

# CLIMATE CHANGE BUSINESS JOURNAL®

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October 2008

## Green Building Business Takes Off

*Economic turmoil dents but doesn't derail the movement.*

In just a few years, the green building business has grown from a boutique market to the hottest segment of the building industry. In the United States, green building—also known as sustainable or high performance building—has expanded from the coasts to the heartland, from a specialty practiced by a few to a competency that few designers and other building trades firms can thrive without. From a market made up of mission-driven public agencies and institutions it has grown into one in which corporations and developers are going green to meet the demands of customers, tenants, employees, legislators and shareholders.

“In the old days, getting clients to embrace green building was like pushing a rope uphill,” said Paul Goldsmith, sustainability champion for planning and design firm **Harley Ellis Devereaux** (Detroit). “Now it’s like holding on to a big boulder that’s rolling downhill.”

“Up until about 18 months ago, we were constantly battling against the overwhelming myth that to build green would cost you a pound of flesh that you’d never get back,” said Michelle Moore, senior vice president for policy and public affairs for the **U.S. Green Building Council** (USGBC, Washington, D.C.), keeper of the Leadership in Energy and Environmental Design (LEED) rating systems.

## The Green Building Industry

*The U.S. Green Building Industry represented \$45 billion in value of construction put in place in 2007, up from less than \$5 billion in 2001 as a critical mass of designers, builders and suppliers emerged to meet strong market demand. Economic turmoil and depressed property markets cloud the future, but a strong foundation is in place.*

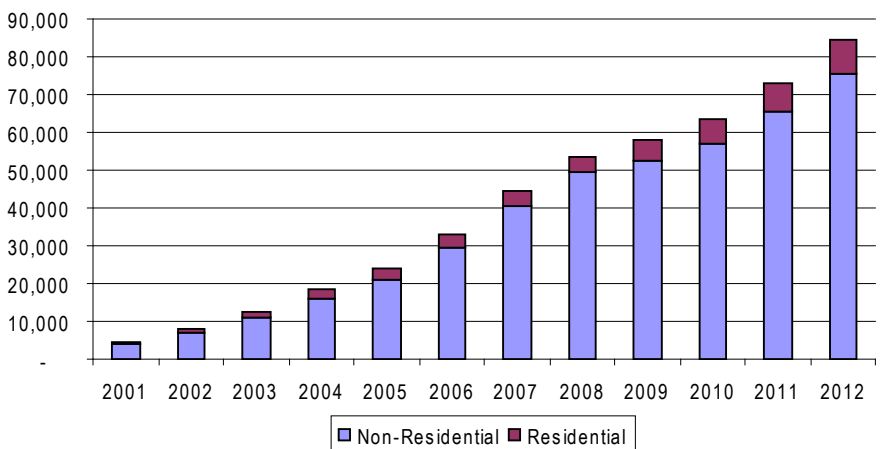
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“But for the past 18 months we’ve seen a widespread acceptance of the business case for green building, an understanding that [LEED certification] will add to the bottom line in [operational] cost savings and higher valuations.”

Virtually all of the more than 120 developers, designers, engineers and consultants interviewed or surveyed by CCBJ for this edition reported surging demand

in the United States for green building design and features—and not just in green hotbeds such as Boston, Seattle and San Francisco. “Green building is huge in Houston,” said Brian Malarkey of architecture firm **Kirksey**. “Of the private-sector projects [in development] that are over 50,000 square feet, about 75% are going for LEED certification.” Malarkey said that among energy companies,

**The U.S. Green Building Industry 2001-2012 (\$mil)**



Source: Climate Change Business Journal, EBI Inc. derived from a variety of sources including USGBC, GBI, government sources and CCBJ and EBJ annual surveys and interviews of consultants, designers, architects, construction firms, non-profits and experts.

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the percentage is above 90%. "Of the 27 projects under construction right now [by energy companies], 25 are seeking LEED certification."

Without a doubt, the turmoil in real estate and credit markets has impacted the green building segment, but most observers believe it will be substantially better off than the development market overall. In single-family homes, the credit crunch and the decline in real estate values has definitely stalled green builders. "We're not building any single-family homes because of the market conditions," said Mark Fischer of **The Grupe Company** (Stockton, Calif.), until recently one of the most active green homebuilders in the United States. At the end of 2007 Grupe stopped work halfway through its planned 144-unit zero-energy community near Sacramento. For reasons discussed below, single-family housing is the least developed segment of green building in the United States. The larger segments such as commercial office, government and institutional may be slightly more buffered from the credit and financial markets.

USGBC reported no decline in the

monthly volume of projects registered through September 2008. The first step in the LEED process, registration occurs well before projects break ground but months after they've reached the design phase. "There could be from three to nine months of development work before the first submittal is made," said Goldsmith. In other words, projects registered in August 2008 had likely been planned as early as the fourth quarter of 2007. Therefore, a decline in the pipeline of proposed green construction projects may not have shown up yet. Additionally, many projects that get to the registration phase may be delayed or canceled as the developers find a lack of financing for new construction.

"Green is sort of an overlay that can put a project in a more competitive position and can be a big advantage in permitting... but it doesn't guarantee that a developer will get funding," said Michael Wagner, editor of *Green Real Estate News*. "There definitely are [green] projects that are getting funded. It's just much harder [than before]. Also lender requirements have changed so you typically need more equity to invest in a project and that can have a big effect on your returns."

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## Middle East and Asian Demand Make Up for Slowdown in U.S.

Doug Mass, president of engineering firm **Cosentini Associates** (a Tetra Tech company) that works on high-profile green projects worldwide, reported that his firm is “not doing any less that we would be in a robust market.” But in the United States, he said some green projects have indeed been canceled or postponed. “What happens generally is that there is some seed money [from equity investors] to put a project through the schematic phase. But the banks are not going to give you a loan until they know what the hard costs are based on a design development level document. And right now, banks are saying ‘we don’t have the capital,’ or ‘capital is only available at a much higher rate.’”

Like other design and engineering professionals who are working globally, Mass reported that demand for green buildings overseas has shown little sign of diminishing in the wake of credit problems emanating from the United States. “Overseas is a whole different world. Asia and the Middle East are showing very strong demand for green building,” said Mass.

“So far we’ve seen some slowdown in the United States,” agreed Mary Ann Lazarus, sustainable design director for leading green design firm **HOK** (St. Louis). “A couple of projects seem to have been put on hold.” By contrast, HOK’s international green building business is showing no signs of easing off the accelerator pedal. “We’re doing a lot of work in the Middle East. Asia also has a strong demand for sustainably designed buildings.”

As noted in the October 6 *V-Carbon News* published by **Ecosystem Marketplace**, widespread financial turmoil could negatively impact the entire climate change industry. *V-Carbon* editors pointed out that the “crisis could further delay the passage of a U.S. federal cap and trade

program—or even influence EU optimism for long-term reduction targets. Additionally, long-term difficulties in debt financing and credit availability could affect the supply (and prices) of credits, as companies struggle to fund capital-intensive offset projects in both the regulated and voluntary markets. Without the assurance of legislation-driven demand, the voluntary markets stand to be in a particularly precarious position.... Suppliers have expressed concerns that the demand for ‘luxury’ items such as VERs may decrease as corporate buyers pull fiscal resources into their core business practices.”

## Key Trends and Market Drivers

Presuming that troubled financial institutions can be shored up and business credit becomes available again, CCBJ expects the U.S. green building segment to continue its growth, although at reduced rates. CCBJ estimates the U.S. green building industry at \$45 billion in 2007 in terms of value of green buildings put in place during the calendar year. Annual growth has been 30-40% from 2004-2007, after 50-60% growth in 2001-2003 when EBI Inc. started estimating the value of green buildings based on certification data, total construction data, interviews and surveys of practitioners and experts. Annual growth is expected to be in the 8-20% range in 2008-2012, with 2009 at the low-end. Overall U.S. construction data released by **FMI** indicates that after double-digit growth years in 2004 and 2005 and 4% growth in 2006 to top \$1 trillion in value put in place, construction markets declined 5% in 2007 with FMI’s current forecast at -9% for 2008 and -6% for 2009 with recovery starting in 2010.

Executives across the spectrum of the green building industry said that in spite of the current conditions, green building market drivers are robust and will remain so for the long term. Combining CCBJ survey and interview research with analyses by other industry observers, CCBJ ranks these six issues as the top market

## Top 10 Green Design Firms

HOK (St. Louis, Mo.)
URS Corp. (San Francisco, Calif.)
Gensler (San Francisco, Calif.)
HKS Inc. (Dallas, Texas)
Fluor Corp. (Irving, Texas)
Kimley-Horn and Associates (Raleigh, N.C.)
AECOM Technology Corp. (Los Angeles)
Perkins+Will (Chicago, Ill.)
Tetra Tech Inc. (Pasadena, Calif.)
Perkins Eastman (New York, N.Y.)

Source: *Engineering News Record, ENR.com*

drivers for green building in the United States.

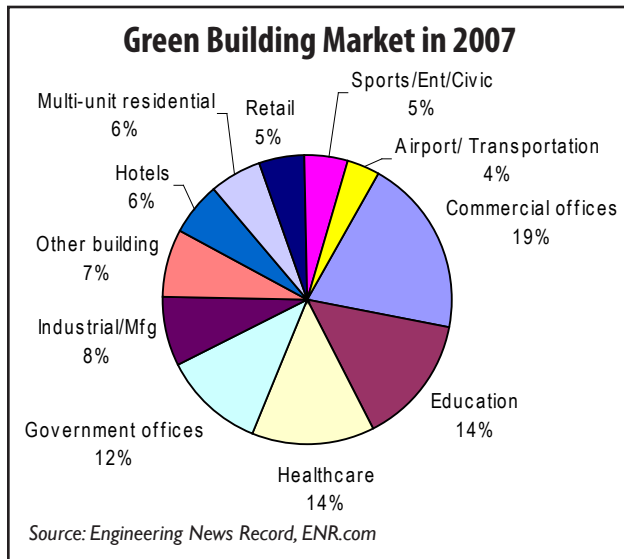
1. **Rising energy costs**, for natural gas and electricity in particular, appear to be the most significant drivers for green and energy-efficient design and features in new construction and retrofits. CCBJ survey respondents ranked energy costs as the top market driver, with 60% choosing it the “most important” factor and 36% ranking it as “very important.” Reflecting the economic imperative to cut energy costs and related concerns about climate change, USGBC in its 2009 version of LEED will give significantly more weight to energy usage by increasing the rating points for Energy and Atmosphere. Water Efficiency is also getting more prominence, with the logic that climate change is impacting water resources, and that water delivery consumes a lot of energy. For institutions such as K-12 schools, energy costs are draining budgets and creating urgency for school authorities to invest in green building retrofits, particularly in more efficient lighting and HVAC systems and improved daylighting.

## Footprint of Buildings

In the USA, buildings account for:

- 65% of electricity consumption,
- 36% of energy use,
- 30% of greenhouse gas emissions,
- 30% of raw materials use,
- 30% of waste output, and
- 12% of potable water consumption.

Source: *US Green Building Council*



According to Brian Domke, senior project manager for **Tetra Tech Architects & Engineers**, “It’s not uncommon to achieve anywhere from 20% to 40% decrease in annual energy costs.”

2. **Government incentives** that reduce the initial costs of investing in energy-efficiency and green building measures, both for new buildings and renovations, are having a major impact in many markets. New Yorkers raved to CCBJ about rebates and incentives from the New York State Energy Research and Development Authority (NYSERDA) for commercial buildings, multi-family and single-family housing. “Developers, whether they’re remodeling or building a new building, are being given substantial incentives to make buildings green and energy efficient,” said green building consultant Steven Winter, president of **Steven Winter Associates**.

