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## **BREEAM versus LEED**

White Paper first published February 2010



# About this White Paper

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Inbuilt leads the way in technical and consulting excellence for the design, delivery and development of sustainability in the built environment.

Inbuilt works closely with clients' design teams, providing expert advice on built environment sustainability, environmental design and environmental assessment including lifecycle assessment and cost analysis. As integral members of the design team, Inbuilt's BREEAM team schedules activities, sets priorities and negotiates the tradeoffs required to achieve the highest BREEAM ratings. They also have additional expertise in building services and the specification of renewable energy technologies, and can therefore ensure that BREEAM criteria requirements are integrated into the building design.

BREEAM and LEED are the two most widely recognised environmental assessment methodologies used globally in the construction industry today. Each has different strengths and weaknesses, with differing philosophies and business models. Generally it is not straightforward to compare the two. What might be applicable in one assessment method might not be relevant in another.

Historically BREEAM has been the leading methodology in the UK, but increasingly clients are asking the question – is BREEAM best or is LEED better?

How can a project team in the UK determine which methodology is most appropriate for their project?

This White Paper aims to give you the necessary background and help you make an informed decision about your project.

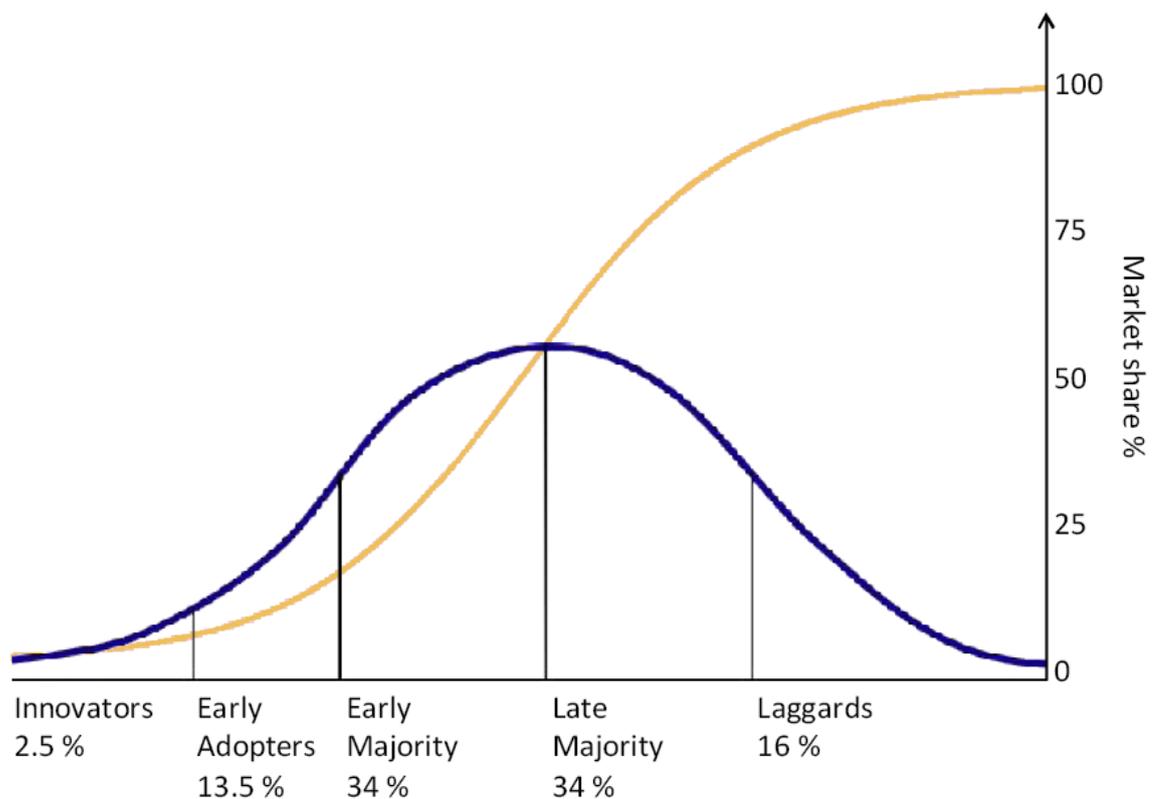
For further information on Inbuilt's BREEAM and LEED assessment services, please contact Melanie Starrs on tel. +44 (0)1923 277087 or email: [melanie.starrs@inbuilt.co.uk](mailto:melanie.starrs@inbuilt.co.uk)

Melanie Starrs and Victoria Kate Burrows at Inbuilt are among the first wave of experts in the country to achieve the new BREEAM Accredited Professionals (BREEAM AP) qualification.

## Introduction

Accreditation systems for measuring the environmental performance of buildings have been around for at least 20 years. They have been instrumental at driving innovation regarding sustainability issues within the construction industry. By using a single 'rating', certification encompasses an umbrella of issues which might otherwise be individually dropped or missed.

