A comparison of green building certifications in Europe: How does it apply to practice in Luxembourg

LuxReal FORUM Sustainability
## Contents

1. What is an environmental certification scheme?  
2. The certification process: Construction and In-use certification  
3. Current trends in building certification in Europe and Luxembourg  
4. The economic benefits of environmental performance certifications
What is an environmental certification scheme?
Introduction

Pollution de l'air à l'intérieur

Article publié dans Pollution et environnement

La pollution de l'air à l'intérieur est un problème majeur pour la santé humaine. Elle est due à une multitude de sources, comme les combustibles fossiles utilisés pour la production d'électricité, les émissions de voitures et les déchets ménagers. Les conséquences peuvent aller de l'irritation des yeux, de la peau, aux pathologies respiratoires.

Le poids du secteur du bâtiment

Le secteur du bâtiment représente environ 15% de la production de déchets du BTP, soit 50 millions de tonnes par an. À titre de comparaison, chaque année, environ 30 millions de tonnes de déchets ménagers sont produits. 85% proviennent de la démolition, 28% de la réhabilitation et 7% de la construction neuve.

Premier consommateur d'énergie

C'est en France le plus gros consommateur d'énergie parmi les secteurs économiques, avec 70 millions de tonnes d'équivalent pétrole. Soit 43% de l'énergie finale et 1,1 tonne d'équivalent pétrole consommée par chacun d'entre nous.

Cette énergie consommée entraîne l'émission de 120 millions de tonnes de CO2 représentant 25% des émissions nationales et 32,7 millions de tonnes de carbone.

Impacts of U.S. Buildings on Resources

- 40% primary energy use*
- 72% electricity consumption*
- 39% CO2 emissions*
- 13.6% potable water consumption*

A comparison of green building certifications in Europe: what implications for Luxembourg? • LuxReal FORUM Sustainability

PwC
What are the benefits of environmental certification schemes?

- Reducing **environmental impacts** of buildings
- Providing a credible environmental **label**

As a consequence

- **Differentiating buildings** based on their environmental performance
- Allowing a **transparent comparison** of buildings

And finally

- Stimulating demand for sustainable buildings
- Helping companies to demonstrate their **social responsibility** commitments and achievements
Environmental certification schemes are increasingly developed and used across the world.
Section 1 – What is an environmental certification scheme?

How do environmental certification schemes work?

- Voluntary approach
- Establishing **criteria** and standards going beyond national and local legal obligations
- They cover a broad range of environmental impacts:

<table>
<thead>
<tr>
<th>BREEAM</th>
<th>LEED</th>
<th>DGNB</th>
<th>HQE</th>
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<td>• Health &amp; well being</td>
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<td>• Innovation</td>
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</table>

- Adapted strategy depending on asset context
- Assessor (or PoC)
- Scoring and certificate

Section 1 – What is an environmental certification scheme?

Comparing the different schemes

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<thead>
<tr>
<th>Target buildings</th>
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<td>Renovation</td>
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<td>Excellent</td>
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<td>LEED Existing Buildings</td>
<td>Specific purposes</td>
<td>LEED Existing Buildings</td>
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<td>Specific purposes</td>
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<td>Specific purposes</td>
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<td>Specific purposes</td>
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## Comparing the different schemes

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<tr>
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<td>• BRE Quality Assurance</td>
<td>• US GBC fees</td>
<td>• DGNB fees</td>
<td>• Certivéa Fees</td>
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<td>• (AMO)</td>
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<td><em>(AMO)</em></td>
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<td><strong>Complexity of the</strong></td>
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<td>BREEAM assessors</td>
<td>(LEED accredited professionnal)</td>
<td>DGNB auditors</td>
<td>HQE auditors</td>
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<td>BRE QA</td>
<td>USGBCI</td>
<td>DGNB</td>
<td>Certivéa</td>
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**A comparison of green building certifications in Europe: what implications for Luxembourg? • LuxReal FORUM Sustainability**
The certification process: Construction and In-use certification
The certification process: a focus on the BREEAM scheme