Nationwide, local governments and investor-owned utilities are in the lead with incentives. Cash payments are the most common form of incentive, according to a November 2007 report by **Yudelson Associates** for the **National Assn. of Industrial and Office Properties Research Foundation**. Additionally, many cities are offering developers expedited permit processing for green projects—a key advantage given developers’ financing costs. And some cities are giving what are known as density bonuses—permission to build

more densely than zoning ordinances allow—for green and energy efficient projects. In many cases, density is also a key factor in so-called Smart Growth planning strategies that aim to concentrate people, jobs and services within existing urban and suburban areas. “If you can allow a developer to get more condos, apartments or offices in less square footage of dirt, he makes more money and you get a more sustainable city,” said Alan Whitson, president of the **Corporate Realty Design and Management Institute** (Portland, Ore.).

3. **Demand from tenants, customers, shareholders and employees** is increasingly a factor in developers’ and corporations’ decisions to adopt green building strategies. “It may be the most important driver of all,” said Wagner of *Green Real Estate News*. “Companies are getting pressure from their shareholders and customers who are asking what they’re doing for sustainability.” Renting space in a green building helps provide at least a partial answer. Helen Kessler of Chicago-based **HJKessler Associates**, a green building consultancy, noted that “when a tenant says to a developer, I’d love to have my 80,000 square feet in your building, under one condition—you get LEED Gold certification—that’s definitely a driver.”

Wagner believes that in many U.S. cities where there are no LEED office buildings, “There are huge opportunities to be the first in the market.” Ditto for owners of existing buildings who are looking at LEED for Existing Buildings. “There’s mounting evidence that tenant retention is higher and turnover rate is much lower [in green buildings],” he said.

Demand for green buildings is also coming from employees and prospective employees. According to Malarkey of

Kirksey, a key motivator for Houston-based energy companies to build green—aside from the public relations value—is staff recruitment. “It turns out that a lot of kids out of college are asking to work in LEED buildings, and the energy industry has to compete hard for new hires because there’s a shortage of talent out there and not a lot of people want to get into the oil & gas business,” he said.

But in spite of impressive growth, the green office building segment is still constrained by corporations’ and developers’ aversion to extra upfront costs and the fact that builders of speculative office developments for prospective tenants—as opposed to projects “built-to-suit” for owners—do not reap the operational savings from investments in energy and water efficiency because they generally sell their buildings within a few years. Additionally, common lease structures create a disincentive for these developers because savings accrue to tenants.

4. **Policies and regulations** are emerging that require projects above a certain size threshold to achieve LEED equivalence (actual certification is generally not required). “Los Angeles, San Francisco and Dallas over the past six months have all passed green building ordinances,” that require projects above 50,000 square feet to achieve ratings similar to LEED Certified, the minimal LEED rating, said Wagner. Nellie Reid, director of sustainable design for **Gensler** (San Francisco), an architecture and design firm, noted that the District of Columbia recently adopted energy performance labeling requirements for buildings similar to those in place in the United Kingdom. “You’re going to start seeing the Energy Star ratings posted on all buildings in Washington, D.C.,” she said.

In jurisdictions without such ordinances, designers and developers foresee them coming “down the track like a freight train,” said Winter. “First cities and jurisdictions are hoping and wishing

that green practices will be pursued, so they provide incentives. The next thing they provide is regulation. I see green as becoming a de facto requirement.”

**5. Sustainable materials, green building design features and equipment** are improving in terms of performance, cost and availability. “There’s no question that availability of more good sustainable design materials has made it possible for creative designers to do good work and also do environmentally sensitive design,” said Bradford Perkins, president of **Perkins Eastman**, a New York design firm. “If you’d have asked me 10 years ago to specify a green roof on top of a sensitive area of a hospital, I would have said you were nuts. The technology just wasn’t there. Today building a green roof that actually performs is fairly routine.”

The reduction in cost premiums for green materials and features is as significant as the improvements in performance. Cost is the largest disincentive to green and energy efficient buildings, but premiums may not be as high as many expected. Median responses from CCBJ survey respondents indicated that cost premiums for LEED buildings were: 2.5% for Certified; 3% for Silver; 6% for Gold and 10% for a the highest or Platinum rating. Yudelson’s report on incentives also surveyed developers, 41% of whom ranked cost as the top barrier to more green building. Many CCBJ sources say that the cost premiums are trending downward because of the volume of demand for once-obscure materials like low-VOC paints. “Because there has been so much uptake among market leaders, including governments building green, the price premiums for materials have really come down,” said Moore of USGBC.

**6. Reducing water consumption**, especially in regions like the Southwest. Water concerns are rising with climate change, so even water-rich areas like the northeast are installing more high-efficiency fixtures and water re-use systems

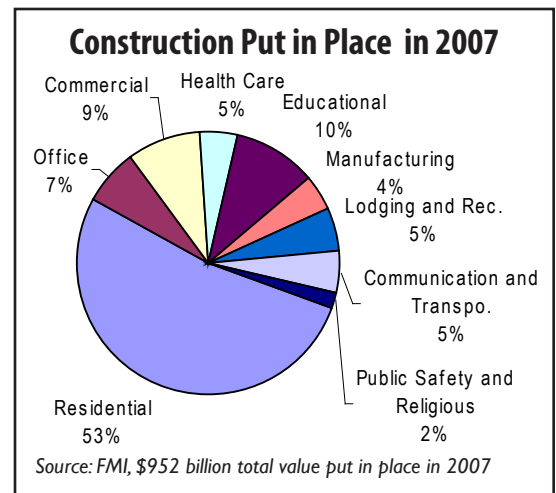
both for conservation and cost savings. “In New York City over the last three years, water and sewer rates have gone up 36%, and a 15% increase is projected for 2009,” said Les Bluestone of green multifamily developer **Blue Sea Development**. (New York, N.Y.). “If you have a building that’s saving thousands of gallons of water through the use of efficient showerheads, that’s real money in your pocket.” Fifty-one percent of CCBJ survey respondents ranked reducing water consumption as “very important” and 28% ranked it as “important.”

### ‘First Cost’ Still A Hurdle

Despite these robust market drivers, a larger issue constrains the growth of the green building industry—an issue that may well become much more significant in the economically difficult months or years ahead: Developers as well as corporate real estate and building managers find it problematic to increase the initial costs of a project for the promise of lower operating costs over a long term, especially when those first costs are financed with debt.

“Many of our clients are looking to get buildings that would qualify as LEED certified. They want the aspects of sustainable design and green building that can deliver environmental and economic benefits over the long term, but they’re not necessarily prepared for the additional costs,” said Perkins. “They are so driven by first costs that they can’t make some decisions based on long-term thinking.”

Whitson of the Corporate Realty Design and Management Institute described an exercise that he and his colleague lead in energy-efficiency seminars for corporate real estate managers. “We ask people ‘How many of you would take a project to management that had a payback period of 13 years?’ Nobody raises their hand.” The presenters ask the question for a 12-year



payback period, then 11 years, 10 years and so on. “When we get to five years, one or two people raise their hands. But most don’t raise their hands until we get to three years or even two years.”

Whitson said such thinking ignores the value of a secure, long-term return on investment. “If you look at the number from a return on investment perspective, a 13-year payback is a 7.7% return,” he said. “A 10-year payback is a 10% ROI.... Where can you invest your money and get 8-10% on it right now with virtually zero risk?” He cited a Department of Energy study which showed that corporate energy-efficiency projects have a lower beta—a measure of risk—than U.S. Treasury Bonds. But the culture of corporate management and the expectations of CEOs and investors make it difficult to justify major investments in energy-efficiency upgrades even when they promise secure, long-term cost savings.

“The problems in actually achieving and recognizing these savings can be subtle or mundane,” said Daniel Kammen of the **University of California Berkeley Energy & Resources Group**. Kammen noted that in many cases the difficulty stems from the fact that one unit of a company must make the additional investments, while another unit will be credited for the savings. “If a company invests an extra 5% in an energy-efficiency feature that will save a lot of money over the life of a building, the company divi-

sion that pays the upfront cost is not the division that operates the building and therefore registers the savings. The company is paying out in apples and getting back in oranges.”

Kammen said the bifurcation in costs and benefits also occurs when investments in improved lighting and insulation improve workers’ health and productivity and reduce the incidence of sick days—an outcome verified by studies, according to Kammen. “If one unit with a company makes the expenditures, e.g., capital projects, and the returns come to another through reduced company healthcare costs, this may never be recognized as savings and hence never show up as a cost advantage of the project.”

Kammen pointed out that regulations imposing a cost on greenhouse gas emissions would help change corporate thinking, as would ways to integrate upfront capital costs with the operation and maintenance costs: “One way that is typically done is through a performance contract. A company that installs your new heating systems gets a certain level of payment for installation and the balance over time. If their system meets expectations, they get the rest of the money plus interest. If the product performs better, they get more. If it performs worse, they get less.... There are not that many performance contracts like that out there yet because companies aren’t being pressured to cut their emissions,” said Kammen. “A carbon price would make such an approach much more viable.”

### **Certification Evolves; Certifiers Emerge in Home Market**

While people throughout the green building industry credit the USGBC for building up the industry with education and enforcing consistent standards with LEED, the group and its rating system are not without critics. Perhaps the most common criticism is that LEED ratings don’t give enough weight to the cost

differentials for various green features and upgrades. “Not all the points in the LEED certification process make sense to builders and developers,” said Steven Winter, a former USGBC board chairman. He cited an oft-heard critique—that both a bicycle rack and an expensive piece of equipment like a high-efficiency HVAC unit both get a builder one point. “In the larger view that is a sensible approach.... But that kind of comparison among points makes no sense to some builders.”

Winter and others also pointed out that LEED certification itself is not cheap and that while USGBC is a non-profit, it raises substantial revenues from certification fees. “There’s a business opportunity [for competing certifiers], and there is already some competition in the market,” said Winter, referring to the **Green Building Initiative (GBI)** and its Green Globes rating system.

Originally founded with the National Assn. of Homebuilders to educate residential builders, GBI has since evolved to handle commercial projects as well. Mark Rossolo, director of state and local outreach, told CCBJ: “We don’t feel we’re directly competing with LEED and the USGBC. For one thing, we’ve got a really big problem in the United States in that 40% of our energy consumption can be attributed to buildings. We’ve got 80 million buildings in operation now.... The American Institute of Architects estimates that by 2025, about 75% of the nation’s building stock will either be new or heavily remodeled. Now is our window to get in there and make sure we’re building in as environmentally friendly a manner as possible, and to accomplish that we need as many hands on deck as we can get.”

Rossolo claimed that Green Globes gives greater weight to energy efficiency, while LEED offers more points for materials and resources. But he said that other than those differences, the systems

are roughly equivalent. Like LEED, Green Globes has four rating levels. Eight U.S. buildings have been dually certified LEED and Green Globes, and for each building the rating matched. “Where you fall within Green Globes is where you fall within LEED,” he said.

Rossolo also stated that GBI is targeting a different demographic than USGBC. “USGBC has stated publicly that they’re going after the top 10-15% of buildings.... We’re targeting the other 85%,” said Rossolo. “We want everybody in the middle to be building green, including the corner gas station.” GBI’s rating system is entirely online and set up to offer recommendations as builders enter their project data. “We’re targeting builders, architects and other folks who don’t have the extra budget to go hire a green consultant or perhaps are new to green building,” he said. “Our process cuts down on a lot of the soft costs such as green consultants and excess staff time.”