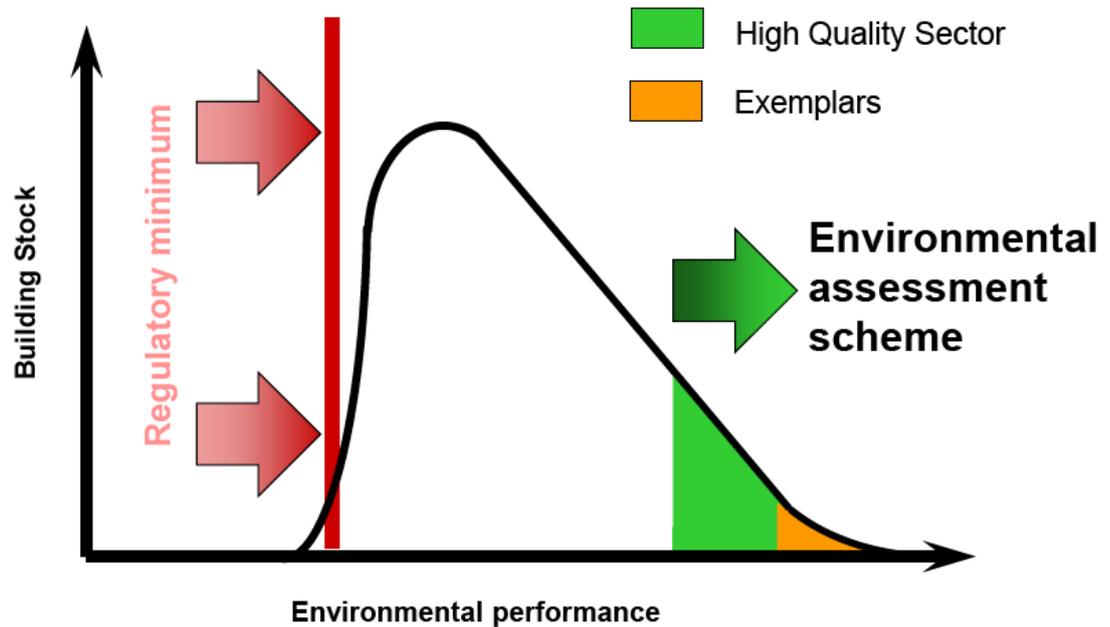
As any innovation matures and moves through from the early adopters to the early majority, the price of implementing it falls, in turn stimulating more growth.



<http://upload.wikimedia.org/wikipedia/commons/0/0f/Diffusionofideas.PNG>

Accreditation schemes need to push the legislative boundaries, keeping ahead of the mass market in order to drive innovation. This is one reason why requiring accreditation as a legislative minimum may be a bad idea. In order for any scheme to retain value, it should be hard to achieve. At the very least there should be exemplar levels to aspire to attain.

## Difficulty keeping ahead of Legislation



Source: BRE

BREEAM and LEED are the two most widely recognised environmental assessment methodologies used globally in the construction industry today.

This report looks at:

- The history, facts and features of BREEAM and LEED
- An overview of BREEAM 2008, credits and weightings
- An overview of LEED 2009, credits and weightings
- A detailed credit comparison between the two schemes
- The overlaps, and the conclusions about each scheme's benefits in a UK context



## **BREEAM**

### **History**

BREEAM (Building Research Establishment Environmental Assessment Method) was conceived by BRE and was first used in 1990.

### **Facts and Figures**

The number of buildings certified is quoted as 116,000 buildings and 714,000 buildings registered, but the breakdown as to which scheme (building type and year) is not publicized.

### **Drivers**

There are a number of drivers for BREEAM in the UK:

- Legislation & Planning –some local planning authorities require BREEAM pre-assessments and, increasingly, accreditation (including Section 106 agreements)
- Private sector companies –some developers have set voluntary minimum BREEAM rating for all new buildings (i.e. British Land, Land Securities, Hammerson, etc)
- Public Sector –a minimum BREEAM rating for all new buildings and refurbishments has been in place since 2006 (OGC, HCA, DCSF, Department of Health, etc)



## LEED

### History

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for environmentally sustainable construction.

The characteristics of the USGBC, compared to the BRE are an important predictor in some of the differences between the two schemes. Whilst the BRE was a government funded research body when BREEAM was conceived, USGBC is a national nonprofit membership body, with 19,957 member organizations including corporations, governmental agencies, nonprofits and others from throughout the industry. LEED is consensus-driven with committee-based development.

LEED is a registered trade mark and a brand name. It's part of a keen commercial mindset at USGBC, who have attracted over 6,500 paying members bringing in over \$24 million a year.

The hallmark of LEED is that it is an open and transparent process where the technical criteria proposed by the LEED committees are publicly reviewed for approval by the more than 10,000 membership organizations that currently constitute the USGBC.

The transparency extends to publishing collated data on which credits are achieved, resulting in a kind of league table of more common and rare credits. For instance credit ID2 (having a LEED-AP) is always achieved, whereas credit MR1.3 (Re-use of shell and 50% of interior) has never been achieved.

