Assessing Assessment:
Toward a More Holistic Rating System for Sustainability Performance

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NOTE: This paper is in draft form and still represents an early iteration of the final paper. Much of the information which will guide the heart of the research in this paper will come from interviews with key informants at USGBC and BRE. Interviews have been scheduled over the next two weeks, but none have yet taken place. As a result, in an effort to provide some substance for the review, the early focus has been on reviewing potentially relevant literature. It is expected that this literature review will need to be condensed in places (and expanded in others) to provide the appropriate background information for the research, however, at this point there has been little editing of information. Notes are included in the paper where possible expansions of the literature review are being considered, as well as sections that may need significant re-writes or abridgment.

Abstract

This paper investigates the evolution of the multitude of alternative building certification/ assessment rating systems around the world. In addition, the paper compares best practices, with a particular focus on the two most commonly used and/or modified environmental assessment systems – LEED (Leadership in Environmental and Energy Design) and BREEAM (Building Research Establishment Environmental Assessment Method).

In order for these certification/assessment rating systems to continue to push for innovation, it will be important that they begin to converge and speak the same language, so this paper will explore the different philosophies and business models from which they have evolved. Similarities will be identified, topics of significant difference will be highlighted, and strengths and weaknesses of each system currently being applied will be described. Issues that remain to be tackled by the rating systems – e.g. such as a need to move beyond checklists to better performance indicators that measure performance more holistically – are identified for further research.

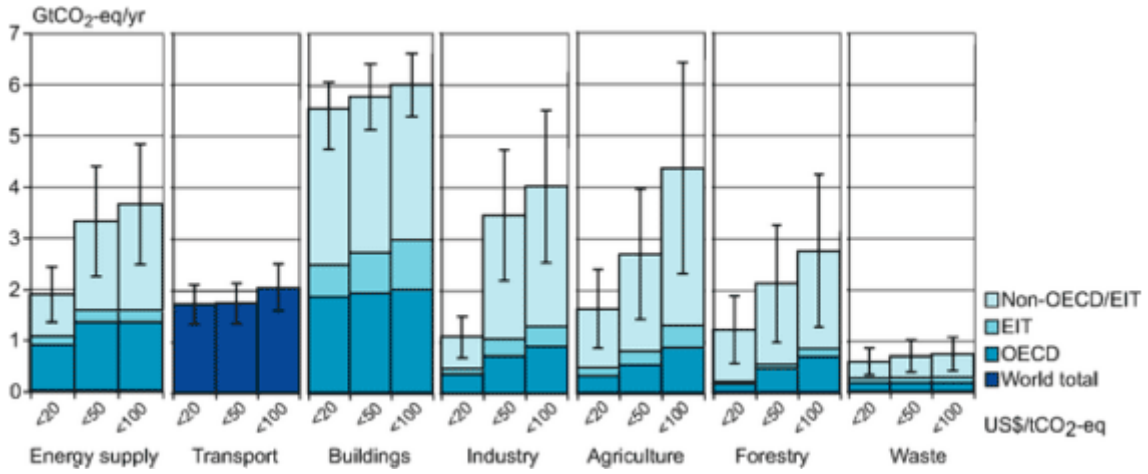
Introduction

[Reduce and paraphrase] "The U.N. Intergovernmental Panel on Climate Change (IPCC) estimates building-related GHG emissions are expected to nearly double by the year 2030 under a high-growth development scenario.[1] This increase would take place almost entirely in the developing world, as energy consumption increases with the growing demand for housing, commercial office space, and other building types. Meanwhile, North America and Western

Europe have thus far missed significant opportunities to address their own emissions from existing building stocks, and without action, are not projected to do so over the next 20 years. Comprehensive policies and strategies to make buildings more efficient would both avoid emission growth in the developing world and reduce it in industrialized nations.

