

International Applications of Building Certification Methods: A Comparison of BREEAM and LEED

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ABSTRACT: As sustainable development has become mainstream conversation globally, the construction industry has increasingly sought to apply green building labelling methods internationally. In the absence of a universal green labelling procedure the key factors of each must be analysed to determine which one favours a particular project. Labelling methodologies such as BREEAM and LEED are instantly recognisable in their respective countries. Both have grown out of national best practice and years of consensus-based research, but it is yet to be determined which one is best suited for international applications. In fact, neither has proven to be as such. Their differences are many, but their goal is the same. Each project team must choose which methodology is best suited to their development. This paper discusses the main differences between BREEAM and LEED that should be considered when determining the most desirable green building labelling methodology based on cost, technical requirements, flexibility and adaptability to the local geographic, climatic and ideological conditions.

Keywords: BREEAM, LEED, assessment, labelling, certification, green building, sustainability

INTRODUCTION

As sustainable development has been brought into mainstream conversation on a global scale, the construction industry has increasingly sought to apply green building labelling methods internationally in an effort to create performance benchmarks, by which the sustainable performance of developments around the world can be gauged. Developers, Owners, and Occupants alike have begun to recognise the benefits of sustainable design and the value of achieving a measurable level of sustainability by obtaining a 'green label'.

The US-based LEED (Leadership in Energy and Environmental Design), developed by the USGBC (United States Green Building Council), and the UK-based BREEAM (Building Research Establishment Environmental Assessment Method), developed by the BRE (Building Research Establishment), methodologies have become the forerunners in the race to become the internationally recognised sustainable building certification scheme. But in a world characterised by diversity in architecture, cultural differences and abundance of natural resources, is it possible to gauge buildings by a universal sustainable measure? This is very unlikely. So, of the systems already developed which parameters favour one assessment methodology over another for a particular project?

BREEAM and LEED have both become the national standard in their respective countries, becoming an

integral part of the design and construction process. In fact, numerous Local Authorities and government bodies have already mandated LEED/BREEAM into planning and development processes, e.g. London may soon require all major developments to achieve BREEAM certification.

Although their competition and lessons learnt in recent years have forced their evolution paths to converge, there remain several fundamental differences that must be considered when a project team decides which methodology to use. Methodological and project specific factors, such as process, applicability, location, owner/developer and intended occupant(s), should influence the decision-making process to ensure successful implementation and certification.

Assumptions Current versions of the assessment methodologies, LEED-NC v2.2 (LEED for New Construction and Major Renovations) US and BREEAM International 2008, are referenced in this analysis. [3, 4] Project experience and lessons learnt through practical application of the methodologies by the author and professional colleagues [7] are also incorporated throughout the analysis.

COMPARISON

With regard to overall organisation and objectives, BREEAM and LEED have many similarities, the most fundamental of which is the general process and intent.

Both schemes provide an independent third-party certification that is benchmarked against recognized standards and regulations to differentiate levels of achievement. (Table 1)

Each methodology has been developed through years of consensus-based research and comment and have a similar organisation. Through a system of credits divided into various topics, a diverse range of sustainable development issues are addressed with respect to a holistic approach to sustainability: Environmental, Social and Economic. Each credit is comprised of a set of criteria and evidence submittals required to comply. The project team then produces and assembles the required documentation, it is submitted to the respective assessor and/or organization (USGBC/BRE), a Quality Assurance (QA) review is undertaken, and, if all evidence is in order and complies, a certification rating is issued.

BREEAM and LEED both have a two-stage assessment process, under which project performance is assessed; once at the end of the design phase and again following completion of construction. Where the two differ with regard to this for international applications is discussed in the following section. Both methods also use certification thresholds to award varying levels of certification – BREEAM (Pass, Good, Very Good, Excellent and Outstanding) and LEED (Certified, Silver, Gold, Platinum) – and each has program-specific schemes for almost any building type, from homes to offices to healthcare facilities.

Hence, given the overall aims, certification processes and documentation procedures of BREEAM and LEED are very alike, project teams must consider method-specific intricacies and project-specific demands when deciding which methodology to apply.

CONTRAST

Although the two methodologies cover many of the same topics and have many similar requirements, the BREEAM and LEED methodologies are applied through different mechanisms, making each of them more readily usable for differing circumstances. (Table 1) Depending upon the location of the project, previous experience of the project team, and project-specific goals, one methodology will be more appropriate than another.

