# GREEN BUILDINGS TREND


**An increasing number of buildings are certified through Green Building Rating Systems such as BREEAM, LEED, DGNB, HQE and most are still certified on a voluntary basis. However, we are starting to see minimum environmental performance requirements being applied through regulations. We are playing a proactive role in this new dynamic.**

KNAUF INSULATION
it's time to save energy

We are at the tipping point of a green construction revolution. Evolving Green Building Rating Systems (GBRS) are pushing up standards, construction regulation is incorporating more demanding sustainable practices and new legislation is starting to highlight the importance of environmental impact, building wellbeing and health.

This is great news for building users and great news for the industry because it enforces good sustainable practice based on 'people, planet and profit' — considering social and environmental impact as well as traditional bottom lines of profit and loss.

And that is why we are working with key stakeholders by providing our expertise to improving GBRS standards as well as continuously contributing to future directives, regulations and laws that will impact sustainable construction.

Critically, we also share this insight and expertise with specifiers at every step of the way. It is vital we play such an integral role because the trend for green building is shaping the future of construction. For example, research from 69 countries by the World Green Building Trends Smart Market Report in 2016 found that global green building had doubled since 2013, when it last studied this trend.

*"Emerging economies will be the engines of green growth in the next three years with development varying from twofold to sixfold over current green building levels,"* said the report. *"Across all regions 37% of survey respondents forecast that more than 60% of their projects will be green by 2018."*

New green construction requirements are pushing standards upwards to a future of buildings that will tend towards zero impact (see graph below). They have also started to be driven by green building regulations that demand greater information about a building's environmental performance. For example, in France, the 'Réglementation Bâtiment Responsable 2020', which is the future new buildings regulation, will include health and environmental impact criteria.

At Knauf Insulation, we are providing our expertise at every level, for example, we are actively contributing to the work of the European Insulation Manufacturers Association (Eurima) and the European Regional Network of the Green Building Council — both of which are influential stakeholders to the European Commission.

Through Eurima we are involved in the preparation of research that will ultimately inform common EU Framework of Core Indicators in the context of the Resource Efficiency Opportunities for the Construction Sector, one of the programmes of the current Circular Economy Package of the EU Commission. This is an historic development that will have a major impact on the construction industry.

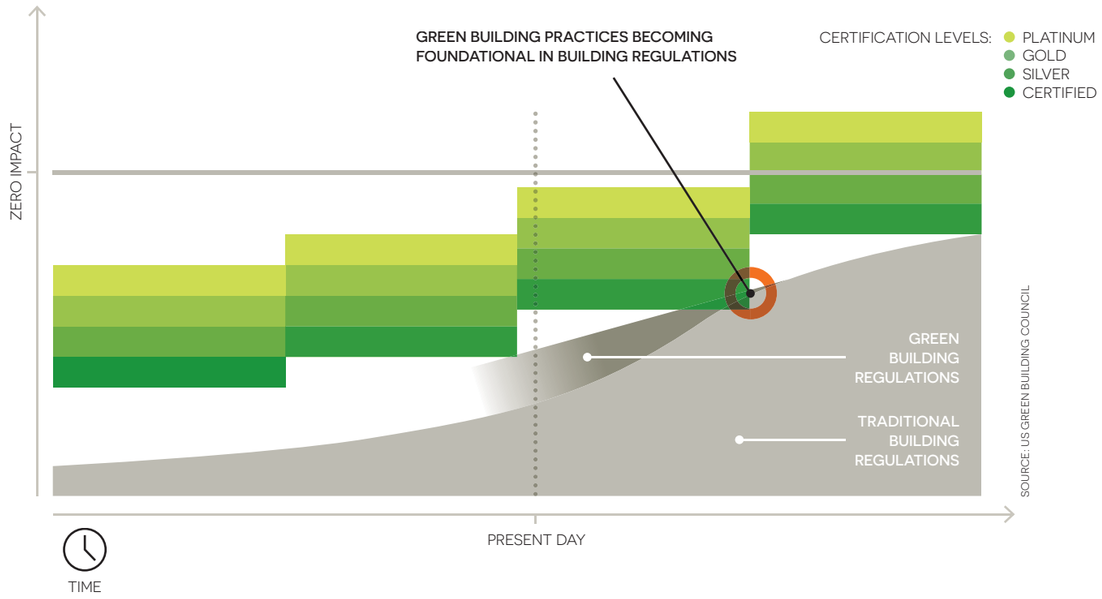
Green Building Rating Systems are also constantly evolving. LEED, for instance, has a new focus on existing buildings and is working towards systems that are 'beyond platinum', the highest rating offered by the scheme. Additionally, it is developing a 'dynamic plaque' platform that continuously monitors and benchmarks a building's performance in areas such as energy, water, waste and human experience.

