

## ARL Ecolabel and product declaration for sustainability

The term "Sustainability" has gained considerable significance in recent years. It is particularly in connection with construction products that you can speak of a key factor for success in the future. After all, the construction and real estate sectors have an immense impact on the environment, since they consume large amounts of energy and raw materials. The most diverse evaluation or assessment systems have been developed with the objective of coming closer to sustainable construction. The current Ordinance on Construction Products of the EU (BauPVo, Ordinance EU 305/2011), too, places the aspects of sustainability in the foreground. Hence, the objective is to provide an overview with respect to the various building certification systems prevalent in the market.

### 1. Sustainability and building certification

From the historical point of view, the term **Sustainability** dates back to the 17th century and originally means to survive on the return without touching the capital. An excellent example is sustainable forest management in which the amount of wood removed is only that which grows again. The mere ecological consideration is no longer adequate in today's times. Rather, all aspects of sustainability – economy, ecology, socio-cultural and technical functionality – must be taken into consideration, in order to ensure a good quality of life in the future, too.

- **Ecological sustainability:**
  - Minimisation of energy and resource consumption (no overexploitation of nature)
  - Reduction of surface area consumption
  - Stress on the ecosystem as low as possible during the life cycle of the real estate
- **Economical sustainability:**
  - Optimisation of the total costs (Life cycle costs)
  - Economic optimisation of the time points for investment, replacement and maintenance cycles
- **Social sustainability:**
  - Urban planning and landscape integration – aspects for the care of monuments
  - Functional and other aspects pertaining to human beings such as comfort, accessibility, etc.

In general, buildings are used for very long periods of time. Hence, it is only the consideration over the entire **life cycle**, in other words, "from the cradle to the grave", that can provide information regarding the actual quality of a building. Thus, all the life phases of a structure must be analysed with respect to the different aspects of sustainability and must be optimised in their interaction. As far as the construction material or building product level is concerned, the life cycle consideration of a building is divided into the following individual phases:

- Raw material recovery,
- Product manufacture,
- Erection,
- Utilisation,
- Preventive maintenance, refurbishment, etc.
- Demolition and recycling

This is why the estimate of the life period or utilisation period of a building, the components and the component layers is of considerable significance for the evaluation of sustainability.

What is meant by a "Green Building" or a "Blue building" is one in which due attention is paid to particularly responsible handling of the resources, viz. energy, water and material, while, at the same time, the hazardous impacts on human health and the environment are reduced to a minimum. Certification systems have been established in order to assess these aspects. Unfortunately, in the meantime, several systems have been established that have little, or, in fact, nothing in common. The most important of these are described in the following.

**What can be said in general is that the certifications listed in the following always ever assess merely the building and not the construction product. The construction product contributes only indirectly to the respective assessment system by being given certain points. And last, but not the least, there can be no sustainable product per se even without information regarding the specific purpose of use.**

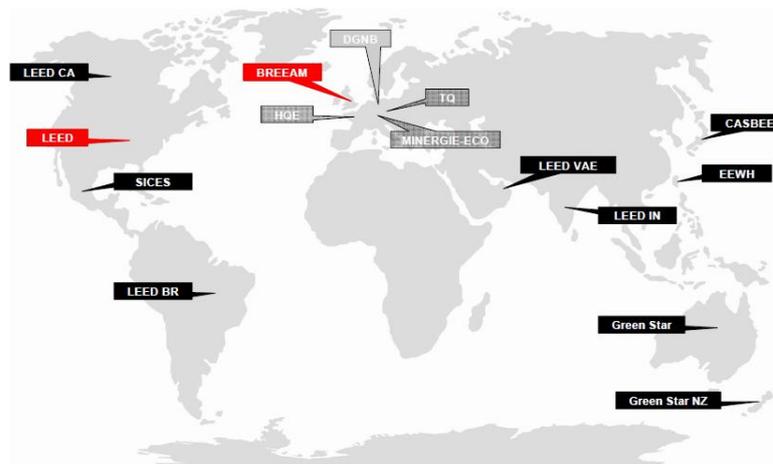


Figure 1: Overview with respect to the most important green building certification systems internationally

## 2. Requirements and verifications for building products

Product-related information is requested from the manufacturers of building products as the basis for certification in Germany and Austria, and this information describes the important criteria of sustainability during the entire product life cycle (manufacturing phase, construction stage, utilisation stage, subsequent use or reuse and recycling potential). In order to obtain the environmental impact, a so-called EPD (Environmental Product Declaration) is prepared in accordance with DIN ISO 14025 as well as prEN 15804 in most cases. Prior to this, however, the respective product must be assigned to a certain category. This is recorded in a PCR (Product Category Rule).

