Sweden's environmental objectives	
	Good health and well-being		Sustainable cities and communities		Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential and non-residential buildings without comfort cooling	Alternative 1: • Bronze on indicator 2 and airing possibility. Alternative 2: • PPD ≤ 20 percent. Regardless of alternative: • Administration procedures for summer thermal climate checks.	• Bronze rating is met. Alternative 1: • Silver on indicator 2 and opening windows or window doors. Alternative2: • PPD ≤ 15 percent.	• Silver rating is met. Alternative 1: • Gold on indicator 2 and opening windows or window doors. Alternative 2: • PPD ≤10 percent. Regardless of method: • Survey or measurement.

Non-residential buildings with comfort cooling	• PPD ≤ 15 percent. • Administration procedures for summer thermal climate checks.	• Bronze rating is met. • PPD ≤ 10 percent.	• Silver rating is met. • Survey or measurement.

Instruction

Assessment with indicator 2

The simplified method referring to Indicator 2 is used in residential and non-residential buildings without comfort cooling and where the internal load of critical rooms (people, lighting and electrical equipment) is less than 20 W/m². The simplified method cannot be applied to rooms that do not meet at least Bronze ● on indicator 2.

In indicator 2, only critical rooms between 90° and 270° are calculated. For the indicator in question, critical rooms with an orientation of 15° to the north-east or north-west (75° to 90° and 270° to 285°) must also be checked or equipped with the same g-value for windows, shading and ventilation as critical rooms in indicator 2.

Assessment with PPD

Operational temperature limits for users or activities can be found in manuals, such as the Energy and Environmental Technology Association's R1 or in the annex to the standard EN ISO 7730:2006.

Simulation takes place during the days when the need for added comfort cooling is greatest, or when the risk of discomfort is greatest. The assumptions for simulation are presented, justified and realistic with regard to utilisation, safety, health and noise.

The operational temperature is calculated at the point in the occupied zone where the risk of discomfort is greatest. It is usually at a point 1.0 metre inside the centre of the largest window, between 0.6 and 1.7 metres above the floor. The calculation is made using simulation programs.

The following calculation assumptions are used in the simulation:

- the geometry of the space
- U-values for external walls and for any roof and foundation construction (if relevant)
- window location, size, g-values and shading device
- any cooling effect, size, location and surface temperature of cooling surfaces
- supply air flow and supply air temperature
- internal loads.

If data for the activity and users are unknown, the following can be used: 0.5 clo, 1.2 met and air speed 0.20 m/s in the occupied zone and relative humidity RH = 50 percent.

The report must demonstrate that the required cooling capacity is installed in the room to ensure the desired room air temperature at design conditions.

Measurement

Any measurement of the thermal climate for Gold ● is done according to EN ISO 7726. Also see the guidelines of the Energy & Environment Technical Association, R1 Guidelines for the specification of indoor climate requirements.

Choice of floor and room for assessment

The calculation and results of the critical assessed rooms of the building are clearly separated from any other assessed rooms. Instruction and aggregation of ratings according to ”Methodology”. Selection is made as follows:

- Rooms on the top floor with occupancy rooms must be assessed.
- Rooms on an additional floor must be assessed if they deviate significantly from the top assessed floor in terms of operations, floor plan or window solution and which, at the same time, are deemed to affect the indicator rating. Small houses are exempt from this point.
- Only occupancy rooms are included for the assessment.

On each assessed floor, rooms must be assessed to 20 percent of A_{temp} achieved. In some cases, 20 percent cannot be achieved on an assessed level.

Security, confidentiality, accessibility or specific hygiene and health requirements may be reasons to exempt rooms from assessment. This must be justified in the application. In some rooms, the activity may mean that the criteria are not applicable, for example rooms intended for high physical activity or rooms with high internal loads. These rooms can also be exempted from assessment and must then be justified in the application.

Administration procedures

Administration procedures for summer thermal climate checks. Procedures for checking the thermal climate in summer may include, for example, checking the function of the comfort cooling system, the possibility of ventilation, control measurements of temperatures, user surveys or procedures for handling complaints.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Assessed floor plans with assessed rooms marked on floor plans with cardinal points. The corresponding windows are marked on the façade drawings.
- Justification for the choice of floors and rooms and, if applicable, justification for floors or critical rooms excluded.

If assessed against indicator 2:

- Internal loads
- Management of sun protection and ventilation in rooms orientated 15° to the north-east or north-west (75 to 90° and 270 to 285°).

