

Development in the United States and around the globe is racing forward at an all time high, making buildings one of the worst emitters of greenhouse gases. In 2009, buildings alone accounted for roughly 40% of energy consumption and green house gas emissions in the United States. Residential buildings accounted for 21% of this figure. Due to the current state of the economy and the political ideology in the United States, the development of alternative energy sources is not progressing at a rate necessary to curb greenhouse gas emissions. These two factors coupled together require us to take a harder look at our building standards. Stringent building standards can have a significant impact on reducing green house gas emissions. Designing and creating buildings that use energy efficiently is imperative in the fight against green house gas emissions.

Fortunately, various nongovernmental organizations have been in the green building code business since the early 1990's, starting with BREEAM in the United Kingdom in 1990.<sup>1</sup> France followed suit in 1996 with HQE, and in 1998-2000 LEED was developed in the United States. Green building codes exploded in the 2000's.<sup>2</sup> We began to see green building codes in countries such as Canada, Australia, Poland, Germany, Vietnam, Romania, and Brazil.<sup>3</sup> As of 2011 there was some form of green building code in six of the seven continents.<sup>4</sup> These figures illustrate that there is recognition that buildings are huge emitters and that more stringent standards are necessary to combat green house gas emissions. The question really is how effective are these various systems? This paper is going to offer a comparative analysis of the two more well know green building codes; LEED and BREEAM.

BREEAM, the first green building code of its kind, was launched in the United Kingdom in 1990. The code was developed by the Building Research Establishment. Since 1990 110,808 units have been certified globally.<sup>5</sup> Of these 110,808 units, 109,450 of the units are in the UK, and 1358 of the units are non-domestic.<sup>6</sup> BREEAM's biggest competitor, LEED was first launched in the United States in 1998. LEED was developed by the United States Green Building Council and has undergone a number of revisions since its development in 1998.<sup>7</sup> As of February 2008 there were 1823 certified units globally, including 540 domestic, and 1283 non-domestic certified buildings.<sup>8</sup>

Why are there more BREEAM certified buildings around the globe? Is BREEAM the better standard? What is the future of these two systems? These are just a few of the questions this paper will attempt to address in doing a comparative analysis of BREEAM and LEED.

## BREEAM

BREEAM has established four aims and six objectives.<sup>9</sup> Through its green building code, BREEAM aims to mitigate the impacts that buildings have throughout their life span.<sup>10</sup> All BREEAM buildings are designed to have the lowest possible environmental impact.<sup>11</sup> In designing the buildings, BREEAM seeks

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<sup>1</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>2</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>3</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>4</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>5</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>6</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>7</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>8</sup> [http://www.prres.net/papers/Reed\\_International\\_Rating\\_Tools.pdf](http://www.prres.net/papers/Reed_International_Rating_Tools.pdf)

<sup>9</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>10</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>11</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

to ensure that the best environmental practices are used through the entire life of the building; from planning, to design, to construction, through the operation of the building.<sup>12</sup> BREEAM aims to use the code as a way to provide a way for buildings to be recognized for being environmentally friendly.<sup>13</sup> Additionally, BREEAM aims to provide a credible label for buildings that achieve BREEAM certification.<sup>14</sup> Importantly, BREEAM aims to stimulate demand for sustainable buildings through their code and labeling efforts.<sup>15</sup> In stimulating demand BREEAM's objective is to raise awareness of the benefits of buildings with low impact on the environment.<sup>16</sup> One of BREEAM's objectives is to minimize the cost of green buildings by encouraging market innovation.<sup>17</sup> Finally, BREEAM seeks to go further than government regulations, choosing to be market leader in the field of green building codes.<sup>18</sup>

There are numerous BREEAM schemes to assess different building types. Among the different schemes are BREEAM New Construction, BREEAM refurbishment, BREEAM Code for Sustainable Homes, and BREEAM communities.<sup>19</sup> For the sake of this paper, I will focus on BREEAM New Construction to provide a consistent comparison to LEED. From scheme to scheme, however, there are basic underlying principles that are consistent throughout. Each scheme is designed to ensure environmental quality and to provide quantifiable measures to assist in assessing the impact each building has on the environment.<sup>20</sup> The BREEAM scheme goes beyond looking at just the environmental benefits and takes into consideration the social economic benefits of each scheme.<sup>21</sup> The hallmark of BREEAM is its flexibility, adaptability, and third party certification. Each scheme is designed to meet the needs of the location, considering factors such as regulation and climate.<sup>22</sup> To facilitate this goal, each scheme utilizes a "common framework of assessment," standards that every project must meet, but then tailors the details of the project to meet the specific needs of the location.<sup>23</sup> BREEAM has also utilizes a third

