



Green Design and Practice in the Development of Buildings and Neighborhoods

Prepared by Arabella Philanthropic Advisors
Authors: Mark Valentine and Desiree Vargas
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The first-ever conference for foundations interested in “green” buildings and neighborhoods was held in the fall of 2005 in Cleveland, Ohio. *It’s So Easy Funding Green* was organized by the Funders’ Network for Smart Growth and Livable Communities, in partnership with six funder affinity groups.^{1,2} In advance of that meeting, the Funders’ Network commissioned a paper—“Green Design and Practice in the Development of Buildings and Neighborhoods”—to provide conference attendees with an overview of the state of the green building market as well as the role that foundations were playing at the time in shaping the green building field.³ This paper is structured as an update to its predecessor, but it will not cover all of the same material, particularly with regards to the origins of green building sub-movements structured around education, health, and affordable housing. To get a fuller sense of this history as well as profiles of select green building projects, we invite you to review the original paper at the Funders’ Network website, www.fundersnetwork.org.

In the wake of the meeting, sensing a growing funder interest in the subject of green buildings and neighborhoods, the Funders’ Network organized a series of conference calls on emerging issues in the green building field. In the summer of 2006, as interest in the issue continued to grow, the Funders’ Network created the Green Building Learning Network. Through the Learning Network, the Funders’ Network hosts funder briefings, commissions research and reports on activities in the green building field, and organizes quarterly conference calls on topics ranging from innovative efforts to embed green building education into architecture schools to new models for securitizing the value of green buildings. If your foundation is not already a member, you are welcome to join. And while the network is hosted by the Funders’ Network, your foundation does not have to be a member of the Funders’ Network to participate. For more information, contact Jennifer Cummings at the Funders’ Network. She can most easily be reached via email at jennifer@fundersnetwork.org.

In 2005, the green building field looked poised for takeoff, but it was by no means certain that it would scale to become the new normative standard for design and construction practices. Two years later, a growing national consensus on the need to reduce the imports of foreign oil and our overall use of fossil fuels has added an economic and national security overlay on a field once perceived to have been shaped primarily by lofty environmental goals. It finally seems to have registered with policymakers and corporate leaders that there are enormous challenges and opportunities associated with the fact that buildings account for 40% of the nation’s energy use and almost 40% of its carbon dioxide emissions.⁴
⁵ The U.S. Conference of Mayors’ Climate Protection Agreement, the William J. Clinton Foundation Energy Efficiency Building Retrofit Program, and the Bank of America’s recently-announced \$20 billion environmental plan are all evidence that there is far more wind in the sails (or wind turbines) of

* Mr. Valentine and Ms. Vargas are both consultants to Arabella Advisors. Arabella helps philanthropists maximize impact by providing thoughtful guidance and sophisticated, unbiased analysis of philanthropic strategies and the nonprofit community. Its expertise helps donors support issues and organizations with confidence, transforming philanthropic goals into results. More information can be found at: www.arabellaadvisors.com.

the green building movement than was the case even just two years ago. The question is whether this momentum can be sustained.

In an effort to better understand the rapid changes affecting the green building field and the role that philanthropy can play in helping it scale, the Funders' Network is convening funders for a strategy session in Chicago, Illinois, in early November. This paper is meant to serve as an update—even a progress report of sorts—on how the field, and the role of philanthropy, has evolved in the two years since funders last gathered to consider the state of the green building field. Specifically, this paper will cover:

- the current market demand for green buildings;
- the evolving role of voluntary certification regimes such as Leadership in Energy and Environmental Design (LEED) in standardizing practices in the field and the emergence of alternative standards;
- the roles that the public and private sectors have played in catalyzing the green building market and the degree to which the individual consumer is now also affecting that market;
- the mounting pressure for city officials, architects, and engineers to respond to the threats posed by climate change and the inherent opportunity for proponents of green building;
- the current state of green building practices in the health, education, and housing sectors; and
- the roles that philanthropy can play in accelerating the pace at which green buildings and neighborhoods become the norm.

How quickly is the green building market expanding?

Some would argue that the green building movement began in earnest in 2000, when the U.S. Green Building Council (USGBC) issued the first iteration of the Leadership in Energy and Environmental Design (LEED) standard. One year later, there were only 13 LEED certified buildings worldwide. Today, there are approximately 13,000 commercial and residential projects—in 24 countries and all 50 U.S. states—that have registered or indicated an intention to comply with LEED requirements. LEED officials expect to certify their 1,000th building sometime before the year is out and have over 13,000 commercial buildings in the process of being certified.⁶ The green building market is currently estimated to be worth nearly \$12 billion (for commercial buildings); ten years ago, it was marginal at best.⁷

While LEED is the dominant standard for commercial buildings, three other programs account for the majority of green homes built in the country. One functions at a national level, while the other two work at a state and regional level. The first is the U.S. Department of Energy's (DOE) Building America program, established in 1993, which has helped builders to design and construct more than 40,000 (10,000 of those units have been built in the last two years) new, energy efficient homes over the past ten years (minimum 30% reduction in energy used for heating, cooling, and hot water at no net cost).^{8,9}

The second is a Colorado-based program called Built Green Colorado. It was founded in 1995 by the Home Builders Association of Metro Denver (HBA), the Governor's Office of Energy Management and Conservation (OEMC), Xcel Energy, and E-Star Colorado. After about four years of operation, however, the program transitioned into becoming primarily privately funded, supported by contributions from companies like Boise, Tex, and Whirlpool. Over the past twelve years it has worked with builders across the state to build over 35,000 energy- and water- efficient homes—which amounts

to an average of 25% of all the homes built in the Denver metro-region during that period and 12% of homes built statewide over just the past two years.¹⁰

Another example of a program which emerged from a public-private partnership is EarthCraft House, a program that the Greater Atlanta Home Builders Association developed through a partnership with Southface Energy Institute, government, and industry leaders.¹¹ It is also focused on assisting builders in designing and constructing green homes. Since its launch in 1998, EarthCraft has certified 4,000 single-family homes and over 1,500 multi-family dwelling units in the Greater Atlanta region. Recently, EarthCraft House has begun to partner with state agencies and home builder associations in other parts of the southeast, so that it is now possible to buy an EarthCraft House-certified home in select parts of Virginia, Georgia, Alabama, Florida, North Carolina, South Carolina, and Tennessee.

To put the green building market in perspective, it is useful to compare it to two other sectors that have attracted a lot of attention in recent years: organic foods and renewable energy. In a recent interview with Greener World Media, Christine Ervin, former executive director of the USGBC, noted that while “organic agriculture has been the fastest growing part of the retail foods market for well over a decade ... it’s still hovering at just 3 percent of the market.” Similarly, “renewable energy is also exploding in growth, but still represents less than 5 percent of the market.” In comparison, “green buildings already represent 5–7 percent of new commercial buildings ... and are predicted to reach 10 percent by 2010, with no end in sight.”¹²

In light of both the momentum in the green building marketplace as well as the mounting public concern over the threats posed by climate change, the USGBC recently committed itself to achieving the following goals:

- 100,000 LEED-certified commercial buildings and 1 million LEED-certified homes by 2010.
- 1 million LEED-certified commercial buildings and 10 million LEED-certified homes by 2020.¹³

Why is LEED important to the green building field?

Another measure of the growth of the green building field is the degree to which LEED has become an international building standard. To review, LEED is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. Its development began in 1993 under the aegis of the USGBC but the first pilot standards were not promulgated until late 1998, with effective implementation occurring in 2000.

The USGBC established the LEED rating system to:

- define "green building" by establishing a common standard of measurement;
- promote integrated, whole-building design practices;
- recognize environmental leadership in the building industry;
- stimulate competition for the honor of erecting the “greenest” building;
- raise consumer awareness of green building benefits; and
- transform the building market.

In developing the initial standards, the USGBC made a deliberate effort to include all segments of the building industry. The first set of standards was oriented toward new, commercial buildings and major renovation projects and is identified as LEED-NC. In the intervening seven years, however, in response to escalating market demand, the USGBC comparatively quickly has developed (in some

cases, the standards are still in draft form) the following additional standards: multiple buildings and on-campus buildings, existing buildings, core and shell development, schools, retail, homes, neighborhood development, healthcare, and laboratories. *More information about the various LEED standards can be found in Appendix I.*

Each set of LEED standards provides a comprehensive framework for assessing building performance and meeting sustainability goals in terms of water conservation, energy efficiency, site development, materials conservation and waste reduction, and indoor environmental quality. There are also innovation bonus points available for builders and designers inclined to push the envelope. The framework, in turn, is correlated with a scorecard that allows architects, designers, and builders to know how “sustainable” their building is. Once a building is completed, the developer submits all of the back-up documentation to the USGBC where a third-party evaluator determines the project’s final LEED score. LEED provides four levels of certification: certified, silver, gold, and platinum. As of mid-October 2007, almost 1,000 projects have been certified to date, with approximately 55 projects certified as Platinum and 265 making the Gold grade. Two years ago, these figures were much lower: 300 certified projects, 12 accorded the Platinum level, and 56 earning a Gold rating.

It is important to understand that these standards are not static, but evolve over time as the USGBC and its members take into account new technologies as well as new environmental and performance challenges. For example, earlier this year the USGBC announced that projects seeking LEED certification can earn an “Innovation in Design” point by incorporating into their buildings materials which have been certified as being “carbon-neutral.”¹⁴ In October, 2007, LEED certified its first carbon-neutral building. Fittingly, it is the building that houses the Aldo Leopold Legacy Center in the town of Fairfield, Wisconsin.¹⁵ It earned a score of 61 out of a possible 69 points and is the first “net zero energy” building to be constructed in Wisconsin. Among the key energy features incorporated into the building are solar panels on the center’s roof—which face south and produce six times the electricity used by the average Wisconsin household—and an underground system that tempers the air before it is sent into the building.¹⁶

As LEED standards have proliferated, the USGBC itself has grown from a handful of institutional members at its founding in 1993 to today having over 10,000 member companies and organizations—including a four-fold increase in the past five years. Similar exponential increases in participation are to be seen in the growth of the USGBC’s annual Greenbuild conference, which this year is expected to draw between 18,000 and 20,000 participants.

LEED professional accreditation has also become increasingly popular among architects, engineers, and construction specialists. As of 2007, there are 37,045 LEED-Accredited Professionals (AP).¹⁷ This number is up from 527 in 2001, when the program began.¹⁸ While this represents only a fraction of the total number of practicing architects, engineers, and other professionals in the construction trades, the trend is encouraging. In an interview conducted for this assessment, a senior manager with a large construction firm based in the Midwest reported that nearly half of the firm’s project managers have gone through the LEED accreditation process, and within the near future all of them will be LEED-accredited.

Counterpart building rating systems—e.g. Built Green, EarthCraft, Green Globes, etc.—have emerged in recent years. Most organizations, however, including the federal government, still prefer the USGBC’s LEED system. The General Services Administration, essentially the landlord for the federal government, determined in 2006 that LEED was the most appropriate rating system based on several factors, including the flexibility LEED offers with its variety of project-type certifications, its

quantifiable measurements of sustainable design and building performance, the use of trained and certified professionals in the rating process, the ability to incorporate updates to the system, and the prevalence of LEED certification throughout the United States.¹⁹ *More information about competitors to LEED can be found in Appendix II.*

Regardless of whether or not they pursue LEED accreditation, it appears that more and more architects, engineers, and contractors are applying green building techniques to their projects. Based on data gathered in 2005 for the Green Building Smart Market Report, issued by McGraw-Hill Construction, of the architects, engineers, and contractors surveyed:

- Approximately 86% participate in green building activities.
- Nearly 60% specify that green building products be used in the projects on which they work.
- 57% recommend that their clients install green mechanical systems.

