Ethical quotation system

COVALENCE ANALYST PAPERS

Green Building: How green is green?

Alison Leon, University of Southern California (USA), intern analyst, Covalence SA, 9 June 2006

"Green building," a less frequently trumpeted catch-phrase in the realm of sustainable development, is a movement that deals specifically with the built environment: our cities, homes, airports, factories—all the buildings we construct and maintain. Since it is unfathomable to stop expanding this environment, or retreat from the ground we already inhabit, our buildings, the resources they consume and the chemicals they emit have become an integral part of sustainability rhetoric. So what exactly are we doing? Who is in charge, what are they gaining and what good is coming from it? Is it still just the granola crunching hippies flocking to this aspect of sustainability? It appears that the green building has a growing impact, and a focus that hinges on being too mainstream, but at the same time not mainstream enough. In this onslaught of semi-vague rhetoric, there is a lull in the movement wherein the future is unclear. Should green design and technology take center stage or is passive architecture the best answer? Is this just for rich hippies or smart CSR departments? While these questions still puzzle us, two things seem clear. In new construction, a truly green approach to building should be used as much as possible, and as a movement, we should continue to work towards sustainability and a cohesive standard of what it means to be green.

What is behind the catch phrase of "green building?" Finding a definition is simple and difficult at the same time. Shiny slogans are available, like, "environmentally sensitive" [1] and "ecologically intelligent."[2] These expressions most likely appear on the Frequently Asked Questions pages of an architecture firm, or peppering an introduction to a green building consultancy. Looking at definitions that originate from government agencies and environmental standards, we conclude the following two basic qualifications—efficiency in energy, water, and materials, and decreased impact through non-toxicity, reusing, and recycling. The reasoning behind these aims is easy to see in a concrete example. While numbers are difficult to find for commercial buildings, an average impact for the construction of a standard American house is one acre of forest, 14 tons of concrete, 68 gallons (257 liters) of paint and coatings, and 3-7 tons of waste.[3] If recycled cement is employed, if wood use is perfectly planned, and if non-toxic paint is used, that can have a meaningful impact on the sample house's construction. Other methods for employing green building are through passive ventilation systems, recycled steel and metals, solar paneling, rainwater collection, and even on-site waste treatment plants. Through acknowledgement of these kinds of figures, the movement had used green building as a focus for taking action.

In order to understand the current setting, one must understand the players, as well as the past. The players—the bodies that have emerged to codify and delimitate green building—started with governments or large, non-profit groups. These boards produced standards that would be able to advocate and assist businesses and the public become aware of and involved in green building. In the United States, the U.S. Green Building Council (USGBC) is the organization that provides the Leadership in Energy and Environmental Design (LEED) standards. Canada uses a web-based rating system called Green Globes, begun in response to what their Green Building Initiative believed was overly inhibitive lumber restrictions.[4] The U.K.'s sustainability arm, the Building Resource Establishment (BRE), uses the Environmental Assessment Method (BREEAM) to rate buildings. The U.N. has a Sustainability division, including specifically the Sustainable

Building Construction Initiative. While these are all similar, they still represent authorities with slightly different goals or targets, and slightly different constituencies. The lack of one definition and one rating system, makes it difficult to push forth a unified and concise set of standards in judging whether something is implementing the best and greenest procedures. This makes it more difficult for the other players—the architects, the suppliers, and the consultancies—to do their job best.

The other piece necessary to understand the current state is the past. The movement began with the kinds of changes environmentalists extolled: better ventilation, shaded buildings for better cooling efficiency, and roof gardens for eco-balance.[5] The next step in the process was a focus on energy efficiency, driven by the 1973 oil embargo and fear about future energy security. Here the two divergent schools of thought arose, the first preferring passive systems to help reduce the need for energy produced heating, cooling, and waste management, and the second which trumpeted technological advancements that would produce energy saving benefits. These were all just smaller pieces of the greater sustainable development movement that came out of the UN World Commission on Environment and Development. The sensibility about the environment already existed, but they weren't yet focused specifically on the built environment. This would soon change.

Governments catalyzed a large part of the early efforts specifically on building green. Their ability to finance greater expenditures upfront in hopes for future energy and efficiency savings allowed them to form the early vanguard of large-scale green. Buildings, which contribute 40% of all carbon emissions,[6] comprise a wide market for efficiency measures, especially when they can be combined with election promises to help the environment. After the massive publicity of "greening" the White House, and former U.S. president Bill Clinton's 1998 executive order 13101 which recommended the use of "environmentally preferred" products,[7] and his 1999 executive order 13123, which called for the improvement of energy management and reduction of emissions in building construction,[8] green building fully imprinted itself into public conscience. Similar state-directed initiatives arose in Australia, Canada, and the U.K.[9] It was during 1999 that the USGBC, and thus their LEED standards that helped any planned construction go green, were founded.