At this critical juncture, leadership in the building sector is nothing short of essential. Buildings offer us the single largest global opportunity to make deep emission cuts at low, no, and even negative cost.[5] By increased efficiency alone, the residential and commercial sectors can achieve up to a 29% emissions cut below projected levels by 2020, at no cost.[5] Importantly, the energy savings and emission reduction potential in buildings is relatively independent of the price of carbon; savings remain largely consistent across large price fluctuations up to $100/ton of CO2-equivalent.[1] This finding leads to the conclusion that the building sector has the greatest potential to achieve emission reductions across all global sectors, in all regions, and at all cost levels potential" (www.globealliance.org).

[Include the UN data on building energy consumption] "While buildings offer the largest share of cost effective opportunities for GHG mitigation among the sectors … achieving a lower carbon future will require very significant efforts to enhance programmes and policies for energy efficiency in buildings and low-carbon energy sources well beyond what is happening today" (Levine, 2007:390). As shown in the graph below (www.globealliance.org), the building sector represents the greatest opportunity for reductions, underscoring the need for an international effort to rapidly enhance sustainable building practices to capitalize on this emission reduction.



The real estate construction industry has made significant progress over the past 20 years in developing environmental benchmarking tools. The tools developed have been instrumental in driving innovation and incorporation of sustainability concerns within the real estate industry. However, to date, no single rating system has emerged as the sole leader at the global scale. This lack of consistency among tools and measures has resulted in a lack of consistency in the collection and reporting of data - and therefore an inability to compare and monitor performance in the industry and within real estate investment portfolios (Levy and De Francisco, 2008).

Ellison and Brown (2010) indicate that there are two potential impacts from the lack of standardization in the sustainability assessment systems. First, the variation between rating systems limits the opportunity for comparison between, as well as the ability to judge the effectiveness of, the sustainability practices that have been used on the individual properties, investment portfolios or within organizations on the basis of sustainability performance – thereby limiting a key driver of industry change, competition. Second, the lack of consistency makes it difficult for organizations to decide on the best approach to implement when beginning the process of data collection for the purpose of monitoring progress in achieving sustainability goals.

This paper investigates the evolution of the multitude of alternative building certification/ assessment rating systems around the world. In addition, the paper compares best practices, with a particular focus on the two most commonly used and/or modified environmental assessment systems – LEED (Leadership in Environmental and Energy Design) and BREEAM (Building Research Establishment Environmental Assessment Method).

In order for these certification/assessment rating systems to continue to push for innovation, it will be important that they begin to converge and speak the same language, so this paper will explore the different philosophies and business models from which they have evolved – and investigate the direction in which they aim to move forward. LEED-EB and BREEAM In-Use will be assessed - similarities will be identified, topics of significant difference will be highlighted, and strengths and weaknesses of each system currently being applied will be described. Issues that remain to be tackled by the rating systems – e.g. such as a need to move beyond checklists to better performance indicators that measure performance more holistically – are identified for further research.

Sustainable Development – An Overview of the Global Policy Debate [include commentary on the direct relationships with commercial real estate and the development of assessment tools – possibly condense this section]

The concept of sustainability, or sustainable development, is clearly the basis of sustainability assessment; therefore, to better understand the evolution of environmental assessment systems, it is crucial to understand the political drivers promoting sustainable development at the international level. The United Nations Conference on the Human Environment (UNCHE), held in Stockholm from 5 to 16 June 1972, was the first to bring sustainability related issues to the international political table and raise awareness about the challenges our global society would face if we did not soon adopt attitudinal changes. The Conference concluded with the *Declaration of the United Nations Conference on the Human Environment* – more commonly known as *the Stockholm Declaration*. The *Declaration* stressed a need to protect and improve natural and non-natural environments - and developed the term 'ecodevelopment' to describe the concept of ecologically sound development with active management of the environment for human benefit; the need for international cooperation to address the growing set of problems which were international or global in scope; and the relationship between poverty and environmental problems. In addition to the document, *the Stockholm Declaration*, another outcomesof the UNCHE included the establishment of the United Nations Environment Programme (UNEP); a clear recognition by the international government participants for the need to protect and improve living environments. A weakness of the UNCHE was that it focused primarily on environmental issues faced by developed nations, such as those related to industrial development and rapid growth in consumption, with much less attention on the needs of developing countries for economic development and environmental improvement.

