Sustainability Certificates
Concepts

Group 8 I ARTS SUMMER SCHOOL 2023
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Royal College of Art

How can a contemporary building system gain value from conforming to established sustainability standards?

What certificates exist today that could encourage designers to look beyond conventions, generating new frameworks for architecture?

Content

- *What are sustainability Certificates, why do they exist and what are the benefits?*
- *Examine five relevant global certificates that include; Forest, Wood and Building certificates.*
- *Examples of design projects that successfully meets each of the chosen certificate standards.*
- *Evaluate these certification systems and their case studies?*
- *Conclusion and areas for further research.*
- *References.*

1990s

What are Sustainability Certificates and why do they exist?

- Sustainable certificates first emerged in the **1990s** in part as a response to the **United Nations Earth Summit.**
- In **2015** the UN General Assembly set **17 goals for sustainable development.**

Forest and Wood Management Certificates

The two most widely recognised and utilized forest and wood certification schemes are the **Forest Stewardship Council** (FSC) founded in **1993** and the **Programme for the Endorsement of Forest Certification** (PEFC) founded in **1999.** Both share similar objectives but have slightly different approaches and set of criteria.

Forest Stewardship Council

Programme for the Endorsement of Forest Certification

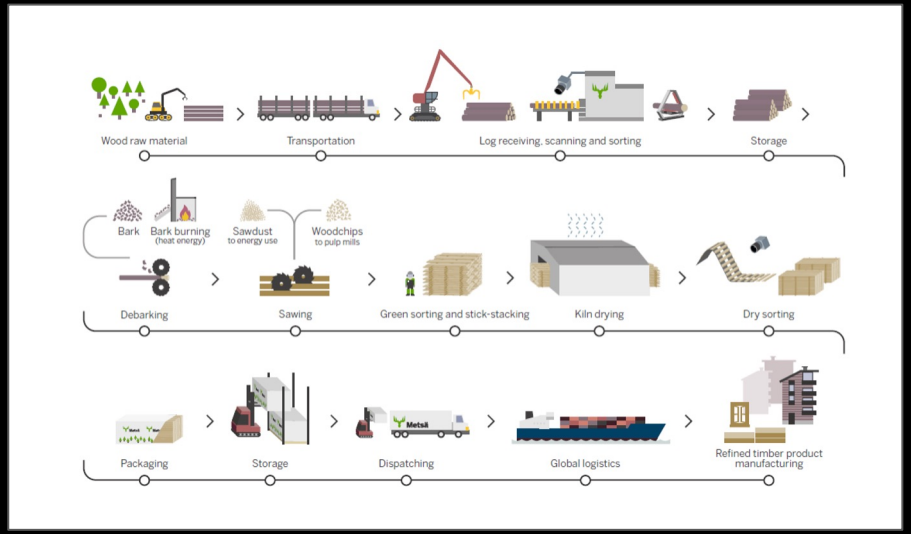


Image: ‘Sawn Timber Production’, *Metsä Fibre* <https://www.metsagroup.com/metsafibre/about-metsafibre/sawn-timber-production/>
‘An Introduction to Forest Certification | NC State Extension Publications’ <https://content.ces.ncsu.edu/an-introduction-to-forest-certification>

Global Building Certificates

The world green building council lists **58 building certifications** administered by the green building council. However there are many more that exist that are perhaps region specific or explore niche areas of design.

‘Sustainable Building Certifications’, *World Green Building Council* <https://worldgbc.org/sustainable-building-certifications/>

Global Building Certificates

BREEAM

CASE STUDY:
Helsinki Airport Extension

LEED

CASE STUDY:
Wood City, Jätkäsaari, Helsinki

HQE

CASE STUDY:
Lucie Aubrac School Group, Nantes, France.