Businesses could profit from the foundation governments set up because there now existed knowledgeable suppliers, materials and engineers schooled in the system. Businesses were becoming aware of the necessity to evoke a "triple bottom line," across environmental, social, and economic lines. Now that the public knew about the possibilities, they were keen to demand the business community to take action, or at least communicate their environmental impact and planning. Here began a disconnect between the best green measures and the best business measures, which did not always align. In 1991, McDonald's moved away from the styrene packages to paper as a part of a more general waste reduction strategy, in response to public opinion. This was just one example of a general mood in businesses to become environmentally—and therefore economically and sustainably—sound.[10] This was not, however, the whole picture. When McDonald's changed their packaging, it was in the middle of a public sentiment that demanded "greening." The styrene packaging their replaced was the subject of a three year study by the corporation, during which they deemed styrene more recyclable than their paper packages. Public opinion was to remain uncomfortable with using the petroleum derived synthetic.[11] In a building example, green projects often eschew wood for recycled steel, but the energy costs of remanufacturing steel for reuse are five times the amount of disposal.[12] These cases demonstrate how in a company's environmental activities, doing enough good, or enough perceived good, was a company's best bet. James Noble at Tufts University commented that businesses will likely change around 25% of their pollution causing activities for greener alternatives, but that the next 25%, a little harder to tackle and perhaps more costly, would never be attempted because of complacency.[13] Will the first 25% be investing in the studies that assess efficiency? Could the second 25%, from which the company stops short, be the full implementation? While support exists for environmentally friendly changes, the motives and sentiment as well as the execution functioned in a less than ideal manor, and if the benefits and realities are unclear, the best procedures might be overlooked.

A place where business sentiment and public sentiment aligned was in the side movement of healthy buildings. In the sixties and seventies in the United States, there was outcry

over alleged “sick building syndrome,” in which people became ill due to the chemicals and toxins in paint and building materials, as well as poor ventilation[14] after the energy crisis of the 1973 energy embargo forced businesses to seal up their buildings.[15] Numerous case studies were conducted that claimed a 6-15% increase in productivity through less sick days and higher alertness with smart building technologies like non-toxic paints and natural ventilation and lighting.[16] These measures, fairly easy to execute, rationalize, and see on the profit line, were well received.

Over time, the movement has become more dynamic in other ways as well. Advancing from 1990, where products and materials were considered “green” if they were 30% recycled, manufacturers began to include other aspects of sustainability in the picture, such as the distance materials had to travel, the durability, and the embedded energy.[17] As more research went in, and more public knowledge and architect knowledge increased, a new, holistic approach began to form. It was designing a building specific to its location, energy needs, and purpose. A growing list of talented architects and firms, like Ken Yeang and Sim Van der Ryn, are providing star power along side brains. A slew of news-catching features like Yeang’s bioclimatic high rises helped keep the edge on the movement. Less celebrated, but perhaps slightly more widespread, smaller community recognition and awards for real innovation are popping up. Whole communities are aiming for green lives—they produce all the energy they use. Other less extreme cases involve co-op or dorm living, where families or individuals share power by using one central kitchen.[18] As the green movement widens its scope, networks for reusing and recycling—two of the most effective and simple ways to reduce impact—are becoming available.[19] Subsidies allow for experimentation and creativity. With an expanded base, more people can be exposed to greener options. And this shows: as a whole, the industry is growing, according to the USGBC, the market for sustainable projects was $7 billion as of January 2006, which is a 37% increase from 2004.[20]

While it might sound perfect that the movement has such momentum, there is a downside. Positive, if superficial, press coverage makes it seem like the whole world is “jumping on the green bandwagon.”[21] The problem with this point in the movement resurfaces when considering the lack of consensus with its resurfacing questions: are the goals of energy efficiency and decreased impact being met? Perhaps not always. Projects can be labeled as LEED-certified without being innovative leaders in their field. Trying for a platinum rating means going all out, but to scrape past the bar for a simple certification, one needs only measures to increase ventilation, water efficiency, and even building “design” innovation.[22] The point system is notoriously flawed, in one case giving one point each for a “$1.3 million for a heat-recovery system that will save about $500,000 in energy costs per year,” and a $345 bicycle rack.[23] Design is another trap. Designers and architects might embrace the look of “green,” with environmentally null elements like exposed steel,[24] but maintain only the outside appearances. Even the future does not do much to assure us. While there are architectural schools teaching sustainable design, it is not at the center of any mainstream university’s curriculum.[25] The government subsidies that can make creativity and innovation feasible are not encouraged by the USGBC and other leaders in the movement, in order to avoid pushing green building as a way to secure free money.[26]

People within the field now are trying to iron out these wrinkles. One industry professional described the need for a “paradigm shift” in the definition for green design or green building.[27] Another lamented the lack of cooperation between architects, designers, and the green movement, and how “pieces” were being added, but no comprehensive whole. This process could be easier if there were more skill green architects to go around, and less bureaucracy in planning green buildings.