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<sup>12</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>13</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>14</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>15</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>16</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>17</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>18</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>19</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>20</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>21</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>22</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>23</sup>[http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

party to certify each project.<sup>24</sup> Third party certification ensures independence and lends credibility to those projects that have attained BREEAM certification.<sup>25</sup>

The BREEAM New Construction scheme assesses each project in the nine different environmental sections. The areas of assessment include management, health and wellbeing, energy, transport, water, materials, waste, land use and ecology, pollution, and innovation. Each area is broken down further and includes criteria that the project is assessed against. For example, in the area of water, BREEAM aims to reduce consumption of water for sanitation purposes. All criteria are geared towards the end goal of reducing the quantity of water consumed *per person* per day. There are different benchmarks for consumption reduction, allowing a project to earn more credits for the greater reduction.

Projects earn credits for each criterion that they meet. Each area of assessment has been weighted. To determine a project's score, credits are awarded for each criterion met and the percentage of credits achieved for each section is calculated. This figure is then multiplied by the specific areas weighting to determine the project's area score. The area scores are then added up to get the project's total score. The total score is then compared to the BREEAM benchmark ratings to determine what level of classification the project has attained. The BREEAM benchmark ratings are pass, good, very good, excellent, and outstanding.

As mentioned previously BREEAM is designed to be flexible and adaptable to various locations; however there are certain minimum standards that all projects that wish to obtain BREEAM certification must meet. These minimum standards insure that every project's performance lives up to the aims, goals, and objectives laid out by BREEAM. Within these guidelines, however, credits can be traded to help a project achieve a particular level certification. In sum, there are two requirements to obtaining a BREEAM rating; the minimum standards must be met and the project must obtain a minimum percentage score.

Although BREEAM was originally voluntary, and remains voluntary in places, it is required by a number of governments throughout Europe. UK HAS MADE A COMMITMENT TO NET ZERO HOUSES- GREATLY AID PROMULGATION OF BREEAM. (FROM GREENBLO CLASS) This is a key point that could be enlightening in comparing BREEAM and LEED.

## LEED

The first domestic green building certification system in the United States was developed in 1998 by U.S. Green Building Council (USGBC).<sup>26</sup> Like BREEAM, LEED has undergone many revisions since 1998, but maintains a similar vision to BREEAM. LEED was established to provide a green building scheme to be implemented throughout the life of the building; from the design phase, to the construction and operation phase, and through the maintenance phase of the building.<sup>27</sup> LEED is also similar to BREEAM in that it has developed different schemes to be applied to different building types, such as commercial buildings, new construction, schools, and residential buildings.<sup>28</sup> LEED also has a

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<sup>24</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>25</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073\\_BREEAM\\_2011\\_New\\_Construction\\_Technical\\_Guide\\_ISSUE\\_2\\_0.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/SD5073_BREEAM_2011_New_Construction_Technical_Guide_ISSUE_2_0.pdf)

<sup>26</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

<sup>27</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

<sup>28</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

neighborhood development scheme that seeks to apply sustainable practices beyond just buildings and throughout the neighborhood.<sup>29</sup>

LEED also takes a holistic approach in their assessment of buildings. Each LEED scheme is designed to assess the project in five different categories. The five categories are sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.<sup>30</sup> In addition to these five, each project is also assessed in the areas of innovation in design and regional priority.<sup>31</sup> The regional priority credits attempt to address environmental issues that are of particular importance to the region that the LEED scheme is being implemented in.<sup>32</sup> Each of these areas is broken down even further into certain criteria that each project can earn credits for. For example, in the area of water, LEED buildings utilize various strategies to increase water efficiency and reduce consumption of water.<sup>33</sup> The end goal of these strategies is to reduce water consumption by a certain percentage for the entire *building*.<sup>34</sup> A greater reduction results in more credits being awarded.

Each project is scored out of 100 points, with a possible ten bonus points for innovation in design and regional priority credits.<sup>35</sup> To calculate a building's score, each assessment area is weighted to reflect the impact that each area will have.<sup>36</sup> Credits are then awarded for each criterion that the project meets. As with BREEAM there are benchmarks that determine if the project has attained LEED certification and what level certification the project has attained. The different benchmarks are, from least to greatest, Certified, Silver, Gold, and Platinum.<sup>37</sup> Also, there are minimum standards that each building must meet in order to be certified. The minimum standards insure that the integrity of LEED is well preserved. Like BREEAM, each project that wishes to attain LEED certification must meet the minimum standards and be awarded a minimum number of credits.