The concerns first brought to the global policy table at the United Nations Conference on the Human Environment (UNCHE) was followed by the *Cocoyoc Declaration* of 1974, which dealt with the question of how to "respect the 'inner limit' of satisfying fundamental human needs within the 'outer limits' of the Earth's carrying capacity. However, it was the *World Conservation Strategy* which expanded the concept of sustainability to include consideration for inter-generational limitations when it noted that "human beings, in their quest for economic development and enjoyment of the riches of nature, must come to terms with the reality of

resource limitation and the carrying capacities of ecosystems, and must take into account the needs of future generations … [this] gives rise to the need for global strategies both for development and for conservation of nature and natural resources" (IUCN, 1980: I). In addition, the *World Conservation Strategy* was the first global policy which attempted to define sustainable development and, as such, it launched sustainability and sustainable development into the global policy debate:

> For development to be sustainable, it must take account of social and ecological factors as well as economic ones: of the living and non-living resource base, and of the long-term as well as the short-term advantages and disadvantages of alternative action. (IUCN, 1980: Introduction)

The most common criticism of the *World Conservation Strategy* is that it placed more emphasis on ecological sustainability than sustainable development. It did, however, lay the groundwork for what has become the most common definition of sustainable development, which was created at the next large UN Conference in 1987 – the World Commission on Environment and Development (UNWCED). The most universally quoted definition was produced in *Our Common Future* – more commonly known as the *Brundtland Report* after its Chairperson, Gro Harlem Brundtland, Prime Minister of Norway. It called for a strategy that united development and the environment – described by the now-common term 'sustainable development':

> Humanity has the ability to make development sustainable – to ensure that is meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does not imply limits – not absolute limits but limitations imposed by the state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities … Yet, in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs (UNWCED, 1987: 8-9).

The UNWCED brought the discussion of sustainable development it to a wider audience than any of the previous UN reports and conferences had achieved, and following the publication of

the *Brundtland Report*, series of alternative definitions for 'sustainable development' emerged. These definitions most often include both the meaning of development (i.e. the main goals of development: economic growth, social equity issues, environmental protection, etc.) and the conditions necessary for sustainability.

The concept of sustainable development continued to 'fly under the radar' in the international political arena, however, until the UN Conference for Environment and Development (UNCED) in Rio de Janeiro in 1992, otherwise known as the "Earth Summit." *Our Common Future* paved the way for the UNCED, which brought more heads of state together than ever before (117 heads of state and 178 governments were represented) where a set of five agreements were approved. These agreements still inform contemporary policy making related to sustainable development:

1. *Agenda 21*: a global plan of action for sustainable development, containing over 100 programme areas, ranging from trade and environment, through agriculture and desertification to capacity building and technology transfer.

2. *The Rio Declaration on Environment and Development* - a statement of 27 key principles to guide the integration of environment and development policies (including the polluter pays, prevention, precautionary and participation principles).

3. *The Statement of Principles on Forests* - the first global consensus on the management, conservation and sustainable development of the world's forests.

4. *The UN Framework Convention on Climate Change* - a legally-binding agreement to stabilize greenhouse gases in the atmosphere at levels that will not upset the global climate system.

5. *The UN Convention on Biological Diversity* - a legally-binding agreement to conserve the world's genetic, species and ecosystem diversity and share the benefits of its use in a fair and equitable way. (Dalal-Clayton, 2010: 2)

One last note about the definition of sustainability provided by the *Brundtland Report*. Dalal-Clayton (2010) notes that "despite the wealth of references to the Brundtland definition, it is not supported by professional consensus." Banuri (1999) supports this statement and comments that, "there is considerable professional disagreement about this definition, mostly on how to put the

idea of sustainable development into operation, but also to do with questions of definition and on its claims to synthesis." Perhaps this is because the "simplicity of [the Brundtland] definition belies what is a complex web of systems and cycles in science, economics, politics, ethics and engineering" (Lowe and Ponce, 2010:1). As such, it is critical to keep in mind the complex relationships woven together in the concepts of sustainability and sustainable development when beginning to think about creating common metrics that capture the interplay between economic, environmental and (social) equity impacts of real estate on the planet, and more specifically, the community in which they are located.