The main logistical and methodological characteristics influencing their international applicability are:

- Phase of development to be certified
- Feasibility of meeting assessment requirements

- Potential for contracting necessary expertise

Application Considerably fewer buildings have been certified under the LEED methodology than BREEAM [5, 9, 10]. Despite the fact that LEED is a newer methodology, this is in no small part due to their certification requirements and should be considered prior to choosing either methodology. LEED has always required both Design Phase (DP) and Construction Phase (CP) documentation and reviews, delaying the achievement of any LEED certification until completion of construction and making the timeline for certification substantially longer. Until recently, all BREEAM schemes required completion of only a single stage assessment to obtain BREEAM certification, either the Design Stage (DS) or the Post-Construction Stage (PCS), enabling project teams to obtain certification in a much shorter timeframe. This single phase certification option still holds true for BREEAM International.

As previously stated, under LEED, one certificate is issued and a single rating is achieved for the overall project. As LEED requires assessment of both DP and CP documentation, certification cannot be achieved until substantial completion of construction. This increases the timeframe but ensures that what is designed and specified has ultimately been built. Once the Construction Documents are finalised, the documentation for credits designated by the USGBC as DP credits may be reviewed. The USGBC then designates the credits as either 'anticipated' or not achieved. All anticipated credits are then reconfirmed at the end of construction through affirmation that nothing has changed in the interim. The CP documentation is also reviewed at that time and the final rating issued. The DP and CP reviews may be undertaken jointly at the end of construction, however it is often beneficial for the project team to complete the design portion early on to provide a better understanding of the assessment status.

Despite all of the other BREEAM schemes being updated in 2008, BREEAM International does not require both stages of assessment for certification. Currently, project teams may elect to undertake only a DS or a PCS assessment. In practice, the two stages are quite similar to the LEED phases, but independent of one another. DS assessments are, as indicated by the name, only applicable to design phase specification and documentation. The responsibility for achievement of credits is held primarily by the owner and design teams. PCS assessments are then undertaken separately following substantial completion of construction and require construction phase documentation. The responsibility for achievement of credits is held primarily by the owner and construction teams. The option to

Table 1: Summary of LEED and BREEAM Methodology Comparison.

ASSESSMENT METHODOLOGY SIMILARITIES

<ul style="list-style-type: none"> ▪ Independent third-party certification verification. ▪ Aim to assess the overall sustainability of a development using a 3-prong approach: Social, Environmental & Economical <ul style="list-style-type: none"> ▪ Credit thresholds determined by improvement upon industry standards. ▪ Recognized “label” for certification.
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ASSESSMENT METHODOLOGY DIFFERENCES

LEED	BREEAM
<ul style="list-style-type: none"> ▪ 2 phase review process required (Design & Construction) to earn a single rating for 1 certificate. ▪ U.S. regulations and best practice apply. Eg. ASHRAE ▪ LEED AP participation in process is optional. ▪ Pre-requisite credits apply for every project to achieve any level of certification. ▪ Up to 4 Innovation points available. 	<ul style="list-style-type: none"> ▪ 2 phase review process optional (Design Stage & Post-Construction Stage). Each phase is separated certified, for a possible 2 certificates with different ratings. ▪ Local and/or Regional regulations and best practice apply. ▪ BREEAM International Assessor contracted to complete formal assessment is required. ▪ Pre-requisite credits apply only for non-International assessments attempting higher levels of certification. ▪ No Innovation points available for BREEAM International.

complete only one assessment stage for certification limits liability for project teams and simplifies the process, which can be vital for projects outside North America and the EU. This freedom is likely to be only temporary, though. It is anticipated that future versions of BREEAM International will be brought into line with the other schemes by incorporating a similar dual-stage certification.

Arguments for both approaches can be made. BREEAM provides a mechanism for the design team to pursue certification and the building to receive a level of certification without placing burden upon the construction team. However, LEED (and likely the next version of BREEAM International) ensures that what was specified is actually installed and that the designers’ intent was realised. Hopefully a dual-phase certification approach will become industry standard as this would mandate a minimum level of implementation and accountability.

Flexibility Functionally, the feasibility of meeting assessment criteria must be considered. Main items that project teams should review prior to selecting a certification methodology are; the Standards to which the project must be compared, the utilisation of pre-requisite credits, and the potential to achieve credits for innovative approaches or exemplary performance.