The upshot is that this green system evolution represents a huge opportunity to shape the industry and we are actively involved in this process.

During a Berlin meeting in April 2016 with Mahesh Ramanujam, who takes over as CEO of the US Green Building Council at the end of 2016, our sustainability team shared their views and expertise in a variety of areas of sustainability.

*"The U.S. Green Building Council is grateful to Knauf Insulation for its leadership in creating a more sustainable buit environment and their focus on life cycle thinking, product disclosures, indoor air quality and other topics that are critical within the existing buildings market.Knauf Insulation's commitment to ensuring their products support LEEDv4 requirements can be seen in both their organisation's sustainability report and product factsheets,"* Mr Ramanujam said.

## Impact of Green Building Rating Systems on the evolution of building regulations



# HOW WE CAN HELP

## ACHIEVING POINTS IN GREEN BUILDING RATING SYSTEMS – GBRS – IS A CHALLENGING TASK – WE MAKE IT EASIER FOR ARCHITECTS, SPECIFIERS AND GBRS ASSESSORS.

1

As we launch new solutions we want the market to know the points they contribute. Whether it is our innovative Urbanscape Green Roof Solution or our SUPAFIL Blowing Wool, a factsheet showing how they add points can be instantly downloaded from our website.

2

Our most important contribution is related to energy performance, but our products also contribute in areas related to thermal and acoustic comfort, indoor air quality and resources used. Mineral Wool also has an impact on the fire performance of buildings, which is taken into account in DGNB.

3

The number of points our solutions can contribute for each category.

4

Verified Environmental Product Declarations (EPDs) are now a criterion in LEEDv4 and BREEAM International 2016. Points are distributed in the Materials and Resources categories for projects including products with Life Cycle Assessments (LCAs) and EPDs.

5

The key contact to help you find additional information about our contribution to GBRS.

KNAUF INSULATION
it's time to save energy

July 2016

**LEED version 4**

PRODUCT DATA FOR CERTIFICATION

**GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY**

**LEEDv4** (Leadership in Energy and Environmental Design) is a voluntary standard that defines high performance green buildings which are healthier, more environmentally responsible, and more profitable structures. Credits for certification can be earned in various categories, each with a unique focus on sustainable design: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation and design process.

**KNAUF INSULATION** products can put you on the right track for the highest result for certification!

| LEED Credit Category code | Definition | Knauf Insulation Products contribution | Contributes towards |
|---|---|---|---|
| **Energy and Atmosphere (EA)** Optimize Energy Performance | To achieve increasing levels of performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use. | ECOSE Technology products help reducing energy demand through very high insulation efficiency. | **20 points** |
| **Materials and Resources ( MR)** Building Product Disclosure and Optimization – Environmental Product Declarations | To encourage the use of products where Life Cycle Assessment (LCA) is available and have environmentally, economically and socially preferable LCA. To reward project including products with verified LCA. | Third party verified Environmental Product Declarations (EDPs) are available on line for ECOSE Technology products[1]. | **2 points** |
| **Materials and Resources ( MR)** Building Product Disclosure and Optimization – Sourcing of Raw Materials | To encourage the use of products where LC A is available and have environmentally, economically and socially preferable LCA. To reward project including products verified to be extracted or sourced in a responsible manner. | ECOSE Technology Products are manufactured with up to 80% of recycled content (pre and post-consumer)[2]. | **1 point** |