There are also differences in the way LEED calculates credits. They are generally linked to the US Dollar (especially the energy credits), which means that if the exchange rate is unfavourable, then the building's rating could suffer.

Third-party certification through the independent Green Building Certification Institute (GBCI.org) assures that LEED buildings are constructed as intended. GBCI includes a network of ISO-compliant international certifying bodies, ensuring the consistency, capacity and integrity of the LEED certification process.

### Facts and Figures

Typical costs: \$750-3750 on registration + \$1500-7500 doc submission + \$10-30k AP doc gathering fee. Design team prior experience is an important factor in allowing for costs. Documentation costs at \$30,000 to \$60,000 for teams working on their first LEED project, and as low as \$10,000 for experienced teams. (USGBC)

Roughly 400 buildings are LEED-certified, with another 3,500 seeking certification. Every business day, \$464 million worth of construction registers with LEED.



There are LEED projects in all 50 US states and 91 countries.

**Drivers**

San Francisco, Portland and Austin, Texas, all require new municipal construction to earn LEED “silver” certification, the second of the four levels. In 2003, the Los Angeles City Council voted to require that all new public buildings meet the first level, and more recently, the council voted to expedite the approval process for developers willing to step up to silver.



## BREEAM 2008

### Overview

Buildings have been assessed under BREEAM 2008 from 1 August 2008. BREEAM 2008 replaced BREEAM 2006.

A new rating was been added for scores over 85% of 'Outstanding'. In order to get the rating, not only does the building need to gain 85%, but there are minimum requirements in several individual criteria PLUS information on the building HAS to be published as a case study (written by BRE Global).

| BREEAM rating | % score |
|---------------|---------|
| Unclassified  | <30     |
| Pass          | ≥30     |
| Good          | ≥45     |
| Very Good     | ≥55     |
| Excellent     | ≥70     |
| Outstanding   | ≥85     |

The other main change was the introduction of Innovation credits. Now there is a route to get accreditation for innovations which BREEAM does not cover. For each innovation for which accreditation is sought and approved, 1% is added to the overall score.

### Mandatory credits

Minimum levels have been set at ALL ratings for some criteria, the onus of which increases as the rating rises. You still need to gain the minimum percent for each rating band.

To gain a **Pass** (30%) credits:

- Man 1 - Commissioning
- Hea 4 - High frequency lighting and
- Hea 12 - Microbial contamination are compulsory
- To get a Good (45%), add the following:
- Wat 1 - Water consumption and
- Wat 2 - Water meter



**Very Good** (55%) adds:

- Ene 2 - Sub-metering of substantial energy uses and
- LE 4 - Mitigating ecological impact

For **Excellent** (70%):

- Man 2 - Considerate Constructors,
- Man 4 - Building user guide,
- Ene 5 - Low or zero carbon technologies and
- Wst 3 - Storage of recyclable waste are added
- plus in Ene 1 - Reduction of CO2 emissions (i.e. an EPC of 40 or less for a new build office) a *minimum of 6 points* must be awarded.

To get the new rating of **Outstanding**, in addition to all of the above (plus scoring 85% or more):

- Man 1 – Commissioning needs 2 points,
- Man 2 - Considerate Constructors and
- Wat 1 - Water consumption (total available in Wat 1 is 3), plus
- Ene 1 - Reduction of CO2 emissions - a minimum of 10 points must be awarded (i.e. an EPC of 25 or less for a new build office).

In addition, the building now has to have a Post Construction Review (before these were not mandatory unless the client required them). A BREEAM assessment made at stage D is now known as a DS (design stage) assessment and is an interim stage towards final certification as building completion. It will not be possible to value engineer out the BREEAM features between design and completion without getting penalised (or put another way, caught).

## Weightings

The weightings changed in 2008. The baseline BREEAM scheme used for comparison is Offices. There are slight differences between schemes. Energy now accounts for 19% of the total (an increase) and water now accounts for a slightly larger slice of the pie.

Waste is a new section meaning when added to Materials, there is a much greater focus on embodied energy, with Management, Land Use and Ecology and Pollution now accounting for relatively less of the overall score.



| <b>2008</b>        | Weighting | Credits | % per credit |
|--------------------|-----------|---------|--------------|
| Management         | 12        | 10      | 1.20         |
| Health & Wellbeing | 15        | 13      | 1.15         |
| Energy             | 19        | 24      | 0.79         |
| Transport          | 8         | 10      | 0.80         |
| Water              | 6         | 6       | 1.00         |
| Materials          | 12.5      | 13      | 0.96         |
| Waste              | 7.5       | 7       | 1.07         |
| Land Use & Ecology | 10        | 10      | 1.00         |
| Pollution          | 10        | 12      | 0.83         |
|                    | 100       | 105     | 0.95         |

It has never been possible to gain 100% in BREEAM (mainly due to the recycled facade and structure credits (not available to new build for obvious reasons) - by reusing a building it is highly unlikely that the fabric would perform as well as new build in energy terms, even if the embodied energy is less).