If assessed with PPD:

- Calculation program used and version
- Input to the calculation program. Internal height, width and length of the room
- U-values for external walls and for any roof and foundation construction (if relevant)
- Window location, ventilation, size, g-values and shading device
- Any cooling effect, size, location and surface temperature of cooling surfaces
- Supply air flow and supply air temperature
- Internal loads
- Clo and met, i.e. the insulation value of the users' clothing and the users' metabolic activity level, respectively
- Simulation day
- Relative humidity and air speed in the occupied zone
- Supporting documentation to show that the cooling output in the calculation is installed in the room
- Results for each room assessed
- PPD and room rating
- Floor area and its proportion of the floor A_{temp}
- Operational temperature
- Aggregate indicator rating
- Administration procedures for these have been developed.

Verification

- Checking that calculation assumptions are consistent with preliminary certification. If this is not the case, calculations may need to be updated.
- Verification of glass, shading devices and room cooling, for example, delivery receipts, delivery notes, order confirmations or photos.
- Administration procedures.

For Gold ●

- Survey questionnaire with results or measurement results of PPD.

Back reporting

The administration procedures for checking the thermal climate in summer provide the basis for back reporting. For back reporting, evidence must be provided that administration procedures are followed and that performance on the relevant indicator is maintained.

INDICATOR 9

PHASING OUT HAZARDOUS SUBSTANCES

Purpose

The purpose is to promote buildings that are designed, constructed and managed with as few hazardous substances as possible in the materials and construction products.

What is assessed

Presence of candidate, phase-out, endocrine disruptor and priority risk reduction substances in construction products, emissions of VOCs in the indoor environment and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
Good health and well-being	Good built-up; Non-toxic

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• substances on the candidate list under the European chemicals legislation REACH are only present to a minor extent in construction products for the product categories E, F, G, H, I, J, K, L, M, N and Z according to BSAB 96. • administration procedures to avoid hazardous substances.	• Bronze rating is met. • Phase-out substances and prioritised risk reduction substances according to the KEMI PRIo criteria are only present to a minor extent in building materials. • Endocrine disruptors according to the ChemSec SIN list are only present to a minor extent in building materials.	• Silver rating is met. **A1-7.1-DNSH 5** • From construction products (including chemical products) to which the user is exposed indoors: - do not exceed the LCI emission values emit less than 0.06 mg /m^3 formaldehyde. - emit less than 0.001 mg of carcinogenic volatile organic compounds of category 1A and 1B per m^3.

Instruction

Information on the content of phase-out substances, endocrine disruptors, priority risk reduction substances and emission values of construction products can be found in the construction product declaration, see indicator 15.

Assessment systems are commonly used but own tools and methods are accepted. In the event of self-assessment, there must be documentation showing the evaluation method and the qualifications of the person who carried out the assessment.

Building material

In Miljöbyggnad, building material refers to the product that is installed or used in the building. It can be a chemical product as defined in REACH. Composite building materials follow the definitions in REACH.

Candidate list

The Candidate List is a list of substances of very high concern according to the European chemicals legislation, REACH.

Phase-out substances

Phase-out substances are considered particularly dangerous and are defined by KEMI. Phase-out substances according to KEMI's PRIO criteria must not be present in quantities exceeding the content limits according to the CLP Regulation.

Endocrine disruptors

The SIN List is a database of substances that, according to ChemSec, meet the criteria for being substances of very high concern (SVHCs) under REACH, but have not yet been included in the legislation. The SIN List can be used as a guide for those who want to get ahead of the legislation and phase out hazardous substances. Substances listed as endocrine disruptors on the SIN list complement the EU ED database of endocrine disruptors Cat 1 and Cat 2.

Priority risk reduction substances

For Gold ●, non-priority risk reduction substances according to KEMI's PRIO criteria may be present in quantities above the concentration limits according to the CLP Regulation.

Emission values

EU-LCI emission values are measured according to the EN16516+A1:2020 standard or equivalent. Previous measurements corresponding to EN16516 are accepted.

Assessment systems are commonly used to show emission values. Own tools and methods are accepted. In the event of self-assessment, there must be documentation showing the evaluation method and the qualifications of the person who carried out the assessment.

Minor scope

A few deviations from the rating criteria are accepted. It must be stated that alternative products have been investigated. Deviations must be documented, justified and summarised. The quantity and location must be indicated.

For Silver ●, an assessment of building materials and chemical products with non-public content is accepted if none of these substances are present.