The Three Pillars – How They Translate into Assessment Indicators [this section may need an overhaul and move in a different direction once LEED/BREEAM information is obtained]

Sustainable development has become an increasingly central concept in real estate thinking over the last 15 years. The 3 pillars of sustainability - environmental, economical and (social) equity - represent the three dimensions that should be considered decision making related to sustainable real estate development. In business, the three-pillars are most commonly incorporated into decision making through the triple bottom line model which separates development issues into social and economic factors, emphasizing that "material gains are not sufficient measures or preservers of human well-being" (Gibson, 2001: 7). He points out that the three pillars of the triple bottom line method, despite being acknowledged as interconnected and interdependent, still: "reflect more or less conventional modern disciplinary categories" whereas sustainability should be: "necessarily an attack on conventional thinking and practice" (Gibson, 2001: 6).

Some sectors within the industry have made greater advances in developing principle-based assessment tools than others. The construction sector have made the greatest strides in developing sustainability assessment tools, however the principles are heavily weighted on environmental indicators to monitor the management of energy, water, waste, indoor air quality, location selection and planning aspects, site design, materials selection and use of resources, innovation in the design process and regional priority, etc. These efforts are supported by numerous benchmarking tools to assess the attainment of sustainability in new - and more recently in existing building renovation – construction projects. The BREEAM (Building Research Establishment Environmental Assessment Method), developed in 1990, was the first such assessment system and has emerged as a strong competitor in many countries around the

globe, while the LEED (Leadership in Energy and Environmental Design) series of ratings has become the most commonly adopted tool in the United States, as well as in modified form in 24 other countries around the world, since its origination in 2000 [verify 2010 numbers in interview]. Recently, communities across the US have incorporated requirements for LEED certification for new buildings in an effort to promote and integrate sustainability decision making into the daily mindsets and local regulatory statutes of the community. [Include more information from the Reed et al, 2010; Falkenbach et al, 2010; UNEP-FI/SBCI, 2009 articles here]

Social indicators are being included in sustainability assessment tools developed by the construction industry through the incorporation of criteria such as: occupier satisfaction, access to public transportation, and development impacts on the community. In addition, *ISO 26000 - Guidance on Social Responsibility* (2010), issued by the International Standards Organization, has attempted to standardize definitions, terminology and best practices for social responsibility across the globe, including the identification of '7 Core Subjects' that need to be considered, while the *Global Reporting Initiative, G3* is currently the most utilized global standard for reporting of corporate social sustainability results (Pivo, 2008). While both provide a framework for incorporating (social) equity into assessment rating systems , neither has entered into the real estate industry with regard to standardizing asset level data collection and reporting practices. [expand; GRI sustainability reports …check 2010 numbers for participation]

Economic indicators related to sustainability are different from traditional economic indicators capturing financial conditions of the organization itself. Instead, economic sustainability indicators focus on how the organization impacts the status of its stakeholders' economic changes in relation to its activities, as a result, they have proven to be challenging to integrate into sustainability assessment rating tools. The difference is similar to the difference between gross and net profit of the company in that it considers the financial gains in production of goods and services – social & environmental costs (such as the financial costs of crime and pollution). According to Philip Lawn (2003), these indicators include the: cost of personal consumption; an index of distributional inequality/weighting of personal consumption expenditure; cost of consumer durables; sservices yielded by existing consumer durables; services yielded by publicly provided human-made capital; services provided by volunteer and non-paid household

work; disservices generated by economic activity (such as: the cost of noise pollution, commuting, crime, under-employment, unemployment, lost leisure time); defensive and rehabilitative expenditures (such as: the cost of household pollution abatement , vehicle accidents, family breakdown, a certain percentage of private health expenditure assumed to constitute a form of defensive expenditure); net capital investment; net foreign capital lending/ borrowing; cost of sacrificed natural capital services (such as: the loss of farmland and the cost of resource depletion (lost source services of natural capital), cost of ozone depletion and air and water pollution (lost sink services of natural capital), cost of long-term environmental damage and the loss of wetlands and old-growth forests (lost life-support services of natural capital). Lawn notes that there is a "need for a more robust and consistent set of valuation methods" for each of these indicators (Lawn, 2003). [How are these be integrated into assessment systems?]