- The first method for assessing the environmental performance of buildings
- Established in 1988 and officially published in 1990
- Used in more than 50 countries worldwide
The BREEAM construction certification process: stages of assessment

- The scheme can be used to assess the impacts at different development stages

Diagram:
- Pre-assessment
- Design Stage
- Post Construction Stage
- Fit-out
- Interim Certificate
- Final Certificate
- Fit-out Certificate
The BREEAM construction certification process: stages of assessment

Pre-assessment

- Evaluation of the potential score
- Identification of potential improvements

Design Stage DS & P: Evaluation of the design by the assessor

- Assistance to the design team
- Evaluation of environmental aspects of the building: studies, choice of materials, energy consumption, ...
- Improvement actions to increase the environmental performance
- "Interim Certificate"
Post Construction Stage

There are 2 types of performance evaluation of a building:

- **Post-Construction Review (PCR)**
  - Control the execution of works
  - Performance check of DS&P
  - Confirmation of the rating obtained by DS & P
  - Final certificate

**Option for the Shell & Core evaluation (closed structural work ...)**

**Option for the Fit-out evaluation**

- **Post-construction Assessment (PCA)**
  - Evaluation of the building performance without DS&P
  - Limited influence on the performance of the building, low possibility to increase the score
  - Evaluation scheme and similar process to classic BREEAM scheme
The BREEAM In-Use certification process

- Inception
- Pre-Assessment
- Action Plan
- Implementation
- Review
- Certification

Improve your business
The BREEAM In-Use certification process

Standard approach for the provision of environmental performance information encompassing three parts. Each part can be carried out independently.

**Part 1: Building – Asset rating**
- Inherent performance characteristic of building based on built form, construction and services

**Part 2: Operation of building - Building Management Rating**
- Management policies, procedures and practices related to the operation of the building
- Consumption of key resources (energy, water and other consumables);
- Environmental impacts such as carbon and waste generation

**Part 3: Occupiers activities - Organisational effectiveness**
- Understanding and implementation of management policies, procedures and practices
- Staff engagements
The BREEAM In-Use certification aims at:

- **Improving environmental performance** of existing buildings
- Helping building managers to **reduce running/operational costs**
- **Enhancing the value** and marketability of property assets
- Providing a **transparent platform** for negotiating building improvements between landlords, tenants and property managers
- **Ensuring compatibility** with environmental legislation and standards, such as energy labelling and ISO 14001
The BREEAM In-Use certification process: Use

The BREEAM In-Use certification can be used by owners to improve the value of the building.

It allows owners or tenants to:

• Manage and monitor the sustainability of the asset
• Evaluate management practices and the organisation of activities within the building
• Develop action plans for sustainable management of the building and its operation
• Develop action plans to improve the sustainability of asset and its occupation / operation.
Current trends in building certification in Europe and Luxembourg
The stock of certified buildings is expected to increase significantly in the coming years

Existing stock:

- 1% certified properties in Europe (2010) \(^{(1)}\)
- 2% certified properties in Europe (2015) \(^{(2)}\)
- 16% certified properties in Luxembourg (2012) \(^{(3)}\)

85% of the new properties which will be completed in 2013 in “Ile de France” will be certified.

\(^{(1)}\) Pike Research
\(^{(2)}\) Pike Research
\(^{(3)}\) PwC Research
Current trends in green retrofitting and new construction in Europe

Source: RICS, Going for Green May 2012
Certified buildings in Europe: state of play

Certified and registered buildings in Europe (May 2012)

Source: RICS, Going for Green May 2012
Certified and registered buildings in Europe (May 2012), dominated by BREEAM

But, outside the birth country, LEED is leading

Source: RICS
Certified buildings in Luxembourg: figures

Certified office buildings in Luxembourg (%)

Certified office buildings in Luxembourg (No. buildings)

* The data presented in this section covers certified buildings for which information is publicly available as well as those buildings that will be certified in the future and for which PwC has access to confidential information.