And as for the 1% innovation credit number? This makes sense when you look at what credits are now worth. The spread between points has narrowed. The mean percentage value of one credit is 0.95%, top value is 1.20% and bottom 0.79%. This is more evenly distributed than BREEAM 2006 (1.08%, 1.5% and 0.81%).



## LEED 2009

### Overview

LEED 2009 replaced LEED 2.0 from 27 April 2009. All discussion which follows refers to LEED-NC (new construction). There are small differences for the other schemes.

Unlike BREEAM, LEED is a points rather than percentage system. There are 100 base points, 6 possible Innovation in Design and 4 Regional Priority points.

| LEED rating | Points              |
|-------------|---------------------|
| Certified   | 40-49               |
| Silver      | 50-59               |
| Gold        | 60-79               |
| Platinum    | 80 points and above |

### Prerequisites

LEED introduced prerequisites before BREEAM's mandatory credits. Prerequisites are mandatory for all ratings.

#### Sustainable Sites

- SSP1 – Construction Activity Pollution Prevention

#### Water Efficiency

- WE1 – Water Use Reduction

#### Energy and Atmosphere

- EAP1 – Fundamental Commissioning of Building Energy Systems
- EAP2 – Minimum Energy Performance
- EAP3 – Fundamental Refrigerant Management

#### Materials and Resources

- MRP1 – Storage and Collection of Recyclables

#### Indoor Environmental Quality

- EQP1 – Minimum Indoor Air Quality Performance
- EQP2 – Environmental Tobacco Smoke (ETS) Control

### Weightings

Whilst LEED does not convert points into a percentage in the same way that BREEAM does, there was a considerable change in allocation of points per credit between LEED 2.0 and LEED 2009 which means there is now an implicit weighting.



## Detailed Credit Comparison

The narrative below picks up the main differences and significant similarities in LEED 2009 from BREEAM 2008. Credit details and breakdowns of scores can be found in the appendices.

### Sustainable Sites

- SS1 forbids development on farmland, wetlands and within 50 feet of a water body. BREEAM has no equivalent (but these may be covered elsewhere within UK legislation).
- SS2 requires development density calculations which BREEAM does not. There are similarities in the types of services (bank, shops, post office, etc) which the development is rewarded for being near.
- SS3 (brownfield development) is considerably easier to achieve than LE2 (contaminated land).
- The transport credits in LEED are considerably less onerous than the BREEAM equivalents. For example, a 300,00ft<sup>2</sup> office building would require 95 cycle spaces under BREEAM, but only 36 under LEED. LEED rewards specific parking for LEV and FEV or for an LEV sharing scheme. There is no current equivalent under BREEAM, but there is the opportunity to propose this as an innovation credit.
- SS5.2 promotes a high proportion of open space to encourage biodiversity. There is no BREEAM equivalent.
- SS7.1 and 7.2 refer to heat island effect which BREEAM does not cover, although green roofs are rewarded (for different reasons) under LE 4, LE 5, LE 6 and Pol 5.

### Water Efficiency

- WEP1 looks at water use reduction against a baseline, rather than setting an absolute target like BREEAM.
- WE1 looks at irrigation which is included as Wat 6 in some BREEAM schemes, but not currently in BREEAM Offices 2008.
- WE2 relates to BREEAM credit Wat 5, recycling, which is again not included in BREEAM Offices 2008.
- In BREEAM there are 3 credits which reward specific design solutions or technologies, namely water meters, sanitary supply shut-off and major leak detection. LEED tends not to dictate design solutions, focussing instead on the intention (i.e. water use reduction).

### Energy & Atmosphere

- EAP2 requires the building to be designed to ASHRAE 90.1. This is more onerous than designing to CIBSE standards and UK Building Regulations, and there is no BREEAM equivalent. However, by designing to this standard, there is no need to specifically require technologies or design solutions, in the same way that BREEAM does. It gives designers more discretion.
- EAP3 relates to refrigeration and is covered in the EU by legislation.



- EA1 is roughly equivalent to Ene 1. However there are 2 key differences – it is stated in terms of improvement over a baseline in energy, rather than a target carbon amount, and is also stated in terms of COST of energy. This is also the case for EA2 which looks at renewable and is roughly equivalent to Ene 5.
- There is a total of 11.85% available for BREEAM Offices Ene 1 for a zero carbon building (which relates to Building Regulation Part L calculations). The maximum number of points available under LEED is 19 for a 48% improvement on energy performance calculated from Appendix G baseline from ASHRAE 90.1-2007. Points are very roughly equivalent to 0.9%, so a maximum 17% in LEED for a very good low energy building versus almost 12% for a zero carbon building seems better value! The calculations are more onerous for ASHRAE than for Part L.
- The other main difference in LEED is that Green Power is rewarded, whereas in BREEAM contracts with green energy suppliers is not rewarded.
- EAc1 –Software Requirements - LEED energy modelling is based around the Performance Rating Method which in turn is based on the calculation procedure outlined in ASHRAE 90.1. While some software requirements are laid out in Appendix G of ASHRAE 90.1, there is no direct software accreditation for LEED energy modelling.
- LEED metric (\$) is an effective marketing tool but arguably not the most relevant metric for environmental impact assessment.