Administration procedures

Procedures for maintaining a logbook may include, for example, instructions for future refurbishment, tenant adaptation or reuse. During the management phase, the logbook must be continuously updated.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Supporting documentation to show that the management of hazardous substances during the construction phase with regard to the rating criteria of the rating applied for.
- If the logbook is completed: complete logbook with relevant elements supporting the rating applied for including any deviations.
- In the event of self-assessment, there must be documentation showing the evaluation method and the qualifications of the person who carried out the assessment.
- Administration procedures for these have been developed.

Verification

- Complete and, where appropriate, updated logbook with relevant elements to support the rating applied for including any deviations.
- Administration procedures.

Back reporting

The administration procedures for the avoidance of hazardous substances provide the basis for back reporting. Any refurbishments or tenant adaptations that affect the rating are reported.

INDICATOR 10

CLIMATE RISKS

Purpose

The purpose is to strengthen climate change knowledge building and to promote buildings that have identified climate risks in the geographical location where the building is to be constructed and to implement priority measures.

What is assessed

Mapping of climate risks that exist, climate risk and vulnerability analysis carried out and measures for adapting the building and the outdoor environment of the property to climate change.

Global objectives and Sweden's environmental objectives

Global objectives		Sweden's environmental objectives
Good health and well-being	Sustainable cities and communities	Good built-up area environment

Rating criteria

	BRONZE	SILVER	GOLD
Residential	• Identify what climate-related risks exist in the geographical location.	• Bronze rating is met. • A climate risk and vulnerability analysis has been carried out. • Administration procedures.	• Silver rating is met. **A1-7.1-DNSH 2** **A2-7.1-SC 2** • A climate risk and vulnerability analysis has been carried out in accordance with the EU taxonomy.

Instruction

Identifying climate risks

Identify the physical climate-related risks in the geographical location based on Table 10.1.

Table 10.1. *Classify the risks.*

	Water-related	Related to solid mass	Temperature-related	Wind-related
Recurrent (chronic)	Changes in precipitation patterns and types (rain, hail, snow/ice)	Coastal erosion	Temperature changes (air, freshwater, seawater)	Changes in wind patterns
	Variations in precipitation and/or hydrology	Land degradation	Heat stress	
	Ocean acidification	Soil erosion	Temperature variations	
	Saltwater intrusion	Soil liquefaction	Thawing permafrost	
	Rising sea levels			
	Water stress			
Urgent (acute)	Drought	Avalanche	Heatwave	Cyclone, hurricane, typhoon
	Heavy precipitation (rain, hail, snow/ice)	Landslide	Cold wave/frost	Storms (including snow, dust and sandstorms)
	Flooding (coastal, fluvial, pluvial, groundwater)	Soil acidification	Uncontrolled surface fire	Tornado
	Flooding of glacial lake			

Climate-related risks (table 10.1)

Climate-related risks must be divided into recurrent (chronic), which occur slowly over time (e.g. sea level rise and increase in average temperature), and urgent (acute), which are extreme weather events (e.g. torrential rain, forest fires and heat waves).

All climate-related risks in Table 10.1 need to be considered, but since not all the listed risks can be considered relevant to the Swedish climate and Swedish properties, these may be excluded from the assessment. In such cases, this must be clearly stated and justified.

Climate risk and vulnerability analysis

The physical climate risks relevant to the site have been identified from the climate risks listed in Table 10.1.

Climate risk and vulnerability analysis is carried out with the following steps:

- Analysis of which physical climate risks from Table 10.1 may affect the building during its lifetime.
- Assessment of the significance of the physical climate risks to the building. Each climate risk can be rated as low, medium or high risk.
- Proposal and assessment of adaptation measures that can reduce the most significant identified physical climate risks.

For Gold ●

The climate risk and vulnerability assessment is proportionate to the type of activity and lifetime of the building, in that:

- the analysis includes information on the economic impact of the identified climate risks on the building over its lifetime.

- the climate risk analysis is carried out through projections available from, for example, SMHI or the Swedish Civil Contingencies Agency (MSB).
- the analysis is done using the highest resolution climate projections available (see SMHI for more information) for future scenarios covered by the IPCC (Intergovernmental Panel on Climate Change) representative concentration evolution pathways, RCP 4.5 and RCP 8.5.
- the projections are consistent with the lifetime of the building (minimum 50 years), and the climate projection scenarios need to be for at least 30 years.
- the climate projections and impact assessment are based on best practice and available guidance and take the latest scientific evidence into account.