Moore of the USGBC averred that the organization’s focus is the “top 25% of projects as measures in building practice and leadership in the industry, whether that’s a class A office building in Manhattan or an affordable housing development in Seattle.”

Critiques of LEED also come from those advocating for more stringent criteria. “Critics of LEED—many of them architects who were green before green was cool—see a system that’s easy to game and has more to do with generating good PR than saving the planet,” wrote author Daniel Brook on *Slate.com* in December 2007. A recent analysis of the costs of LEED certification by the University of San Diego’s **Burnham-Moores Center for Real Estate** found that “only minor efforts” are needed to obtain a LEED-Certified rating. “Talk to several developers successful at securing LEED certification and they will tell you that with a little planning it is neither that hard nor costly to hit the minimum point

total for certification, which is 26 out of 69 possible points. Many points are easy, such as designating minimal parking for low emission vehicles and facilitating bike racks. Others, such as teaching construction workers to toss waste into three different bins, are harder but feasible.”

The current effort to create a new version of LEED in 2009 has received more than 5,000 public comments, according to Moore. Its final version will likely yield a major change in point weightings, with energy and atmosphere rising from 17 out of 69 points to 35 out of 100, but that remains to be decided. “The last step in the consensus process will be the full USGBC membership voting on the rating system,” said Moore.

In terms of acceptance in the marketplace, LEED is still dominant, with the possible exception of regional green home rating systems. None of the industry participants interviewed by CCBJ—and very few respondents to our Green Building Survey—indicated that GBI and Green Globes had equivalent status. “We haven’t done a Green Globes project, and the only familiarity I have with it is an article someone wrote for the *AIA* magazine,” said Carolyn Forsyth, sustainable design advocate for Seattle- and Portland-based design firm **Ankrom Moisan Associated Architects**. “In the markets we’re in, everybody knows LEED, they’re familiar with it and have a lot of confidence in the rating system.”

“LEED has been more widely accepted in the marketplace,” said Renee Loveland, director of sustainable design for green developer **Gerding Elden**. “It’s the standard that jurisdictions such as the City of Los Angeles are using [in green building ordinances]. We find that the rigor of LEED holds us accountable. It’s not enough just to say we have an eco-roof. The point is that we have an ecoroof that will reduce stormwater runoff by a certain quantity. We can answer the questions how deep is our soil? What is our

planting like? How much of the roof is an eco-roof?”

In fairness to GBI, its lack of status among experienced green builders and architects may be partly because it has geared its services toward builders and designers with less experience in green building. “From architecture to the building trades, if you’re not versed in green building practices, you’re going to be at a great disadvantage,” said Rossolo. “We offer these firms an opportunity to learn and get on top of this trend.”

Another twist in the green building rating and certification area is the emergence of regional green building certification outfits. Most are focused on housing and many are associated with local governments and builders associations. San Antonio builder Kyle Lindsey, for example, follows criteria established by Build San Antonio Green, a program of public-private consortium **Metropolitan Partnership for Energy**. “It’s starting to become really popular in the San Antonio marketplace,” said Lindsey, noting that Build San Antonio Green sponsored a Parade of Homes this year with the Greater San Antonio Builders Assn. Like LEED and Green Globes, Build San Antonio Green has four rating levels. Lindsey said that he and other builders believe the local certification program is more tailored to the South Texas climate. “Both LEED and the NAHB [Green Globes] don’t take into account the climate conditions for the area you’re in.”

In the San Francisco Bay Area, green certification systems appear to be vying for brand recognition in real estate marketing. The New Homes section of the Oct. 4, 2008 *San Francisco Chronicle* featured single- and multi-family projects that are touted as “GreenPoint Rated” (through Berkeley-based nonprofit Build It Green), “ComfortWise Green” (through a program run by Stockton-based ConSol, an energy consulting firm) and “California Green Builder Certified” (by the Cali-

fornia Building Industry Assn.). Another ad touts “eco-friendly” homes ready for occupancy and mentions LEED; but the builder’s website said only that certification is “a goal [it] will work to attain.”

According to Moore, such confusion in the green home certification area is a result of the fragmented nature of the homebuilding industry and the fact that LEED for Homes was only released last year. “LEED for Homes is new, and what has been out there for a longer time are some really effective local and regional programs that grew up from the grassroots, such as Austin Energy in Texas, Earthcraft in the Southeast and Build-ItGreen in California,” she said. “This is also reflective of the homebuilding market in general where the typical 80/20 rule, which says that 80% of companies in an industry do 20% of the business, doesn’t apply. Most homebuilding is done by smaller businesses, while the large production homebuilders don’t do as large a proportion.”

With LEED for Homes becoming established, Moore said USGBC hopes for wider adoption. “Having a uniform benchmark for assessing leadership in green home building will help the market to build capacity and advance more rapidly than 80 or 100 local and regional programs.” She also said that USGBC has greater ability to maintain and update a green home standard. “The R&D effort behind maintaining a rating system at the leading edge of practice is not trivial,” said Moore. “USGBC has almost 200 staff, including many PhD consultants who focus on supporting our technical committees.”

Some in green building have also questioned whether local and regional building certification programs have adequate rigor, especially when local homebuilder groups are backing the program. “We’ve had great sustainable design before we had LEED, but with LEED the [ratings and certification] are a lot more rigorous,” said Reid of Gensler.

## Breaking The Glass Addiction

Another back-burner issue relative to LEED-rated buildings that may be gathering steam is the abundant use of glass exteriors in office buildings. Even the most highly efficient window glass has a much lower R value than insulated walls. "We've got some buildings here in Manhattan where it's not just floor to ceiling glass, it's floor to floor, so the room joists have a nice view of Manhattan," said Craig Kneeland, senior project manager, energy efficiency services, for NYSERDA.

But when Kneeland mentions this to green architects and developers, he said their response is that they work for clients, not the state and their clients and their clients' tenants want lots of glass. "Everybody wants more and more glass for better views and to make their buildings more marketable," affirmed Doug Mass of New York-based green engineering firm Cosentini. "I don't care what kind of glass you use, even the new low-E glass or triple-pane systems, nothing matches the energy efficiency of an insulated wall." As a state agency, NYSERDA can't tell private-sector developers and builders how to run their business, but Kneeland said many in the green building community know that "glass boxes are not appropriate" and the topic is being more widely discussed. Indeed, it is slated for a panel at an upcoming conference of the New York Green Building Council.

Mass described an education process that his firm tries to go through with clients who want glass buildings. "They say 'we're selling views,' to which we say, 'Your tenants or employees don't look up or down at their ankles, they look out.' So a 6 or 7 foot band [of glass] is maybe all they need, but they want 10. So we negotiate with them," said Mass.

## EBOM: Opening Niches in Retrofit and Performance Monitoring

A certification issue already being widely discussed in green building circles

### Growth of Green Office Space

LEED – New Construction	2004	2005	2006	2007
LEED New Construction Registrations	1,792	2,758	3,895	5,423
LEED New Construction Certifications	167	330	513	820
LEED – Existing Buildings and Commercial Interiors				
Commercial Interior Registrations	106	233	462	740
Existing Building Registrations	88	151	244	535

Source: State of Green Business 2008, adapted from U.S. Green Building Council data

is that once a building receives its LEED rating (or its Green Globes), no follow-up is required to ensure the building performs as rated. "A building is awarded certification based on predicted performance from plans, calculations, modeling and so on," said Winter. "There is no testing or verification required after the building is actually in operation. I think that's going to be a big thing in the future, making sure that buildings are in fact performing as anticipated."

Whitson said that in the crucial area of energy efficiency ratings, some studies have shown that "some of our older buildings are performing better [on energy efficiency] than some new LEED buildings. The LEED program is about process not about execution," said Whitson, adding that USGBC has acknowledged this and is trying to address the topic. Moore from USGBC said the organization's focus is on getting the owners of LEED-rated buildings to apply for the newly upgraded LEED for Existing Buildings: Operations & Maintenance (EBOM) certification.

EBOM is the newest innovation in LEED for Existing Buildings, and judging from initial response to its July 1, 2008 release, it will have a significant impact. According to a story by Vanessa Wong on *GreenBuildings.com*, only 85 projects had been certified under LEED for Existing Buildings since 2004 when the first version of LEED-EB was released (by contrast, more than 1,700 new buildings had been certified as of October 2008, according to USGBC). But in the first four months of LEED-EBOM's activation, more than 375 projects have

registered. As of early October, the first and only certified project was the Colorado State Capitol.

EBOM shifts the emphasis toward facilities and maintenance, adding new credit options for energy and water. "EBOM raises the minimum Energy Star rating from 67 to 69 and the number of possible energy points from 10 to 15 [and] the number of points for water... from 5 to 10," wrote Wong. "As the focus on energy and water efficiency is strengthened, facilities managers may need to invest in efficient plumbing and lighting systems to achieve credits."

"EBOM is expected to be particularly successful in urban areas, which have a dense concentration of existing buildings and limited space for new constructions," wrote Wong. "The implications are significant: If successful, EBOM will give green building the muscle to transform an enormous section of the industry... Opitz said the existing buildings market is much larger than that for new construction with about 5 million [existing] commercial buildings.

Energy consulting firm **The Cadmus Group** (Boston) sees "great opportunity" in the existing building market, according to Vice President Ed Miller. As discussed throughout CCBJ's review, design and engineering firms with green building expertise are seeing substantial demand for their services, and Miller described the new-build market as "either mainstream today or very near to it."

By comparison, retrofitting existing buildings is still a niche, according to



Miller, but “big firms are paying attention and positioning themselves.” How difficult is selling the concept of green building for existing stock? “We tend not to encounter too much skepticism regarding the concept, particularly at the facility manager level,” Miller reported. At the CEO or COO level, the issue is not so much one of skepticism, but rather issues such as whether green building should be an organizational priority, whether the firm has the necessary organizational capacity to pursue a green-building strategy, and whether financing is available.”

When tracking the cost profile for green design, retrofits must be distinguished from new construction, but in general, “there is a growing body of evidence that the life cycle costs of operating a building show that green building features are very cost effective,” said Cadmus Principal Julio Rovi. “There is also an important evolutionary step taking place in the market. Cities with experienced designers and engineers can design green and operate green buildings at no noticeable incremental cost [over] conventional construction.... LEED Gold and Platinum buildings may cost more, but also offer significant advantages in reduced operations and maintenance costs.

“This empirical data has to pass more rigorous evaluation tests over next few years,” Rovi continued. “Perhaps the biggest challenge for designers and consultants has to do with calculating and guaranteeing the savings on the unproven new technologies and technical approaches. Only visionary clients welcome this new type of risk, and typically they reap the rewards in terms of economic savings and pollution prevention.”

New tools for measuring and verifying the savings afforded by green design are continuously emerging, Rovi added. The Portfolio Manager, available on line for free through EPA's Energy Star program, is the most widely recognized tool for this purpose, “but it is not yet used

universally, because it does not track all green building characteristics.” A growing supply of software tools provides a range of functionality, from full carbon footprint evaluation to the measurement of specific suites of green building attributes, according to Rovi.

### **K-12 Depends On Local Funds**

USGBC has hired Cadmus to undertake a pilot study of LEED EBOM for K-12 schools. Cadmus staff are working with 10 public school districts to evaluate the energy efficiency needs in school buildings and explore other opportunities for improving the sustainability of the buildings' operations. The first phase of that project will be complete by the end of this year, and a second phase will begin in early 2009, according to Rovi. Cadmus is also under contract to the Broward County Public School District in Florida to evaluate energy performance improvements in 252 schools and verify the data generated under the district's existing performance contracts.