### **Materials & Resources**

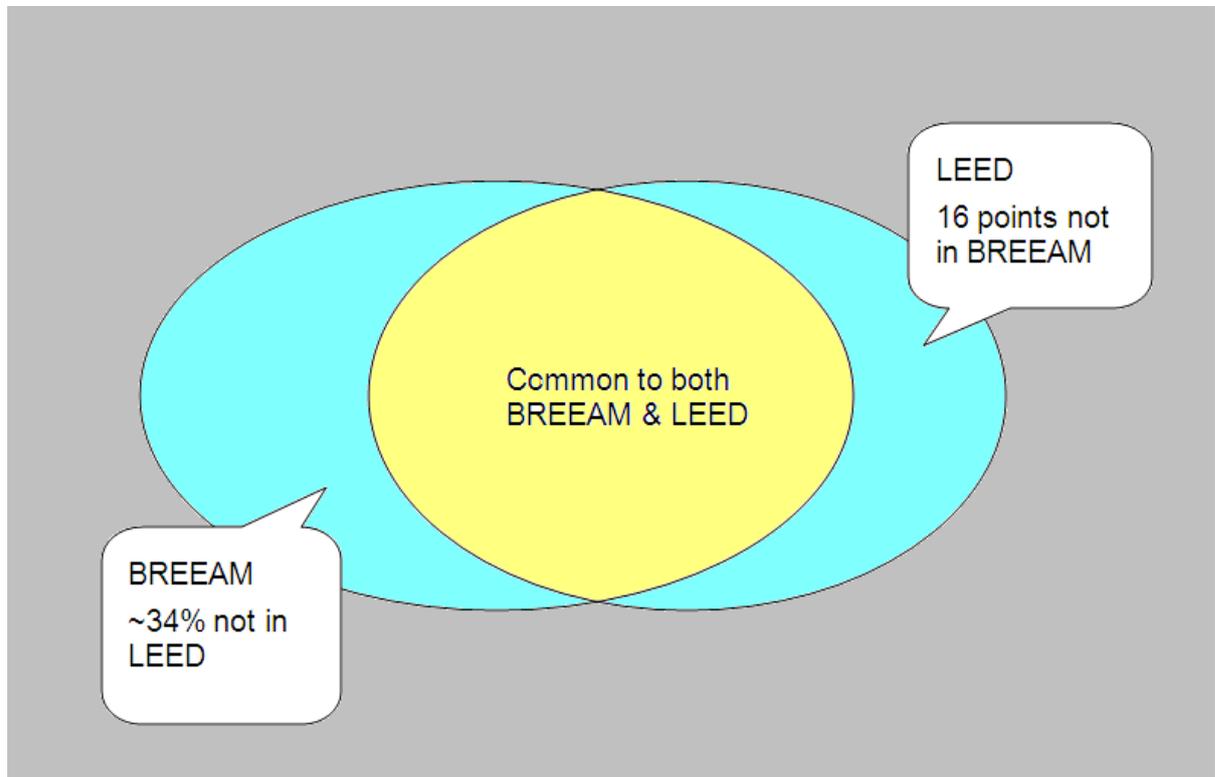
- MRP1 relates to storage for recyclable waste. This is similar to BREEAM but the areas required are much greater – almost double at smaller floor areas and 1.5 times as large at higher floor areas.
- LEED generally deals in percentage improvements rather than absolute values. This applies to the reuse of materials too. There are a number of additional credits to BREEAM where items such as rapidly renewable materials, local materials and reuse of interior elements are rewarded.
- Rather than focus on an accreditation scheme and chain of paperwork (which Mat 5 in BREEAM now uses), the intentions are stated and it is up to the assessor and design teams discretion to ensure compliance is met.
- There is still a focus in both schemes for rewarded recycling rather than reducing waste in the first place.

### **Indoor Environmental Quality**

- IEQP1 relates to ASHRAE 62.1. There is no BREEAM equivalent as minimum ventilation rates are covered by Building Regulations.
- IEQ1, IEQ2, IEQ3 and IEQ5 are quite sophisticated and beyond any current UK requirements. BREEAM does not reward well designed mechanically ventilated systems. If a building requires mech vent, LEED may well be the better accreditation to go for.
- IEQ7.1 requires ability to measure post-occupancy thermal comfort. This is far and beyond BREEAM or CIBSE, but is picked up in BSRIA's soft landing framework.
- IEQ8 covers daylight and is similar in scope but uses a different methodology to BREEAM.

## Comparing the two schemes within a UK context

There is a considerable amount of overlap between the two schemes.



If a building has scored well under LEED, it is likely that it will score well under BREEAM. The converse relationship does not hold quite as well.

Where there are prescriptive credits in LEED, these are generally less onerous than BREEAM. The targets set in BREEAM are often linked to specific technologies or solutions whereas in LEED it is more common to state the intention and leave it up to designers discretion as how best to comply.