[1] http://www.knaufinsulation.com/en/product-sustainability
[2] See annexe1

For additional information please contact Sustainability@knaufinsulation.co



Visit our website to see how our solutions contribute to points in the latest versions of BREEAM and LEED. Simply click on the 'Sustainable Buildings and Green Building Rating Systems' section of **knaufinsulation.com**.

# SHARING OUR EXPERTISE

Members of our sustainability team are trained in BREEAM for new construction, several national variations and BREEAM International 2016 that offer more focus on indoor air quality and EPDs. We also have LEED and LEEDv4 Green Associates in the US and Europe as well as DGNB and HSE specialists. Our experts can offer unique insight into sustainable construction challenges, technical, legal and financial support and offer customised solutions. Our colleagues **Christophe Barrau (CB)**, Sustainable Buildings Officer, providing national level specifier support in France and **Jean-Pierre Pigeolet (JPP)**, Sustainabilty Technical Manager, responsible for coordinating this expertise at Central level, explain how.

### How can Knauf Insulation solutions contribute to green buildings?

JPP: Our solutions contribute to well-being, improve internal comfort, acoustic performance, indoor air quality, energy efficiency. They can also provide effective fire barriers. As such they add significant points in Green Building Rating Systems. But all these benefits are lost if our sustainability expertise is not communicated to the people in charge of building projects. That is why we have invested significantly in training members of our sustainability team in Europe, Turkey and North America to become experts in BREEAM, LEED, DGNB and HQE to offer a unique advantage to the market.

### How do our customers benefit?

CB: Our role is to understand and answer to the real final needs for new buildings and for existing buildings in cases of renovation. There are never unique solutions. So the challenge is to find the right answer to the right need regarding multiple parameters such as fire protection, acoustic and thermal comfort, environmental impact, building energy efficiency, health and Indoor Air Quality whilst helping our clients stick to their budget. We need to speak the language of building owners, investors and specifiers, to have insight into the challenges of Green Building Rating Systems and offer solutions based on solid sustainability expertise .

### What are the new challenges of Green Building laws in France?

CB: New laws focusing on indoor air quality and the Volatile Organic Compound (VOC) levels in materials have become huge topics in France, particularly in buildings for children, the elderly or hospitals.

Moreover, a new version of FDES ('Fiches de Déclarations Environnementales et Sanitaires') will be mandatory by mid 2017. It will go beyond the general European level of information, for example, by providing additional details on sanitary and carbon savings levels. A new labelling of buildings is also expected to precede the new 2018 Environmental Regulation (RE2018) that will be qualified as 'environmental' and not only 'thermal'. This shows enormous progress towards a higher level of environmental protection for buildings in France.

### What solutions do you recommend?

CB: Our ECOSE Technology solutions contribute to indoor air quality because they have no added formaldehyde and use a bio-based binder. Urbanscape, SUPAFIL, Mineral Plus and many other Knauf Insulation products are also incredibly innovative and appeal to end users looking for that innovation, it's the job of our sustainability team to communicate those benefits.

### How do you help specifiers maximise Green Building Rating Systems?

JPP: Using green building materials makes sense economically, environmentally and ethically. Our solutions add points in Green Building Ratings Systems in significant categories. For example, with our Glass Mineral Wool with ECOSE Technology under LEED certification we can contribute to points for recycled content as the products are manufactured with up to 80% of glass cullet. In The Netherlands, for BREEAM NL in the category for volatile organic compounds, our ECOSE products with no added formaldehyde can contribute maximum points.