[Include the information related to the development of the Key Performance Indicators by International Sustainability Alliance in collaboration with BREEAM … and the USGBC Building Performance Partnership]

Implications for the Commercial Real Estate Market

While the construction side of real estate has made progress in developing environmental benchmarking tools, the demand side of real estate has struggled with developing successful measures. Benchmarking tools have been developed by several organizations in many countries around the world targeting property owners and occupiers – a quick internet search identified over 50 different rating systems (see Appendix X) and EPSRC found approximately 600 different tools that measured or evaluated the social, environmental and/or economic pillars of sustainability – however, none of them seems to have emerged as *the* global standard. This multitude of tools has caused a lack of consistency among tools and measures resulting in a lack of consistency in the collection and reporting of data as well as an inability to compare and monitor performance in the industry and within portfolios (Levy and De Francisco, 2008). As Al Skodowski from Transwestern notes, "… the entire mood in the building industry is more about doing the right thing, … The difficulty is understanding what the right thing is" (Malin, 2010).

Due to the lack of standard benchmarking measures and metrics, individual companies and investment funds have developed their own sustainability measures. Ellison and Brown (2010) indicate there are 2 potential impacts of the variation in sustainability assessment systems. First, it

limits the opportunity to compare and judge the effectiveness of properties, portfolios and organizations on the basis of sustainability performance thereby limiting a key driver of industry change – competition. Second, the lack of consistency makes it difficult for organizations to decide on the best approach to adopt when beginning the process of data collection for the purpose of monitoring progress in achieving sustainability benchmarks.

It has become obvious that "an information demand exists which cannot be appropriately satisfied at the moment. The problems is twofold: First, information on buildings' sustainability performance is not yet readily available; and second, the necessary information flow between the key actors in property and construction markets is neither organized nor standardized" (Lowe and Ponce, 2010: 20). While there are clear business drivers for collecting sustainability data at the asset level (Muldavin, 2010); sustainability has not yet emerged categorically as a factor in the open market value of an asset (Sayce et al, 2010) and therefore the agency community has less incentive to participate in the data collection than the investment community.

However, corporations and major retailers are including sustainability goals in the corporate social responsibility statements (CSRS). As a result, the acronym now often stands for their 'corporate social responsibility and sustainability' statement – and is becoming a demand driver for sustainable real estate. [NOTE: also include discussion of Greenprint Foundation data collection, reporting & participation – possibly here or maybe in previous section] Social responsibility in investment has emerged as a separate academic field of inquiry over the past 10 years, Responsible Property Investment (RPI), with an extensive literature unto itself. However, it is important to note the difference between RPI and Sustainable Property Investment (SPI). [NOTE: Include UN discussion on the difference between RPI and SPI; Pivo, 2008; Ellison and Sayce, 2007]

While there have been significant efforts to standardize investment performance data and reporting systems within the investment community, this has not yet trickled into the sustainability debate related to real estate assets. "For the demand side of the property industry to make effective progress in understanding, measuring and improving sustainability of commercial real estate a common set of metrics through which sustainability performance can be measured in required" (Ellison and Brown, 2010). One attempt to overcome the disparity among the existing benchmarking criteria is a research project by the Investment Property Forum (IPF) in London that

focuses on the methodology for developing a framework for a Sustainable Property Index (ISPI). The framework is "designed specifically for the property investment community as a means of linking sustainability and investment performance, it is not designed as a detailed sustainability assessment tool for commercial buildings" (IPF, 2009: 8). Throughout the report document there is an acknowledgement that as the level of sustainability knowledge continues to grow in the commercial real estate industry, the questions and framework will need to continually by fine-tuned. The framework, however, is a good first attempt to engage the industry in the conversation of sustainable development and through the dialogue move the industry towards more uniform measures that enable improved comparison of sustainable assets.