Ironically, in the long run, the greatest challenge to LEED may come from within the ranks of the USGBC. In an effort to set the bar higher than LEED Platinum, the Cascadia Regional Chapter of the USGBC has issued the Living Building Challenge, a set of 16 prerequisites that aims to create buildings that produce their own energy, minimize negative environmental impact, and maximize positive environmental design concepts. While still in its early stages, the Living Building Standard is primarily designed to be an ideal that buildings will increasingly meet in the next three to five years.²⁰ According to a representative from the Cascadia Regional Chapter, there are currently several buildings around the world that are close to meeting the Living Building Standard. It is their goal to bring visibility to these innovative projects and further inspire the entire construction community to have these pinnacles of green building in mind when designing future projects.²¹

What role does the public sector play in catalyzing the green building market?

Clearly, the explosive growth of the USGBC, LEED, and other certification regimes is indicative of a broader public awareness of the importance of promoting green buildings as part of a larger strategy to combat climate change and reduce dependence on oil. This has translated into growing calls for the adoption of green building standards by public agencies. According to the USGBC, 55 cities, 11 counties, 8 towns, 22 states, 33 schools and 11 federal agencies have guidelines, requirements, ordinances, incentives, executive orders, or other policies associated with LEED.²²

The public sector has also chosen to lead by example, as is evident from the fact that approximately half of the buildings certified under LEED are owned and operated by local, state, and federal government agencies. A few cities have particularly stood out over the last few years for their progress.

Austin, Texas, one of the few cities to have a rating system that predates LEED, has a free consulting program through the local utility company that helps buildings achieve LEED certification. Austin Energy, the publicly-owned utility company, runs the Austin Green Building Program and has done so since 1991, when the organization developed its residential green building rating tool.²³ Since 2000, the city has required that all public buildings larger than 5,000 square feet get LEED certification.²⁴

Chicago, Illinois, has a variety of green initiatives currently in progress. Created under the leadership of Mayor Richard M. Daley, the Chicago Standard is based on the LEED points system but includes only those sections applicable to the Chicago area. Another unique program is the city's Green Permit Program, which expedites the building permit process depending on the level of LEED certification

being pursued. This has been one method to combat the lack of incentives for developers to build green.²⁵

Seattle, Washington has encouraged the private sector to implement green building techniques by offering grant incentives since 2002. In April of 2006, the city passed zoning legislation that gives height and density bonuses to commercial and residential projects that receive LEED-Silver certification and contribute to affordable housing.²⁶

Although it has no government-based incentive system yet, Pittsburgh, Pennsylvania, has more green building space than any other city in the world. The progress made in Pittsburgh is a direct result of the work of the Green Building Alliance, a coalition of private foundations and local nonprofits that have invested millions in the greening of the city.²⁷ This same group inspired the development of the Pittsburgh Green Government Task Force in October of 2006. The task force aims to reduce greenhouse gas emissions and promote a healthier local environment.²⁸

Close to two dozen cities dangle before private developers the prospect of accelerated permitting and/or density bonuses as an incentive to build green. In Austin, Texas, for example, Lowe's (a counterpart to Home Depot) wanted to open a new store. In exchange for a commitment to building to the LEED Gold standard—which will result in between 40% and 70% less energy use and a 50% reduction in water use—Lowe's got the green light for the project in 3 months as opposed to the usual 15 months. By opening 12 months earlier than anticipated, Lowe's was able to generate an extra \$3 million in revenue. The store itself cost \$2.85 million to build. Effectively, the store paid for itself before it was even originally scheduled to open.²⁹

Ten states use LEED-Silver requirements in promulgating building codes and incentives, although rarely in the same way. For example, in 2004, California passed a law requiring all new and renovated state buildings to meet LEED-Silver requirements. Arizona's standard is applied more broadly, as it currently requires all state-funded buildings to meet LEED-Silver standards and requires the incorporation of renewable energy. Washington is seeking to extend the application of the standard even further by requiring that all new construction, whether private or public, meet LEED-Silver requirements.³⁰ Pennsylvania amended its Public School Code in 2005 to give incentive to public schools to achieve LEED-Silver certification, and Oregon is offering tax credits for Core and Shell, New Construction and Commercial Interiors projects that meet at least LEED-Silver certification standards.³¹

However, even in states that have established a track record for taking an enlightened approach to issues such as climate change, back-sliding occurs. Most recently, California's Governor Arnold Schwarzenegger rejected three bills that would have enhanced the state's ability to push the envelope in the green building field. One would have mandated that new and renovated state buildings meet the LEED-Gold standard. Another bill would have mandated the implementation of new residential green building standards by 2010. The third bill to be vetoed would have required new commercial buildings greater than 50,000 square feet to meet the Gold standard by 2013. In each case, the California Chamber of Commerce argued that the bills would have destroyed jobs by increasing construction costs, and this appears to have been one of the arguments which persuaded the Governor to veto all of the bills. On a more positive note, however, the Governor did sign into law a mandate to boost the energy efficiency of indoor lighting by 50% by 2018.³²

How has the threat posed by climate change affected government policy related to building and construction practices?

The last couple of years have seen a flurry of definitive reports from international organizations like the Intergovernmental Panel on Climate Change (IPCC), a development that has shifted the public debate on climate change from “if” to “when” and “with what repercussions.” In response to the threats posed by climate change, various organizations and campaigns have emerged to focus national attention on the opportunity to green America’s cities. One such campaign is the 2030 Challenge, which was first promulgated by Ed Mazria, a nationally-prominent architect and proponent of sustainable design. Under the rubric of the 2030 Challenge, he has invited (or perhaps, more accurately, commanded) the architecture and building community to meet the following targets:

- All new buildings, developments, and major renovations shall be designed to reduce their energy consumption by 50% of the regional average for that building type.
- In parallel, at a minimum, an equal amount of existing building area shall be renovated to meet the 50% reduction target.
- Between now and 2030, fossil fuel reduction standards for all new buildings will be ratcheted up to 60% in 2010, 70% in 2015, 80% in 2020, and 90% in 2025, with full carbon-neutrality achieved in 2030.

How these targets are to be met is left up to the architects, designers, and engineers by implementing innovative sustainable design strategies, development of on-site generating capacity for renewable power, and/or purchasing renewable energy and/or certified renewable energy credits.³³

Thus far, the 2030 Challenge has been embraced by a variety of professional organizations such as American Institute of Architects (AIA), American Society of Heating, Association of Collegiate Schools of Architecture (ACSA), Refrigeration and Air-Conditioning Engineers (ASHRAE), the U.S. Green Building Council (USGBC), and the Royal Architecture Institute of Canada (RAIC). Many nonprofit organizations have endorsed the challenge as well, including the Rocky Mountain Institute (RMI), International Council for Local Environmental Initiatives (ICLEI), World Business Council for Sustainable Development (WBCSD), and the National Wildlife Federation (NWF). It also has drawn support from various city, county, and state governments as well as one federal agency, the Environmental Protection Agency.³⁴

Most importantly, the 2030 Challenge has been embraced by the U.S. Conference of Mayors, which has launched its own campaign to engage cities in the fight against the threats posed by global warming. On February 16, 2005, Seattle Mayor Greg Nickels launched the U.S. Conference of Mayors’ Climate Protection Agreement to advance the goals of the Kyoto Protocol through leadership and action by at least 141 American cities.³⁵ Mayor Nickels reached his goal within five months. Now, over two years later, almost 700 mayors, representing approximately 75 million people residing in municipalities in all 50 states and Puerto Rico, have signed the U.S. Conference of Mayors’ Climate Protection Agreement. Signatories commit to reducing their city’s CO₂ emissions to 7% below 1990 levels by 2012. The agreement also commits signatories to:

- urge their state governments as well as the federal government to enact policies and programs to meet or exceed the target of 7% reduction in CO₂ emissions from 1990 levels by 2012;
- make energy efficiency a priority by improving building codes and retrofitting city facilities with energy efficient lighting; and
- practice and promote sustainable building practices using the U.S. Green Building Council’s LEED program or a similar system as a guide.³⁶

How cities will make good on these pledges remains to be seen. However, the U.S. Conference of Mayors has enlisted the aid of ICLEI as the lead implementer for the Climate Protection Agreement. In that capacity, ICLEI's U.S. affiliate has undertaken a number of steps to provide city officials with a variety of technical resources designed to enable them to both reduce the carbon footprint of their communities and plan for the future. Among the resources created by ICLEI are:

- Local Climate Action Map, which includes climate profiles for more than 650 cities, towns and counties in the U.S., highlighting what local governments are attempting and achieving when it comes to climate protection.³⁷
- "Preparing for Climate Change: A Guidebook for Local, Regional and State Governments," co-authored by the Climate Impacts Group at the University of Washington, King County (Washington) Executive Ron Sims, and King County's global warming team.³⁸
- "ICLEI International Progress Report - Cities for Climate Protection" which includes details on how 546 local governments in 27 countries are collectively reducing greenhouse gas emissions by 70 million tons per year and a global register of Cities for Climate Protection participants.³⁹

While ICLEI recognizes that each community will need to develop its own approach to reducing its carbon footprint, there are a number of areas that it suggests every city consider as part of its climate action plan. These include implementing energy efficiency improvements to municipally owned/operated facilities, committing to applying green building standards to all new publicly funded construction projects, retrofitting streetlights, expanding mass transit systems, promoting transit-oriented in-fill development, and investing in renewable energy.

So as to enable its outreach efforts, ICLEI is busy opening up regional offices around the U.S. in order to provide more targeted technical assistance to communities striving to prepare their own climate action plans. Since 2006, ICLEI has added offices in Houston, Texas (to serve the southern and southwest regions of the country), Seattle, Washington (serving the Pacific Northwest), Fort Collins, Colorado (serving the intermountain West), and Boston, Massachusetts (serving the Northeast). ICLEI's U.S. headquarters are located in Oakland, California.