LEED, like BREEAM, is a voluntary assessment tool. However, LEED's efforts in promulgating a green building code throughout the United States and abroad is not aided by government regulation, unlike the BREEAM standard.

Is BREEAM more stringent than LEED?

A 2008 report prepared by BREEAM attempted to compare the major green building standards around the world. In that report BRE assessed a UK building using the BREEAM and LEED schemes, among others. What they found was a building designed to comply with LEED standards would only achieve a BREEAM rating of Good.<sup>38</sup> Conversely, a building designed to comply with BREEAM criteria would achieve a LEED rating of Gold.<sup>39</sup> A side by side comparison of the two benchmarking reveals that a Good rating under BREEAM is only their second highest rating, whereas a Gold rating under LEED is their next to highest rating.<sup>40</sup> This report seems to imply that BREEAM standards are more stringent.

A separate study, prepared in 2007, attempted to compare LEED and BREEAM by using the two schemes to assess an office building in Greece. This study found that the office building would achieve

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<sup>29</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

<sup>30</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1991>

<sup>31</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1991>

<sup>32</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>33</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>34</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>35</sup> <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1991>

<sup>36</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>37</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>38</sup> [http://www.dgbc.nl/images/uploads/rapport\\_vergelijking.pdf](http://www.dgbc.nl/images/uploads/rapport_vergelijking.pdf)

<sup>39</sup> [http://www.dgbc.nl/images/uploads/rapport\\_vergelijking.pdf](http://www.dgbc.nl/images/uploads/rapport_vergelijking.pdf)

<sup>40</sup> [http://www.dgbc.nl/images/uploads/rapport\\_vergelijking.pdf](http://www.dgbc.nl/images/uploads/rapport_vergelijking.pdf)

LEED certification, but would fall short of attaining BREEAM certification.<sup>41</sup> Another study that used LEED and BREEAM to assess an office building in Dubai, found that the office building achieved a BREEAM rating, but did not achieve LEED certification.<sup>42</sup> The conflicting conclusions in these case studies make it difficult to definitively state which scheme is more stringent. A closer look at the schemes themselves could provide insight.

A broad view of the actual language of the BREEAM and LEED schemes lead one to the conclusion that BREEAM is actually more stringent. There are many areas of overlap between the schemes, and there are some areas that LEED assesses that BREEAM does not, but there are significantly more areas of assessment in BREEAM. BREEAM also seems to take a more focused look at the areas of assessment. For example, BREEAM in evaluating a project's water consumption, bases their assessment on the on the amount of water consumer *per person* per day; This figure is then compared against the project's baseline performance to calculate the percent improvement for the entire project. In comparison, LEED evaluates a project's water consumption based on the amount of water consumed by the *entire building*. LEED compares this figure to an established baseline performance to calculate a percent reduction. Not only does BREEAM take closer look by evaluating a project on a per person basis, the standards set by BREEAM are much more stringent. In the area of water efficiency, LEED awards four credits for 40% reduction from the baseline, whereas BREEAM only awards three credits for 40% reduction. (See <http://www.sustainablebusinessonline.com/news/news.asp?id=308&cat=3>) This is only one specific example of how BREEAM standards are more stringent. Simply looking at the areas of assessment from each scheme reveals that BREEAM takes a closer look at each project. BREEAM assesses each project in ten different areas, whereas LEED limits their assessment to five categories. In terms of achieving a truly sustainable building, BREEM's requirements go much further than LEED in achieving this goal. However, this does not answer the question why there are more BREEAM certified buildings. In fact it would be logical to conclude that more stringent standards would lead to less certified buildings. The fact that BREEAM is more stringent is a double edged sword. It does help achieve the goal of creating more sustainable buildings, but it can also hinder the development of BREEAM as a global player in the field. As one person theorized, more stringent standards can actually turn people off.<sup>43</sup> In looking at BREEAM's scheme for New Building Construction, one can see where a person could easily be confused by how in depth the BREEAM approach is and actually choose to use another standard, such as LEED.

Why are there more BREEAM certified buildings?

Despite the fact that BREEAM's standards are more stringent, there are more BREEAM certified buildings around the globe. Comparisons of the BREEAM and LEED schemes aside, the biggest reason is the most obvious; BREEAM has been around eight years longer than LEED. BREEAM was launched in 1990, therefore, they have had eight more years to learn and adapt.