Tetra Tech Architects & Engineers is active in the K-12 market in the U.S. Northeast. According to Brian Domke, senior project manager, “the primary market driver at the moment is economics. Increasing energy costs quickly begin to cut into the academic budget, even threatening the ability of some districts to maintain their teaching staff.”

Domke said three of the most common and effective systems to upgrade in schools are windows (for R-value and better daylighting), energy-efficient lighting and HVAC systems. “That's the fundamental trio of integrated systems where the greatest efficiencies can be gained if it's done well.... Having an integrated control system that both monitors and allows for adjustments is important to doing it well.” The newer controls systems have what Domke described as “the ability to learn.” Based on usage patterns, these systems control temperature and light-

ing for optimum efficiency, for example, bringing room temperatures up just before staff and students arrive in the morning.

Another effective technology for schools in the Northeast is geothermal heating and cooling. “These systems use the relatively constant temperature of the earth to heat and cool buildings with 40-70% less energy than conventional systems,” said Domke. “While conventional furnaces and boilers burn a fuel to generate heat, geothermal heat pumps use relatively small amounts of electricity to simply move heat between the earth and buildings, allowing much higher efficiencies.” Geothermal heat exchange systems offer the best return on investment when they're used for both heating and cooling, said Domke.

In terms of rating systems, both USGBC's LEED and the Collaborative for High Performance Schools Criteria (CHPS) are competing for the loyalty of school districts. The major difference from Domke's perspective is that “CHPS does have an operations and maintenance component to it that LEED does not require for new construction [although USGBC] offers a separate rating system for existing buildings.” Adding complexity to the rating game, New York state recently adopted its own version of CHPS, according to Domke.

Despite all the ripe opportunities for operational cost savings, Domke said the K-12 market is not consistently strong from the vendor's perspective. “The education market is hard to project due to the fact that a lot it is driven by legislation, annual state budgets that are not always passed in a timely manner, and community referendums,” said Domke. “There are consistently capital improvements in the school markets, but it's a question of at what level.” But while the project pipeline may be inconsistent, there's nothing vague about where the priorities of school districts in the Northeast are headed: “The RFPs we've seen coming in over the last

year for the first time are almost exclusively focused on green and sustainable measures.”

## Home Market Still Emerging

Of all the segments of green building, single-family homes is by far the smallest. As of September 2008, USGBC had certified less than 90 single-family homes nationwide. “My sense is that the demand isn’t there yet,” said Wagner of *Green Real Estate News*. “If you look at the percentage of utility costs versus household income, [savings from water and energy efficiency] are still too small and the payback period is too long. Most homebuyers would rather put in a marble kitchen.”

In San Antonio, Texas, custom homebuilder has often received that kind of reaction when he recommends green building features like spray foam insulation—a \$10,000 upgrade that can reduce air conditioning load by 45% in the South Texas climate—to his clients. “Green has to compete with the eye candy, the granite countertops, it really does,” said Lindsey. “Even with the current energy situation, there clearly has to be an education process about green building, at least here in Texas. A lot of people just don’t know about it or they think it means I’m a tree-hugging liberal.”

Even in the tree-hugging Pacific Northwest, green single-family homes are uncommon; about 150 had been LEED certified as of the end of September 2008, according to USGBC data. “I think it’s partly just from habit,” said Carolyn Forsyth, a senior associate with the design firm **Ankrom Moisan Associated Architects** (Portland, Ore.). “Homebuilders just do what they’re used to doing, and the faster they can do it the better.” Forsyth noted that LEED for Homes was only introduced last year, and before that “the single family home industry hadn’t had that kind of standard to work from.”

Sue Loomans, interim executive director of the **Wisconsin Green Building Al-**

**liance** told CCBJ that Wisconsin builders are having a difficult time convincing homeowners to make the investment [in green upgrades]. “Home owning is a more temporary thing these days, with people not staying in their homes as long as they used to, and that gets in the way of making the case.”

But interest is definitely growing according to a number of sources, even in Texas. Brian Malarkey of Kirksey reported that 10,000 people attended the Houston USGBC chapter’s first Gulf Coast Green expo for homeowners last spring. “It was a very engaged and diverse crowd of the general public, not practitioners,” he said. “It really shows the interest building from the residential side.”

For The Grupe Company, building green on its Carstens Crossing project near Sacramento proved to be a good marketing move—that is before the project was halted with the real estate market downturn. Senior Vice President of Construction Mark Fischer told CCBJ that it was difficult to determine whether the green homes—for which features like PV panels, upgraded insulation, tankless water heaters and high-efficiency HVAC systems cost the builder an extra \$18,000 per house—fetched a significant premium. But there was no question that LEED certification helped Grupe sell the homes faster than similar homes in the same market, especially when Grupe could advertise projected savings of \$1,500 annually on energy. “The absorption rate exceeded the market by two to one,” said Fischer.

With the real estate downturn well underway in 2007, Fischer said the three- and four-bedroom homes of between 2,100 and 2,700 square feet sold for as much as 20% less than the asking prices of \$450,000 to \$550,000. But the faster pace of sales still gave the company an economic edge. “Let’s assume that I got same price [for a comparable home] that every other builder did... but mine cost \$18,000

more. Because I sold mine so much faster, my holding costs were much less. I think we at least broke even.”

Now Grupe is looking for project opportunities in the more affluent Coastal areas of California such as Santa Cruz. “The more sophisticated and more affluent buyers seem to be looking for green homes more than the guy who is just struggling to get into a home,” said Fischer.

“Not that he doesn’t care, but as Maslow’s hierarchy of needs tells us, first you want basic shelter then you can talk about [optional features like] going green.... We’re looking to do small three- to eight-unit communities that will be very green,” he said. The homes will likely be smaller than 2,000 square feet, possibly attached units. “It’s just a matter of finding them. We had one on the line getting ready to go hard on, but the number was a little too high.”

Fischer figures the reason that few homebuilders have embraced green homes is the extra cost. But that thinking is quickly changing, and when the California housing market recovers, Fischer believes his firm will have a lot more competition. Some of the big public [homebuilding] companies are getting on board. Lennar is starting to do solar in a lot of their communities. In some communities they’re marrying it with energy-efficiency, and in others they’re not. Centex Homes is getting into it as well.”

According to **Centex Homes’** website, the firm is making a branded Centex Energy Advantage package standard in new homes beginning in January 2009. In addition to Energy Star appliances, R38 to R60 insulation and radiant barrier roof decking, the homes will have an energy monitor to let homeowners measure and control energy consumption, a capability that the National Assn. of Homebuilders says can empower homeowners to reduce their energy use by up to 15%.

For some green building designers, senior housing projects are becoming a major source of business. Ankrom Moisan's Forsyth said the firm's green portfolio has gotten a "turbo-boost" from client Pacific Retirement Services. "Ten years ago, you couldn't say the term green building to them... Now they're so into the concept of green building and sustainability that they're saying, 'Don't hold us to LEED, we want to go beyond.'" A PRS project in Portland, Ore.'s, South Waterfront "is going to be an easy Platinum," said Forsyth.

### Healthcare Sector Lags

While healthcare facilities represented more than 13% of ENR's U.S. green building market in 2007, many green building specialists told CCBJ that hospitals are still somewhat resistant to green materials and methods. "The healthcare industry is still lagging," said Malarkey. "They have just not embraced green building as rapidly as the commercial market has. On the surface it has to do with materials and a perception that some of the products such as low-VOC paints aren't as good a quality."

"For hospitals there's definitely an additional regulatory layer that is not insignificant," added Forsyth. "There are a lot of eyes on hospitals, as there should be, questions about the cleanability and static generation for flooring and vector control for your air handling system." These requirements make it more difficult for hospitals to concentrate on green building and energy efficiency upgrades in their capital planning.

But with increasing energy costs, their incentive is growing. Forsyth and others see this as inevitably moving hospitals toward green. "We definitely see the healthcare market going green—sometimes through LEED, but there also is the Green Guide to Health Care certification that some clients opt for," said Myrrh Caplan, Skanska USA Building's national program manager for green construction.

Last year, USGBC and the Green Guide to Healthcare agreed to merge their efforts into LEED for Healthcare. The USGBC news release on the joint venture pointed out that "studies have shown dramatic increases in the health, happiness, and productivity of people who live and work in green buildings, and hospitals are no exception."

### Energy Analysts Needed

Several CCBJ sources reported that of all the trades and specialties in the green building value chain, energy analysts and energy modelers are in shortest supply. "We need energy analysts," said Loveland of Gerdin Edlen. "There are a lot of great engineers, but it's not easy to find ones who focus on energy optimization and energy strategies, taking a holistic view that involves technical competencies."

Paul Goldsmith of Harley Ellis Devereaux agreed with Loveland, saying that energy analysis is the professional discipline most in demand in the green building supply chain. "It's a skill level that engineers didn't have to do in the past," said Goldsmith. "But that's changing. Sustainability is being taught in engineering school, including at Lawrence Institute of Technology where I teach."

Like other veteran green builders, Goldsmith revels in the dramatic increase in market acceptance and professional competence that marks today's U.S. green building industry. "LEED workshops are routinely filled up or sold out in advance," he said. "These days if you're an architect and you're not green, you're out of it," echoed Steven Winter, a former USGBC chairman. "Architects need to highlight their green credentials in order to be selected for many jobs."

Indeed, Goldsmith, Winter and other green building veterans foresee a day when LEED will become irrelevant. While CCBJ survey respondents estimated a median of 30-40% of new construction will be green in 2020, by 2030 the

median response was 60-70%, with 44% of respondents saying they believe more than 75% of new construction will be green, almost effectively rendering the term obsolete. "I see green as being a de facto requirement," said Winter. "USGBC members have always talked about what happens when our mission has been met and we've converted the world to green," said Winter. "Even when the world is green the USGBC and the green building community can lead the way by recognizing more advanced standards of sustainability."

Of course, Winter will be the first to admit it's way too early to declare victory. "It is still a niche market even though claims are being made for how many millions of square feet are green and so on," he said. "My guess is that fewer than 5% of all U.S. buildings in development or construction are undergoing some sort of LEED certification.... By 2020, I think it will be over 50%. By 2030, it will be mainstream and we won't even know it as green construction. It will just be good construction."

To realize that dream, many conditions must be met. The existing market drivers will have to remain strong. The march of green-building regulations will need to continue. A compliance market for greenhouse gas emissions must be created. Split incentives will have to be rationalized. And the corporate and household aversions to upfront spending for long-term cost savings and productivity gains will have to transcended.

That's a tall order for 20 years, especially in the light of the extraordinary economic crisis that will likely close out the first decade of the new millennium. But since buildings and the devices deployed in them for heating, cooling, cooking and other functions represent about 40% of global greenhouse gas emissions, not meeting the challenge seems almost unthinkable. ⚙️

## Commercial Office Developers Get On Board

*Even speculative office developers are seeing the value of going green.*

Building green has become a key marketing issue for many commercial office developers. Yes, being able to boast of a LEED rating is a more significant advantage in towns and cities with large environmentalist constituencies, but even in such bastions of conservatism as Bakersfield, Calif.—the largest city on the top 10 most conservative list as ranked by the Bay Area Center for Voting Research—green building is catching on. While only one existing building is LEED-rated in the city, the Kern Schools Federal Credit Union Office, as of September six projects had registered for LEED certification, including a mixed-use office/retail development by **Castle & Cooke** (Honolulu).