### What about EPDs?

JPP: We have EPDs that cover 85% of our Glass Mineral Wool products and 60% of our Rock Mineral Wool range. We have also a unique EPD for entire systems such as our Green Roof Solution Urbanscape. EPDs are increasingly being seen as playing a critical role in adding points in Green Building Rating Systems as well as in future sustainable regulation because of their forensic examination of the environmental impact of every component that makes up a product. Having an EPD underlines sustainability credibility.

## EIFFAGE REFERENCE CASE

**Project:** A €200 million mixed-use campus for 5,000 Societé Générale employees in Paris featuring 90,000m² of office space, wooded areas, a gym and restaurants.

**Challenge:** Eiffage Construction Grand Projects, which aims to certify the construction HQE exceptional and LEED Gold, had requested information from suppliers of 700 different construction products including information such as Volatile Organic Compound (VOC) emissions.

**How did Knauf Insulation help?** We supplied 7,000m² of ECOSE TP 138.

Feedback from Caroline Pin, Environmental specialist and BREEAM International Assessor at Eiffage Construction Ile-de-France: *"By using Knauf Insulation products the project was able to achieve a LEED point for post construction indoor air quality assessment. The project has to be certified to a high Green Building Rating System level and we welcomed Knauf Insulation's expertise and insight."*

# EIGHT CRITICAL PERFORMANCE CRITERIA OF GREEN BUILDINGS

AT KNAUF INSULATION WE BELIEVE THAT FUTURE GREEN BUILDINGS REGULATIONS SHOULD CONCENTRATE ON KEY PERFORMANCE CRITERIA WHICH HAVE THE GREATEST IMPACT ON THE SUSTAINABILITY OF A BUILDING THROUGHOUT ITS LIFE CYLE. OUR FOCUS IS IN LINE WITH INDICATORS BEING DEVELOPED BY THE EUROPEAN COMMISSION.

## 1 ENERGY

All our thermal insulation products reduce energy use and save customers money in new and renovated buildings.

**Case in point**
The three most important pillars of sustainability are energy use, energy use and energy use. We are investing heavily in quantifying exactly how significant these energy savings are by scientifically monitoring dozens of occupied homes across Europe. We are examining how our insulation can make a difference by monitoring the properties before insulation was installed and after.

## 2 WATER

Water consumed during the lifetime of a building and water management on site are important building sustainability aspects. Our Green Roof Solution Urbanscape can contribute significantly to the management of storm water run-off. It can store up to three times more storm water than traditional green roof substrates and this helps limit accidents caused by heavy rainfall and leads to a decrease on the burden put on sewer systems by 70%-95% depending on the roof design and local climate.

**Case in point**
We have developed a Performance Evaluation Tool (PET) and a storm water laboratory in the US to monitor the on-site performance of green roofs.

## 3 ACOUSTIC

Noise pollution has been linked to sleep disturbance, heart diseasen, high blood pressure and increased stress, according to new research presented to the European Commission. Working with the European Insulation Manufacturers Association (Eurima), we are contributing to an industry 'white paper' report to highlight the importance of good acoustic health in buildings and how this can be achieved with Mineral Wool.

**Case in point**
Our Mineral Wool products in combination with Knauf plasterboards offer excellent acoustic performance making them ideal, for example, in partition walls and pitched roofs.

## 4 INDOOR AIR QUALITY

Air quality in buildings is increasingly becoming an important issue in many countries. In France, for example, interior building health legislation is set to include new air quality standards.

**Case in point**
In this context, our team of sustainability specialists are working to create a document that enables end users to find sustainable solutions to indoor air challenges. Expertise for the document is being gathered from a variety of different industries from paint and carpet manufacturers to HVAC producers.

## 5 THERMAL COMFORT

Thermal comfort is an increasingly important aspect of well-being in buildings, particularly in the light of climate change. It is about ensuring that appropriate thermal comfort levels are achieved through design, focusing first on the fabric of the building - with the important contribution of insulation - supported by the benefits of smart technology.