AIA's Committee on the Environment also has lined up to support the U.S. Conference of Mayors in their efforts to embrace the 2030 Challenge. It has created the on-line Green Cities Toolkit, which provides city officials with resources related to green buildings and sustainable community design.⁴⁰

The impact of the 2030 Challenge has also been felt at the national level, where legislation is being considered in both the House and the Senate that would dramatically increase the requirements for energy efficiency in federally funded building projects. Senator Hillary Rodham Clinton (D-NY) has introduced the Zero Emissions Building Act of 2007, Senate Bill 1059, which would require all new and renovated federal buildings to cut fossil fuel use by 50% (compared to 2003 baseline derived from Commercial Buildings Energy Consumption Survey data). In 2010, the requirement would increase to 60% and increase by 10% every five years until carbon neutrality is reached in 2030.⁴¹

A counterpart measure in the Senate, sponsored by Bernard Sanders (I-VT) and Barbara Boxer (D-CA)—anticipating the eventual enactment of a cap and trade system for climate emissions—would authorize awarding allowances to owners and developers who reduce CO₂ emissions from their buildings.⁴²

On the House side, H.R. 2947 would establish an energy performance standard for all new and renovated buildings constructed with federal funds. These facilities would need to meet LEED's Silver standard (or an equivalent approved by EPA) and achieve at least 60% reduction in fossil fuel energy

consumption compared to the regional average for that type of building. Any new or renovated building which relies on federal funding for at least 10% of its construction budget would need to achieve an immediate reduction in fossil fuel consumption by 50% with the goal of achieving carbon neutrality by 2030.⁴³

In the meantime, the chairman of the House Energy and Commerce Committee, Rep. John Dingell, has proposed a measure which would attack the role that residential construction plays in the exacerbating the climate crisis. Under his proposal, the mortgage interest deduction would be phased out for homes larger than 3,000 square feet in size. Using a graduated scale of reductions, owners of homes between 3,000 and 3,200 square feet in size would be eligible for only 85% of the mortgage interest deductions currently available to home owners. The deduction would be completely eliminated for homes larger than 4,200 square feet.⁴⁴ Environmental advocates believe that this measure has the potential to both curb the tendency upon the part of some Americans to build unnecessarily large primary residences as well as to indulge in their McMansion fantasies when it comes to building their dreamed-for second home out in the “country.” A study by the Sopris Foundation of Colorado found that these homes can produce up to three times more CO₂ per occupied day than full-time residences thanks to luxuries like heated driveways, hot tubs, and towel bar heaters.⁴⁵ An often overlooked fact is that the average American household has dropped in size from 3.67 members in 1940 to 2.62 in 2002. In the meantime, the average size of new houses has increased from about 1,100 square feet in the 1940s and 1950s to 2,340 square feet in 2002. Factoring together the family size and house size statistics, it emerges that 1950 houses were built with about 290 square feet per family member, whereas in 2003 houses provided 893 square feet per family member (NAHB 2003). This represents a three-fold increase in personal living space.⁴⁶ If adopted, Dingell’s bill may invite Americans to revisit their expansive (and expensive) tendencies when it comes to home construction.

How aggressively has the private sector embraced green building principles?

The private sector still lags behind the public sector when it comes to green building but is catching up fast, primarily due to the rising cost of energy and a growing (in some sectors) concern about climate change. According to the Building Owners and Managers Association (BOMA) International, the electricity costs associated with office buildings in the U.S. eat up \$24 billion annually. In fact, in a typical office building, energy costs represent approximately 30% of total operating costs.⁴⁷

As a reflection of growing concern in the commercial real estate sector about growing energy costs, earlier this year the CoStar Group, the country’s largest provider of information services to the commercial real estate industry, announced that it would start labeling in its database of over 2 million commercial properties those which have earned EPA’s Energy Star rating. This builds on last year’s initial foray into the green building space when CoStar began highlighting the 200 commercial properties which have attained LEED certification. By providing this type of information to real estate brokers, CoStar appears to recognize that energy performance is a key indicator of the quality of facility management.⁴⁸

Another indicator of the growing importance of environmental performance in the commercial real estate sector is the fact that a large Midwest real estate brokerage firm, Tenant Rep Agency, recently announced that it would make LEED standards its “official benchmark” for the construction and leasing office projects it represents. Tenant Rep has now committed to promoting green building in the representation of all of its clients, which could serve to motivate builders to incorporate green features

if there is the demand from future tenants. The company cited lower energy use, reduced carbon emissions, and cheaper operating costs as reasons for using LEED as its marker.⁴⁹

Private investors are also starting to look at the financial benefits of green building. According to the USGBC, 40% of the 300 Real Estate Investment Trusts (REITs) in the United States are pursuing energy efficiency and green building upgrades. Some of the investment funds already involved are Forward Progressive Real Estate Fund—the first socially-responsible investment REIT mutual fund—Simon Property Group, Weingarten Realty Investors, Prologis and SL Green Realty.⁵⁰ The Rose Smart Growth Equity Investment Fund is one of the few that specifically targets urban green development.⁵¹ The rise of these funds indicates the investment community is looking for a new niche in a cooling traditional real estate market, and this recent attention by investors could be central to motivating the private-sector construction industry.

Further evidence of the swelling interest in the real estate sector in green buildings is to be found in a May, 2007, survey conducted by the Urban Land Institute (ULI). In the survey of real estate executives, more than 80% responded that they are committed to exceeding minimum legal standards when addressing social and environmental issues. As for green buildings, 57% of respondents said that they are promoting energy and water conservation or recycling on their properties, and 36% of those interviewed indicated that they had already invested in green building projects. An additional 31% indicated that they would do so in the future.⁵²

Some of the most visible U.S. corporations also appear to have begun taking seriously their energy and climate exposure. For example, Bank of America recently announced a \$20 billion environmental plan to reduce the environmental impact of its corporate clients, individual customers, and the corporation itself. Nearly \$18 billion is going to promote “green” economic growth by helping corporations finance, market, and learn about alternative products and services. In addition, Bank of America will give a portion of its earnings from credit card transactions to environmental organizations and is offering a reduced interest rate for home loans that meet the Energy Star requirements. For its own facilities, Bank of America has committed to meeting LEED certification requirements in all new construction. It will invest \$1.4 billion in green construction for its own office and banking centers and has allotted \$100 million to make its existing buildings more energy efficient. These commitments are in addition to the \$1.5 billion the bank has already invested in new green office towers in New York City and Charlotte, North Carolina.⁵³

In an innovative display of public-private partnership, the William J. Clinton Foundation unveiled its new Energy Efficiency Building Retrofit Program earlier this year. The program will provide city governments and private building owners with access to funds that can be used to retrofit existing buildings, with a goal of reducing energy use by 20 to 50%. This will be accomplished by having energy service companies such as Honeywell, Johnson Controls, Siemens, and Trane conduct energy audits and perform building retrofits. The financing for these retrofit operations will come from large international lenders such as ABN AMRO, Citi, Deutsche Bank, JPMorgan Chase, and UBS. Each firm is committed to arranging \$1 billion in financing for cities and private building owners willing to undertake these retrofits. It is expected that cities and private building owners will be able to pay back the loans plus interest through the energy savings generated by the retrofits. Participating cities include Bangkok, Berlin, Chicago, Houston, Johannesburg, Karachi, London, Melbourne, Mexico City, New York, Rome, Sao Paulo, Seoul, Tokyo, and Toronto.

Many utility companies across the United States are also offering incentives for green builders. According to the Database of State Incentives for Renewables and Efficiency, there are over 30 U.S.

utility companies providing financial incentives for energy efficiency.⁵⁴ The most prominent examples include Austin Energy's Green Building Program, Seattle City Light's Sustainable Building Program and Sacramento Municipal Utility District's solar-powered roof initiative.⁵⁵ The foci of these initiatives vary across the country, but usually they include both an educational component and a financial incentive for employing sustainable technologies.

Even the lodging industry is beginning to see reductions in energy use as an important component of a more robust bottom line. This is evident from a recent agreement between the parent company of the Motel 6 hotel chain (Accor North America) and Honeywell and Pacific Gas and Electric Co. to perform energy efficiency retrofits to more than 7,000 hotel rooms in California. The retrofit process will entail the installation of sensors that shut off air conditioning and heating equipment when the rooms are unoccupied. When completed, the retrofit will save the company an estimated \$140 per room in annual energy savings, or an average of 1,100 kilowatt-hours. It is also expected that the reduced energy demand will result in annual reductions of over 10 million pounds of CO₂ emissions.⁵⁶ So, it now appears that the motel chain that once bragged that it would always leave a light on to welcome its customers will now, finally, be switching from incandescent to compact fluorescent bulbs.

How important is the individual consumer as a catalyst in stimulating the green building marketplace?

Another indicator of the growing appeal of green building approaches is the emergence of a retail consumer market for prefabricated green houses and housing materials. No longer are green homes a custom-made luxury for the wealthy. These homes are competitively priced with traditional "stick-built" homes and allow average citizens to build eco-friendly homes that generate long-term cost savings. Companies like PLACE Houses claim that they can make building a green house as easy as buying a car.⁵⁷ LivingHomes built the first Platinum-certified LEED for Homes structure last year and made the AIA's Top Ten Green Building Projects of 2007 list.⁵⁸

In addition to prefabricated homes, the construction-materials industry is also going green. The GreenSpec Directory from BuildingGreen.com offers 2,100 environmentally preferred products as a guide for commercial and residential builders.⁵⁹ This year's NeoCon, the largest interior design and facilities management convention, featured booth after booth of environmentally friendly and green interior building materials, including everything from high fashion upholstery to sound-buffering cubicle walls.⁶⁰

Beyond NeoCon and the USGBC's Greenbuild conference, there are dozens of other annual exhibits promoting sustainable design both to the building community and the general public. The National Association of Home Builders hosts a green building conference that presents information regarding sustainable design and the use of renewable resources in residential construction.⁶¹ The popularity of these conferences is such that states and cities are beginning to host their own smaller versions. The state of Maryland and the city of Aspen, Colorado, have both hosted green building conferences.⁶² CIFAL Atlanta, an affiliate of the United Nations Institute for Training, hosted a green building conference in July 2007 for municipal leaders from around the world, which featured local public-private partnerships.⁶³ San Francisco welcomed more than 8,000 visitors to the inaugural West Coast Green Building Conference in November, 2006.⁶⁴ In September 2007, over 11,000 people attended the conference with one of the most popular attractions being an *mkLotus* modular home featuring a living roof, energy efficient LED lighting, solar panels, and a gray water collection system among other

environmentally-sound technologies.⁶⁵ Most impressively, it was erected (and disassembled at the conference's close) in just two days.

Which other sectors are adopting green building technologies?

The green building market has begun to take off in several other areas outside of the commercial real estate sector. For example, while progress has been slow in the health care, educational markets, and affordable/moderate housing markets, all three are showing signs of increasing green building activity. In each case, foundations and nonprofits have targeted these sectors due to the compelling arguments to be made that adopting green building principles will reduce operational costs and improve patient/student/resident health and productivity.

HEALTHCARE

In 2005, the question posed in the earlier edition of this paper was whether it was possible to green the healthcare industry. The answer at that time appeared to be a cautious yes. Healthcare facilities have been a target of green building advocates for a number of years due primarily to three factors: (1) a growing body of scientific data which makes the case that the use of unhealthy materials (PVC—vinyl, for example) endangers patient health as well as creating local environmental hazards when it comes to their disposal; (2) poorly designed buildings that reduce natural airflow and natural light impede the healing process and reduce worker productivity; and (3) hospitals are resource intensive structures and, according to the EPA, rank only second to food service facilities as consumers of energy, with approximately \$5.3 billion spent on energy costs annually.⁶⁶

In the intervening two years, momentum to green the health care sector has continued to build, driven in part by escalating energy costs as well as a shifting marketplace. With energy prices rising by 31% between 2003 and 2005, hospital administrators are under increasing pressure to contain operational costs.⁶⁷ At the same time, according to the American Hospital Association, the nation is in the midst of a health care facility building boom as aging baby boomers begin to draw more intensively on the health care infrastructure.⁶⁸ Taken together, there is a growing awareness within the industry of how the adoption of sound environmental policies help hospitals deliver improved patient care and reduce operational costs while also promoting their images as responsible social actors, thus enhancing their market competitiveness.⁶⁹

Until recently, many healthcare institutions were reluctant to use LEED as a guide for their construction projects because existing standards were not always applicable to the operational and service delivery challenges that they faced. Near the end of 2004, the Green Guide for Health Care (GGHC) was issued (as a pilot) to fill this niche.⁷⁰ Three years later, with the release of the *Green Guide* Version 2.2 in January 2007, the Guide has moved from being a pilot effort to becoming a full-fledged registration and self-certification program. Like LEED, which influenced its design, it uses a point system to gauge success in meeting sustainability goals in both construction and operations. However, unlike LEED, GGHC is self-certifying and does not translate scores into rankings. Instead, it believes that its point system provides project teams with a tool for developing a series of benchmarks which can be used to support continued refinements in the design and construction process.