In the commercial office building segment, build-to-suit developments initially led the way in terms of going green. First public agencies and later corporations contracted with developers to build green office buildings. **Koll Development Co.** (KDC), for example, built its first green project in 1999 for the Kansas City office of the U.S. Environmental Protection Agency. Today, 70% of KDC's build-to-suit projects are LEED certified or pursuing LEED certification, according to the company's website. In June, the developer and its client Chevron Corp. cut the ribbon on Chevron's new LEED gold rated 300,000-square-foot regional office building in Tammany Parish, the first LEED-certified office building in Louisiana, according to a Koll news release.

But in the speculative office development business—in which developers build not for a client to own the property but for lease to prospective tenants—green building has been a tougher pill for developers to swallow. But surging demand from tenants has led speculative develop-

ers to see green features as a tonic for their marketing. "Five years ago if we had a speculative office developer for a client and we started talking to them about green building and going for a LEED rating, they didn't see the market demand.... Now they almost need that LEED rating to be competitive," said Nellie Reid, director of sustainable design for **Gensler**, a leading architecture and design firm. "Let's say they're building a new 300,000-square-foot multi-tenant office building in downtown Los Angeles. Many of their potential tenants have adopted their own corporate sustainability initiatives and they want to lease space in an energy-efficient building," said Reid. "They want to be able to extend their marketing and PR to the building they occupy."

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***"The hurdle for more green buildings is lease structure."***

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But for many developers, going deep with green design on speculative office buildings is still a tough sell. "One of the big problems with speculative office buildings is that often the developer will hold onto the building for only three to five years," said Reid. "As soon as they get the first round of tenants in and signing 10-year leases, they want to turn around and sell the building."

With such a short period of ownership, operational savings from reduced energy and water consumption will accrue not to the developer but the buyer and tenants. "If you're going to recommend they spend a little more money on innovative water and energy systems, you need to show them they're going to get that money back within the time frame that they're still owning the building," said Reid. The best way to do that is to demonstrate that such features increase the value of the building, an argument that is increasingly being borne out in reality, according to Reid and others. "If a building uses 20 percent less energy than a code-compliant building,

that can significantly increase the value [to a potential buyer]."

Recent analysis by the University of San Diego's **Burnham-Moores Center for Real Estate** found strong but not conclusive evidence that LEED ratings translated into higher values. "We confirm that those buildings that do not reflect more efficient operating abilities as required by green buildings will become obsolete much faster," stated the study authors.

### **Koll Builds Intellicenters**

KDC is taking a unique approach to green speculative development by building a series of Intellicenters around the United States and offering green features "typically only available with build-to-suit projects," including raised access flooring, under-floor air distribution and large efficient floor plates, according to KDC's website. "The Intellicenter concept is basically a roll-out of several buildings based on a similar design concept," said Reid, whose firm has worked on KDC's Intellicenters. "They are speculative multi-tenant office buildings that have achieved LEED Core and Shell certification."

According to KDC, the Intellicenter concept emerged from a survey of 50 clients and brokers. "The overwhelming response was a desire for 'green' buildings." KDC partnered with **Prudential Real Estate Services** for a nationwide program expected to cost \$250 million and amount to 2 million square feet. The partnership has so far constructed Intellicenters in Atlanta, Houston and Dallas; has three under development in Riverside, Calif., Tampa, Fla. and Charlotte, N.C. (100% Leased to Freightliner); and has 14 additional locations on tap.

### **Gerding Edlen Shaves LEED Premiums to a Minimum**

While developers like KDC and Castle & Cooke have been drawn to green building recently by market demand, other developers began focusing on green build-

ing earlier and have achieved elite status as experts. Portland, Ore.-based **Gerding Edlen Development**, for example, is building South Park in Downtown Los Angeles with partner Williams, Dame and Atkins Development. The \$320 million, 1.5 million-square-foot residential and commercial development is a landmark project in both its LEED rating and the fact that it is one of the first major residential projects in downtown Los Angeles in about 20 years. Gerding Edlen is also one of two finalists for a green redevelopment of the San Diego City Hall and Civic Center.

Gerding Edlen committed to obtaining LEED ratings on all its owned projects beginning in 2000, “when LEED had just come out the door,” said Renee Loveland, director of sustainable design. The firm’s first major green development was a six-building project in Portland. The \$350-million, mixed use project was completed in 2006, achieving one Platinum rating, four Golds and one Silver. In all, the firm has developed 39 LEED buildings, noted Loveland.

According to Loveland, with the company’s expertise and that of the handful of architects and other contractors it works with, the cost premiums for LEED-rated buildings can be held to a minimum. “We’ve been doing this for a long time and we have some very strong partnerships with architectural firms that know how to pursue an integrated design process to deliver a beautiful green building and contractors who can get us a building on time and on budget,” she said. “LEED Gold is kind of our baseline, and we’re able to make such projects almost cost neutral, with typical premiums of one to two percent, and two to three percent for Platinum.”

Earlier this year, Gerding Edlen formed a consulting unit to “share our knowledge and expertise with other owners and developers,” according to Loveland. “Our role is to bring all the team

members together and help execute a sustainable design agenda over the course of a typical three-year project.”

### **Green Leases Needed To Incentivize Speculative Developers**

According to Alan Whitson of the **Corporate Realty Design and Management Institute**, “The biggest hurdle to getting more green buildings [in the speculative office segment] is lease structure.” After the first energy shocks of the early 1970s, landlords shifted from gross leases that included utilities and other operating costs to triple-net leases that bill tenants for energy, water and other services. Thus, landlords with triple-net leases “can’t get a return on their investments because all the benefits flow to the tenants,” he said.

A “split incentive” is what Craig Kneeland, senior project manager, energy efficiency services, for the **New York State Energy Research and Development Authority**, calls this scenario “The developer spends the money to make the building more efficient and the tenant reaps the benefits. If you could solve that one, you’d go a long way toward alleviating global warming.”

Whitson’s group is working with U.S. Green Building Council (LEED) staff and a committee of landlords, tenants, brokers and lawyers to design a model green lease that will “align [landlord and tenant] goals in a common direction and put the incentives in the right spot,” he said. Essentially, it will be a version of a full-service gross lease that is designed to guarantee reasonable returns for a landlord’s investments in green and energy-efficient upgrades in exchange for performance standards guaranteed to tenants. Kneeland applauds this effort but is concerned that in the current real estate market, developers and landlords will lack the leverage to negotiate leases that shift costs back to tenants. “Now builders and developers aren’t in very good negotiating positions,” he said. ☀

## **Los Angeles County Leads By Regulation**

*City Council votes to green up commercial and residential projects; LEED Certified criteria must be met.*

**I**n the land of palm trees and 12-lane highways, a supercharged green building industry is thriving on robust demand and deep political support. Indeed, while somewhat behind Chicago, which boasts 49 LEED-rated buildings and Seattle with 45, the City of Los Angeles is one of the leading centers of environmentally sustainable building in the United States. As of October 2008, the U.S. Green Building Council (USGBC) had certified 21 completed green buildings within the Los Angeles City limits and at least 31 in other Los Angeles County cities, the largest concentrations being in Santa Monica, Pasadena and the college town of Claremont.

The pipeline of green projects in development in Los Angeles County is enormous: 268 new projects have been registered—the first step in seeking LEED certification—in Los Angeles and other incorporated cities in the county, according data searches on the USGBC website.

The Los Angeles area green building list includes some extraordinary landmark projects. Among the most noteworthy: the LEED Platinum Audubon Center at Debs Park, where structural rebar incorporated melted-down handguns, and carpeting was made from organic Mexican agave plants; the Natural Resources Defense Council’s Platinum-rated Santa Monica office, with clerestories (glass panels that naturally light hallways and offices), a displacement ventilation system and rooftop PV panels; and the Gold-rated Elleven and Luma condo towers, the first major residential construction projects in the downtown area in 20 years, according to a news release from The South Group, a partnership of Gerding

Edlen Development and Williams, Dame and Atkins Development.

Los Angeles-area green builders report that demand for commercial, retail, institutional and residential green projects is intense. "As of September 2008, 58 percent of our new construction projects in Southern California currently in design or construction phases are pursuing a LEED rating," said Nellie Reid, director of sustainable design for **Gensler**, a top green architectural firm. "Just two years ago, that figure was only 20 percent." In addition to market demand, business and political leaders have driven the green building agenda by lobbying to make Los Angeles and other Southern California cities not only green friendly but unfriendly to large developments that don't adopt green and energy-efficient design strategies.

Consider the **Los Angeles Business Council (LABC)**. You might think such a group would focus on relieving the regulatory burdens on developers, especially when its chairman, Brad Cox, is a managing partner for mega-developer Trammel Crow. But Cox has led the business council on a crusade to green the city. "Building green is good for business, building green is good for developers and building green is good for the city of Los Angeles," he told Los Angeles City Council earlier this year, according to the *Los Angeles Times*.

Renee Loveland, director of sustainable design for green developer **Gerding Edlen Development**, credited Cox and other members of the LABC with being instrumental in neutralizing potential opposition to a green building ordinance. "They really reached out to the development community, hosting forums and panel discussions to help them understand, for example, that a LEED silver building can be cost neutral," said Loveland.

When the green building ordinance reached the Los Angeles City Council in the spring, not a lot of convincing was

needed. For one thing, like every jurisdiction in California, Los Angeles is under pressure to show how it will adjust its planning and building policies to comply with AB 32, California's landmark climate change bill that mandates state emissions be reduced to 1990 levels by 2020. Furthermore, in June 2008, the California Building Standards Commission adopted a green building code with new standards for energy efficiency, water usage, insulation and other features; the code will be voluntary until 2010, then is expected to become mandatory. "In California, lawmakers from the governor on down have really taken a strong stance on climate change, energy efficiency and renewable energy," said Loveland. "All these factors are influencing what happens at the local jurisdictions." And also Los Angeles had already pledged to go beyond AB 32, cutting the city's carbon-dioxide emissions 35% below 1990 levels by 2030.

So it was little surprise when the council voted to require green building design and features on private projects above a certain size. For both new construction and major renovations, projects larger than 50,000 square feet will have to meet LEED Certified criteria. Little surprise but big news. Los Angeles wasn't the first Southern California city to institute such a requirement: Pasadena, West Hollywood and Santa Monica already had passed similar measures. But given the size and scope of Los Angeles, second-largest U.S. city with nearly 4 million people, the ordinance has generated excitement in green circles nationwide. "It's huge," said Loveland.

In similar fashion to most other green building ordinances, Los Angeles builders won't have to get their building LEED Certified but they will have to follow the LEED checklist and demonstrate to city planners that their buildings would qualify for a LEED Certified rating at minimum. Projects can choose the most appropriate LEED rating system, including New Construction, Existing Build-

ings, Commercial Interiors, Core & Shell or Homes. The city will audit one in seven submissions from developers to verify that what is proclaimed in the submittals are reflected in the actual plans. Certain historic structures are exempted.

Builders who go above the LEED Certified standard to achieve the equivalence of LEED Silver, Gold or Platinum will receive extra help. "They'll benefit from an expedited permitting process," said Reid. "That's basically a front-of-the-line pass for all their permitting and all plan checks throughout the process." Such fast-tracking can add significantly to a project's return on investment.

The Los Angeles law will apply November 1 to commercial projects and high-rise residential developments, and by May 2009, low-rise residential projects greater than 50,000 square feet will also come under its jurisdiction. According to published reports, city officials expect about 150 new and renovated buildings, equalling roughly 7.5 million square feet, to be covered by the ordinance annually.