In general LEED is less prescriptive than BREEAM. Designers have more freedom to meet the required standards using their discretion and there is less of a tickbox mentality. This means the calculation methods used are more rigorous, and consequently there is more work to be done to prove accreditation.

LEED is strong on occupant comfort, internal pollution issues (off-gassing etc), heat island effects and is geared towards climates which use mechanical ventilation and air conditioning and where existing infrastructure promotes the use of cars. It also covers some ground not found in BREEAM where UK legislation takes over, for example environmental tobacco smoke control.



BREEAM is strong on pedestrian and cyclist safety, with much higher targets for cyclist spaces. It is also stronger than LEED on water and acoustics.

LEED now has a requirement for the USGBC to have access to Whole-Building Energy and Water Usage Data. The rating will not be tied to the information provided, and the owner does not have to "actively supply USGBC with information, but simply authorize the USGBC to access the information".

BREEAM Outstanding has a mandatory requirement for a BREEAM In Use certification within the first 3 years of operation.



## Conclusions

So is the dynamic tension between two competing systems desirable? The competition between the two schemes (and indeed with other pretenders to the throne) has proved to be of benefit to the global industry. The competition between the two schemes has promoted innovation, both in the schemes and in delivered buildings. For instance, demand for both BREEAM and LEED has undoubtedly stimulated research into building sciences which might not otherwise have happened.

Transparency can also encourage innovation. This is one area where LEED has had clear advantage over BREEAM, with IES software for one developing tools which integrate the design process with LEED accreditation.

Whilst the transparency of LEED is appealing there are some aspects which are harder to digest. Some have accused the building council's "consensus-based approach" of catering to manufacturers rather than basing credits on scientific research, factoring in the life cycles of construction materials and climate variations. There is an element of independence which is missing.

In BREEAM's favour is a more scientific basis for the research behind some credits, and a broader remit covering more of the social aspects of sustainability. However, BREEAM suffers from a lack of transparency. For instance, data on the number of buildings certified in each category and what ratings they have achieved is hard to come by, mainly due to the fact that historically it was seen as a barrier to adoption if this information was made public. However, we live in more accountable times and if BREEAM is to retain its current UK crown in building accreditation schemes, this may need to be addressed.

The key 'philosophical' difference between the two methods is the process of certification. BREEAM has licenced assessors who assess the evidence against the credit criteria and report it to the BRE, who QA the assessment and issue the certificate.

For LEED evidence is collated by the design team (sometimes co-ordinated by a LEED-AP) then submitted to the US-GBC which does the assessment and issues the certificate.

As a result of this the business model for each scheme is very different. BREEAM is funded from the licence fees for the assessor organisations (on a scheme by scheme basis) and also the project licence fees. LEED is funded in part by the licence fees (which tend to be higher than BREEAM) but also through USGBC memberships.

No environmental assessment scheme is perfect. Context is important.

If you have a highly innovative solution, no accreditation scheme is likely to give due recognition. Both BREEAM and LEED are constrained, especially when calculating carbon and energy savings, by the methodologies which they use to award credits. SBEM and ASHRAE 90.1 have limited scope to recognize ultra-innovative solutions. Also, EPBD and ASHRAE 90.1 baselines are different both in terms of methods and metrics. It is not possible



to assume that energy cost saving in LEED can be equivalently translated to carbon saving in BREEAM.

LEED is a measurement tool and not a design tool. The same goes for BREEAM.

Both systems continue to learn from each other's mistakes and as time goes on convergence on some matters is inevitable.

While BREEAM is generally more relevant in the UK as it uses UK policies, LEED can sit alongside as part of a global corporate policy.



## Appendices

### BREEAM 2008 credit descriptions

The BREEAM Offices 2008 credits have been used. Innovation credits have not been included in the list below. Due to rounding errors the total is slightly less than 100. These numbers are for comparison with LEED only.

| Credit | BREEAM 2008 credit description        | % available per credit |
|--------|---------------------------------------|------------------------|
| Man 1  | Commissioning                         | 2.4                    |
| Man 2  | Considerate Constructors              | 2.4                    |
| Man 3  | Construction Site Impacts             | 4.8                    |
| Man 4  | Building User Guide                   | 1.2                    |
| Man 8  | Security                              | 1.2                    |
| Hea 1  | Daylighting                           | 1.15                   |
| Hea 2  | View out                              | 1.15                   |
| Hea 3  | Glare control                         | 1.15                   |
| Hea 4  | High frequency lighting               | 1.15                   |
| Hea 5  | Internal and external lighting levels | 1.15                   |
| Hea 6  | Lighting zones & control              | 1.15                   |
| Hea 7  | Potential for natural ventilation     | 1.15                   |
| Hea 8  | Indoor air quality                    | 1.15                   |
| Hea 9  | Volatile organic compounds            | 1.15                   |
| Hea 10 | Thermal comfort                       | 1.15                   |
| Hea 11 | Thermal zoning                        | 1.15                   |
| Hea 12 | Microbial contamination               | 1.15                   |
| Hea 13 | Acoustic performance                  | 1.15                   |