Standards The Standards to which the project must be compared often has the greatest number of implications for international applications. LEED-assessed projects must use U.S.-recognised standards and criteria (eg. ASHRAE and Imperial Units), regardless of where the project is located. With regard to achieving credits, this may often prove beneficial for projects in Europe, where regulations are often more stringent, but detrimental for projects in Asia, Africa or South America, where regulations tend to be less prescriptive. This also frequently presents a difficulty in assessing compliance, as project teams abroad are unlikely to be familiar with U.S. Standards. Often, a U.S. based consultant must be contracted to undertake compliance analyses, adding to professional costs and potentially construction costs as well.

The BRE has begun to address this issue with BREEAM International, which provides region-specific criteria for Europe, Asia and the Middle East. The requirements for other regions remain to be defined. Projects in other areas are still required to go through the Bespoke assessment process, but the BREEAM International mechanism will enable the BRE to more efficiently respond to project demands. BREEAM International allows the BREEAM criteria to be adapted to local variations in climate, priorities and regulations

[8], and attempts to provide flexibility whilst retaining credibility.

Pre-Requisites The rigidity of pre-requisites has the potential to be incredibly cumbersome in locations outside the U.S., Canada and the EU. LEED has pre-requisites (seven in NC), which must be achieved for every project to be certified at any level. BREEAM International does not.

Failure to achieve a single LEED pre-requisite results in the declination of certification for even an otherwise Platinum-level design. As LEED has been developed in the United States and the criteria are geared to US standards and industry trends, this does not often present a problem in the States or Europe. However, for regions where local Regulations are not as stringent and design and construction practices are not monitored to the same extent, the pre-requisites may present site-specific challenges for an international project and add an undesired additional level of uncertainty and complexity. On the other hand, in having pre-requisites, which must be achieved for all projects, the USGBC ensures:

1. a base level of sustainability in most categories
2. a building does not completely disregard specific issues

The aim is to have a more comparable benchmark and well-rounded sustainable developments.

Although BREEAM International does not currently include any pre-requisites, standard BREEAM 2008 schemes do require minimum levels of performance for some credits in order to obtain higher levels of certification. It is anticipated that future versions of BREEAM International will also incorporate similar requirements. At the moment, though, this provides project teams with another means of adapting the system to their specific goals and demands.

Innovation Innovation Credits provide the project team the opportunity to receive credit for innovative approaches and/or exemplary credit performance. The criteria are not always pre-defined and can be project-specific, which incorporates a measure of flexibility into the assessment requirements.

Innovation credits have been a part of the LEED methodology since the first versions. Hence, for LEED assessments there is past precedent for credits and some for exemplary performance on standard credits, but new Innovation credits can always be proposed for review and approved by the USGBC as appropriate. Four Innovation credits are possible, and present the project team with the opportunity to tailor the assessment to the proposed project, achieve additional credits and potentially earn a higher certification rating.

Again, Innovation credits have not yet been incorporated into BREEAM International. However, it is again anticipated that future versions of BREEAM International will, given that the new standard BREEAM 2008 schemes do. Currently, though, there is not a mechanism for project teams to highlight a unique sustainable design solution or aspect of their project under BREEAM International.

Support The potential to contract a LEED AP (Accredited Professional) or BREEAM-International Licensed Assessor could determine whether a project is successfully certified. Similarly, so could the availability of organisational (USGBC/BRE) support.

Assessor Involvement Where the USGBC surrenders a certain flexibility with LEED pre-requisites, the BRE does so by requiring that a BRE-trained individual and licensed institution undertake the assessment and submit the Assessment Report. BRE-provided scheme-specific training, an exam and a test assessment are all required for an individual to become a BREEAM Assessor. The company/institution for which the Assessor works must also maintain a current license for that assessor and BREEAM scheme. BRE dictates this level of prudence because under BREEAM it is the Assessor who reviews all of the documentation and submits the Assessment Report to the BRE for Quality Assurance (QA) review. However, this can be quite costly, even for a firm in the UK, and when an international dimension is added the investment required is multiplied. [6] All BREEAM training must either be taken at designated locations and times pre-determined by the BRE, or a company may contract the BRE BREEAM team to hold a "private" training session for a minimum of 20 people at an international location for significantly higher fees. Unless an international firm foresees several future International BREEAM assessments, the time and capital costs necessary to train and license even one individual can be inhibitive. In such cases, a BREEAM consultant must be sub-contracted. With an overwhelming majority of the BREEAM consultants located in the UK, contracting can be expensive in pounds and remote coordination with no face-to-face interaction can be onerous.