As noted earlier, LEED is in the process of developing its own standard for health care facilities. To date, a few hospitals and other healthcare facilities have opted to use LEED standards (approximately 20 healthcare-related projects have been certified to date under existing LEED standards, with an

additional 160 healthcare projects in the pipeline) to guide their construction. It is hoped, however, that issuance of a new standard tailored for the needs of the healthcare market will allow LEED to more effectively meet the demand in this booming sector.

Nevertheless, despite these signs of progress in the healthcare sector, these efforts are new and understudied. Little evidence has been collected about either the financial benefits of green building in the health care sector or the non-financial benefits of green building, such as improved patient care, enhanced worker productivity or occupancy satisfaction. As a consequence, many hospital administrators are still leery of committing themselves down the green building path. A recent Smart Market report from McGraw-Hill Construction supports this assertion. The report notes that, in the health sector, lingering doubts remain about the cost-effectiveness of going green. Approximately 60% of respondents said that the lack of sector-specific information was a significant impediment to making the case for green buildings in the health field. Despite these reservations, the Smart Market report finds that 19% of respondents said that their organizations would be involved in with a green building project in 2008. This is an increase of 300% of the number of healthcare and hospital administrators who answered affirmatively to the same question in a previous survey.⁷¹

The Role of Funders: The *Merck Family Fund*, through support provided to the Health Care Without Harm campaign, has played an important role in supporting the development and roll out of GGHC.⁷² ⁷³ The *Barr Foundation* also provided early support for GGHC.⁷⁴

Another innovative effort in the healthcare field has focused on supporting the development of green community clinics in California. The Community Clinics Initiative (CCI), founded by *Tides Network* and the *California Endowment*, funds programs for health clinics. Over the past eight years, CCI has made 723 grants totaling over \$60.6 million to 185 clinics and clinic consortia in California. The Major Capital Campaign Gifts sub-program has awarded grants totaling \$12,592,000 to 55 projects. The RFP also included a one-time Green Buildings grants program focused on environmentally sustainable renovations of clinics' buildings, spaces, and/or operations. To date, \$492K in green building grants have been awarded with an average grant size of \$25,000.⁷⁵

EDUCATION

It is estimated that about 55 million Americans work or study in K-12 public schools daily. There are about 115,000 K-12 educational facilities in operation in the country, and it is expected that approximately \$270 billion will be spent by local, state, and federal agencies to meet the projected demand for both new and renovated schools.⁷⁶

This presents an enormous opportunity for greening the K-12 education sector. As it stands, the Department of Energy estimates that schools, which account for approximately 7% of the energy consumed by the commercial building sector, could reduce their consumption by at least one-quarter with simple energy efficiency improvements. This would result in a savings of approximately \$1.5 billion which, in turn, could pay for the salaries of nearly 30,000 teachers.⁷⁷

Another target of opportunity is improving the health of students, teachers, administrators, nurses, and janitors who study and labor under unhealthful conditions. Of the 115,000 schools in operation, nearly one-fifth report unsatisfactory indoor air quality. Additionally, of the pesticides most commonly used in schools, nearly half have been identified as carcinogens.⁷⁸

While there are a variety of different interpretations of what constitutes a green school, in general they share the following characteristics:

- a superior indoor environment marked by an abundance of clean, fresh air, largely free of dangerous chemicals off-gassed by products like carpets, paints, and cleaning supplies;
- high utilization of natural daylight thereby maximizing students' ability to concentrate while at the same time reducing energy costs and greenhouse gas emissions; and
- a commitment to resource use efficiency with green schools, on average, using 33% less energy and 32% less water than conventional schools.⁷⁹

The results of a recent study by McGraw-Hill Construction demonstrate that the education sector is increasingly amenable to the value proposition articulated by green school advocates. The study found that the education sector is, in fact, the fastest growing market for sustainable building. This finding is particularly significant as the education sector makes up the largest portion of new construction, accounting for over \$50 billion a year. The study also indicates that taxpayers and school boards are recognizing the importance of green building, both for the impact it has on their bottom lines and for the benefits it can bring to students. The long-term cost savings of green building have made sustainable design particularly attractive to this population, according to the study. It also appears that school systems are recognizing the importance of improved indoor air quality for student health and productivity.⁸⁰ The USGBC has responded to this trend with a LEED certification system specifically designed for schools' new construction and major renovations.⁸¹ Momentum certainly exists, as more than 300 schools are awaiting LEED certification in the United States.⁸²

Justification for this new LEED rating level can be found in several recent studies attesting to cost and productivity benefits in schools, especially in a 2006 report by Gregory Kats titled "Greening America's Schools: Costs and Benefits."⁸³ The Kats report was funded by the Gund and Kendall Foundations and was sponsored by the AIA, USGBC, and the American Federation of Teachers (AFT). It found that if schools adopted a green building approach they would save, on average, \$100,000 each year in energy costs alone. With those savings a school could then afford to hire two new additional full-time teachers, purchase 5,000 new textbooks, or buy 500 new computers.⁸⁴ Nevertheless, while the study presents evidence of the cost savings and productivity benefits of green schools and demonstrates that ignoring green design in K-12 schools is financially irresponsible, many school administrators are leery of making a commitment to green building practices. According to the study, 64% of executives rated "lack of awareness of the benefits" of green schools as a significant factor in discouraging green school adoption.⁸⁵ Thus, despite the growing trend towards green schools, there is still work to be done in uncovering and presenting evidence for the increased use of green building materials and methods in school construction and renovation.

Many colleges and universities are also constructing green buildings. Higher education is one of the sectors that have most enthusiastically embraced green building. It has become almost trendy for campuses to build at least one trophy example of the institution's commitment to sustainability, but this does not always reflect a campus-wide commitment to green construction. In some cases, it appears that universities are constructing a single green building and then touting themselves as having "Green Campuses" while otherwise continuing to build traditional buildings. Critics say that schools should be looking at how they can employ cost-, energy-, and water-saving techniques across their campuses rather than creating one model that they may or may not intend to replicate. For example, Yale University is constructing a School of Forestry building that will be LEED-Platinum and house a new joint program between architecture and forestry.⁸⁶ Of the other 15 construction projects on campus, no others are pursuing LEED certification. Yale has, however, created a committee for sustainability that will encourage sustainable components in all future construction projects.

One hopeful sign is the emergence of the American College & University Presidents Climate Commitment (ACUPCC), which includes almost 320 schools from 45 states representing about 15% of the country's higher education institutions. Unveiled in June, 2007, the signatories to the Climate Commitment pledge to adopt some mixture of the following measures as long as the net result is a significant reduction in the CO₂ footprint of each campus. The first step is the creation of a long-term plan to become climate neutral, which first requires an inventory of each school's carbon emissions within the next two years. Once a school's carbon footprint has been defined, it is committed to then taking at least two of the following actions: ensuring that all new campus construction will be built to at least the USGBC's LEED Silver standard; purchasing only Energy Star-certified products when possible; offsetting greenhouse gas emissions from school-funded air travel through the purchase of carbon offsets; encouraging public transit use by students, faculty, and visitors; purchasing energy from renewable resources and supporting shareholder resolutions that address climate change and sustainability issues in companies in which the school has invested part of its endowment. In addition, all of the signatories to the Climate Commitment have pledged that they will make climate change and sustainability part of the curriculum for all students—whether they are studying to be doctors, lawyers, engineers, or poets.⁸⁷

In addition to the activism and commitment of their administrations, colleges and universities are incorporating sustainability more deeply into the curriculum of their schools. Yale University is creating a joint degree drawing on its architecture and forestry schools, called the Master of Environmental Management and Architecture.⁸⁸ Arizona State University will soon graduate the first class of graduate students in the United States with degrees in sustainability. Its Global Institute for Sustainability will handle both on-campus green constructions—ASU currently has eight LEED projects—and the training of the next generation of thinkers in sustainability, including economists, architects, and advocacy specialists.⁸⁹ Despite the progress, many architecture professionals complain that education still falls short of current market demand.⁹⁰

The role of funders: The foundation community has been most visibly active in this sector through the provision of capital funding for select projects. For example, the *George Gund Foundation* provided support to Oberlin College for The Lewis Center for Environmental Studies at Oberlin College, which, at the time (2000) was described as one of the most advanced green buildings in the U.S.⁹¹ At the time that the grant to Oberlin was made, it was the exception and not the norm for capital grants from Gund. Recently, however, Gund, in conjunction with the *Cleveland Foundation*, announced that all future capital grants would be restricted to projects committed to seeking LEED certification.⁹²

The Kresge Foundation, however, over the past four years has been the national leader in providing capital support to nonprofit organizations, including educational institutions (primarily higher education), seeking to build green facilities. Since launching its Green Building Initiative in 2003, The Kresge Foundation has awarded over \$13 million in green building planning and bonus grants. Most recently, in September of 2007, The Kresge Foundation awarded a \$1 million challenge grant to Mills College in Oakland, California, for the construction of a new natural sciences building. The College is expected to seek the LEED Gold certification for the building. It was one of 22 grants—out of 81 made at the board meeting—supporting sustainable design projects.⁹³

Foundations like the *Kendall Foundation* have attempted to influence the education sector by supporting efforts to develop policy frameworks as well as the standards and practices. Under the rubric of its climate change program, four years ago it launched a new initiative designed to green the

design, construction, and maintenance of schools in New England. Grantees include: the Connecticut Green Building Council, the Global Environment & Technology Foundation for their report “The Costs and Benefits of Greening America’s Schools,” and the Northeast Energy Efficiency Partnership to assess the demand for technical support for states adopting energy efficiency standards in K-12 schools and to promote the construction of high performance schools in the New England.⁹⁴

Other funders interested in catalyzing change in the educational sector have instead focused on changing the way that architects and planners are trained. With support from the *Tides Foundation’s Keneda Sustainability Fund*, AIA’s Committee on the Environment (COTE) produced a report entitled “Ecology and Design: Ecological Literacy in Architecture Education.” It provides a look at the degree to which ecological literacy and sustainability have been integrated into American architectural education. The report includes:

- a survey of recent efforts to bring environmental awareness into education across the board and issues of sustainability into architecture education;
- definitions of sustainability, ecological literacy, and sustainable design;
- examples of U.S. academic architecture departments where ecological literacy has had an impact;
- surveys of U.S. architecture school Web sites and course offerings; and
- profiles of grant winners following a call for coursework.

Among the recommendations included in the report are a proposal to create the AIA COTE Center for Ecological Design, which would be committed to advancing ecological literacy and an understanding of sustainability as an integral part of architectural education and practice.⁹⁵

AFFORDABLE AND MODERATE INCOME HOUSING

In comparison to their counterparts in the market-rate housing sector, developers in the affordable and moderate income housing sectors lag behind in incorporating sustainable design principles and construction practices into their projects. This is, on the surface, somewhat surprising given long-term direct and indirect economic benefits which accrue to owners and tenants of green affordable housing units. But momentum is slowly building to push affordable housing developers to become leaders in the green building industry.