|       |  |      |
|-------|--|------|
| Ene 1 | Reduction of CO2 emissions                         | 11.7 |
| Ene 2 | Sub-metering of substantial energy uses            | 0.78 |
| Ene 3 | Sub metering of high energy load areas and tenancy | 0.78 |
| Ene 4 | External lighting                                  | 0.78 |
| Ene 5 | Low or zero carbon technologies                    | 2.34 |
| Ene 8 | Lifts  | 1.56 |
| Ene 9 | Escalators   | 0.79 |
| Tra 1 | Provision of public transport                      | 2.4  |
| Tra 2 | Proximity to amenities                             | 0.8  |
| Tra 3 | Cyclist facilities                                 | 1.6  |
| Tra 4 | Pedestrian and cycle safety                        | 0.8  |
| Tra 5 | Travel plan  | 0.8  |
| Tra 6 | Maximum car parking capacity                       | 1.6  |
| Wat 1 | Water consumption                                  | 3    |
| Wat 2 | Water meter  | 1    |
| Wat 3 | Major leak detection                               | 1    |
| Wat 4 | Sanitary supply shut off                           | 1    |
| Mat 1 | Materials specification (major building elements)  | 3.84 |
| Mat 2 | Hard landscaping and boundary protection           | 0.96 |
| Mat 3 | Re-use of building façade                          | 0.96 |
| Mat 4 | Re-use of building structure                       | 0.96 |
| Mat 5 | Responsible sourcing of materials                  | 2.88 |
| Mat 6 | Insulation   | 1.92 |
| Mat 7 | Designing for robustness                           | 0.96 |
| Wst 1 | Construction site waste management                 | 4.28 |



|       |  |      |
|-------|--|------|
| Wst 2 | Recycled aggregates  | 1.07 |
| Wst 3 | Storage of recyclable waste                                    | 1.07 |
| Wst 6 | Floor finishes   | 1.07 |
| LE 1  | Re use of land   | 1    |
| LE 2  | Contaminated land  | 1    |
| LE 3  | Ecological value of site AND Protection of ecological features | 1    |
| LE 4  | Mitigating ecological impact                                   | 2    |
| LE 5  | Enhancing site ecology   | 3    |
| LE 6  | Long term impact on biodiversity                               | 2    |
| Pol 1 | Refrigerant GWP - Building services                            | 0.83 |
| Pol 2 | Preventing refrigerant leaks                                   | 1.66 |
| Pol 4 | NOx emissions from heating source                              | 2.49 |
| Pol 5 | Flood risk   | 2.49 |
| Pol 6 | Minimising watercourse pollution                               | 0.83 |
| Pol 7 | Reduction of night time light pollution                        | 0.83 |
| Pol 8 | Noise attenuation  | 0.83 |

58 credits in total (excluding innovation credits)



## LEED 2009 credit descriptions

| Credit | LEED 2009 credit description  | Points per credit |
|--------|---|-------------------|
| SSP1   | Construction Activity Pollution Prevention                            | 1                 |
| SS1    | Site Selection  | 1                 |
| SS2    | Development Density and Community Connectivity                        | 5                 |
| SS3    | Brownfield Redevelopment  | 1                 |
| SS4.1  | Alternative Transport – Public Transportation Access                  | 6                 |
| SS4.2  | Alternative Transport – Bicycle Storage and Changing Rooms            | 1                 |
| SS4.3  | Alternative Transportation – Low-emitting and Fuel-efficient Vehicles | 3                 |
| SS4.4  | Alternative Transportation – Parking Capacity                         | 2                 |
| SS5.1  | Site Development – Protect or restore habitat                         | 1                 |
| SS5.2  | Site Development – Maximise Open Space                                | 1                 |
| SS6.1  | Stormwater Design – Quantity Control                                  | 1                 |
| SS6.2  | Stormwater Design – Quality Control                                   | 1                 |
| SS7.1  | Heat Island Effect – nonroof  | 1                 |
| SS7.2  | Heat Island Effect – Roof   | 1                 |
| SS8    | Light Pollution Reduction   | 1                 |
| WEP1   | Water Use Reduction   | 1                 |
| WE1    | Water Efficient Landscaping   | 4                 |
| WE2    | Innovative Wastewater Technologies                                    | 2                 |
| WE3    | Water Use Reduction   | 4                 |