- **PCR (Product Category Rules):** A PCR defines meaningful boundary conditions and regulations for the preparation of an EPD for the given product group. The regulations illustrate calculation and assessment methods in order to analyse the effect of construction products across the life cycle (= Eco balancing).
- **Eco balance – LCA, life cycle assessment:** This means a systematic analysis of the environmental impact of products during the entire life history ("From the cradle to the grave"). This includes all environmental impacts during the production, the utilisation phase and the disposal of the product, as well as the associated upstream and downstream processes (e.g. manufacture of the raw materials, auxiliary materials and consumables).

- **EPD (Environmental Product Declaration):** The quantitative determination of the environmental impacts takes place in the course of an EPD. In the process, the basis is a so-called PCR and the compilation of an eco balance (in accordance with DIN EN ISO 14040 and EN ISO 14044). What the EPD contains:
  - Primary energy from renewable and non-renewable energy sources
  - Global warming potential
  - Ozone depletion potential
  - Potential for acidification of air and water
  - Over-fertilization potential
  - Summer smog potential

Only obligatory statements about the manufacture are asked for in an EPD ("cradle to gate" - from the cradle to the factory gates). The remaining life cycle phases ("gate to grave" - from the factory gate to the grave) may be considered optionally (this is, however, mandatory for the DGNB and BNB!).

The multiplicity of criteria and systems often makes it difficult to obtain all data that is necessary. The so-called mean EPDs that are based on the mean data of the industry, come to the rescue. The second and more cumbersome option is the compilation of a product-specific or company-specific EPD, in which all the data needs to be collected and assessed specifically for each company / product.

The Building and Environment Institute (<http://bau-umwelt.de>) in Germany provides a closed external representation of environment product declarations (EPD) as a manufacturers' association.

- **Product Carbon Footprint, PCF:** Fundamentally, this refers to the greenhouse gas emissions related to the product. The most significant greenhouse gases are carbon dioxide, laughing gas (nitrous oxide) and methane. These and other greenhouse gases are quantified as the **GWP (Global Warming Potential)** indicator in units of carbon dioxide equivalent (CO<sub>2</sub>).

### 3. International standards on building certification

- **BREEAM (England):** was established in 1990 by the BRE (Building Research Establishment Ltd.) and stands for BRE Environmental Assessment Method. BREEAM merely evaluates the ecological criteria. The assessment is aligned with the system of "Benchmarking", in which the best products and methods available at present achieve the maximum points score. Depending on the points score, the building is assessed with "Certified", "Good", "Very good" or "Excellent".
- **LEED (Leadership in Energy & Environmental Design, USA):** LEED was developed in 1998 by the American GBC (Green Building Council) and is based on the BREEAM system. Six categories are evaluated: Sustainable ground and soil, water effectiveness, energy and atmosphere, materials and resources, indoor air quality as well as innovation and design. The LEED certificate, at present, is that system with the most international significance. Depending on the points score, a "Silver", "Gold" or "Platinum" certificate is issued.
- **CASBEE Comprehensive Assessment System for Building Environmental Efficiency, Japan):** The JSBC (Japan Sustainable Building Consortium) has developed CASBEE, which classifies the ecological performance of buildings based on the application. It is composed of four evaluation tools that correspond to the life cycle of a building: CASBEE for design, new construction, existing buildings and modernisation. Each tool is foreseen for a separate

application with its own utilisation objective and has been designed for various applications (office buildings, schools, residential premises, etc.).