Marshalling arguments comparable to those brought to bear in making the case for green schools, green building advocates have targeted the affordable housing market by asserting that affordable housing units built with green design principles and technologies will result in reduced utility costs (nearly 17% of a low income family’s earnings can be consumed by energy costs), reduced maintenance costs due to the use of more durable materials, a healthier living environment for residents, and a higher value retention for properties built to these specifications.⁹⁶

These arguments appear to be gaining traction in many parts of the country. According to a study recently completed for the National Housing Trust, all fifty states as well as the District of Columbia and the Commonwealth of Puerto Rico have programs which encourage developers of affordable housing to install energy efficient appliances and heating and cooling systems as well as, in a few cases, incorporate the use of renewable energy into the overall design. Forty-eight states give preference to and/or award points in their Low Income Housing Tax Credit (LIHTC) qualified allocation plans for developments which incorporate green building design principles and/or materials.⁹⁷ Two years ago, only half the states had comparable measures in place.

Nevertheless, based on the findings in a 2005 study produced by New Ecology, Inc. and the Tellus Institute, it is clear that incorporating green building and design principles into affordable housing projects is still more often the exception rather than the norm. Using sixteen affordable housing developments as examples, the authors of *The Costs and Benefits of Green Affordable Housing* calculate, on average, that greening an affordable housing development adds a small premium of approximately 2.4% (which is less than half of the amount of money routinely set aside as a contingency fee for most developments). This is more often than not recouped through lower operating costs as a result of water and energy savings.⁹⁸ However, as is often the case with commercial developments, the greatest incentive to the developer to green an affordable housing project is if they intend to retain a long-term ownership interest in the project.

Ownership issues aside, despite clear evidence of the long-term value of adopting a green design and building approach, most affordable housing developers are reluctant to embrace this approach due to a number of factors, including:

- a near exclusive focus on upfront, initial costs as opposed to operating costs over the life span of the development;
- the existence of fixed per-unit cost caps;
- regulatory regimes that restrict the ability of developers to incorporate green design elements into their projects; and
- a financing system that is often incapable of recognizing the long-term value of investing in green design and technology.

Shifting from incentives for developers to the impact green building has on the tenants of affordable housing, the New Ecology-Tellus study clearly indicates that green features incorporated into affordable housing units almost always translate into tangible benefits for tenants. In some cases, the benefits take the form of lower utility payments. In others, the value is derived from being able to live in a more comfortable environment with improved indoor air quality.

Taking their own analysis to heart, New Ecology and Tellus entered into a strategic partnership with Boston Community Capital, the regional office of Local Initiatives Support Corporation (LISC), and the Massachusetts Association of Community Development Corporations for the purposes of forming the Green Building Production Network (GBPN). GBPN awarded \$2 million to four Boston area Community Development Corporations (CDCs) to help them build or renovate over 800 units of mixed income housing using green design principles and technologies. While half of the units will be in stand alone housing developments, the other half will be incorporated into a mixed-use development that will also include retail shops, a community center, and offices. Over time, GBPN expects that it will invest a total of \$7 million into the four developments while leveraging much larger sums to round out the total financing needs of the projects.

Urban Edge's Jackson Square in Boston was GBPN's first project. It is one of the largest CDC projects in the country to date and is now in the design phase. When completed, the project will include 430-units of mixed-income housing as well as retail space, a community center and offices. It is located on a twelve-acre site in Jamaica Plain, convenient to public transit. Energy for the project will come from an innovative combination of photovoltaic panels, wind turbines, geo-thermal heating and cooling, green roofs, and co-generation powered by burning bio-diesel fuel. To conserve water resource, grey water will be used for larger bathrooms in the office buildings and the community center. To improve indoor air quality wood and cork flooring, non-vinyl floor tiles, low VOC paints, adhesives and solvents, and non-toxic finishes will be used to finish interiors. In addition, native plants will be used

to landscape the project thus avoiding the need to install a sprinkler system. Construction is expected to begin in early 2008. Jackson Square is part of the LEED-ND pilot.⁹⁹

To further expand the market for green affordable housing, in 2004 a consortium of public and private financial institutions, non-profits, and foundations launched the Green Communities Initiative (GCI). The GCI will be administered by the Enterprise Social Investment Corporation (ESIC is a subsidiary of the Enterprise Foundation). Lead nonprofit supporters include the Natural Resources Defense Council (NRDC), AIA, the USGBC, Southface, Global Green, and the American Planning Association. GCI will provide both grants and favorably priced financing to developers of affordable rental and for-sale homes nationwide. Projects will be built in accordance with a set of criteria partially derived from LEED. In addition to financing, GCI also will provide expert training and technical assistance to help housing developers meet Green Communities criteria. By 2009, Green Communities expects to have provided \$550 million in grants, loans, and equity investment in order to create 8,500 affordable rental and for-sale homes nationwide. The tax credit investors involved in this effort include Bank of America, Fannie Mae, Freddie Mac, J.P. Morgan Chase, and Washington Mutual. To date, Enterprise has funded 160 new developments, which amounts to 7,000+ new, green, affordable homes. In support of this output in the affordable housing market it has awarded \$4.4 million in green design and planning grants, \$12.2 million in loans, and \$334 million in LHITC equity. In the process, in partnership with the USGBC it has also trained 2,700 housing professionals in green design and construction techniques.¹⁰⁰

Emblematic of the type of projects supported through the GCI is the Kingsbury Place Apartments, an affordable and supportive housing complex for -income, disabled, and formerly homeless individuals and families. Built by Genesis Nonprofit Housing Corporation, in Grand Rapids, Michigan, Kingsbury Place provides 44 units for low-income families and individuals. Of these, 29 units are reserved for families with disabilities. Indoor environmental quality and occupant health were priorities for the developers and the project team ensured that paints, adhesives, and sealants used in the complex met the volatile organic compound (VOC) requirements of some of the more stringent standards in the country. The team also designed the mechanical system to provide 15 cubic feet of fresh air per minute per occupant—double the typical ventilation rate. The project team also focused on energy efficiency as a key component of affordability. Thus, energy efficient lighting fixtures, appliances, and mechanical systems were installed to cut down on energy use. In addition, strategically located trees were planted so as to limit solar heat gain in the summer, lowering cooling loads. For its efforts, this project was part of the LEED for Homes pilot project and received a silver certification.¹⁰¹

LEED for Homes is finishing its second pilot phase this fall. There are currently 375 builders and over 6,000 homes expected to receive LEED certification during the pilot phase, and there are already over 200 homes certified, many of them affordable to people of low and moderate incomes—either for purchase or as rentals. To ensure that LEED for Homes is embraced by developers of housing for people of low and moderate incomes, the USGBC has been working with the Home Depot Foundation, Enterprise Community Partners, Global Green, and Southface to create tools and educational opportunities to specifically engage housing developers that serve these discrete markets.

The Role of Funders: The *Barr Foundation* catalyzed the development of the Green Building Production Network in Boston, MA with a grant of \$1.5 million and also has provided direct support to projects such as Jackson Square, which is enrolled in the LEED-ND pilot phase. A number of private and community foundations have lined-up as supporters of the GCI. They include: *Blue Moon Fund*, *Bullitt Foundation*, *George Gund Foundation*, *Home Depot Foundation*, *Kendeda Sustainability Fund*

at the Tides Foundation, New York Community Trust, Paul Allen Foundation, and the Rockefeller Brothers Fund.

The *Oak Hill Fund's* Environmentally Sustainable Affordable Design (ESAD) program promotes the incorporation of the principle of sustainable development into the design of affordable construction, with a primary focus on residential housing. Under the rubric of ESAD, Oak Hill supports non-profit educational initiatives that promote and encourage sustainability and affordability in residential design. It also supports efforts to provide the public with easy access to sustainable and affordable products and technology used in residential construction. In its home state of Virginia, Oak Hill also provides modest capital support (grants are usually in the \$20,000 range) to non-profits greening their existing facilities.

As noted above, the *Home Depot Foundation* has supported the USGBC in its efforts to develop the LEED for Homes standard. In May, 2007, it announced a \$100 million commitment to build at least 100,000 sustainable, affordable homes over the next five years and plant 3 million urban trees. Both the *Oak Hill* and *Home Depot Foundations* are supporting the USGBC in its efforts to train nonprofit developers in using the LEED for Homes standard. This effort will be kicked-off with pre-conference workshops in advance of the upcoming Greenbuild conference.

Where do the imperatives of the smart growth movement intersect with those of the green building movement?

One of the early criticisms of LEED was that it paid insufficient attention to issues of siting and housing type in relation to smart growth goals of promoting density and social/income equity and diversity in new (re)development projects. LEED has responded, in part, to this criticism by working with the Congress for the New Urbanism (CNU) and NRDC to develop a new set of standards designed to be applicable to neighborhood and community design. The result is LEED-ND (Neighborhood Development), which has been designed to measure entire developments' impact on the environment and community.

By virtue of the partnership that co-designed the standard, LEED-ND is unique among the LEED family of ratings systems. It is also the first rating system of its kind to incorporate features of green building, smart growth and new urbanism, by addressing two of the leading contributors to greenhouse gas emissions, buildings, and transportation.¹⁰² Expanding on the success of the LEED for New Construction and its offshoots, LEED-ND combines sustainable building design with greater attention to the interrelated nature of neighborhoods and incorporates features of smart growth and new urbanism in both the prerequisites and point scale. Credits are given based on a variety of factors including: site selection; proximity to public transportation; reduced water use; reuse of historic buildings; minimizing site disturbance; heat island reduction; and on-site energy generation.¹⁰³

The pilot phase will likely last into the middle of 2008, when the Core Committee will open the new rating system to its standard revision process, which includes two periods of public comment. The launch of LEED-ND is expected in early 2009. If the pilot registration is any indication of market demand, there will be projects lining up for the 2009 registration opening. The LEED-ND pilot was originally designed to include only 120 projects. By April of 2007, the USGBC had over 370 applicants for the program. Of those, 238 projects self-determined a readiness to participate in the program and continued with the registration process.¹⁰⁴ According to the USGBC, a handful of projects are nearing completion and will begin the certification process this fall.

It should be noted that admittance into the pilot phase of LEED is not a guarantee that a project will be certified. In fact, one of the challenges of defining a LEED standard is to set the prerequisite bar at just the right level. If it is set too high and too few projects pass muster, then many developers will shy away from using the standard and market transformation will not occur. If the bar is set too low, then the standard will be meaningless. By the end of the pilot phase of LEED-ND, the USGBC hopes it will have calibrated the prerequisites so that developers will have to stretch, but not unreasonably so, to become certified. In finding that point of tension is the art of crafting a useful standard which is attainable yet also precipitates market transformation over time.

As with the development of other LEED systems, the USGBC and its partners received outside funding to support the work of the volunteer Core Committee and outside consultants. Donors included, *Blue Moon Fund*, the *EPA Office of Brownfields Cleanup and Redevelopment*, the *EPA Development, Community, and Environment Division*, the *Centers for Disease Control and Prevention*, the *National Endowment for the Arts*, and the *Surdna Foundation* via a grant to NRDC. In addition, *The Kresge Foundation* contributed \$100,000 to help cover the cost of registration for 14 non-profit developers to participate in the pilot.¹⁰⁵

Another approach to melding green building with smart growth urban design is being piloted by EarthCraft, mentioned earlier as a pioneer in the green building home market. In response to growing interest in the convergence between smart growth and green building, EarthCraft has begun to branch out to include a new set of certification criteria designed to promote the development of entire communities—comprised of certified EarthCraft homes—designed to combat sprawl and conserve the environment. Specific attributes include proximity to multi-modal transportation options, creation/preservation of community greenspace, and attention to new urbanist design principles such as walkable streets with sidewalks, porches in the front, and garages designed to serve as storage facilities for cars rather than as de facto front doors.