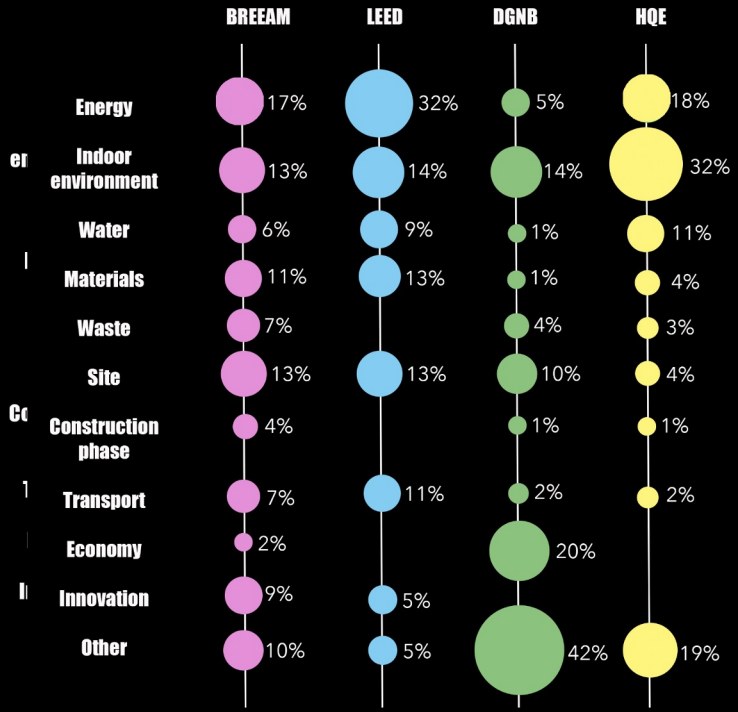
DGNB

CASE STUDY:
EDGE Suedkreuz, Berlin, Germany.

EDGE

CASE STUDY:
Tetra Pod, Bali, Indonesia.

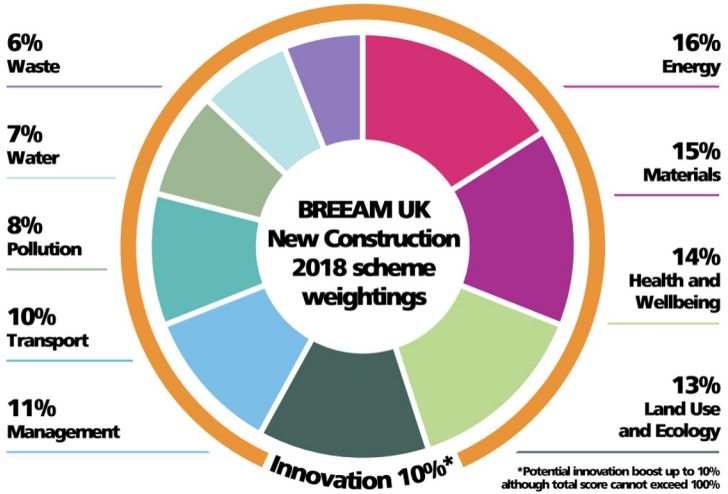
Most **sustainability certifications** use a **complex grading system** and each **standard has individual requirement** and weights those accordingly. The first step to choosing the right green building certification should be to assess the stage of the property's life cycle, appropriate end goals, or design purpose.



Hamedani, A. Zeinal, and F. Huber, 'A Comparative Study of DGNB, LEED and BREEAM Certificate Systems in Urban Sustainability' (presented at the The Sustainable City 2012, Ancona, Italy, 2012), pp. 121–32 <https://doi.org/10.2495/SC120111>

BREEAM

BREEAM was the world's first green building rating system. Launched in **1990**, it was created as a cost-effective means of recognising the value of sustainable development. **BREEAM methodology seeks evidence of sustainable value in ten categories:** *Energy, Materials, Health and Wellbeing, Land Use and Ecology, Waste, Water, Pollution, Transport, and Management.*

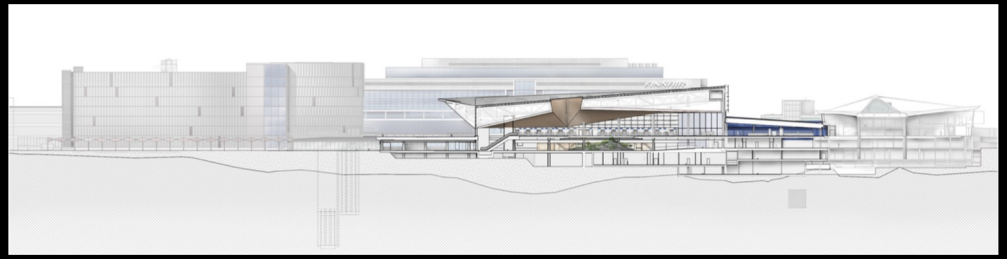


'BREEAM - BRE Group', 2022 <https://bregroup.com/products/breeam/>
'BREEAM UK New Construction', 2018 <http://www.breeam.com/NC2018/>