Adaptation to climate change (Adaptation Plan)

An adaptation plan is drawn up for any projects requiring climate adaptation measures. For the selected adaptation solutions, the following applies:

- They are in line with local, regional or national adaptation plans and strategies.
- They do not negatively affect adaptation measures or resilience to physical climate risks of other people, nature, cultural heritage, assets or other economic activities.
- They favour nature-based solutions or rely as much as possible on blue or green infrastructure. Nature-based solutions are defined as solutions that are inspired and supported by nature and are cost-effective, provide simultaneous environmental, social and economic benefits and help build resilience. These could include trees, green walls and roofs, retention ponds, rain gardens, etc.

For Gold ●

- Before the building is put into use, climate adaptation measures in and around the building must have been applied to such an extent that significant risks are clearly reduced.
- The application of the adaptation solutions that reduce the most significant identified physical climate risks must be implemented within five years.

Administration procedures

Established adaptation plan with measures that reduce the building's most significant climate-related risks.

It is clear that if changes to the building or property are made, an updated climate and vulnerability assessment may need to be prepared.

For Gold ●

- An assurance that the implementation of measures for the most significant risks from the adaptation plan is intended to be implemented over a five-year period.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Mapping of the climate risks associated with the geographical location of the building.

For Silver ● and Gold ●

- Administration procedures
- Presentation of physical climate risks per building based on the expected lifetime of the building and how they were prioritised
- Climate risk and vulnerability analysis at building or property level
- Adaptation plan.

Verification

For Gold ●

- Supporting documentation to show that climate adaptation measures with clearly reduced climate risks have been applied before the building is occupied.

Back reporting

The administration procedures for climate risk management provide the basis for back reporting. When back reporting, evidence must be provided that the management procedure with adaptation plan has been followed.

INDICATOR 11

ECOSYSTEM SERVICES

Purpose

The purpose is to promote properties that are developed with the aim of preserving or adding ecosystem services to the site, thereby contributing to a resilient and attractive outdoor environment.

What is assessed

System document landscape, Green Area Factor (GAF) calculation as well as administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives		Sweden's environmental objectives	
Sustainable cities and communities	Ecosystems and biodiversity	Good built-up	Rich plant and animal

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• Established system document LA. • Site-specific description LA. • Administration procedures.	• Bronze rating is met. • Green Area Factor (GAF).	• Silver rating is met. **A1-7.1-DNSH 6** • The building has not been built on land according to the EU taxonomy DNSH 6.2.

Instruction

For Bronze

Established system document landscape

A landscape architect, biologist, ecologist, landscape engineer or other person with knowledge of design, ecological and social values and local climate develops a design for the outdoor environment that includes supporting, regulating and cultural ecosystem services. If the site is undeveloped or contains green spaces with high ecological values, the focus should be on preserving and developing the green qualities that provide the site with ecosystem services. If the site is previously developed, the focus should be on creating ecosystem services.

Solutions that provide supporting, regulating and cultural ecosystem services are designed based on the intended type of activity of the building. The regulating ecosystem services can be usefully coordinated with indicator 10.

Site-specific description landscape

The system document is supplemented by a report with an overview of the regulating, supporting and cultural ecosystem services that the project has worked with. The presence of, and consideration for, existing valuable natural land and trees worthy of ecological protection for ecosystem services is particularly highlighted. If necessary, the report can be supplemented with illustrative material to clarify how the design has taken into account the site-specific conditions for ecological and social values.

For Silver ● and Gold ●

Green Area Factor (GAF)

An attractive and healthy outdoor environment is created by planning, building and managing green and blue structures in the building area. The Green Area Factor (GAF)is a well-established tool to ensure that the outdoor environment has the conditions for high-quality greenery that provides the site with ecosystem services and biodiversity.

Many municipalities have developed their own GAF model, and the requirement to calculate GAF differs between municipalities. If the project is subject to a municipal GAF requirement, the same basis can be used to report the indicator. If the project is not subject to a municipal GAF requirement, any GAF model can be used. The project must then achieve the target value of the selected GAF model including balancing, if any.

If there is a municipal requirement for a GAF model, the following must be reported:

a. Which municipality's GAF model is required

b. Target value of the GAF model

c. The GAF calculation

If there are no municipal requirements for calculating the GAF, the project can use any GAF model or the GAF model provided by SGBC. The following must be reported:

a. Selected GAF model

a. Target value of the GAF model

a. AF calculation

The GYF calculation is carried out by a landscape architect with knowledge of design, ecological and social values and local climate.