EarthCraft now has several projects under development including the Winchester Forest, a 100-house single-family complex in Richmond, Virginia, which began construction in the fall of 2007. All of the houses in the complex have window coatings and wall assemblies that adhere to the most energy-efficient specifications for mixed humid climates like Richmond's. Twelve home plans, based on vernacular Virginia architecture, have been designed to appeal to a wide variety of families and lifestyles. The site plan was designed to preserve existing mature trees with the largest clusters of mature trees being set aside for neighborhood parks. The complex was also designed to be pedestrian-oriented and has continuous sidewalks and narrow roads to encourage residents to walk to neighborhood stores and to minimize asphalt surfaces. Stormwater run-off will be reduced through the use of planted rain gardens and permeable driveways.¹⁰⁶

What role can foundations play in supporting the green building movement?

To date, foundations have supported the green building movement through a diverse array of approaches. Some funders, as has been noted in earlier sections of this paper, have supported efforts like the development of the Green Guide to Health Care, the pilot phase of LEED-ND, and the Green Communities Initiative.

Many foundations have begun to encourage capital grant seekers to employ sustainable design and construction approaches in their project designs. These include the *Barr Foundation*, *Cleveland Foundation*, *Gates Family Foundation*, the *Gulf Coast Community Foundation of Venice*, *Gund Foundation*, *Heinz Endowments*, *The Kresge Foundation*, *Meadows Foundation*, and the *Wege Foundation*. Several of these foundations, including Gund, Cleveland, Venice, Heinz, and Wege, will fund capital projects *only* if they meet LEED certification standards. For its part, *The Russell Family Foundation* is pushing the envelope in green building and products standards by providing the USGBC's Cascadia Chapter with \$400,000 in support of its Living Building Challenge and the Pharos project.¹⁰⁷

A few foundations, however, have attempted to bring integrated strategies to bear when looking for opportunities to scale the green building movement. In doing so they have deployed a diversity of strategies including:

- supporting the development of certification standards like LEED and GGHC;
- providing funding for the research and analysis required to make the case for the triple bottom-line pay-off of green buildings;
- supporting public education and advocacy campaigns designed to advance the green building agenda at the local, state, and national levels by changing relevant policy frameworks and encouraging public investment;
- underwriting the development of technical resources and training modules designed to accelerate the diffusion of green building techniques and technologies;
- providing capital support for building projects through grants and Program Related Investments (PRIs); and
- investing in smart growth-green building real estate investments as a means of harnessing market power to expand the green building industry.

Some of the leading funders in this space include:

Barr Foundation: The Barr Foundation is a private foundation committed to enhancing the quality of life for all of Boston's citizens. Its primary areas of emphasis are education and the environment, but it also provides support to arts and cultural activities. Under the Environment umbrella, they fund programs that focus on: Open Space and Water Resources to preserve community character and promote public health; Environmental Justice to ensure democratic representation for all income levels on environmental issues; Environmental Citizenship to promote environmental education; and Development Planning and Urban Design to ensure that healthy city planning is a Boston priority.

Under its Development Planning sub-program, Barr has supported organizations such as the Green Roundtable (which—with additional support from the *Merck Family Fund*—was formed to provide technical advice to the Green Building Task Force which was convened by the city's mayor) as well as the Massachusetts Technology Collaborative for LEED training for city and state staff. It also helped form the Massachusetts Smart Growth Alliance, which helped to push through 2004 LEED-Silver standard for all city buildings. In addition, Barr provided start-up funding to Green Homes Northeast and jump-started the Green Building Production Network with a grant of \$1.5 million. Understanding the ongoing need for good data on green building performance, Barr also provided funding for the Kats study on green schools. Finally, as noted above, Barr is also a capital grant maker with higher awards provided to projects that meet LEED standards.¹⁰⁸

Heinz Endowments: Based in Pittsburgh, Pennsylvania, the Endowments fund activities nationally but focuses its investments on efforts to enhance: the arts and culture; the status of children, youth, and

families; the range of economic opportunities, the array of educational institutions, and the quality of the environmental resources available to communities in southwestern Pennsylvania. Under the rubric of their environmental program, the Endowments have a focus on sustainable development in civic design and have acted on this interest through a number of complementary activities, including providing direct support to landmark projects such as the David L. Lawrence Convention Center in downtown Pittsburgh (the nation's first convention center to achieve the LEED Gold rating). Now, all capital projects will be required to become LEED certified with the expectation that the projects strive to achieve at least the Silver level of certification.¹⁰⁹

The Endowments also helped found the Green Building Alliance (GBA) which has become a national model. Its Green Building Fund assists building owners and developers with the implementation of green building practices. GBA has argued successfully that the application of green building principles improves the Pittsburgh region's economic competitiveness through bottom-line benefits to businesses, including: (1) reduced utility costs; (2) increased worker productivity; (3) improved employee/tenant retention rates; and (4) enhanced public image. The Green Building Fund is available to qualified developers who plan to integrate green design into either new construction or rehabilitation projects. The Fund provides a source of flexible financing with: (1) loan amounts from \$200,000 to \$400,000; (2) subordinate collateral positions; (3) fixed market-rate financing for the term of the loan; (4) extended repayment terms when necessary; and (5) potential support for soft costs associated with the LEED rating system. LEED certification is a requirement of the Fund.

The GBA also has focused on integrating of green building into economic development-related policies and practices in the region. Their five year strategy includes plans to: (1) change existing local and state government policies that create barriers to green project/product implementation; (2) establish green building as an economic development priority for state and local policymakers; (3) advocate policy incentives that make green development more advantageous; and (4) increase federal/national awareness of Pittsburgh's green leadership. GBA also works to demonstrate the added value of green projects through the collection, analysis, and dissemination of green building information. Through these efforts, green building data, tools, and materials are made accessible for use in the local market. In collaboration with critical partners, GBA facilitates the collection and analysis of performance data of green buildings in the Pittsburgh region for local and national use. In the aggregate, the GBA has influenced over five million square feet of green development in the Pittsburgh region.¹¹⁰

Home Depot Foundation: The Home Depot Foundation (HDF) is dedicated to creating healthy, livable communities through the development of affordable housing built responsibly and the preservation and restoration of community trees. The Affordable Housing Built Responsibly program focuses not only on the up-front construction costs of the home but also on the long-term costs associated with mortgage repayment as well as operations and maintenance. It also takes into account the health and environmental costs associated with the construction. The Healthy Community Trees: The Urban Forest program funds organizations that focus on incorporating trees into community development, use trees in urban design to reduce utility costs, and engage the community in educational programs demonstrating the importance of maintaining an urban green environment.

On average, HDF gives away 15–20% of its assets on an annual basis. Since its inception in 2002, HDF has made \$25 million in grants. Approximately 75% of the grants go to support affordable housing programs while the rest go to tree-planting efforts. In May of 2007, HDF announced a \$100 million plan over ten years to build 100,000 sustainable, affordable homes and plant 3 million urban trees. In addition, as noted earlier, HDF (in partnership with *Oak Hill Foundation*) is supporting the

USGBC in its efforts to train nonprofit developers in using the LEED for Homes standard. This effort will be kicked-off with pre-conference workshops in advance of the upcoming Greenbuild conference.¹¹¹

Illinois Clean Energy Community Foundation: The Illinois Clean Energy Community Foundation (ICECF) was established in 1999 with a \$225 million endowment from Commonwealth Edison as a result of a compromise with the state over the utility's decision to sell off of seven of its power plants. It has three main program goals: increasing energy efficiency; expanding the use of renewable energy resources; and preserving and enhancing natural areas and wildlife habitats throughout Illinois. As part of its overall efforts to promote energy efficiency and the expansion in the use of renewable energy, ICECF will make grants to support building projects being undertaken by nonprofit organizations and local government agencies. The focus is on projects which will enjoy widespread public use and/or visibility. Where no local energy code is in place, the project must meet or exceed the International Energy Conservation Code. If a local energy building code is in place, the project must meet LEED Silver standard at a minimum and maximize all of the LEED points related to energy and atmosphere. While the bulk of the grants are for design and engineering costs as well as for commissioning (the process under which all of the major mechanical—heating and cooling—systems are tested to check if their performance tracks with projections), ICECF will occasionally provide construction funding to cover the costs associated with innovative energy-saving features. ICECF also provides training and technical assistance to local governments interested in incorporating energy efficiency into their building codes.¹¹²

Foundation grants have supported installation of high-efficiency lighting in more than 3,000 buildings, including 2,000 K-12 schools. The Foundation also has provided funding in support of the design more than fifty new and remodeled educational, public safety, affordable housing, and other community facilities. It offers a \$35,000 incentive for projects which achieve a LEED Gold standard. However, the foundation does not require that buildings get LEED certified, because the cost of certification is too high and not justified for public buildings. In the renewable energy sector, more than half of the foundation's grants went to support the installation of wind power systems, especially ones that will provide power for schools and colleges. The second largest share of renewable energy funding supports installation of solar energy systems, including small-scale photovoltaic systems for K-12 schools. Since 2001, the Foundation has given 2500 grants totaling over \$128 million. Of that amount, it is estimated that roughly two-thirds of the grant dollars have been awarded for green building or lighting retrofit projects.

The Kresge Foundation: Based in Troy, Michigan, historically the foundation's core grant-making program has consisted of challenge grants for nonprofit capital projects. Under the rubric of its capital challenge grant-making program, the foundation had over time supported various green building projects. However, in 2003, it decided to codify its support of the green building movement by launching a Green Building Initiative (GBI). GBI was designed to make it easier for nonprofits to develop projects which take advantage of green materials and design principles. It did so by providing planning grants to nonprofit organizations committed to green building projects. The grants were designed to defray the additional costs associated with constructing a green building including: design charrettes; energy analysis and modeling; materials and technology analysis; ecological site planning including storm water management; and the added expenses associated with registering with LEED and amassing the documents necessary to be certified. These projects were then eligible to apply for larger grants for capital support which would be awarded if the building achieved LEED certification. Kresge also has published a series of educational brochures and case studies designed to help nonprofit organizations apply a green building lens to their building projects. Between 2004 and 2006, the

foundation made approximately 140 grants for green building projects, totaling over \$13 million. While the program is currently under revision, as noted earlier, the foundation continues to make grants to support nonprofits pursuing green building projects.¹¹³

Opportunities (and challenges) for funders interested in catalyzing stronger market demand for green buildings.

As part of the process of updating this paper, the authors spoke with six leaders from the nonprofit and philanthropic communities:

- Rebecca Flora, Green Building Alliance (and incoming chair of the USGBC)
- Jen Henry, USGBC
- Jon Jensen, Park Foundation
- Jim Mann, Illinois Clean Energy Community Foundation
- Mariella Puerto, Barr Foundation
- Fred Wacker, Home Depot Foundation

We asked them for their thoughts about the opportunities which exist for funders interested in scaling up the green building market. They were also asked to offer their insights on the impediments which need to be overcome if green building practices become the new normative standard for design and construction. The following lists reflect our best efforts to summarize those areas where there appeared to be a significant amount of consensus. One of the interviewees, Jon Jensen, the catalyst for the Funders' Network's immersion into the green building field and the host of the 2005 conference in Cleveland, in fact has a list of ten simple things that every funder interested in green buildings can do. *Some of those items are referenced in the comments below, but we provide the full, unedited list in Appendix III.*

OPPORTUNITIES

RETROFIT THE EXISTING BUILDING STOCK – Several interviewees commented on the fact that there are significant opportunities for funders to support efforts to rehabilitate and retrofit existing buildings, especially in older cities. In fact, by some accounts, the buildings constructed in the 1930's and 1940's—based on construction practices at the time—lend themselves to green retrofitting far more so than the building of the 50's and 60's. These buildings should be targets for green building funders.