Another important reason there are more BREEAM certified buildings is government regulation. Contrary to the United States, the United Kingdom and most of Europe, has taken a strong approach in confronting and dealing with green house gas emissions. Europe and the UK have recognized buildings as one of the largest contributors to overall green house gas emissions. In 2006 England declared that

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<sup>41</sup> A.M. Papadopoulos, E. Giama, *Rating systems for counting buildings' environmental performance*, September 2007

<sup>42</sup> Ya Roderick, David McEwan, Craig Wheatley, Carlos Alonso, *A Comparative study of building performance assessment between LEED, BREEAM, and Green Star schemes*, Integrated Environmental Solutions Limited.

<sup>43</sup> <http://www.sustainablebusinessonline.com/news/news.asp?id=308&cat=3>

all homes would be net zero by 2016.<sup>44</sup> To achieve this goal they are enacting more green building codes. Some governments are going so far as to actually require the use of BREEAM.<sup>45</sup> The enactment of green building codes and requiring BREEAM certification, even simply setting a goal to have all houses be net zero by 2016, reflects a social and political thought process that is completely different from the current thought process in the United States. BREEAM's overall success in promulgating green building standards is greatly aided by government regulation and progressive thinking. Conversely, it is logical to conclude that LEED is not experiencing the same level of success in the United States as BREEAM is in England because of the lack of government support and regulation. The green movement has almost been demonized in the United States, so there is also not an enormous amount of public support. Whereas in the UK, citizens recognize the problem, and embrace the solution that is green building codes. **Rather than being tied to government regulation, LEED is tied to the ASHRAE standard (CITATION) LOOK UP WHAT AND DISCUSS WHAT ASHRAE IS.**

BREEAM is also excelling in the market because of its adaptability and flexibility. Every BREEAM project must meet BREEAM's minimum standards, but BREEAM works with local experts on non-domestic projects to develop a country-specific scheme.<sup>46</sup> A country-specific scheme works to adapt BREEAM to the social, cultural, and cultural differences to a local context.<sup>47</sup> Each country-specific scheme begins with the Core Standards, but there is more flexibility for the local experts to demonstrate that their methods will be successful in achieving certification.<sup>48</sup> Giving local experts some freedom to develop their own plan streamlines the process, making the process of becoming certified easier.<sup>49</sup> Also, adapting the BREEAM scheme to local contexts makes BREEAM exportable and encourages non-domestic projects to use BREEAM. Unlike BREEAM, LEED has not traditionally been considered exportable.<sup>50</sup> However, LEED has done well in listening to their critics, and in the past few years have begun to take a different approach in developing the LEED scheme. In the most recent LEED scheme, USGBC has adopted regional priority credits.<sup>51</sup> LEED's goal with these regional credits is to encourage each project to take measures that address environmental issues that are specific to the location.<sup>52</sup> Additionally, LEED has adopted Alternative Compliance Paths for Projects Outside the U.S. (ACPs).<sup>53</sup> ACPs are similar to BREEAM's adaptation efforts in that it provides alternative ways to attain certification, however, it does not quite capture the same level of adaptability. As stated, BREEAM works with local experts to develop a scheme that is suitable to the specific project's location, but LEED does not go this far. The ACPs are predetermined alternatives that are included in the LEED scheme. LEED does not yet work to provide project specific alternatives, or to provide projects freedom to use their expertise to demonstrate compliance.

Although LEED trails BREEAM significantly in the number of certified buildings, it cannot be said that LEED has not made significant progress since its development in 1998. Despite perceived

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<sup>44</sup> 'Zero carbon' homes plan unveiled, December 13, 2006, available at

<http://news.bbc.co.uk/2/hi/science/nature/6176229.stm>

<sup>45</sup> <http://www.breeam.org/podpage.jsp?id=273>

<sup>46</sup> <http://www.breeam.org/page.jsp?id=348>

<sup>47</sup> <http://www.breeam.org/page.jsp?id=348>

<sup>48</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/Code\\_for\\_a\\_Sustainable\\_Built\\_Environment\\_-\\_BREEAM\\_Standards\\_for\\_Europe.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/Code_for_a_Sustainable_Built_Environment_-_BREEAM_Standards_for_Europe.pdf)

<sup>49</sup> [http://www.breeam.org/filelibrary/Technical%20Manuals/Code\\_for\\_a\\_Sustainable\\_Built\\_Environment\\_-\\_BREEAM\\_Standards\\_for\\_Europe.pdf](http://www.breeam.org/filelibrary/Technical%20Manuals/Code_for_a_Sustainable_Built_Environment_-_BREEAM_Standards_for_Europe.pdf)

<sup>50</sup> <http://www.bsria.co.uk/news/breeam-or-leed/>

<sup>51</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>52</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