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Certified buildings in Luxembourg: targets

Certified buildings in Luxembourg by project type

- New: 72%
- In Use: 8%
- Extension: 9%
- Renovation: 11%

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PwC

31 January 2013
**A broad coverage of the city districts**

**Localisation of certified buildings***

<table>
<thead>
<tr>
<th>No. certified buildings</th>
<th>CBD</th>
<th>Cloche' d'Or</th>
<th>Gare</th>
<th>Hamm</th>
<th>Howald</th>
<th>Kirchberg</th>
<th>Merl</th>
<th>Strassen</th>
<th>Am Bam</th>
<th>Belval</th>
<th>Diekirch</th>
<th>Dudelange</th>
<th>Kayl</th>
<th>Windhof</th>
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</table>

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Certified buildings in Luxembourg: Kirchberg
Certified buildings in Luxembourg: CBD

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Certified buildings in Luxembourg: Gasperich
The economic benefits of environmental performance certifications
What is green value?

Green value can be defined as the net additional value a green building can obtain on the market with respect to non-green buildings.

Evidence suggests that green certified buildings may be able to obtain a premium compared to non-certified buildings with same characteristics (location, size, comfort...).
Risks for the market value of a non-green building

- Market rent
- Higher owner’s operating costs to maintain the building at market level
- Higher risk premium
- Lower owner’s earnings growth
- Higher depreciation
Environmental determinants of the market value of rental properties

\[
\text{Market value} = \frac{\text{Net operating income} = \text{market rent} - \text{owner’s operating costs}}{\text{Yield} = \text{risk free rate} + \text{risk premium} - \text{growth} + \text{depreciation}}
\]

- Changes in tenants expectations (+)
- Lower share of operating costs (+)
- Lower costs of fittings (+)

- Lower costs for maintenance and servicing activities (-)
- Lower investments to sustain building at market level (-)
- Lower rent waivers (-)

- More cash flow (-)
- Improve marketability (-)
- Shorter vacancy (-)

- Competitiveness (+)
- Rising energy costs (+)
- Sustainability hype (+)

- Longer life span (-)
- Longer compliance with increasingly stringent legislation (-)

A few extracts from the literature on green value of buildings

“The Energy Star and LEED certified buildings have on average a 3% higher rent, a 6% higher rental revenue (rent multiplied by the occupation rent) and a 16% higher resale price.”


“Higher difference in rent, equal to 6%. Their figures are more surprising for resale values: over 31% for Energy Star buildings, over 35% for LEED buildings.”

Fuerst F., McAllister P. (2009), New Evidence on the Green Building Rent and Price Premium, Reading University.

“Resale price difference over 6% for Energy Star, plus 10% for LEED”

Miller N., Spivey J., Florance A. (2008), Does Green Pay Off?, San Diego University, CoStar Data Basis
### Green Value: Different figures

#### Summary of US Green Office Value Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Rental Premium</th>
<th>Sales Price Premium</th>
<th>Vacancy Rate Premium</th>
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<tbody>
<tr>
<td>Fuerst &amp; McAllister (2011)⁰²</td>
<td>Energy Star 4 %</td>
<td>Energy Star 26 %</td>
<td>Energy Star 1-3 %</td>
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<td>LEED 5 %¹³</td>
<td>LEED 25 %</td>
<td>LEED: No Premium</td>
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<td>Eichholtz et al (AER)⁰⁴</td>
<td>Energy Star 3.3 %</td>
<td>Energy Star 19 %</td>
<td>Bundled as “effective rent” : 7 % premium overall</td>
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<td>LEED: 5.2 %¹⁵</td>
<td>LEED: 11 %¹⁵</td>
<td>15%</td>
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<tr>
<td>Eichholtz et al (RICS)⁰⁶</td>
<td>Energy Star 2.1 %</td>
<td>Energy Star 13 %</td>
<td>Bundled as “effective rent” : 6-7 % premium overall</td>
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<td>LEED 5.8 %</td>
<td>LEED 11 %</td>
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<tr>
<td>Pivo &amp; Fisher⁰¹⁷</td>
<td>2.70%</td>
<td>8.50%</td>
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<td>LEED 15-17 %</td>
<td>LEED: 16-18 %</td>
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<td>Miller et. al. (2008)⁰¹⁹</td>
<td>9%</td>
<td>None</td>
<td>2-4 %</td>
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