[tie this back to the topic of assessment systems … this section will need some editing related to what information actually ends up being relevant to the research argument]

The Evolution of Environmental Assessment Systems around the World

Environmental assessment rating systems first emerged in 1990 with the development of BREEAM in the UK. This was followed by EnergyStar for Office Buildings (1999) and LEED (2000) in the US, NABERS (2000) and GreenStar (2003) in Australia, CASBEE (2002) in Japan and HQE (2005) in France. An expanded list of environmental assessment tools, their launch dates, launch dates of their most recent versions, and websites can be found in Appendix X. As the number of sustainability assessment tools has continued to grow, many existing tools have evolved with improved application guidelines and an increasing number of data and case study experiences to help evaluate the impact of their application. Devuyst et al (2001: X) define sustainability assessment as "...a tool that can help decision-makers and policy-makers decide which actions they should or should not take in an attempt to make society more sustainable."

Sustainability assessment evolved from early work related to environmental impact assessment (EIA), and more recently strategic environmental assessment (SEA) (Devuyst, 2000; Pope et al., 2004). This evolutionary process explains why early sustainability assessment tools were considered to be the 'next generation' of environmental assessment (Sadler, 1999). However, Gibson (2001) offers an alternative solution to the both triple bottom line method applied in early sustainability assessment as discussed previously, and promotes a principles-based approach to sustainability assessment. In this approach sustainability criteria are based upon

sustainability principles rather than triple bottom line goals, and the interconnections and interdependencies between the pillar areas are emphasized. Gibson argues that as a result, a principles-based approach may circumvent some of the intrinsic limitations of the triple bottom line approach to sustainability. Similarly, George (2001) also recognizes the limitations of the triple bottom line approach (as applied in the UK) and concludes that a principles-based approach is more appropriate for developing sustainability criteria. Both Sadler (1999)and George (2001) recommend an approach based upon fundamental principles of sustainability as defined by the Rio Declaration and Agenda 21.

Reijnders and van Roekel (1999) have delineated assessment tools into two broad classes: qualitative tools based on scores and criteria, and quantitative tools using a physical life cycle approach with quantitative input and output data on flows of matter and energy. There are a variety of both types of assessment tools around the globe. Examples of widely applied qualitative tools are BREEAM, LEED, CASBEE and GBTool. These qualitative tools are often based on auditing of buildings, putting a score to each investigated parameter, resulting in an overall score for the building. Within the qualitative group of assessment tools, some parameters may be quantitative, like energy use, while others are entirely criteria based. The quantitative group of assessment tools emerged in the late 1990s; all are based on quantitative data pending from life cycle inventories (LCI) or production data of material or energy flows.

Many of the developments seen in the assessment tools listed in Appendix X would fall in the category of qualitative assessment tools and have evolved in line with the principles-based approach set forth by Gibson (2001: 8):

> We have therefore chosen here to propose a slightly different approach—one that avoids constructing the edifice of sustainability criteria on the conventional pillars… The alternative, which is perhaps only superficially different from the pillar approach, is to begin not with categories based on the usual areas of concern (ecological, social, etc.) but with a list of the key changes needed in human arrangements and activities if we are to move towards long term viability and well-being.

Rather than structuring the assessment tools based on the three pillars, many have chosen key principles around which to structure the assessment tools. For example, LEED promotes a whole-building approach based on the performance related to the following key areas: sustainable sites; water efficiency; energy and atmosphere; materials and resources; indoor environmental quality; locations and linkages; awareness and education; innovation and design; and regional priority. Similarly, BREEAM focuses on performance in the following key areas: management; energy; land use and ecology; pollution; materials; waste; water; health and wellbeing; and transport.