**Case in point**
We have developed thermal insulation solutions that are designed to improve the energy performance of buildings. Our Mineral Wool products and technical guidance reduce fabric heat loss, minimize thermal bridging and ultimately make buildings more comfortable.

## 6 FIRE SAFETY

As we increase the levels of insulation we put in buildings — particularly during renovation which can change the fabric of a building — we should make sensible choices about what construction products we use, so we make buildings safer.

**Case in point**
Our Rock Mineral Wool and Glass Mineral Wool products offer the highest Euroclass A1 fire classification according to the most demanding European standards. Through our advocacy work we also want countries to follow the examples of Germany, Croatia, Serbia and Slovakia and introduce minimum requirements such as fire barriers to improve the fire safety performance of their buildings.

## 7 RESOURCE USED

We believe that an Environmental Product Declaration (EPD) is the best way to assess the environmental impact of a product because it examines in minute detail every stage of its lifecycle from the sourcing of materials to the product's disposal or recycling. An EPD also helps us improve our manufacturing process as we aim to have zero negative impact on resource use. Reducing our impact includes research and development to substitute our ingredients with those that have a lower environmental impact, for example, increasing recycled content.

**Case in point**
Our Glass Mineral Wool with ECOSE Technology is made using recycled glass such as bottles or window glass — up to 80% in some locations — and is recyclable at end of life.

## 8 LIFE CYCLE COSTING

Sustainability is about people, planet and profit. The first seven criteria listed above relate to planet and people while Life Cycle Costing is a way of evaluating the economic impact of an asset over its lifecycle. Knauf Insulation products play an important role because our high performance insulation is affordable and designed to cut operational energy costs over a long period of use.

**Case in point**
We have trained our sustainability team in how to systematically integrate the Life Cycle Costing of buildings into project management to help our customers as regulation begins to place greater emphasis on this aspect of sustainability.

# WHAT'S NEW IN GREEN BUILDING RATING SYSTEMS

## LEEDV4 AND BREEAM 2016

In the new version of the US Green Building Rating System, LEEDv4, it is easier than ever to earn points with our products . For example, in the insulation category, our solutions with ECOSE Technology can gain a maximum number of points in 'Indoor Environmental Quality' thanks to being certified Indoor Air Comfort Gold from Eurofins which meets Europe's most demanding indoor environmental standards such Blue Angel and A+ labelling in France.

Knauf Insulation is also now closely involved with the BREEAM certification scheme. Key members of our sustainability team are trained in BREEAM for new construction as BREEAM Licensed Assessors — including various national variations — and the BREEAM International 2016 that offers more focus on indoor air quality and EPDs.

## HQE

In France the 'Fiches de Déclarations Environnementales et Sanitaires '(FDES) which examine in minute detail the complete life cycle of products from cradle to grave are being revised in line with the EN 15804 norm. The new FDES system will be incorporated into the 2017 version of HQE and enable the total life cycle assessment of buildings.

## DGNB

DGNB along with BREEAM is the Green Building Rating System (GBRS) that places emphasis on the principle of Life Cycle Costing. At Knauf Insulation we believe this is important. Also significant is how DGNB will be influenced by Building Information Modelling (BIM). It is not directly incorporated in any GBRS at present, but could be influential when assessing the overall sustainable performance of a building. Our innovative products such as Urbanscape and SUPAFIL are now available in the most commonly used BIM format files.

## LIVING BUILDING CHALLENGE

Living Building Challenge (LBC) is a cutting edge buildings certification system that was developed 10 years ago in the US. Its uptake in Europe is limited to a handful of buildings. The selection of materials used in construction is important to LBC and there is a specific products certification system — DECLARE — based on a 'Red List' of banned substances. Our Glass Mineral Wool with ECOSE was the first mineral wool product to get the certification, and the only one to be 'Red List Free'. This position gave us the privilege to be specified in a number of outstanding LBC projects in the US.