Administration procedures

- Administration procedures developed by the landscape architect
- Administration procedures developed for the outdoor environment, including the green areas of the site
- Administration procedures for the outdoor environment for at least five years, setting out, for example, how green roofs, plant and rain gardens are to be maintained as well as watering and pruning needs.
- Administration procedures contain an objective of how the management contributes to maintaining and developing the site's ecosystem services in the long term.

For Gold ●

The building has not been built on the following: (in accordance with EU taxonomy A1-7.1-DNSH 6)

- Arable and cropland with medium to high levels of soil fertility and below-ground biodiversity according to the EU LUCAS* survey
- Undisturbed land with a recognised high level of biodiversity and land that serves as habitat for endangered species (plants and animals) listed on the European Red List** or the IUCN Red List***
- Land that corresponds to the definition of forest as set out in national legislation and used in the national greenhouse gas inventory or, if one is not available, that is consistent with the FAO definition of forest ****.

** JRC ESDCA, Lucas: Statistical Framework Survey of Land Use and Land Cover (version of the [date of adoption]: esdac.jrc.ec.europa.eu/projects/lucas).*

*** IUCN, The IUCN European Red List of Threatened Species (version of [date of adoption]: www.iucn.org/regions/europe/our-work/biodiversity-conservation/european-red-list-threatened-species*

**** IUCN, The IUCN Red List of Threatened Species (version of [date of adoption]: www.iucnredlist.org).*

***** Land covering more than 0.5 hectares with trees taller than 5 metres and canopies covering more than 10% of the surface, or with existing trees that can achieve these values. The definition does not include land used predominantly in agriculture or as urban land.*

Compliance with taxonomy criterion A1-7.1-DNSH 6 is reported by means of an environmental impact assessment (EIA) or a nature value inventory in accordance with SS 199000:2014 (NVI). In cases where the municipality reports land use in its comprehensive plan, it is possible to use it as a basis for reporting.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- System document landscape, e.g. floor plan, plant list and type sections for plant beds
- Report with site description landscape
- Landscape architect's CV
- Administration procedures.

For Silver ●

- GAF calculation - completed Excel table and floor plan.

For Gold ●

- Environmental impact assessment (EIA), nature value inventory according to SS 199000:2014 (NVI) or extract from municipal comprehensive plan.

Verification

For Silver ● *and Gold* ●

- Statement from warranty inspection.

Back reporting

Inspection report carried out by a green surveyor.

INDICATOR 12

FLEXIBILITY AND DISMOUNTABILITY

12

Purpose

The purpose of the criterion is to promote buildings designed to be more resource efficient, adaptable, flexible and demountable.

What is assessed

That a study has been carried out to identify possible measures that can be applied in the building in question.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
12 HÅLLBAR KONSUMTION OCH PRODUKTION Sustainable construction and production	

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• A study has been carried out to identify possible measures and whether these measures can be applied in the current building in terms of demountability, flexibility or adaptability.	• Bronze rating is met. **A1-7.1-DNSH 4** • Demountability, adaptability and flexibility plan in place. Alternative 1: • At least one measure for flexible, demountable or adaptable building must be applied. Alternative 2: • At least one identified product designed for flexibility, demountability or adaptability must be present in the construction.	• Silver rating is met. Alternative 1: • At least two measures for flexible, demountable or adaptable building must be applied. Alternative2: • At least two identified products intended for flexibility, demountability or adaptability must be present in the construction.

Instruction

A study has been carried out to identify possible measures and whether these measures can be applied in the current building in terms of demountability, flexibility or adaptability.

The study must identify possible measures, see examples below.

Examples of possible measures for the design of the building regarding demountability, adaptability and flexibility:

- The building has a flexible floor plan.
- The building has demountable fittings.
- Reversible connections are used.
- Installation shafts and technical operating spaces in the building are positioned to enable customised floor plans.
- Reversible methods in frame are used.
- Reversible methods in frame supplementation are used.

For more examples, please refer to ISO 20887 or other relevant standards for assessing the demountability or adaptability of buildings.

If the study identifies opportunities that are applied in the relevant project, it must be signed.

For Silver ● and Gold ●

In addition to the study, a demountability and flexibility plan must also be presented to achieve the requested rating. The demountability and flexibility plan must include at least:

- Description of measures implemented or identified products used with regard to demountability, adaptability or flexibility.
- Instructions for demountability, adaptability or flexibility based on the selected measure.
- Description of equipment needs for demountability (installation guide).

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- A project-specific study.
- If the study identifies opportunities that are applied in the relevant project, it must be signed.

For Silver ● and Gold ●

- A project-specific study including demountability and flexibility plan.
- If the study identifies opportunities that are applied in the relevant project, it must be signed.
- Report supporting the selected alternatives.