Los Angeles is also updating its building codes and procedures to accommodate elements of green building like permeable pavement and green rooftops. On the South Park project, a \$320 million, 1.5 million square-foot residential and commercial development, Gerding Edlen and its team built a bioswale water treatment planting area which treats stormwater from the city streets.

At the time the council passed its green building ordinance, some advocates argued for a lower size threshold or a requirement that projects meet the equivalence of LEED Silver, one step up from Certified. Council President Eric Garcetti promised to push in that direction, predicting "in a couple of years, every single building over 25,000 square feet will be covered" by the ordinance, according to the *Los Angeles Times*. Garcetti also spoke favorably of adopting LEED Silver as the standard. ☀

## Pacific Northwest Leads in Green Building

*Cascadia region goes beyond platinum.*

As anyone who has flown into Vancouver, Seattle or Portland knows, the coastal Pacific Northwest is very green. From the Cascade Range that runs from Northern California to Southern British Columbia to the big river systems that flow from the distant Rockies, the region is rich in forests, wilderness, salmon and other wildlife—and populated by folks who care deeply about the environment. This environmental consciousness has helped make the Pacific Northwest—also known as Cascadia—the hands-down regional leader for green building in the United States.

While Chicago can boast of being the top green building city east of the Rockies, Cascadia's much smaller cities are far ahead of the Windy City in terms of green buildings when measured as a proportion of all building space or by population. In fact, according to U.S. Green Building Council (LEED) online data of certified projects, Portland, with 53 certified green buildings including five Platinum-rated structures, is the leading green building city in the United States in absolute numbers. Ranked by population, Portland is even further ahead. With 550,000 people, the city has nearly one green building for every 10,000 people.

Seattle is not far behind with 45 certified green buildings, or about one for every 13,000 of its 590,000 people. "Per capita, Seattle and Portland have long vied for having the number one and number two spots in terms of most green buildings in the country," said Jason F. McLennan, CEO of the **Cascadia Region Green Building Council (CRGBC)**. "In Canada, British Columbia is the leading province for green buildings." With 15 staff spread across offices in Oregon, Washington, British Columbia and Alaska, the CRGBC is also the largest USGBC

and Canada GBC chapter in the United States and Canada "by a significant margin," according to McLennan.

The green building consciousness is deeply rooted in the region's citizenry and its focus on resource conservation and sustainability, according to McLennan and others. A landmark event was a 1997 Sustainable Building Northwest Conference, followed by subsequent gatherings and the adoption in 1999 of the Northwest Region Sustainable Building Action Plan that called for a regional green building strategy in which talent and experience could be shared across city and state lines. The CRGBC was formed soon after as an umbrella organization to lead and harmonize green building efforts.

"The whole reason for our existence is that this region tends to have more in common than not, despite the fact that we cross two countries," said McLennan. "This entire region benefits from having some of the most pristine wilderness areas left in the United States and Canada, with salmon, tourism, timber and resource extraction industries."

"A lot of the same firms practice in the different cities, and there's a regional economy that exists in green building, not that those firms don't go outside these borders," said McLennan. "But you definitely have California firms and then you have Northwest firms. Sometimes they do business in each others' backyards, but there really is less overlap."

As in other parts of the country, local

and state governments led the way by enacting policies to make public buildings greener and more energy efficient. "Seattle was the first city in the country to mandate LEED for all public buildings," said McLennan. "Portland was second, and Vancouver was the first Canadian city to do so." Government policies have also evolved to provide more incentives for private projects. "Seattle, Portland and Vancouver have for a long time been leaders in promoting green building. They have green building staff that advocate for and educate builders about green building."

Carolyn Forsyth, sustainable design advocate for Seattle- and Portland-based firm **Ankrom Moisan Associate Architects**, credited the Oregon Business Energy Tax Credit for providing a substantial incentive for businesses to upgrade their energy efficiency. According to the state website, energy conservation retrofits can qualify for credits of 35% of project cost, while renewable and high-efficiency energy projects can get 50%. Retrofit projects must demonstrate a 10% energy savings, and 25% in the case of lighting. Tax credit awards granted so far have a wide range, including a \$193,000 credit for a winery that installed PV panels and \$1,145 for a landlord that installed high-efficiency windows on a single rental home. More recently, government policies in Cascadia are moving toward requiring green and energy-efficient design strategies and features for private buildings above certain sizes. And those policies are evolving rapidly. "The City of Portland

### 2007 Living Building Challenge Winners

Oregon Health Sciences University Center for Health and Healing	Portland, OR
Omega Center for Sustainable Living	Rhinebeck, NY
Seminar II	Olympia, WA
Warren Skaaren Environmental Learning Ctr at Westcave Preserve	Round Mountain, TX
Alice Ferguson Foundation	Accokeek, MD
Kenton Living Building	Portland, OR

Source: U.S. Green Building Council

has an Office of Sustainable Development that provides a lot of guidance,” said Renee Loveland, sustainability director for developer **Gerding Edlen**. “They’re now trying to fine-tune a proposal to reduce carbon emissions within the City of Portland, and they’re considering establishing a threshold that all buildings will need to meet, probably LEED Silver or Gold, or an Energy Star rating.” According to Loveland, the city is weighing a formula that will charge a fee based on anticipated carbon emissions to owners of buildings that don’t meet the standards, while those exceeding the standards will receive incentives. Even existing buildings above a certain size may have to be rated for energy efficiency and carbon emissions and disclose the rating to potential tenants and purchasers. “The idea is to drive the market to be proactive,” said Loveland.

In July, the Vancouver City Council unanimously approved a Green Homes Program with new requirements for one- and two-family dwellings such as upgraded insulation and windows, in-home energy use monitors, heat recovery ventilators, charging stations for electric vehicles and other features. The city’s Climate Change and Sustainability office estimates that the changes should result in annual savings of 6,000 metric tons of greenhouse gases annually by 2013

McLennan attributed the regulatory trend in Cascadia to “rising awareness of climate change, especially since 2006.” Additionally, the demand side of the green building equation is getting larger as cost premiums for green upgrades and materials come down and perceptions about the economic value of green buildings become stronger. “There is increasing recognition that green buildings are better investments offering better value and better economic return,” he said.

In keeping with its leadership role, the Cascadia Region Green Building Council introduced in 2006 a new standard for green building that is said to go beyond

## Cascadia’s Platinum Buildings

### Oregon (all in Portland)

Oregon Health Sciences University Medical Office Building

Portland Center Stage, Armory Renovation  
Burnside Rocket

The Casey Condominiums  
Mint Dental Works (renovation)

### Washington

Perkins + Will (Seattle)  
King County Recycling & Transfer Station (Shoreline)

Washington Public Utility Dist (Olympia)

Source: U.S. Green Building Council

LEED Platinum. The Living Building Challenge requires that buildings meet all their energy needs with onsite clean energy and capture and treat all of their wastewater. The concept was unveiled at the 2006 Greenbuild trade show to a very positive reaction. “I was delighted,” wrote Christine Ervin of *GreenBiz.com*. “Here was a construct for thinking ‘beyond Platinum’—a concept I was cool toward years ago when we were still building the LEED brand. But with so much experience in the market now, and the USGBC embarking on a next-generation LEED, surely the Living Building Challenge could inspire and stimulate.”

And indeed it has with developers, architects and project teams all over the United States competing for the honors. At the 2007 Greenbuild show, six designs were selected for showing promise during the design phase, four from Cascadia, one from Texas and one from Maryland. “Our living building challenge is getting the region a lot of attention as it becomes a national program,” said McLennan. But with nationwide competition, green builders in Cascadia are still aiming to dominate at Greenbuild 2008. “There are 12 projects pursuing it in Portland alone,” said McLennan. ⚙️

## LEED Or No LEED, a Leading Contractor Says Clients Want Energy Efficiency and Green Attributes

With a commitment to green construction practices that goes back to 1995, when it joined the World Business Council for Sustainable Development, the Sweden-based global construction management firm **Skanska** claims a solid position among the top green-building contractors in the market today. The firm’s U.S. subsidiary **Skanska USA Building Inc.** (Parlissippany, N.J.) was the number-one green contractor on *Engineering News-Records* (ENR) list of top green contractors in 2007 and held its own to place third on ENR’s 2008 list, generating more than \$1.2 billion in revenues (29% of construction revenues) devoted to green design and construction during 2007. (Rankings are based on annual revenues from third-party certified green projects.)

Skanska has nearly 200 LEED accredited professionals (APs) on staff. Among Skanska’s signature LEED projects: Providence Newberg Medical Center, the first LEED Gold hospital in the United States; and the country’s first LEED Gold airport terminal, Delta Terminal A at Boston’s Logan Airport.

“Skanska prides itself on being a city builder with great attention to the quality of community life in the places where we live and work,” said Myrrh Caplan, Skanska’s national program manager for green construction. “Cities will need schools, municipal buildings, infrastructure, housing, and hospitals as well as sports and entertainment centers in the years to come.... There could be a lot of room for green construction.”

The focus on city building is reflected in Skanska’s 2007 revenues in green contracting: 26% in retail and office space; 22% in civic and entertainment facilities,



such as wastewater treatment plants and stadiums; 20% in healthcare facilities; 17% in schools and other educational buildings; and 11% in government office space. As its ISO 14000 registration signifies, Skanska measures its green contracting credentials not only by the operating efficiency of the resulting buildings but also by construction practices. For example, in the ongoing construction of the Meadowlands Stadium in East Rutherford, N.J., Skanska is using a radio frequency identification (RFID) program to manage the flow of materials coming on site, a measure not only saves time and money but also improves safety and reduces the risks of mold and mildew.

According to Caplan, the U.S. green building market varies considerably by region. In Portland, Ore., where Caplan worked before making a recent transfer to Skanska's Parsippany office, "about 50% of our work was LEED-related, with a lot of that work in school construction." By comparison, the percentage of new LEED building in Texas markets ranges from about 5% to 15%, she noted.

Caplan hastened to point out that the pursuit of LEED certification is far from the whole story in green building. Virtually all developers and building owners are looking for improved energy efficiency, air quality, and daylighting, without necessarily pursuing LEED certification. "Clients are more savvy today," she told CCBJ. "Green building is not just a niche anymore." She added, "when I see a client who doesn't want to go through the LEED process, it's not because they don't think they can achieve it; sometimes it's because they don't think they need a plaque on the wall."

Perhaps nowhere is this distinction more evident than in the construction of hospitals and medical centers. "We definitely see the healthcare market going green—sometimes through LEED, but there also is the Green Guide to Health Care certification that some clients opt

for." Hospitals, of course, have major green building challenges, such as high energy and water use; for example, the lights need to be on at nurses stations at all times, and stringent air quality requirements can entail high energy consumption. LEED certification may be out of reach as a consequence, but according to Caplan, hospital administrators are increasingly aware of the data showing that patient stays are two days shorter in green hospitals than in non-green facilities, and hospital staff are measurably happier and more productive. "Your employees are your highest-cost item—about 200 times per square foot compared with utility costs—so if you can make your employees happier and more efficient, it is saving you a lot of money."

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***"When the economy recovers,  
we'll probably see the green  
building market double."***

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In addition to demand from developers and building owners, another set of market drivers comes from states and cities as they upgrade building codes and establish new programs to support—and increasingly require—the construction of new green buildings and efficiency retrofits in existing building stock. "Most states are jumping on board," said Caplan. "They may have various levels of commitment; for example, California, Oregon, and Washington all appear to have a strong desire for green construction."