BREEAM | Helsinki Airport Extension, Helsinki, Finland

Finavia received an ‘Excellent’ **BREEAM** rating for Helsinki Airport South Pier’s performance, in particular energy solutions, land use and eco friendliness. The **Management** and **Waste** categories,achieved **BREAM scores of 96% and 80%** respectively. **Solar power plants** built on the roof of the terminal produce renewable energy and automation has been able to significantly improve the energy efficiency of lighting.

Acoustic ceiling panelling,designed to give communal areas superb acoustics. LVL beams and columns are precision engineered structural frame designed for disassembly. Surfaces are manufactured from recycled paper to sustainable.

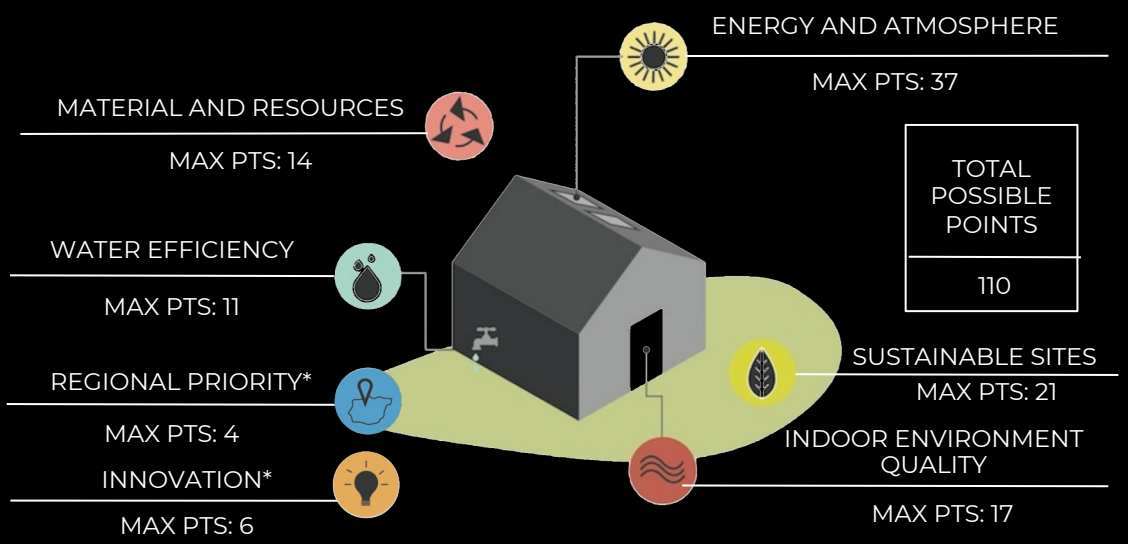


The surface material of the ceiling is made up of local Finnish spruce. The cross laminated timber, or CLT elements create a wave form that mimics movement and natures contour lines.

As passengers pass through customs they see the ‘Luoto’ nature diorama which combines the characteristics of finnish nature with Japanese garden design.

LEED

BREEAM was the world's first green building rating system. Launched in **1990**, it was created as a cost-effective means of recognising the value of sustainable development. **BREEAM methodology seeks evidence of sustainable value in ten categories:** *Energy, Materials, Health and Wellbeing, Land Use and Ecology, Waste, Water, Pollution, Transport, and Management.*