|        |   |    |
|--------|---|----|
| EAP1   | Fundamental Commissioning of Building Energy Systems                  | 1  |
| EAP2   | Minimum Energy Performance  | 1  |
| EAP3   | Fundamental Refrigerant Management                                    | 1  |
| EA1    | Optimise Energy Performance   | 19 |
| EA2    | On-site Renewable Energy  | 7  |
| EA3    | Enhanced Commissioning  | 2  |
| EA4    | Enhanced Refrigerant Management                                       | 2  |
| EA5    | Measurement and Verification  | 3  |
| EA6    | Green Power   | 2  |
| MRP1   | Storage and Collection of Recyclables                                 | 1  |
| MR1.1  | Building Reuse – Maintain Existing Walls, Floors and Roof             | 3  |
| MR1.2  | Building Reuse – Maintain Existing Interior Nonstructural Elements    | 1  |
| MR2    | Construction Waste Management   | 2  |
| MR3    | Materials Reuse   | 2  |
| MR4    | Recycled Content  | 2  |
| MR5    | Regional Materials  | 2  |
| MR6    | Rapidly Renewable Materials   | 1  |
| MR7    | Certified Wood  | 1  |
| IEQP1  | Minimum Indoor Air Quality Performance                                | 1  |
| IEQP2  | Environmental Tobacco Smoke (ETS) Control                             | 1  |
| IEQ1   | Outdoor Air Delivery Monitoring                                       | 1  |
| IEQ2   | Increased Ventilation   | 1  |
| IEQ3.1 | Construction Indoor Air Quality Management Plan – During Construction | 1  |



|        |  |   |
|--------|--|---|
| IEQ3.2 | Construction Indoor Air Quality Management Plan – Before Occupancy | 1 |
| IEQ4.1 | Low-emitting Materials – Adhesives and Sealants                    | 1 |
| IEQ4.2 | Low-emitting Materials – Paints and Coatings                       | 1 |
| IEQ4.3 | Low-emitting Materials – Flooring Systems                          | 1 |
| IEQ4.4 | Low-emitting Materials – Composite Wood and Agrifiber Products     | 1 |
| IEQ5   | Indoor Chemical and Pollutant Source Control                       | 1 |
| IEQ6.1 | Controllability of Systems – Lighting                              | 1 |
| IEQ6.2 | Controllability of Systems – Thermal Comfort                       | 1 |
| IEQ7.1 | Thermal Comfort - Design   | 1 |
| IEQ7.2 | Thermal Comfort –Verification                                      | 1 |
| IEQ8.1 | Daylight and Views – Daylight                                      | 1 |
| IEQ8.2 | Daylight and Views - Views   | 1 |
| ID1    | Innovation in Design   | 5 |
| ID2    | LEED Accredited Professional                                       | 1 |
| RP     | Regional Priority  | 4 |

58 credits in total



## LEED 2.0 vs. LEED 2009

Comparing the weightings per credits for LEED 2.0 vs. LEED 2009

| Credit | LEED 2.0 Points | LEED 2009 Points |
|--------|-----------------|------------------|
| SSP1   | 1               | 1                |
| SS1    | 1               | 1                |
| SS2    | 1               | 5                |
| SS3    | 1               | 1                |
| SS4.1  | 1               | 6                |
| SS4.2  | 1               | 1                |
| SS4.3  | 1               | 3                |
| SS4.4  | 1               | 2                |
| SS5.1  | 1               | 1                |
| SS5.2  | 1               | 1                |
| SS6.1  | 1               | 1                |
| SS6.2  | 1               | 1                |
| SS7.1  | 1               | 1                |
| SS7.2  | 1               | 1                |
| SS8    | 1               | 1                |
| WEP1   | (WE3.1) 1       | 1                |
| WE1    | (WE1.1-2) 2     | 2-4              |
| WE2    | 1               | 2                |
| WE3    | (WE3.2) 1       | 2-4              |
| EAP1   | 1               | 1                |



|        |             |      |
|--------|-------------|------|
| EAP2   | 1           | 1    |
| EAP3   | 1           | 1    |
| EA1    | 8           | 1-19 |
| EA2    | 3           | 1-7  |
| EA3    | 1           | 2    |
| EA4    | 1           | 2    |
| EA5    | 1           | 3    |
| EA6    | 1           | 2    |
| MRP1   | 1           | 1    |
| MR1.1  | (MR1.1-2) 2 | 1-3  |
| MR1.2  | (MR1.3)1    | 1    |
| MR2    | (MR2.1-2) 2 | 1-2  |
| MR3    | (MR3.1-2) 2 | 1-2  |
| MR4    | (MR4.1-2) 2 | 1-2  |
| MR5    | (MR5.1-2) 2 | 1-2  |
| MR6    | 1           | 1    |
| MR7    | 1           | 1    |
| IEQP1  | 1           | 1    |
| IEQP2  | 1           | 1    |
| IEQ1   | 1           | 1    |
| IEQ2   | 1           | 1    |
| IEQ3.1 | 1           | 1    |
| IEQ3.2 | 1           | 1    |
| IEQ4.1 | 1           | 1    |
| IEQ4.2 | 1           | 1    |



|        |     |     |
|--------|-----|-----|
| IEQ4.3 | 1   | 1   |
| IEQ4.4 | 1   | 1   |
| IEQ5   | 1   | 1   |
| IEQ6.1 | 1   | 1   |
| IEQ6.2 | 1   | 1   |
| IEQ7.1 | 1   | 1   |
| IEQ7.2 | 1   | 1   |
| IEQ8.1 | 1   | 1   |
| IEQ8.2 | 1   | 1   |
| ID1    | 4   | 1-5 |
| ID2    | 1   | 1   |
| RP     | n/a | 1-4 |
|        | 69  | 110 |



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