The top construction firms, including Skanska, Turner, Webcor, Bovis Lend Lease and Swinerton, are all demonstrating an increased dedication to the green-building market. "The passion for green design and building among consultants, engineers, and architects has steadily increased in all markets across the country."

Commenting on the cost premiums, Caplan said "the cost of a LEED Platinum building comes down to what you are designing into the project primarily

during the pre-construction phase. It's so hard to look at a green building and say, 'this is the premium,' because every building is different. You have to consider all of the options as well as the client's goals."

Premiums for materials vary greatly. Wood from Forest Stewardship Council (FSC) certified forest operations commands large premiums because supply lags demand. On the other hand, "materials like bamboo flooring and wool carpeting are meeting cost tests, and for other products, like recycled glass tile, you can get great pricing," Caplan noted.

The current economic turmoil has stifled growth in green building. "We're still seeing some growth in green, and when the economy recovers, we'll probably see the green building market double. That's been the pattern in every year we've seen a strong economy." Ensuring that rate of growth will mean meeting several challenges. A major one has to do with human resources. New people are routinely coming through the door while existing staff move up the corporate ladder and out of project teams, so keeping up the education and experience level of its employees is a top concern. Skanska addresses this issue in part through in-house training programs.

At a higher level, the green building industry generally needs better energy efficiency data. "We need to be able to guide our clients better and collaborate with them for the appropriate long-term solutions to ensure that they maintain efficiency levels," Caplan concluded. "We are dedicated to our clients' success and to establishing long-lasting relationships with them. They trust us with professional guidance in the green arena to do the right thing and provide long-term, positive results. With all of our clients, we maintain contact to ensure that their systems are working properly." ⚙️

## In the Midwest, Chicago Leads in Greening New and Existing Buildings

With an aggressive Climate Action Plan poised to reshape the future of energy supply, transport and buildings, and aggressive green building codes under consideration, Mayor Richard Daley's Chicago has gained a reputation for leadership in sustainability and green building. With 49 LEED-certified buildings—including four Platinum buildings—the Windy City ranks only behind Portland, Ore.—with 53 certified buildings including five Platinums—as the top green-built city in the United States.

Indeed, green renovation is growing apace with new green construction in Chicago. A signature renovation project was the greening of the famous Merchandise Mart, which lays claim to being the world's largest commercial building. In November 2007, the 4.2 million square-foot property was awarded a Silver rating under LEED for Existing Buildings (LEED-EB). Renovations leading to the LEED Silver took place over two decades and included the installation of an off-peak cooling system and more efficient lighting systems, the use of Green Seal-approved cleaning products, and recycling programs.

The Merchandise Mart renovation “was significant in terms of leading the way in showing that other historical buildings in the city are not outdated and can be leaders in sustainability,” noted Marina Panos, a senior associate at Chicago-based design and planning firm VOA Associates. The enormous size also showed that green design and renovation could take place at a very large scale. A comparable example of this scale and another signature Chicago project of recent vintage is the McCormick Place expansion, a \$882 million, 2 million square-foot addition completed in August 2007. The

new McCormick Place West includes a 150,000-square-foot green roof, efficient lighting, and extensive use of building materials with high recycled content.

Other signature green-building projects in Chicago include Millennium Park, a section of northern Grant Park that is effectively a green roof over a parking lot and railroad yard (touted by city officials as the largest roof garden in the world). City Hall and the Chicago Cultural Center also sport green roofs.

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*Developers who go green will receive expedited permitting from the Chicago Department of Buildings.*

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The foundation of Chicago's green-building initiatives is the Chicago Standard, a set of construction standards established in collaboration with sustainability guru William McDonough and adopted in 2004 for public buildings. The standard is based on LEED but has adopted those LEED attributes that are best-suited for the city, with an emphasis on energy, water conservation, and materials use, according to Chicago Department of Environment Commissioner Suzanne Malec-McKenna. “LEED is a great tool, but it is not the only tool,” she said. The cost of LEED-oriented design in particular can be intimidating to building owners and developers, and the Chicago Standard is designed to provide a broader range of tools to show that green building design “isn't as scary and difficult as it might at first seem,” Malec-McKenna told CCBJ.

The city is promoting green building within both the public sector and the private sector through a series of requirements and initiatives. On the public side, “we require any public building or any publicly funded building to be LEED Silver-certified,” said Malec-McKenna. On the private side, a key initiative is the city's Green Building Permit Program,

now several years old. Under this program, designers and developers who go green in their building projects will receive expedited permitting from the Chicago Department of Buildings. “What used to take six to eight months now takes only 30 days,” noted VOA's Panos. The city also waives fees for the consultants hired by the city to review project documents.

In October 2007, Chicago launched the Chicago Green Homes Program, under which residential developers and homeowners can apply for certification based on the incorporation of energy and water efficiency, waste reduction, improved landscaping, reduced maintenance, and other sustainable features specified for different types of residential units.

### Climate Action Plan Geared To Renovation

The newly announced Chicago Climate Action Plan is very much geared to the retrofit and rehabilitation aspects of green building. Consisting of 26 initiatives for greenhouse gas (GHG) mitigation and nine initiatives focused on climate change adaptation, the plan emphasizes energy efficiency in buildings, according to Malec-McKenna. She estimated that 70% of the city's GHG emissions come from energy use, and 61% from buildings. “We were able to devise a specific roadmap for reducing emissions by 15.1 million metric tons, or 25% below 1990 levels by 2020. ... These are interim goals we've established to get to the Kyoto goals.”

By 2020, Chicago expects to have upgraded 400,000 residential units, 9,000 commercial buildings, and 500 industrial facilities, according to Malec-McKenna. The target number for the residential stock represents about 35% of the city's 1.1 million units, she said, while the commercial and industrial upgrades should cover about 50% of the building stock in each category.

In addition to government policies, Chicago green builders, like their coun-

terparts elsewhere, also benefit from recent upgrades in materials, technology and know-how. “The occupancy sensors in rooms are an energy-oriented feature that wasn’t available in residences 10 years ago,” said VOA’s Panos. Energy recovery wheels are also standard in VOA projects today. “These devices capture all the heat from the air handling units and reuse it. ... We also are doing a lot with hydronic systems, which use a combination of pipe and air and materials to re-pipe the hot and cold water to make the air hot or cold, rather than pushing a lot of air through a building. You save a lot in pipe sizing, ductwork sizing and energy loss.”

Panos said that her firm’s green building work is equally split between retrofit and new construction, “perhaps tipped a bit more towards new construction. But there’s no dearth of renovation projects, especially in the city, where there’s a lot of interior building projects at universities. There will always be projects for existing buildings, especially the historical ones.”

Along the green-building value chain in Chicago, the sophistication among the players is growing rapidly, Panos observed. “Five years ago, when I presented the LEED or sustainability charrettes during a construction kick-off meeting, the contractors and builders were more skeptical. It’s very different today. I can walk into a meeting, and 85% of the contractors know what they need to do.”

Among the leaders in Chicago’s green building market are design firms GreenWorks, VOA, Perkins & Wells, Gensler, Arup, SOM, and Jones Lang LaSalle, which recently acquired the environmental and energy services consultancy ECD Energy. “There’s a handful of architects and consultants who have been green for five, ten, or even thirty years,” said Helen Kessler of Chicago-based **HJKessler Associates**. “There are others who haven’t been doing green design, and now that owners are looking for it, they’ll do it.” Kessler was involved in some of high-

est profile LEED projects in Chicago, including the Chicago Center for Green Technology, the Exelon headquarters, and the first two Chicago public libraries to gain certification. She sees institutions like Northwestern University making the same level of commitment to green building as the city, with the University of Chicago and other institutions starting to follow suit. “Chicago is definitely a leader in green building—no question,” she declared. “And in all of the suburbs, there are at least one or two LEED projects.”

### Wisconsin Vies for Leadership

Other midwestern cities such as Detroit and St. Louis are incentivizing green building through policies, according to the professionals interviewed by CCBJ. At the state level, however, Wisconsin may be the regional leader. “For everything Chicago has going for it, there is certainly the impression that, at the state level, Wisconsin has more incentives than Illinois,” noted Susan King of **GreenWorks Studio**, a sustainability consultancy with offices in Chicago, Los Angeles and Detroit.

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*“Owners and developers are still looking at the payback and how to measure it.”*

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As part of the state’s 2007 plan to meet 25% of electricity and transportation energy demand through renewable resources by 2025, Wisconsin established Focus on Energy, which uses funds from surcharges on utility bills to support renewable energy and energy efficiency measures in buildings. Meanwhile, the city of Milwaukee is collaborating with the University of Wisconsin’s Center on Wisconsin Strategy (COWS) in the development of the Milwaukee Energy Efficiency (Me2) program to improve the energy efficiency of the city’s building stock.

The signature green building in Wisconsin is the LEED Platinum Aldo

Leopold Legacy Center in Baraboo, a net-zero-energy building, designed by **Kubala Washatko Architects** (Cedarburg, Wis.), that claimed to have earned the highest number of points in the LEED certification system when it was completed in April 2007. More recently, the **Wisconsin Green Building Alliance** (WGBA, Madison, Wis.), the state’s U.S. Green Building Council (USGBC) chapter, recognized this past September the winners of its annual Sustainability Energy Efficiency (SE2) competition. The highest rating went to the Discovery World science and technology museum in Milwaukee. Designed by **HGA Architects and Engineers** (Minneapolis, Minn.), the museum sports a green roof, uses lake water and energy-efficient heat pumps to condition the building, and has a building envelope that uses reflective materials and shade to reduce solar heat gain.

“We’ve seen growing interest and demand over the past few years,” Sue Loomans, interim executive director of the WGBA told CCBJ, but a critical mass of support among building owners remains elusive. “Part of [what’s] really missing right now is convincing decision-makers about the virtues of green building,” she commented. “The building owners and developers are still looking at the payback and how to measure it.” The data isn’t entirely in yet on the benefits, so the state currently has “very few leaders, and then a lot of followers who want to learn more.”

Adoption of federal incentives to reward organizations for building green would go a long way towards “convincing decision-makers that green building is the way to go,” said Loomans. “It’s kind of a momentum issue. Once the ball gets rolling, nobody wants to be left behind. It’s slowly rolling here, but we haven’t reached the tipping point.” ⚙️

## Texas Ranks Second Behind California in LEED Certification

*Austin leads, followed by Houston and Dallas; commercial office segment is strongest.*

When it comes to climate change, the Lone Star state is both increasingly vulnerable to the impacts of changing weather patterns and increasingly pro-active in reducing greenhouse gas emissions. On the climate-change adaptation front, Hurricane Ike is the most recent reminder of how vulnerable the state's Gulf Coast communities are. According to the **Union of Concerned Scientists**, Texas will experience a 3-10°F rise in winter low temperatures and 3-7°F rise in summer highs by 2100. "More frequent intense rainfall events are expected, with longer dry periods in between," states UCS. "[By] 2100, ocean levels around Texas could be 17 inches higher than today" based on natural subsidence and a mid-range rise in sea levels driven by climate change.

In terms of mitigating greenhouse gases, Texas is the U.S. champion of renewable energy. As noted in CCBJ's recent wind energy edition, a rigorous renewable portfolio standard and abundant wind resources have helped to stimulate enormous investment in wind energy. With capacity additions of 59% in 2007, Texas was way ahead of the rest of the United States in wind power with nearly twice as much total capacity as California, the number-two wind energy state.