LEED ZERO CERTIFICATION

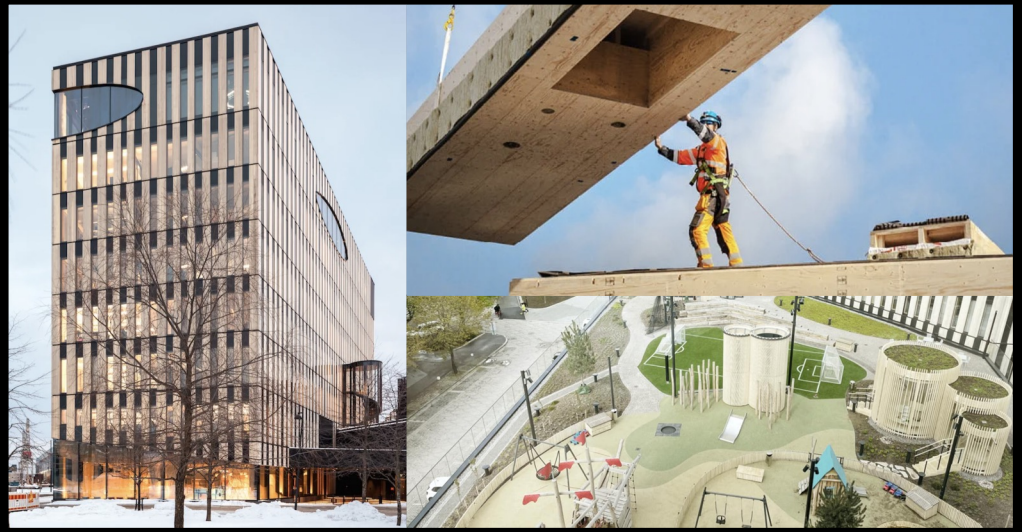
LEED Zero certification was created to recognize the achievement of net zero goals. Projects can earn certification in **LEED Zero Carbon, LEED Zero Energy, LEED Zero Water and LEED Zero Waste.**

'BREEAM - BRE Group', 2022 <https://bregroup.com/products/breeam/>
'BREEAM UK New Construction', 2018 <http://www.breeam.com/NC2018/>

LEED | Wood City, Helsinki, Finland

A mixed-use building complex of about 34,000 square metres, includes residential, office, shops, hotel and green spaces.The eight story building within the complex is constructed entirely of wood. FSC, Laminated veneer lumber provide the ideal solution to reduce its embodied carbon.

Wood City alternates open and closed buildings to create green spaces offering panoramic views of the city and sea, and have as much natural light as possible. Behind the wood city block lies an inner archipelago, hiding and sheltering landscapes and spaces.



The eight story tall building is constructed entirely of wood including **LVL** beams for the supporting structure. **Laminated veneer lumber** is a mass timber product that is twice as strong as steel in proportion to weight. It provides an ideal solution when strength, dimensional stability and high load bearing capacity are essential.

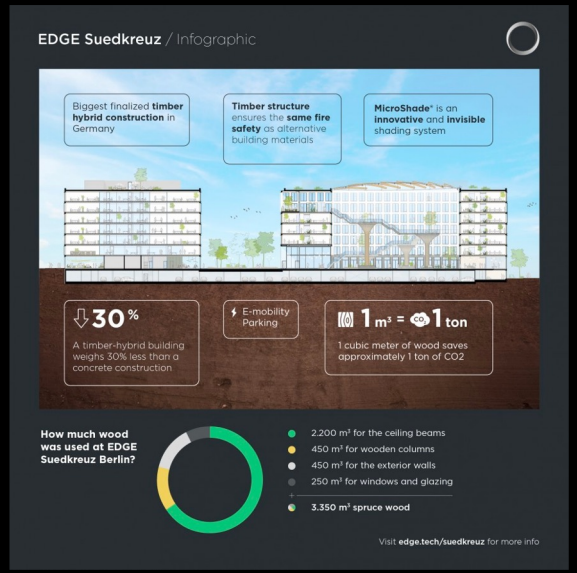
DGNB

The **DGNB** sustainability certification system originated in Germany, and is a internationally recognised comprehensive system. It based on the three central sustainability areas, **ecology**, **economy** and **socio-cultural quality**, which are equally weighted in the assessment.