Verification

- If the study identified opportunities that were applied in the building in question, the measures taken must be attached to the logbook.

For Silver ● and Gold ●

- If the study identified opportunities that were applied in the building in question, an evaluation must be carried out and reported.
- If the study identified opportunities that were applied in the building in question, the measures taken must be attached to the logbook.
- The demountability and flexibility plan must be incorporated and attached to the logbook.

Back reporting

The administration procedures for maintaining the logbook provide the basis for back reporting. Any refurbishments or tenant adaptations that affect the rating are reported.

INDICATOR 13

CIRCULAR MATERIAL FLOWS

Purpose

The purpose of the criterion is to promote reuse and the use of building materials containing recycled content.

What is assessed

The project identifies and uses building materials containing recycled materials and/or identifies and uses reused building materials.

Global objectives and Sweden's environmental objectives

Global objectives				Sweden's environmental objectives	
	Good health and well-being		Sustainable construction and		Non-toxic

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• At least two building products must contain at least 10% recycled material by weight.	• Bronze rating is met. • At least three building products must contain at least 20% recycled material by weight. *Or* • Bronze rating is achieved. • At least 20% by weight of at least one type of building material must be reused.	• Silver rating is met • At least 20% by weight of at least two types of building material must be reused. *Or* • Silver rating is achieved. • At least 40% by weight of at least one product group must be reused.

Instruction

Recycled material proportion

Building materials containing recycled material must be documented in, for example, the latest eBVD or equivalent and recorded in the project logbook.

Reuse

Where reused materials are present in the building or property, the approximate location and quantity of the product groups must be indicated. Any available documentation on content must be attached to the logbook. The content of the material must be inventoried, and material with chemical content that constitutes hazardous waste must not be circulated.

The following substances are not present in the reused product:

- asbestos
- installations with CFC and HCFC refrigerants
- PCB.

The presence of the following substances is known:

- radioactive isotopes
- cadmium, lead and mercury.

It is up to the person reusing the products, in consultation with the ultimate responsible party such as the building owner, to ensure that the reinstallation complies with the laws and regulations in force in Sweden, such as technical quality requirements, building regulations, rules for CE markings and applicable environmental and work environment regulations.

Examples of solid interior building products that can be reused:

- interior doors
- glass sections
- non-load-bearing internal walls
- suspended ceilings
- floors
- stairs.

Examples of other types of building products that can be reused:

- material in the frame
- façade materials, brick and stone
- roofing sheet
- wood products
- ground materials for the outdoor environment of the property.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Supporting documentation to show that the management of a logbook during the construction phase containing information on recycled materials in at least two building products and any reused building materials.
- Product information for building products with recycled content attached to the logbook.

Verification

- The building products from preliminary certification are incorporated in the logbook.
- The approximate location, quantity and any available documentation of any reused building materials are recorded in the logbook.

Back reporting

The administration procedures for maintaining the logbook provide the basis for back reporting.
Any refurbishments or tenant adaptations that affect the rating are reported.

INDICATOR 14

WASTE MANAGEMENT

Purpose

The purpose of the criterion is to promote sites that work to reduce the amount of building waste going to landfill, sort building waste and have recycling systems in place.

What is assessed

Waste from building sites is minimised, and recycling systems are in place.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
12 HÅLLBAR KONSUMTION OCH PRODUKTION — Sustainable construction and	Limiting climate impact; Good built-up

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• A waste management plan must be drawn up, and sorting and disposal of building waste on the building site must take place in accordance with the legal requirements of the Waste Ordinance.	• Bronze rating is met. • In the project, material suppliers who take back their material during the construction phase have been identified, and there must be at least one agreement in place. • No more than 10% by weight of building waste goes to landfill.	• Silver rating is achieved. **A1-7.1-DNSH 4** • At least 70% by weight of non-hazardous building waste from the building site is sorted for reuse, recovery or recycling in accordance with the waste hierarchy. • The amount of building waste does not exceed 40 kg/m² GFA.

Instruction

Waste management plan

A waste management plan in accordance with PBL must be in place. Percentage going to landfill refers to the percentage by weight of the total amount of waste.

Take-back system

Material suppliers who take back their building materials for production must be identified and at least one agreement must be signed. The material must be recycled in the material manufacturer's production.

Non-hazardous building waste

Non-hazardous building waste in this context refers to waste that is generated during the construction phase and does not return to building material suppliers or the recycling market.