It would also be easier if standards were being improved. In the U.K., green advocates are lobbying for an energy efficiency labeling, that will tell consumers and the public just how a building rates. This will theoretically make energy efficiency measurable, and therefore increase the incentives for it.[28] This step would be a welcome way to provide a rubric for people to understand. If the public knew more details, they would be more capable of rewarding companies and institutions that really try to implement sustainable building measures, instead of what sometimes resembles a hip and modern façade. The U.S. LEED standards are under review as well. Critics want them more streamlined and cost effective, providing real encouragement for going green.[29] The argument in the insider

circles is that this is necessary to help move green building towards the norm.

It is this that sets the stage for the best conclusion. At the bottom of all these strains of positive and negatives, there are some small truths. Building, in any form, uses resources. Forty percent of all raw materials used globally (3 billion tons annually) are for building.[30] Usually, it produces waste. Always, it produces some sort of carbon emissions, either from the materials used, their transport, or the construction itself. Never will we stop constructing buildings, especially not in the developing world. With the technologies and the knowledge base, the wise words that come from many industry professionals might be the best to heed: "some sustainability measures don't cost much...they should always be included in a development."[31] But if that is our guiding light, we must also remember one more thing, courtesy Ken Yeang, in the midst of the feather ruffling of companies proud of their buildings: "You cannot change the world with green buildings. You need to change to green business."[32] Wise words from both insiders, both of which would be good policy to heed.

Covalence SA, Av. Industrielle 1, 1227 Carouge, Geneva, Switzerland
tel: +41 (0)22 800 08 55 ; Fax: +41 (0)22 800 08 56
US Representative Office, 143 Dudley Street, Cambridge MA, 02140, USA, tel +(1) 617 429 4758
Scandinavian Rep.Office, Lokföraregatan 7C, 222 37, Lund, Sweden, Tel: 0046 (0) 46 14 97 15
http://www.covalence.ch / email info@covalence.ch

---

[1] www.buildinggreen.com
[2] http://www.coldhamarchitects.com/introduction/whats_green.htm
[3] http://www.green-rated.org/faq_grated.asp
[4] http://archrecord.construction.com/features/green/archives/0511ArchTech.asp
[5] London's Crystal Palace, and Milan's Galleria Vittorio Emanuele II, see "White Paper on Sustainability." Building Design & Construction, November 2003.
[6] Milne, Roger, "Carbon cuts are 'challenging.'" Utility Week. March 17, 2006
[7] https://www.denix.osd.mil/denix/Public/Legislation/EO/note45.html
[8] https://www.denix.osd.mil/denix/Public/ES-Programs/Pollution/Green/eo13123pres.html, see also "White Paper..." pg 6
[9] http://www.environment.sa.gov.au/sustainability/gogo.html
[10] Kleiner, Art, "What Does It Mean to be ***Green***?" Harvard Business Review, Jul/Aug 1991, Vol. 69 Issue 4, p 39
[11] Ibid, pg 39
[12] http://www.ilea.org/lcas/Tellus.html
[13]"White Paper on Sustainability." Building Design & Construction, November 2003. pg 46-47 , pg 46-47
[14] http://www.epa.gov/iaq/pubs/sbs.html
[15] Zabarsky, Marsha. "Sick-building syndrome gains a growing level of local awareness," Boston Business Journal. August 16, 2002.
[16] http://www.green-rated.org/faq_grated.asp
[17] "White Paper on Sustainability." Building Design & Construction, November 2003. pg 25, 28
[18] http://www.coldhamarchitects.com/introduction/whats_green.htm
[19] http://www.buildingreuse.org/directory/

[20] Weeks, Katie, “Outlook: It's Easier Being Green?” Contract Magazine: Business Media, Inc. April 1, 2006.
[21] Ibid.
[22] https://www.usgbc.org/ShowFile.aspx?DocumentID=1317
[23] http://www.grist.org/comments/soapbox/2005/10/26/leed/index.html
[24] http://www.coldhamarchitects.com/greenbuilding/greengrandtour/SW_Mader/mader_desc.htm
[25] Whitaker, Barbara. “Architects Are a Lagging Indicator for Sustainable Design.” New York Times. 17 May, 2006. pg. 6
[26] http://www.grist.org/news/powers/2003/05/28/green/
[27] Whitaker, Barbara. “Architects Are a Lagging Indicator for Sustainable Design.” New York Times. 17 May, 2006. pg. 6
[28] Bennett, Ellen, “Green rhetoric exceeds reality,” Building Design. May 19, 2006. Pg. 8
[29] http://www.grist.org/comments/soapbox/2005/10/26/leed/index.html
[30] Lenssen and Roodman, 1995, “Worldwatch Paper 124: A Building Revolution: How Ecology and Health Concerns are Transforming Construction,” Worldwatch Institute
[31] Thame, David. “Taking a leaf...” Estates Gazette. May 20, 2006, pg. 128
[32] Elghamry, Nadia. “High point of green design.” Estates Gazette. August 13, 2005, pg. 44.