The USGBC has made becoming LEED AP very feasible for almost any location around the world, also frequently making it easier for project to procure the desired expertise. Until recently, the USGBC has been able to circumvent formal training and licensing requirements because all documentation is uploaded to LEED-Online for USGBC to QA during their dual-stage review process. This will change slightly in 2009, with continuing education and maintenance fees will be required for the first time, but an individual will still be able to become LEED Accredited with no formal training

The computer-based exam may be taken at any Prometric testing facility world-wide, and there will be online opportunities to participate in continuing education units.

Further, in order to undertake a LEED assessment and achieve certification, the involvement of a LEED AP is not required. Rather, the USGBC has chosen to encourage LEED AP involvement from early in design process by making an additional point available.

Organisation Involvement Both organisations have incredible demands in this ever increasing sustainable development market, and they are continually improving methods of communication and response time. However, BRE is very slow to answer queries, and the Credit Interpretation Request (CIR) process can be hindering. But the USGBC is typically more prompt in responding and more online support is available. [6, 7]

OTHER CONSIDERATIONS

Whatever certification methodology is determined to be the most logistically suitable to the project, other considerations, such as marketability, recognition and uniformity, will often ultimately have as significant or greater an influence on the final methodology selected. Property development is a business. As such, the owner and/or developer often seeks measurable publicity and exposure as a result of achieving certification.

Marketability The project team must determine under which methodology the project can achieve a higher rating. If the potential for positive promotion is not there, then typically formal assessment will not go forward.

Recognition The methodology that summons the greatest extent of recognition among the target audience is usually chosen. Quite frequently one methodology will be more recognisable due to proximity or historic relationships (eg. Canada & LEED and France & BREEAM). If potential renters/buyers/customers do not recognise the “brand” of the certification rating achieved, then any investments have not been wisely made.

Uniformity Quite often multi-national corporations choose one methodology to use consistently throughout their company, regardless of location. For instance, if a company headquartered in the US is constructing a satellite office or store in Singapore, they will likely choose LEED to adhere to an overlying corporate policy. This provides companies a means to compare and track their building stock and communicate performance with shareholders.

PROJECT SPECIFIC EVALUATION

Given these considerations, project teams must be aware that early examination of the assessment methodology is imperative to the successful certification of an internationally located project. It is straightforward to compare and evaluate which methodology is preferred in theory, but when it comes to practical application all positives and negatives for any potentially applicable methodologies should be weighed against one another to better gauge which will likely provide the greatest success for the proposed project.

Pre-Assessment It is highly beneficial for the design team to undertake a Pre-Assessment or Feasibility Assessment at the very early stages of project development, ideally prior to completion of the conceptual design stage. During the Pre-Assessment, the proposed development will be analysed against all credits of each of the potential methodologies at a high level. Credits will be rated according to achievability, and a likely resultant score under each will be determined. It is recommended that any locally developed methodology available also be considered and compared in the Pre-Assessment as they will often better understand the intricacies of the influencing factors of the site.

CONCLUSION

Clearly, all assessment methodologies available world-wide have not been discussed herein. The two most recognised third-party verified certification schemes, BREEAM and LEED, have been chosen. They have varying benefits and disadvantages, and it is the responsibility the project team to consider these and advise the owner which scheme will be more beneficial and feasible, locally and globally.

As the evolution of the two methodologies continues in the coming years, it is anticipated that the main logistical difference will be whether the design is assessed against a standard set of codes or regulations throughout, as with ASHRAE for LEED, or whether local and regional codes and regulations can be used as appropriate, as with BREEAM International.

Of course, this then leads to another topic for conversation: Can building certifications schemes, such as BREEAM and LEED, which were developed for regionally specific circumstances and priorities, adequately address the regional and local intricacies of all sites around the globe? Sustainable design solutions must be site-specific, but how regionally bespoke can certification methodologies be and still maintain international relevancy and comparability? This will be an interesting subject for debate over the coming years.

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