GmbH, DGNB, 'About the DGNB System', *DGNB GmbH* <https://www.dgnb.de/en/certification/important-facts-about-dgnb-certification/about-the-dgnb-system>

DGNB | EDGE Suedkreuz, Berlin, Germany

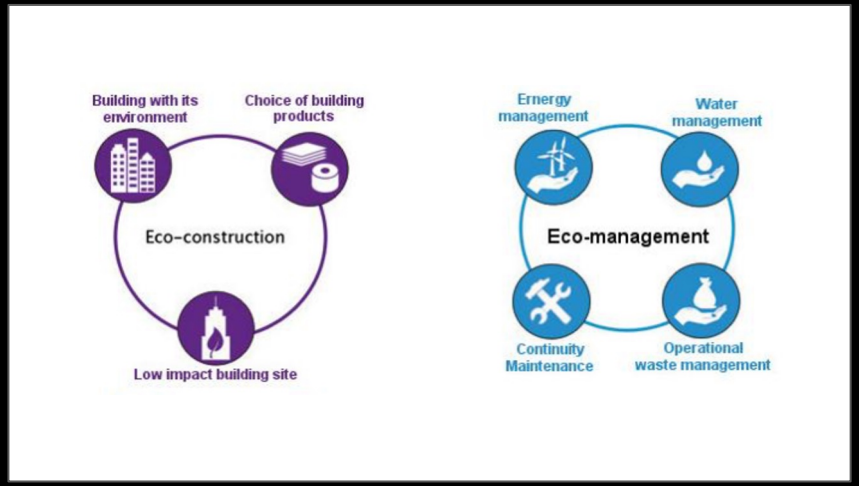
The seven story office complex is the largest free standing modular wood-hybrid building in Germany and one of the biggest in Europe. It received a DGNB Diamond award for design quality. The heart of the building is a large atrium which feels open and close to nature. Tree shape columns reach for the sky creating a feeling of the forest, a symbol of the origin of the wood material used. This recognition confirms the successful implementation of the holistic strategy of both sustainability and well- being.



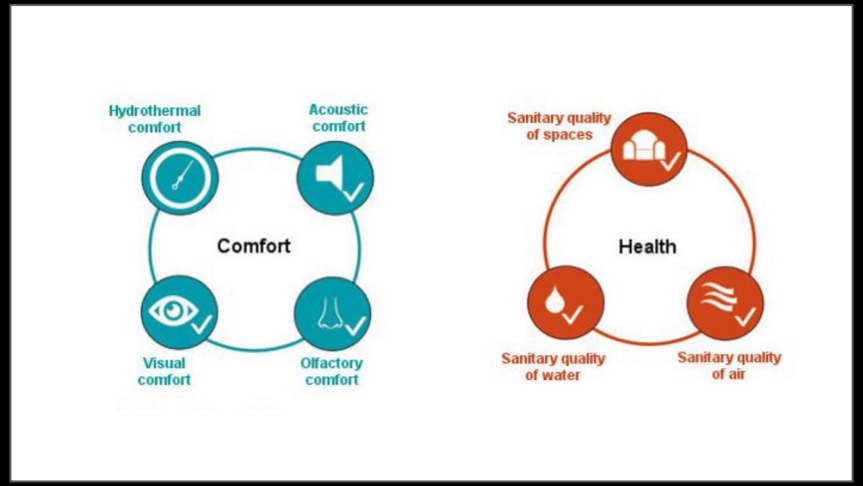
HQB

The HQE is a French standard introduced in 2002 as a sustainable building benchmark that can lead to certification.
The HQE aims to minimise the impact of new and existing buildings on their environment (based on multi-criteria, multi-stage assessment) and to optimize the health and comfort of users while ensuring effective, stringent management of the project.