USE THE GROWING CONCERN ABOUT CLIMATE CHANGE TO LEVERAGE MORE INVESTMENTS INTO GREENING NEW CONSTRUCTION AND RENOVATION OF EXISTING BUILDINGS – As is evident from the momentum behind the U.S. Conference of Mayors' Climate Protection Agreement, the William J. Clinton Foundation Energy Efficiency Building Retrofit Program, and Bank of America's recently announced \$20 billion environmental plan, climate change has finally grabbed the public's attention. It also appears to be precipitating some shifts in philanthropy, as well.

Earlier this year, the *Doris Duke Charitable Foundation* unveiled a new Climate Change Initiative which will invest \$100 million over five years with the goal of building a clean energy economy. Strategies include: (1) designing optimal pricing policies for greenhouse gases; (2) deploying and developing clean-energy technologies and supporting policies that bring these technologies to market more quickly; and (3) identifying ways to adapt to climate change. In its first round of grant making,

Duke awarded a \$21 million grant over three years to the *Energy Foundation* for work in two areas: (1) the development and adoption of new building codes, appliance standards, and building technologies which have the potential to greatly reduce energy consumption in the building sector; and (2) infusing green design and construction practices and technologies into the building sector in China as the country continues to experience an extraordinary building boom.¹¹⁴

The growing interest in climate change presents the opportunity to focus on creating “green collar” jobs for people with skills in conducting energy retrofits, green renovation and construction, etc. There is a tremendous opportunity for low-income workers to be trained to participate in this industry. Funders can facilitate this process by creating a bridge between the environmental, environmental justice, and labor communities.

SUPPORT ADVOCACY AND PUBLIC POLICY REFORM – While enormous strides have been made, particularly at the state and local level with respect to the adoption of green building policies, much more still needs to be done. This is also true with respect to land use policy, as sprawl in many parts of the country shows no signs of abating. While national groups play an important role in shaping key policies on issue such as climate change, building codes and standards as well as land use policy are primarily matters for local and state governments. Thus, it is important to support organizations working to advance policy change at the state and local level as they often lack the resources—human and financial—to be truly effective. The widespread adoption of the LEED-ND standard could be an effective way to integrate local land use and building policies. The state of Illinois’s legislature recently adopted a measure which would link state planning funds to LEED-ND certification. Passed unanimously in both chambers of the Illinois General Assembly, the Green Neighborhood Award Act would allow the Illinois Department of Commerce and Economic Opportunity to issue grants to three LEED-ND developments in an effort to give incentive to more developers to build green and smart.¹¹⁵

SUPPORT CAPITAL PROJECTS AS WELL AS THE UP-FRONT PLANNING PROCESS – It is clear that programs like that of *The Kresge Foundation* provide enormous stimulus to the green building industry. While capital grants are critical, equally important in many instances is support for the integrated design process. The sooner funders become comfortable with insisting that all capital grantees meet at least the base level LEED standard or local equivalent, the sooner the green building market will scale. Arguments against this strategy allege that requiring that sustainable design be a part of any new building project places an unfair financial burden on the organization. Evidence abounds, however, that even in the most remote parts of the country, LEED Silver requirements can be met at little to no additional costs. Furthermore, placing a green requirement on capital grants encourages organizations to begin thinking about green building earlier in the process, which further lowers cost thanks to the efficacy of integrated design.

HELP LEED-ND SUCCEED – Once LEED-ND finishes its initial pilot phase, much more work will be required before it is ready to go live in 2009. In that context, funders could:

- Help support the development of educational programming around LEED-ND. Policymakers, regulators, and community development agencies are all going to require education and training about why and how to use LEED-ND. Additionally, design and planning professionals as well as planning commissioners (often volunteers) will require training. In some cases, public officials from some of the poorer regions of the country may require scholarships to participate in training and education programs.
- Underwrite the development of detailed, professional case studies of the pilot projects so as to be in a position to reduce expenses for future projects and determine which ones offer the best potential as replicable models.

- Support the USGBC as it integrates all the data from the pilot phase. Analyzing the pilot projects and incorporating all of the public comments will require a considerable amount of time and money. The USGBC likely will need help funding consultants to do some of this work.
- Continue to support LEED-ND projects, particularly those developed by nonprofit developers as they will have the toughest time getting the financing together. Capital support is important, as are planning funds which enable project teams to take an integrated design approach.

CHALLENGES

GREEN BUILDING IS STILL A MYSTERY TO MANY FUNDERS AND NONPROFITS – Many foundations are uncomfortable with what they see as the need to hold the hand of their grantees through the green building design and construction process. This is often compounded by an acute sense of their limited knowledge in this area. In other words, they worry that they do not have the expertise to determine if a project is “green enough.”

SKEPTICISM STILL REIGNS IN SOME PARTS OF THE MARKET – Several of the interviewees bemoaned the degree to which there is still mostly anecdotal evidence that green buildings perform as projected. While they acknowledged the fact that LEED has only been in operation for seven years and that most green buildings are less than four years old, they still believe that getting better data on operational building performance is a critical need.

It is not a completely blank slate, however. Based on the analysis conducted as part of the development of a report commissioned by California’s Sustainable Building Task Force, an upfront investment of 2% of construction costs will typically yield life cycle savings of over ten times the value of the initial investment. The trick is that most developers have little interest in capturing life-cycle savings as they have no intention of operating the building for any longer than they need to sell it. In other cases, owner-developers with comparatively short-term time horizons, like so-called “big box” stores such as Wal-Mart and K-Mart, have little interest in investing in a building that they may have to abandon in less than ten years as they chase their customer base deeper into the suburbs.

For those inclined to take the long view, however, the report to the California Sustainable Building Task Force noted that savings come primarily in the form of reduced energy, water, and waste removal costs. Additionally, well-designed green buildings often require less maintenance over time. Finally, there is increasing evidence that green buildings result in enhanced occupant (tenant, worker, student, etc.) productivity and health. In fact, one study conducted by the Lawrence Berkeley National Laboratory estimated that U.S. businesses could save as much as \$58 billion in lost sick time and as well as an additional \$200 billion in diminished worker performance if improvements were made to indoor air quality.¹¹⁶

But several of these studies are already a few years old and/or employed too small a sample size. The first report by Kats regarding the costs and benefits of green building is now nearly 5 years old. While the Davis Langdon report, "Costing Green: A Comprehensive Cost Database and Budget Methodology," of 2004 has recently been updated, the new study, titled “Cost of Green Revisited,” shows similar findings to its earlier version:

- Many projects are achieving LEED within their budgets, and in the same cost range as non-LEED projects.
- Construction costs have risen dramatically, but projects are still achieving LEED.
- The idea that green is an added feature continues to be a problem.¹¹⁷

This dearth of quantifiable information, especially sector-specific information, is a fundamental barrier which has to be addressed before we can see the nascent green building finance sector take off. It is also a liability when convincing housing developers to take risks. From the perspective of some interviewees, optimally a definitive study on the costs and benefits of green buildings would be undertaken by a consortium of institutions that has the requisite breadth of technical expertise and is also immune to charges of partisanship when it comes to toting up the figures.

As part of the answer to the challenge posed by inadequate data on building performance, the Green Building Alliance (in association with over 50 leaders in the green building field) is designing a High Performance Building Data Repository. It would, in effect, create a national database of green building performance. Currently, the Data Repository is still in the conceptual design phase.

Conclusion

In the two years since the first edition of this paper was written, it appears that the green building movement has continued to gain momentum and may, in fact, be reaching a tipping point. Malcolm Gladwell, the author of the best-selling book Tipping Point, defines a tipping point as the moment when a trend of modest proportions becomes a social epidemic. In its current state, however, the green building movement cannot yet be considered to be operating at the scale of a social epidemic.

While the air seems to be thick with daily news items about the newest LEED-certified construction and the state of innovation in green building design and materials, there are large swaths of the U.S. where examples of good green design and construction are thin on the ground. Most of the green building activity in the U.S. is clustered in a handful of metro regions—Austin, Boston, Chicago, Pittsburgh, Portland, New York City, San Francisco, and Seattle—where a willingness to invest in green building arose out of a variable combination of civic leadership, a strong philanthropic presence, and a deep understanding of the links between environmental health, economic well-being, and the built environment. When you look at a map of green building, you cannot help but notice the wide expanses that separate these centers of green building activity. Given that many of these blank spaces on the map constitute some of the highest green growth areas in the country, it seems inconceivable that the USGBC will reach its near-term goals (100,000 LEED certified commercial buildings and 1 million LEED certified homes by 2010), let alone its longer-term goals (1 million LEED certified commercial buildings and 10 million LEED certified homes by 2020), unless it and its allies are able to shade these areas green.

With the rising awareness of the threat posed by global climate change, both green building and smart growth advocates have an increasingly attentive audience. Towns and cities across the country are contemplating what they can do to reduce their carbon footprint and (re)design their communities so as to be better equipped to adapt to a changing environment and react to natural disasters. Nevertheless, significant hurdles remain before the majority of the country has accepted the green building gospel. Unfortunately, time is one commodity that we do not have in abundance.

A lack of good information about the life-cycle operation costs for green buildings stands out as a consistent concern. This has led many organizations to pursue traditional building approaches. Despite a steady stream of anecdotal studies touting the economic and environmental benefits associated with green buildings, skepticism prevails about the true costs of both constructing and operating a green

building. Misperceptions about added costs and decreased quality persist even in the face of strong evidence that building green, even at the LEED-Silver level, involves little or no cost premium.¹¹⁸

In addition, while a 2–3% premium seems like a reasonable price to pay to build green, that calculation only makes sense if you intend to own and operate the building long enough to recoup the upfront investment. As most buildings are built by developers looking to flip the property within a relatively short time frame, that logic often breaks down fairly quickly. This is changing somewhat as more and more companies consider operational costs (particularly heating and cooling) when looking for office space. However, more needs to be done to continue to reduce the costs associated with green design and technology. Increased demand may help drive some of these costs downward. In addition, continued innovation is called for in terms of the rewards and incentives available to developers—from density bonuses to tax breaks—willing to embark on the green building path.

LEED for Homes and LEED-ND, both programs with extraordinary promise, are nevertheless in their relative infancy. Both will continue to require support from foundations in the form of underwriting outreach, training, and education for public officials and industry professionals, as well as specific building projects. It will also be important to continue to support efforts designed to build the demand for green buildings and neighborhoods. For instance, while the adoption in Illinois of the Green Neighborhood Award Act is a promising example of the role that the government can play in providing incentives for green residential developments, its scope is modest and it needs to be both expanded in the state and replicated nationwide before this type of intervention in the market will precipitate the desired transformation. In addition, green building advocates need to continue to work with public officials to reduce transaction costs (the amount of time required to permit projects, reducing liability exposure associated with in-fill projects in brown-fields, etc.) for developers.

Clearly, foundations have played an important role in supporting the field of green building and neighborhood design as it has matured and expanded. However, more foundations need to become engaged in these efforts if the green building movement is to grow quickly enough to make a meaningful contribution to reducing the nation's carbon footprint. Significantly, few foundations have yet complemented their grant making with other tools at their disposal, including program-related investments (PRIs) and investments of capital from the corpus. Looking at the scale of the challenges that lie ahead, more philanthropic leadership of this type could prove crucial in determining if and when green building hits its tipping point and becomes an epidemic of positive change.