- **HQE (Haute Qualité Environnementale, France):** The HQE method is being tested since 1994 with construction projects (residential constructions and other buildings) and was finally structured by the HQE Association. Knowledge about the ecological impacts of the building products are based on an EPD, and the selection is included in the ecological criteria. The same is required for health-related aspects (e.g. emissions and indoor air). HQE covers three phases with the assessment: Order, design and execution.
- **BNB (Evaluation system for sustainable construction, [www.nachhaltigesbauen.de](http://www.nachhaltigesbauen.de)):** Since the international assessment systems available are not suitable for an objective and highly quantitative evaluation, the Federal Ministry of Transport, Building and Urban Affairs in Germany has developed its own assessment system for sustainability. In the process, it considers ecological, economic, socio-cultural and technical qualities as well as the location and the process quality over the entire life cycle (more than 40 criteria in all). Based on information furnished by the Ministry, the system is expected to be introduced for all official buildings with effect from 2011. Depending on the level of fulfilment, a commendation / award is accorded in "Bronze", "Silver" and "Gold".
- **DGNB (Deutsches Gütesiegel Nachhaltiges Bauen - German quality seal for sustainable construction):** The certificate issued by the DGNB (German association for sustainable construction, [www.dgnb.de](http://www.dgnb.de)) refers to a basis formulated jointly with the BNB and was introduced in 2008. Nonetheless, the DGNB has incorporated additional criteria in the evaluation system, such as, for example, the resistance to hail, storm and floods. The commendation is awarded only for official and administrative buildings. Depending on the level of fulfilment, a commendation / award is accorded in "Bronze", "Silver" and "Gold".
- **ÖGNB:** The Austrian association for sustainable construction is an official partner organisation of the Austrian climate protection initiative **klima:aktiv (Climate:Active)**. In the process, the ÖGNB assures to keep its evaluation system, as has been the case so far, 100 % compatible with that of klima:aktiv (Climate:Active). By complying with the minimum criteria of klima:aktiv (Climate:Active), the building assessment of klima:aktiv (Climate:Active) can be prepared in parallel to that for the ÖGNB without incurring any additional costs and without the provision of any additional verifications.
- **MinErgie:** The certification is based on the determination of the overall thermal economy of a building. In addition, attention is paid to ensure that the energy is fed primarily from renewable energy sources.
- **MinergieEco:** The ecological construction of a real estate property is assessed apart from a favourable energy balance of a structure. The MinergieEco certificate can always only be received as a supplement to a Minergie certificate. The general conditions for a MinergieEco certification are:
  - Comfort
  - Health
  - Building ecology
  - Energy efficiency

#### 4. Product certifications or ecolabels that support the requirements of building certification

- **Austrian ecolabel:** The Austrian ecolabel is available since 1990 and is awarded to products, tourism companies and training facilities. The guidelines UZ 01 (paints and varnishes, glaze finishes and wood sealing coats), UZ 06 (wooden furniture), UZ 07 (wood and wooden materials), UZ 17 (wall paints) and UZ 56 (floor coverings) are relevant for ADLER.
- **Baubook (Construction book):** The baubook web platform ([www.baubook.at](http://www.baubook.at)) supports the implementation of sustainable buildings. For this purpose, it provides ecological criteria for product assessment that is based on the Austrian ecolabel.
- **ECO Label:** The ecolabel (or also called European ecolabel) is assigned to products and services. The commendation was introduced in 1992 by the European Commission and is awarded independently, at present, by national institutes of the participating countries. In Austria, it is awarded via the Ministry of Environment and Water Management ("Life Ministry").
- **RAL UZ (Blue Angel):** The Blue Angel is the first and oldest environmental conservation-related label in the world for products and services. It was established in 1978 at the initiative of the Federal Minister of Internal Affairs and by the resolution passed by the Federal Environment Minister and the Federal state in Germany. Since that time it has been an instrument of environmental policy conforming to the market, with the help of which the favourable characteristics of offers can be labelled. The RAL UZ-12a (low-emission paints and varnishes) guidelines are used for the issue of this label to coating products.
- **Emicode:** The Emicode mark of conformity evaluates low-emission installation materials, adhesives or construction elements. Apart from adhesives and filler materials, even sealing materials, underlay channels, adhesive bands and water-based parquet coating materials are analysed to see whether they release volatile organic compounds (emissions) into the room atmosphere and lead to smells. Parquet coatings are divided into classes EC1 or EC2, whereby EC1 calls for lower VOC (Volatile Organic Compound) values.

#### 5. General requirements that are met by all ADLER products

By giving the finishing touch to construction products with our coating materials, even the products from the house of ADLER contribute indirectly to a sustainable building certification. For example, by dispensing with the use of toxic or carcinogenous, mutagenous raw materials or others toxic to reproduction (T and CMR substances of category 1 and 2 in accordance with the Chemicals Ordinance 1999 - Federal Law Gazette II no.81/2000 pursuant to Federal Law Gazette II no. 186/2002), our coating materials comply with significant provisions of the or other evaluation systems. Many of our paints and varnishes have been formulated in such a manner that they comply with the requirements of the Austrian ecolabel, DGN and LEED, etc. The improved usability of building products made of wood as a renewable raw material also has a very favourable impact on the overall assessment. However, detailed aspects need to be considered specifically in each case.