Control the impacts on the external environment

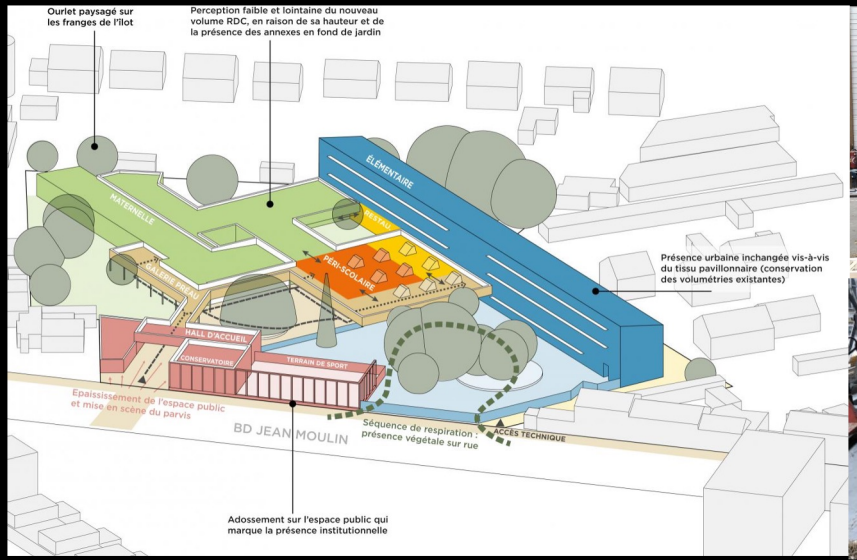


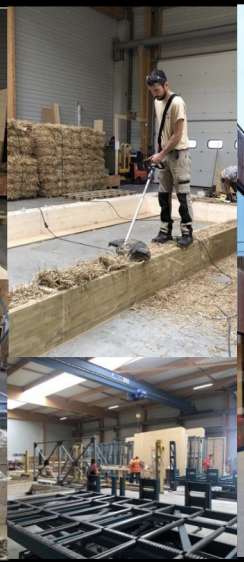
Create a satisfying indoor environment



HQE | Lucie Aubrac School Group, Nantes, France

The school group project faced the challenge of restructuring and adding a building extension that reflected a city on the move, while needing to be sustainable, comfortable and stimulating place to learn.