APPENDIX I – A SNAPSHOT OF THE EVOLUTION OF THE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) STANDARDS

- LEED for Commercial Interiors was released in 2005;
- LEED for Multiple Buildings and On-Campus Buildings was approved in 2005;
- LEED-EB for Existing Building Operations and Maintenance was finalized in 2006;
- LEED for Core and Shell Development was approved 2006;
- LEED for Schools was launched in the Spring of 2007;
- LEED for Retail is now in its pilot phase;
- LEED for Homes is now in the final stages of its pilot phase,
- LEED-ND (neighborhood development) is its pilot phase and is expected to be finalized in 2009;
- LEED for Healthcare is currently under development; and
- LEED for Laboratories is also currently under development.¹¹⁹

April 20, 2007—nearly on the eve of Earth Day—marked the official launch of LEED for Schools, meaning that all schools applying for certification must now register under this standard and not LEED-NC. LEED for Schools is based on LEED-NC but takes into account the specific needs of K-12 educational buildings. Special attention is given to such design issues as classroom acoustics, mold prevention, and environmental site assessment. In addition, the USGBC has created a website specifically for LEED for Schools, www.BuildGreenSchools.org. The site offers case studies and highlights the real costs and benefits of green building. It also includes information about government policies that influence green school construction and creates an online community through its social networking component.¹²⁰

LEED for Homes is finishing its second pilot phase this fall. There are currently 375 builders and over 6,000 homes expected to receive LEED certification during the pilot phase, and there are already over 200 homes certified. In addition, the USGBC has been working with the Home Depot Foundation, Enterprise Community Partners, Global Green, and Southface to create tools and educational opportunities to specifically engage the affordable housing community.¹²¹

LEED for Neighborhood Development is also in its pilot phase, with an official launch expected in early 2009. Market demand is expected to be strong. The pilot phase was originally designed to include only 120 projects. By April of 2007, however, the USGBC had over 370 applicants for the program. Of those, 238 projects self-determined a readiness to participate in the program.

Although no timeline has been established, LEED for Health Care is also in the pipeline. It will likely draw a great deal of inspiration from the *Green Guide for Health Care (GGHC)*, which was designed with LEED in mind.¹²² Unlike the GGHC, however, LEED for Health Care will not be a self-certifying system and will require a third party certification process. It is unclear whether the LEED's standard will also give as much attention to operations and the selection of materials used day to day as the GGHC currently does.

Also in the works is a new building code standard based around the LEED rating system. In conjunction with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society of North America (IESNA), the USGBC is

developing Standard 189P (*Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*) which will provide planners, architects, engineers, and policymakers with a definitive baseline for what constitutes sustainable design, construction, and operations. It will apply to new commercial buildings as well as major renovation projects. Key areas of building performance to be addressed include: energy efficiency, greenhouse gas emissions, sustainable site selection, water usage, materials and resources, and indoor environmental quality. The standard is not a building rating system. Rather it is a compilation of criteria that must be met in order for local building code officials to provide a Certificate of Occupancy for a facility. Upon completion, Standard 189 will be an American National Standards Institute-accredited (ANSI) standard that can be incorporated into local building codes with the expectation that it will eventually become a prerequisite for LEED certification.¹²³

APPENDIX II – ARE THERE ALTERNATIVES TO LEED?

Other rating systems have developed in parallel to LEED, as a response to new demands from a variety of sectors and geographic regions. Built Green Colorado, EarthCraft, and the Austin, Texas Green Building Program are among some of the more widely used building rating systems. They address many of the same requirements as LEED but make adjustments for residential and regional factors that constitute added benefits and challenges to sustainable construction in those locations. In some instances, as is the case with Built Green Colorado and EarthCraft, the alternatives cover market segments heretofore ignored by LEED although the imminent promulgation of the standard LEED for Homes will soon rectify that.

There is also a push for alternative professional certification systems in the United States. Green Advantage is a certification system for building professionals in commercial and residential construction and requires recertification every three years.¹²⁴ Some cities and states have their own certification programs for building professionals, as well. Build it Green (BIG) in California offers its own green building professional certificate.¹²⁵ Seattle City Light has a Sustainable Building Advisor Professional Certificate Program.¹²⁶ Many colleges and universities, including the University of California, Davis and Colorado State University, now offer similar certificate programs.

Demand for green buildings overseas has also spurred the development of equivalent rating and certification systems. For example, the United Kingdom has the Building Research Establishment's Environmental Assessment Method (BREEAM). Similar to LEED, BREEAM assesses buildings based on different aspects of their environmental impact and performance. To date, 65,000 buildings have been certified using BREEAM, while another 270,000 certifications are in process.¹²⁷ Like LEED, BREEAM has developed into a number of discrete certification regimes that respond to the needs of builders of offices, retail facilities, schools, homes, courts and prisons.

In Japan, the Japan Sustainable Building Consortium developed its Comprehensive Assessment System for Building Environmental Efficiency (CASBEE). While BREEAM follows the LEED model of an independent assessment system, CASBEE is based on a self-assessment approach.

Green Globes Canada straddles the line between self-assessment and third-party verification. The developers of the Green Globe system argue that their approach—employing an on-line, self-directed questionnaire—makes it possible for the builders, owners and operators of a building to collect much of the data themselves and thus effectively conduct self-assessments. However, if these parties want to publicize their Green Globes scores, they need to engage an independent third-party to verify the accuracy of the data.

Green Globes has also developed a product for the United States that is gaining some traction in the U.S. construction market.¹²⁸ Although Green Globes U.S. has come under scrutiny because of its connection to the timber and plastics industries, it is in the process of applying to become an official American National Standards Institute standard.¹²⁹ One benefit of Green Globes certification is that the fees are lower than LEED's. There is, however, concern that it will allow builders to “green wash” their projects, since the process is self-documented and the point system was developed without much transparency.¹³⁰ Nevertheless, despite this criticism, organizations like the Sustainable Buildings Industry Council think that Green Globes represents a credible competing standard to LEED.

The National Association of Home Builders also has developed its own set of green building guidelines. It is currently working with the International Code Council to create a national green

building standard for residential construction. The standard will be certified and accredited by the American National Standards Institute when it is completed in 2008.¹³¹

APPENDIX III – TEN SIMPLE THINGS THAT FOUNDATIONS CAN DO TO SUPPORT THE GREEN BUILDING MOVEMENT

By Jon Jensen
President, Park Foundation

This list of ten things a foundation can do to advance green building practices is based on The George Gund Foundation's (Foundation) approximately six years (as of 2006) of green-building grant making in Northeast Ohio. It presumes that the reader knows what green buildings are and focuses, instead, on how relatively modest foundation grants can impact what is a large and capital intensive field.

The vast majority of buildings constructed are built by and for the for-profit sector. Foundations, on the other hand, traditionally make grants to nonprofit organizations. So how can they impact a field dominated by the for-profit sector? In several ways, including support for efforts to build awareness and provide training to designers, architects, engineers, etc. Another way to impact the field in a real, concrete (so to speak) sense is to fund the construction of green buildings that can be visited and examined. Many foundations support nonprofit building projects e.g. housing complexes, nature centers, academic buildings, community centers and the like. While they are not the same as corporate office buildings, these buildings, nevertheless, through the creative use of design and technology, can be used to educate the architects and engineers that serve the corporate market.

1. Support a local organization that has the capacity to provide the public with information about green buildings as well as advocate for green building policies and practices. This is, in our experience, the most cost effective grant you can make. It is critical to have organizations that will act as a resource for those new to the green building field. It is critical to have someone there to take the "first call" that anybody interested in the subject can make as well as for someone to maintain a steady drumbeat as an advocate for green buildings.

Example: An operating support grant to the Cleveland Green Building Coalition for its efforts to build awareness about green building in the metro region as well as provide technical assistance and educational training to architectural and engineering professionals.

2. Support programs and initiatives that increase local awareness. Lectures by national experts may, surprisingly, draw a wide range of interested parties that can, over time, establish a mutually supportive network of practitioners.

Example: A grant from the Foundation supported the Oberlin College Ecological Design Speaker Series, a monthly program held in downtown Cleveland. It drew capacity audiences and was the catalyst for the creation of the Cleveland Green Building Coalition.

3. Support specific in-depth professional training opportunities (e.g. a workshop on daylighting). Often these workshops can be offered for continuing education credits, which may motivate more people to attend.

Example: The Cleveland Green Building Coalition regularly runs workshops for architects, builders, developers and homeowners.

4. Communicate your willingness to entertain grant requests for the design and construction of green

buildings. This interest can be conveyed to all of your grantees, not just the environmental organizations. Be willing, if possible, to make a supplemental grant for a green building in addition to what you would normally award the applicant for project or operating support.

Example: The Foundation has supported elements of green building through its environment (e.g. nature centers) human services (e.g. foodbank warehouses) and arts (e.g. museums) grant-making programs.

5. Provide grants that support the green building planning process. Often, the biggest gains can be achieved in the early stages of planning--coordinating the design team, researching green alternatives, etc.

Example: A grant to Oberlin College supported a charrette for the conceptual design team of the College's new Environmental Studies Building.

6. Support unique elements of green building design which have the potential for wider adoption. The "first in the area" installations can serve as a model and inspiration for others.

Example: The Foundation has supported the installation of three green roofs (soil and plants on the roof) in Northeast Ohio--two on nature centers, one on a nonprofit office building.

7. Consider providing a loan for a green building. If your foundation makes Program Related Investments (PRIs), this mechanism can provide capital for a building project when your grants budget is limited.

Example: A PRI loan to the Cleveland Environment Center building (a historic renovation project) provided gap funding and helped subsidize the rents of the nonprofits housed there.

8. Support opportunities to develop the materials necessary to showcase green buildings. This might include tours, workshops, printed materials, website development and signage, or even equipment that monitors building performance and publicly displays it. Most organizations that go to the additional effort to do a building green are proud of it, and want to show it off, but may not have the resources to do so.

Example: In addition to supporting the green roof at the West Woods Nature Center, the Foundation supported development of a graphic display in front of the building to explain what it was all about.

9. Support LEED rating certification. This national standard is important to establishing how "green" a green building really is. It costs money to assemble the data and submit an application. Showing, locally, that a LEED certified building could be built is important in advancing the field. Underwriting these costs can provide incentives to earn LEED certification.

Example: A Foundation grant supported LEED certification and building commissioning for Case Western Reserve University's new dormitory.

10. Policy grants. Support advocacy and technical assistance for revision of local or state building codes to encourage green building. Support policy education and advocacy for federal, state and local incentives to encourage green building.

Example: A Foundation grant to the Ohio Environmental Council supported their advocacy

efforts at the state level designed to secure a new policy that all new and renovated government buildings be built green.

Endnotes

- ¹ The six partner affinity groups are Grantmakers in Health, the Neighborhood Funders Group, the Environmental Grantmakers Association, the Consultative Group on Biological Diversity and its Climate and Energy Funders Group and the Health and Environmental Funders Network.
- ² The Funders' Network for Smart Growth and Livable Communities is a non-partisan, not-for-profit organization that exists to inspire, strengthen and expand philanthropic leadership and funders' abilities to support organizations working to improve communities through better development decisions and growth policies. It brings together foundations, nonprofit organizations and other partners to address the range of environmental, social, and economic problems caused by development strategies that fail to consider the big picture. For more information, see www.fundersnetwork.org.
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