Deviations regarding the amount of building waste are acceptable but the requirements set must be clarified and the procurement requirements must be shown.

The waste contractor's data on waste quantities and sorting are accepted.

Delimitations

Energy recovery does not count as recycling or material recovery. Demolition waste from a previous building is not included in the calculation.

Demolition waste resulting from a redevelopment is included in the calculation.

At least 70% by weight of the non-hazardous construction and demolition waste (excluding naturally occurring materials referred to in category 17 05 04 of the European list of wastes established by Decision 2000/532/EC) from the construction site is prepared for reuse, recycling or other recycling, including backfilling materials where waste is used to replace other materials, in line with the waste hierarchy and the EU protocol on building and demolition waste.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Presentation of a site-specific waste management plan in accordance with PBL.

For Silver ●

- Document showing how the take-back system in the building in question works.
- ODA plan for the project in question.

For Gold ●

- Document showing how non-hazardous building waste is sorted on site.

Verification

- Supporting documentation to show that the waste management plan was followed during the project.
- Supporting documentation to show that no more than 10% by weight of the building waste has been sent to landfill.

For Silver ●

- Supporting documentation to show that the take-back system in the building concerned was complied with during the project.

For Gold ●

- Supporting documentation to show that the amount of construction waste per m^2 GFA was not exceeded in the project, for example by presenting waste statistics from the waste contractor or other accounts that prove the criterion.

Back reporting

Administration procedures that confirm waste management during operation and management.

INDICATOR 15

LOGBOOK WITH BUILDING MATERIALS

15

Purpose

The purpose is to promote buildings with good access to documentation of the content of built-in building products and building materials.

What is assessed

Documentation of built-in building products and declaration of their contents and administration procedures.

Global objectives and Sweden's environmental objectives

Global objectives	Sweden's environmental objectives
3 GOD HÄLSA OCH VÄLBEFINNANDE Good health and well-being	 Non-toxic

Rating criteria

	BRONZE	SILVER	GOLD
Residential buildings and non-residential buildings	• Digital logbook containing information on type of building material, product name and manufacturer or supplier for product categories E, F, G, H, I, J, K, L, M, N and Z according to BSAB 96. • Administration procedures for maintaining the logbook.	• Bronze rating is met. • Digital logbook containing information on the type of building material, product name and manufacturer or supplier for product categories P, Q, R. building products according to BSAB 96. • eBVD or equivalent for product categories E, F, G, H, I, J, K, L, M, N and Z. • Digital logbook is administered at the company level of the property owner.	• Silver rating is achieved. • Digital logbook contains information on the approximate quantity and location of building products. • For product categories P, Q, R according to BSAB 96, eBVD or equivalent is available.

Instruction

The digital logbook contains data on goods incorporated in the building during the construction and management phases. Building products that belong to the building and are permanently installed are covered by the criteria. It must be possible to export the digital logbook and, for example, provide it to customers on request.

A common logbook is acceptable for a housing co-operative consisting of several buildings. The logbook must then indicate in which building a building material is located. It must also be possible to export and create a digital logbook per building.

Assessment systems such as BASTA, Byggvarubedömningen, Produktkollen or SundaHus are commonly used for logbook management and to show the presence of substances in the indoor environment. Own tools and methods accepted.

In the event of self-assessment, there must be documentation showing the evaluation method and the qualifications of the person who carried out the assessment. Documentation is accepted if the content follows the guidelines in section 3 of the eBVD or equivalent.

The following do not need to be included in the logbook:

- building materials outside the building climate screen
- building materials belonging to the activity
- screws, nails, nuts, sheet metal strips, perforated strips, plastic strips, door fittings, etc.
- consumables such as marking spray, fuel, etc.

Few deviations

For Silver ● and Gold ●, a few deviations regarding eBVD or equivalent are accepted. It must be stated that alternative products have been investigated. The quantity and location must be indicated.

How to manage reused building materials in the digital logbook

Reused building materials are exempt from the requirements of eBVD.

Construction products that are reused must be placed in a separate folder in the digital logbook.

Reused materials or building materials used are assessed in the same way as if they were in an existing building. The materials must meet the assessment criteria for the existing building, indicator 16 Remediation of hazardous substances, and achieve a Gold ● rating for indicator 16 in Miljöbyggnad 3.2.

To ensure that the logbook is complete and accurate during the construction phase, procedures for this must be established and followed

Administration procedures

Procedures for maintaining a logbook can include, for example, instructions for tenant adaptation, refurbishment or future reuse.

Reporting

Report the necessary evidence to support the rating applied for. Below is a description of what is usually reported for each stage.