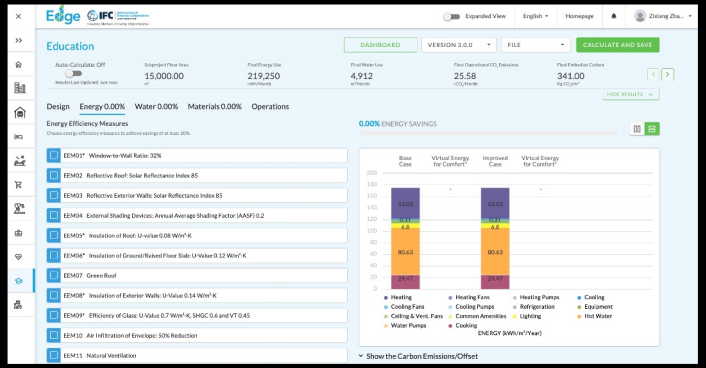


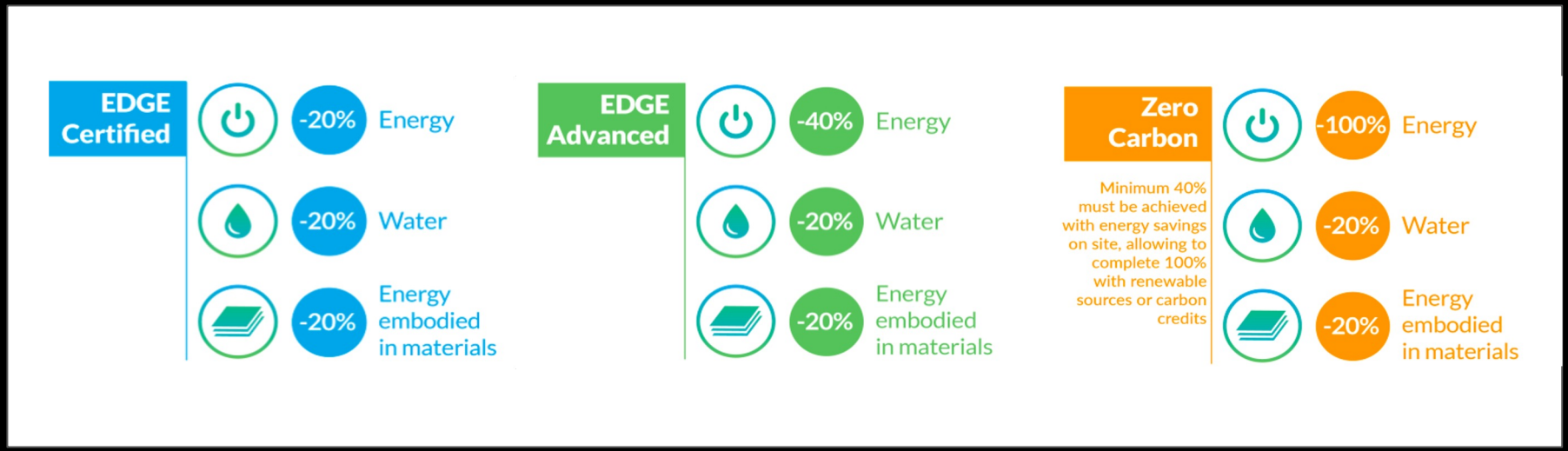


'France's Recovery and Resilience – Supported Projects: Specific Projects' <https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/frances-recovery-and-resilience-plan/frances-recovery-and-resilience-supported-projects-specific-projects_en>

Edge

EDGE is an innovation of international Finance Corporation, a member of the **World Bank Group**. IFC created EDGE to respond to the need for a measurable and credible solution to prove the business case for building green and to unlock financial investment.



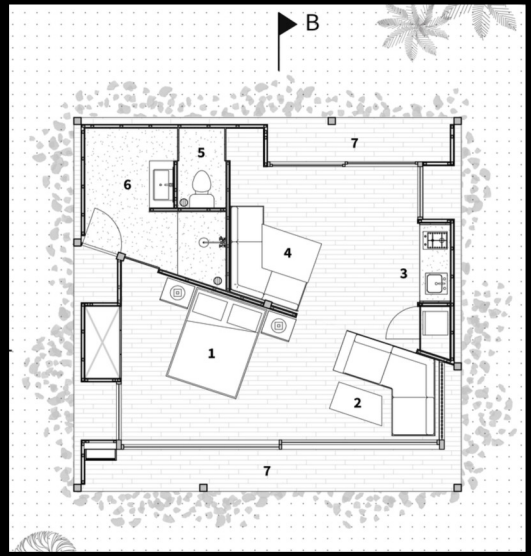


EDGE | Tetra Pod, Bali, Indonesia

A prefabricated house using recycled Tetra Pak Cartons as wall and roof material, The **Tetra Pod** is designed to seamlessly blend the **indoor-outdoor living experience**, bringing together unique low tech design while playing its part in the **local, circular economy.**

The Tetra Pod is built from **wood, steel, glass and recycled materials**. The architecture seeks to blend into its surroundings by making use of the recycled materials' reflective characteristics, while strategically placed openings carefully frame view corridors.

The contemporary design of **the sloping roof channels rainwater** through the designed structural system, which is then stored for further use, like watering the surrounding garden.
Through openings that are closely put under the canopy, the building seeks to **empower passive cooling**.



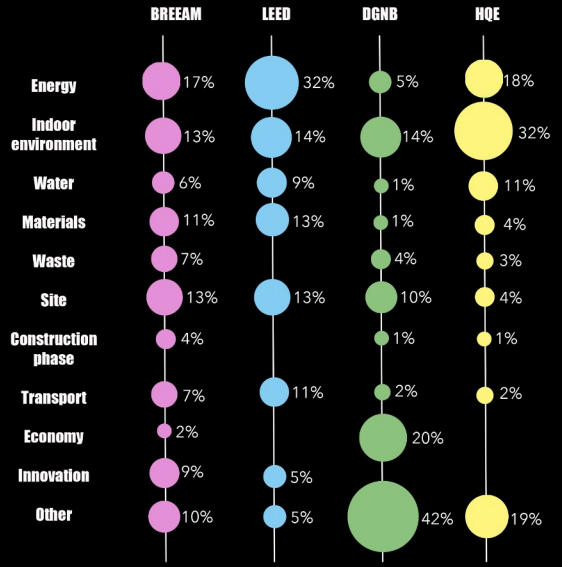
After the successful completion of the first prototype, the construction drawings for Tetra Pod were announced to be pre-sale.

How can a contemporary building system gain value from conforming to established sustainability standards? What Certificates exist today and could encourage designers to look beyond conventions, generating new frameworks for architecture?

Sustainable Building Certification is a significant system at regional and international levels and plays an essential role in supporting and encouraging global sustainable development. Stakeholders can gain significantly by using the data generated to develop better sustainable practices.

The most significance finding we noticed was the nature and well-being and the benefits it has on the human lived experience.

The use of wood as a natural resource and the positive effects it has on the human lived experience.



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