A Comparison of LEED-EB 2009 and BREEAM In-Use 2009

Globally, Buildings are the leading producers of CO2 emissions. In the US, buildings contribute 39% of CO_2 emissions and 13.6% of water consumption. In addition, buildings in the US contribute approximately 40% of the primary energy use and 72% of electricity consumption (USGBC[1], 2010). It is estimated that new commercial building stock in the US will contribute 2-3% growth per year as a percentage of total existing commercial floor space. In the United Kingdom (UK), buildings contribute 40% of total UK carbon emissions and it is estimated that total new office and warehousing floor space will only grow 1-2% per year as a percentage of total existing floor space (BRE Global, 2011). In addition, it is estimated that by 2050 60% of the UK building stock will have been built prior to 2010 (see Figure X); this means that improvements in the existing building stock will be necessary, in addition to new net zero-carbon buildings, if the 68.4 MtCO reduction in CO_2 is to be achieved (BRE, 2011). The need for increased focus on existing buildings indicated by these statistics has led this research to select the LEED-EB 2009 and BREEAM In-Use 2009 for evaluation.

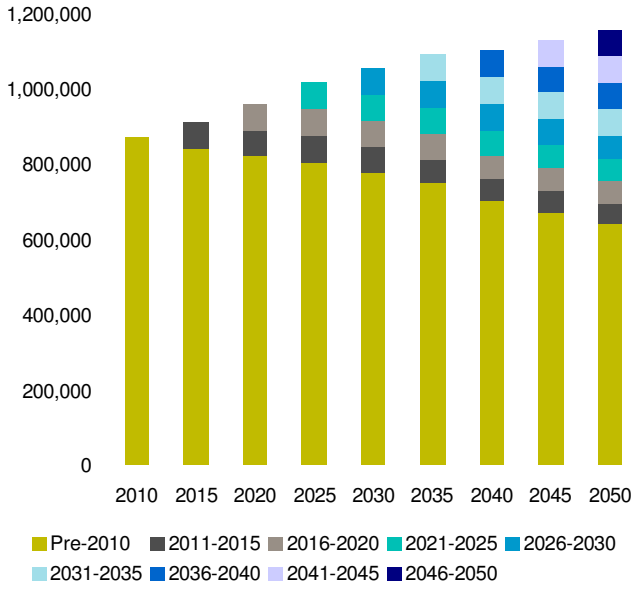


Figure X: Age profile for the projected non-domestic UK building stock (BRE, 2010)

[Interviews with USGBC and BRE representatives will be occurring the week of April 4th and 11th, respectively. As the complete online questionnaire of the 197 questions included in BREEAM In-Use are not available online, this information will not be available for comparison prior to my interview (although it has been promised to be sent after the interview). Therefore, much of that information will be used to fill in this section with regard to the comparison of BREEAM and LEED will be completed afterwards.]

The Future: A More Integrated Holistic Rating System for Sustainability Performance

[Interviews with USGBC and BRE representatives will be occurring the week of April 4th and 11th, respectively. Much of that information will be used to fill in this section with regard to the future direction of and goals for BREEAM and LEED]

Most recently, at the 2009 COP-16 in Copenhagen, there was a call for the international community to recognize and invest in the built environment as a leading strategy for reducing GHG emissions. To assist in this effort, COP-16 parties should "improve and strengthen the Clean Development Mechanism (CDM) and other market-based mechanisms to support efficiency projects and reduce emissions from the building and infrastructure sector" (GLOBE, 2010). In addition, the development and adoption of consistent energy performance metrics across building types to facilitate measurable, reportable and verifiable (MRV) emission reductions was called for in an effort to "increase transparency, facilitate public and private investment in energy efficiency, and support development of baselines and benchmarks … to assist with building and infrastructure NAMA development, CDM participation, data collection, and national building energy performance disclosure policies and programs" (ibid).

BRE Global and CSTB and Certivea (HQE) issued a Memorandum of Understanding in June, 2009 to align their assessment programs in an effort to develop a Pan-European building environmental assessment tool, which will be ultimately be run by the European Council (www.breeam.org, www.certivea.com). In addition, BREEAM and LEED signed a Memorandum of Understanding in November, 2009 to map and develop common metrics for measuring CO_2 emissions from new homes and building.

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