Preliminary certification

- Supporting documentation to show the management of the logbook during the construction phase with regard to the rating criteria for the rating applied for

- Procedure to ensure that the logbook is complete and accurate during the construction phase
- If the logbook is completed: complete logbook with relevant elements supporting the rating applied for, including any deviations
- Administration procedures for these have been developed.

Verification

- Complete logbook with relevant elements supporting the rating applied for, including any deviations
- The logbook must be available to the final owner.
- Supporting documentation to show that the procedure for establishing a logbook during the construction phase was followed.
- Administration procedures.

Back reporting

The administration procedures for maintaining the logbook provide the basis for back reporting.
Any refurbishments or tenant adaptations that affect the rating are reported.

15. CRITERIA FOR FULFILLING THE EU TAXONOMY

Required for Gold rating

The following criteria must be met to comply with the EU taxonomy for sustainable finance. The criteria are reported in connection with regular Miljöbyggnad (green building) certification.

Taxonomy criterion A2-7.1-DNSH 1

Criterion	*Taxonomy criterion A2-7.1-DNSH 1* The building is not intended for the extraction, storage, transportation or production of fossil fuels.
Non-residential and residential buildings	Yes ☐ No ☐
Instruction	The criterion is a self-declaration. No document needs to be presented.

Taxonomy criterion A1-7.1-DNSH 3

Criterion	*Taxonomy criterion A1-7.1-DNSH 3* Tap water. Maximum flow rate requirement (not applicable to residential units).
Non-residential buildings	• Maximum allowable water flows at tap water points according to Table A.1.
Instruction	Study during the design phase ensures that the needs of the activity are met per water tapping point. All water tapping points without specific requirements are designed according to the rating matrix. Water tapping points that may have specific needs for volume of water, can be, for example: • kitchen taps in commercial kitchens • sink taps in commercial kitchens • taps in basins in surgical or sterile environments.

Table A.1. *Maximum allowable water flows.*

Water fixtures	Maximum water flow
Taps in washbasins	6 litres/min
Kitchen taps	6 litres/min
Toilets, including pans, bowls and cisterns	A full flush volume of 6 litres and a maximum average flush volume of 3.5 litres
Showers	8 litres/min
Urinals	Maximum 2 litres/bowl/hour. Flush urinals have a full flush volume of max. 1 litre

Reporting	**Preliminary**	• Drawing or other documentation showing the projected flows. • Product data sheet on designed water fittings, delivery specification, or an existing product label in the EU.

Non-residential buildings	Met ☐ Not metj ☐

Taxonomy criterion A1-7.1-DNSH 3 Statutory criterion

Criterion	*Taxonomy criterion A1-7.1-DNSH 3 statutory criterion* In order to avoid impacts from the building site, the activity meets the criteria specified in Annex B (Risks of environmental degradation related to the preservation of water quality and avoidance of water stress are identified and addressed).
Non-residential and residential buildings	Met ☐ Not met ☐
Instruction	The criterion is a self-declaration. No document needs to be presented but can be attached for a collated report.

Taxonomy criterion A1-7.1-DNSH 5 Statutory criterion

Criterion	*Taxonomy criterion A1-7.1-DNSH 5 statutory criterion* Because the new building is located on a potentially contaminated site (previously developed land), a study has been carried out in the area to detect potential contamination.
Non-residential and residential buildings	Met ☐ Not met ☐
Instruction	The criterion is a self-declaration. No document needs to be presented but can be attached for a collated report.

Taxonomy criterion A1-7.1-DNSH 5 Statutory criterion

Criterion	*Taxonomy criterion A1-7.1-DNSH 5 statutory criterion* Measures are taken to reduce noise, dust and pollutant emissions during building or maintenance works.
Non-residential and residential buildings	Met ☐ Not met ☐
Instruction	The criterion is a self-declaration. No document needs to be presented but can be attached for a collated report.

Taxonomy criterion A1-7.1-DNSH 6

Criterion		*Taxonomy criterion A1-7.1-DNSH 6* Investigation of the need for an environmental impact assessment
Non-residential and residential buildings		• An environmental impact assessment or a study of the need for assessment has been carried out in accordance with Directive 2011/92/EU. • If an environmental impact assessment has been carried out, this means that the required mitigation and compensation measures to protect the environment are implemented.
Reporting	**Preliminary certification**	• Documents or meeting minutes that clarify the need for environmental impact assessment • Any environmental impact assessment • Any document identifying measures to address identified risks in any environmental impact assessment.

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