<sup>53</sup> <http://www.usgbc.org/ShowFile.aspx?DocumentID=8868>

shortcomings, LEED has done a remarkable job of penetrating the market.<sup>54</sup> In thirteen years, LEED has become perhaps the most recognizable green building standard.<sup>55</sup> LEED has seen the number of LEED registered and LEED certified buildings double from 10,000 in 2007 to over 20,000 in 2009.<sup>56</sup> These figures seem to indicate that it is a matter of time until LEED catches up to, and possibly surpasses, BREEAM. BREEAM has had an eight year head start on LEED and its growth has been greatly aided by government regulation. LEED has not had the same advantages, but is just as recognizable as BREEAM, and is a force in the market.

Going Forward- What must LEED do internationally and domestically to catch up to BREEAM?

LEED has proven itself a player in the market but what must it do to continue its growth and challenge BREEAM? To begin with, LEED must continue to grow and revise their scheme. Thus far LEED has done an excellent job of hearing and responding to criticism. For many years, LEED was criticized for not employing a credit weighting scale similar to BREEAM; LEED has since adopted a weighting scale in its scheme. LEED will need to continue to assess and revise their scheme to stay ahead of the curve.

#### Internationally

To keep pace with BREEAM in the international market LEED will have to work on its exportability. This is biggest area of improvement for LEED; an area where LEED will need to mimic what BREEAM has done. Simply put, LEED is in demand. Nations around the globe want to use LEED because it is the American standard (CITATION). It is imperative that LEED become exportable to meet this demand. In order to this, LEED has to become more internationally friendly by involving non-domestic experts in the decision making process on a project to project basis. The current methodology employed by LEED falls short because it continues to attempt to provide a one size fits all scheme. Although the ACPs have been developed in consultation with international sustainable building experts, the ACPs are inherently limited. It is impossible to anticipate every situation in which LEED might be implemented. This approach is either arrogant or naïve; one scheme does not fit all. Projects differ greatly from one country to the next. A major problem in one country might not even be on the radar in another. This is why a scheme that is adaptable is necessary. LEED should adopt an approach similar to BREEAM where a non-domestic scheme can be *individually* tailored during the initial phases of the projects development.

- Maybe work with BREEAM to develop a set of core standards to be used internationally
  - o Increase competition, transparency
  - o Creates common language

#### Domestically

If LEED wishes to match the number of certified domestic buildings that BREEAM has in the UK, LEED will need some assistance. Right now LEED is facing an uphill battle that is nearly impossible to overcome. Sustainable buildings are not high on the priority list in the United States. As mentioned previously, Europe has embraced sustainable building standards, but thus far, the United States has not embraced them in the same manner. It is possible for a grass roots movement to change the way Americans think and feel about sustainable living, but change could be effectuated much more quickly if

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<sup>54</sup> Mao Xiaoping, *A Comparison study of mainstream sustainable/green building rating tools in the world*

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government enacted more green building codes and supported sustainability. This has worked in Europe, and it is reasonable to believe that it could work just as well in the United States.

Government regulations could be very effective in increasing the number of LEED certified buildings in the United States, but there are other techniques that could be as efficient. Taxes, rebates, and the kind could stimulate sustainable development; in turn increasing the number of LEED certified buildings. One interesting technique that could increase the number of LEED certified buildings are impact fees. Impact fees are fees that the government charges developers for land use development.<sup>57</sup> The impact fees can be applied to different facets of development, including energy, water, sewage, and transportation; all of the things LEED assesses.<sup>58</sup> Another method to implementing impact fees involves tying fees collected directly to the level of LEED certification achieved.<sup>59</sup> Kingsley termed this "LEED Indexing Proposal."<sup>60</sup> In this situation developers would be charged fees on each project depending on what level of certification the project achieved. Projects that do not achieve LEED certification would be charged the highest fees, while projects that achieve lower levels of certification (i.e. Certified, Silver) would be charged progressively lower fees.<sup>61</sup> Projects that achieve higher levels of certification (i.e. Gold and Platinum) would not be charged any fee at all.<sup>62</sup> This method would be a disincentive for building unsustainably and encourage the spread of LEED certified buildings. However, the format of this method would go further than just encouraging minimum certification. The construction of the fee schedule would actually encourage projects to attain Gold and Platinum certification.

#### Conclusion

- Summarizing conclusion and recommendations

#### Notes

- Go back and include what it costs to assess a building under LEED and BREEAM

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<sup>57</sup> Benjamin S. Kingsley, *Making it easy to be Green: Using Impact Fees to Encourage Green Building*, NYU Law Review

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