More recently green building has become a significant trend in Texas. A recent analysis by the University of San Diego's **Burnham-Moores Center for Real Estate** found that Texas ranked number-two behind California in the number and square footage of buildings certified by the U.S. **Green Building Council's** LEED system or the U.S. **Environmental Protection**

**Agency's** Energy Star program. According to the USGBC website there are 70 LEED-rated buildings in Texas with nearly 600 additional projects registered. In numbers of existing LEED buildings, Austin is the top Texas city with 19, followed by Houston with 17, Dallas with 10 and San Antonio with three. In terms of growth projections, these four cities boasted 349 additional registered projects: 148 in Houston, 92 in Dallas, 69 in Austin and 40 in San Antonio.

Of course, in the current economic climate, not all of those registered projects will be constructed. Projects are often registered well before hard costs are nailed down and financing arranged. "There definitely are [green] projects that are getting funded. It's just much harder. Also lender requirements have changed so you typically need more equity to invest in a project and that can have a big effect on your returns," said Michael Wagner, editor in chief of *Green Real Estate News*.

### Private Housing Trails the Commercial Office Segment

According to players in Texas green building, the commercial office segment is the strongest while housing is the least developed—a pattern that shows up in other markets as well. "The office market in Texas appears to have fully embraced green building," said Don Brooks, sustainable design manager for **The Dinerstein Companies**, an apartment and condo developer based in Houston. "We feel the multifamily sector is still behind other parts of the country. We're trying to change that."

San Antonio custom homebuilder Kyle Lindsey reported that few of his clients are asking for energy efficiency or green upgrades. "Even with the current energy situation, there clearly has to be an education process about green building, at least here in Texas," he said. But the education is definitely happening and demand for green homes is growing, according to

Lindsey. He cited a new luxury golf resort in San Antonio, Forestar Real Estate Group's Cibolo Canyons, as an example. "For the first time in San Antonio history, a master planned community [is being developed] that will be 100 percent green." As a requirement in the covenants and restrictions, homes built in the community have to achieve Level 1 certification from the local Build San Antonio green rating program.

Lindsey, who has built a spec green house in the development, says water conservation was the primary hurdle for the project. "Our biggest challenge in San Antonio is water restrictions. All our water comes from the Edwards Aquifer, which is experiencing severe limitations," said Lindsey. To manage water concerns, Forestar built "the equivalent of a huge catch basin underneath the two golf courses. The water is pumped offsite, filtered and pumped back to the golf course."

Lindsey credited San Antonio's municipal utility CPS Energy with boosting energy-efficiency in new homes with a \$.50 per square foot rebate for upgraded insulation. "That came to about \$1,900 for my 3887-square-foot [spec house in Cibolo Canyons]," said Lindsey. Speaking of square footage, Lindsey acknowledged that there's a certain contradiction in calling a 3,900-square-foot house "green," but he said that's what the market demands. "If there are people out there looking for smaller homes, they are not in my particular demographics," he said. "Everyone in Texas wants it big."

### Texas Averse To Regulation, But Developers Are Recognizing the Benefits of Green

Brooks credited cities like Austin for implementing tax abatements and expedited plan review measures that have driven growth in the green building market. "The market potential in Texas is great, with Austin leading the way," he

said. “[But] in order to fully develop our potential we need to adopt some of the incentives and policies of California in regards to renewable energy and green building [such as] rebates and stricter building codes to encourage better building design [and] to help preserve our natural resources.”

A major step in that direction was taken by Dallas in April 2008 when the city council passed an ordinance that will require—starting next year—new homes and commercial buildings less than 50,000 square feet to hit energy efficiency targets 15% above code and to implement water-use reduction strategies, according to *EnvironmentalLeader.com*. Larger commercial projects will have to achieve 85% of the points needed for a LEED-Certified rating.

In 2011, the law will require “all homes to be built to either the LEED standard or the Green Built North Texas standard” with more rigorous energy and water savings components. By that date, “all commercial projects [will be required] to be LEED certifiable” with additional enhanced energy and water conservation requirements.

But aside from Dallas, most green building programs in Texas remain voluntary. “In Houston, the regulations and policies around green building are not really happening,” said Brian Malarkey, an active member of the USGBC who works for Kirksey, a Houston architecture firm that specializes in green building. “We got a resolution passed in 2004 that all city buildings over 10,000 square feet have to be LEED certified. But there isn’t anything right now requiring the private sector [to build green].”

### **Oil Companies in Houston Aim for LEED Certification**

According to Malarkey, regulatory drivers aren’t needed because the real estate and development sector in the fourth largest U.S. city is getting behind green

building for business reasons. “One thing you can say about Houston is that we are a business town, and when we see a good idea it’s really embraced and things can happen very quickly.” Malarkey estimated that 75% of projects over 50,000 square feet currently in development in Houston are pursuing a LEED rating. In particular, energy companies such as Shell, BP and Conoco-Phillips are committing to green building principles on new office projects. “Of 27 projects under construction [by energy companies] right now, 25 are seeking LEED certification,” said Malarkey.

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***“One thing you can say about Houston is that we are a business town, and when we see a good idea it’s really embraced and things can happen very quickly.”***

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Malarkey quoted Jeri Ballard, manager of corporate real estate for Shell, telling a business luncheon last year: “In the future, you will not find Shell in a non-green building.” According to Malarkey’s article, “green building not only makes environmental sense but business sense as well. ... Ms. Ballard also offered some very interesting information coming from their human resources department. Potential new-hires, mostly recent college graduates, were asking if they were going to be working in a LEED certified building. Their HR Department was not familiar with green buildings, much less the LEED certification program. After all, what would green building have to do with human resources?”

“It turns out the energy business is having a hard time finding employees,” Malarkey explained. “There’s a shortage of young talent, and not a lot of people are getting into that business so they really have to compete for talent. ... Of course, the energy companies also want to be able to green their image. They all seem to

get it. BP is building a LEED Platinum building.”

For Malarkey’s firm, the surge in demand for green building is resulting in a sharp uptick in business not only from developers but also from other architects. “We’re starting to grow a business working for other architects that are either not up to speed or not interested in the LEED documentation services,” he said.

“Something that’s really growing fast is LEED for Existing Buildings [recently upgraded to Existing Buildings Operation & Maintenance or EBOM],” said Malarkey. “With all these LEED buildings getting ready to come on line in the speculative office market [owners of existing buildings] want to know how they can green their own building to compete. We’ve gotten a lot of requests and we’re starting to work on several LEED EBOM projects.”

“LEED for Existing Buildings is really concentrated on maintenance and operations, which means what all the vendors are doing with housekeeping, pest management, landscaping, waste management,” said Kirksey. Other considerations include phasing out CFCs in refrigerants, plumbing fixture efficiency, and a host of engineering functions. “We’re currently looking at about 10 million square feet of existing buildings, including a feasibility study for a significant client that manages a bunch of properties,” said Kirksey.

“We’ve been in education mode around green building for so long it’s hard to get used to the current levels of demand,” said Kirksey. “In the past, every time we’d get a new client we’d set up a presentation as part of the design charette process to talk about how green building is a good business decision. Now clients are coming to us and asking for green buildings. The whole community is awakened to green building in a very robust way.” ☀

## NYSERDA Drives Green Building In New York State

Ask green builders in New York state what's driving the market there and you may have to ask them to repeat themselves. At first, the acronym for the state's energy agency can sound like the name of a subway stop rendered in a thick New York accent. But NYSERDA (pronounced "Nye-SIR-duh"), the **New York State Energy Research and Development Authority**, is nothing if not cutting edge when it comes to supporting energy-efficiency and green building.

"NYSERDA has remarkable programs with rebates and financial incentives for multi-family housing, commercial buildings and single-family homes," said Steven Winter, president of **Steven Winter Associates**, a green building consultancy in Norwalk, Conn. "They're really driving the market. Developers, whether remodeling or building a new building, are being incentivized to make their buildings green and energy efficient. They receive sequential rebates and payments, first if they do a study on how to make the building perform better, then if they create the plans, then if they actually achieve the savings."

Craig Kneeland, NYSERDA's senior project manager for energy efficiency services, told CCBJ that the agency's programs are funding green and energy-efficient upgrades on about 35% of new construction in the state. NYSERDA's programs cover most of New York. Long Island with its public power agency and many small municipalities are not directly served. Through 2015, NYSERDA expects its ratepayer-funded efficiency programs to have saved the equivalent of 540 GWh of electricity production, a long way toward realizing the state energy action plan that calls for a 15% cut from baseline energy projections by 2015.

Historically focused on energy efficiency, NYSERDA last year began to fund

other green attributes like materials, water and indoor air quality. "Energy efficiency is a given, and something that we've been working on for years," said Kneeland. For its broader green building subsidies, the agency staff chose LEED criteria for which expert assistance would offer the most value. "We didn't want to spend our precious resources on items that you don't need to be a green building expert to do," said Kneeland. "For example, soil erosion planning is standard practice and has been for years. On the other hand, waste management and indoor air quality plans are less well known" among builders.

In addition to new construction, NYSERDA has an aggressive energy-efficiency program for existing multi-family buildings, of which there are about 50,000 in the state, according to Luke Falk, project manager for residential energy affordability. NYSERDA has a ready list of cost-effective upgrades. "The more expensive items with longer term paybacks are the hardest to implement in existing buildings," said Falk. "Think boiler replacement, adding insulation to walls and roofs, and window replacements. These items are frequently recommended in our program, but often they're only cost effective [when the items are near] the end of their useful life." Advanced technologies like combined heat and power (CHP), solar photovoltaic (PV) modules and geothermal heat exchangers "all have high costs, long paybacks and require skilled and knowledgeable people to correctly spec, install and operate."

Sub-metering a master-metered building and billing tenants for their energy use can provide incentives for tenants to conserve, but Falk pointed out that such moves carry "significant regulatory requirements and often lead to anger among tenants."

Kneeland called the market potential for green building in New York "huge." And his assessment is borne out by data from the **U.S. Green Building Council**.

While the state is currently home to 64 LEED-rated buildings, as of early October 2008 there were more than 650 new projects registered with USGBC. (Registration is the first step in seeking certification, done after initial building design work but prior to final design.) While some of the registered projects are already certified buildings seeking an additional LEED for Existing Buildings (or the new Existing Building: Operations & Maintenance rating) at least 600 are entirely new buildings.

As might be expected, growth is concentrated in New York City, with Manhattan the epicenter. But the other four boroughs are seeing a green building boom as well. There were 52 projects registered in Brooklyn, 19 in the Bronx, seven on Staten Island and five in Queens. Statewide the college towns of Ithaca and Syracuse are next in line behind the city, with more than 50 certified buildings and another 48 in the registration pipeline.

In addition to NYSERDA incentives and those offered by other state agencies and local governments, Winter and other observers of the New York State green building scene said that regulatory policies—both those already enacted and those that builders see coming on the horizon—are driving new construction toward green. New York City now requires most public buildings to be designed to meet LEED-Silver criteria. "There is more and more peer and political pressure," said Winter. "The mayors of both Stamford, Connecticut, and New York City are making it very difficult [for developers and builders] not to be green."

In terms of signature buildings, there are a few that seem to be on everyone's list: The 27-story Solaire apartment building (Gold); The Hearst headquarters (Gold); and Seven World Trade Center (Gold). The under-construction Bank of America tower being built by the Durst Organization is aiming for a Platinum but, interestingly, of the state's five existing

Platinum buildings, only two—the Albanese Organization’s 26-story Verdesian apartment building and the headquarters of Cook+Fox Architects—are in Manhattan. The other three are the Queens Botanical Garden in Flushing, Ecology and Environment’s office in Lancaster and the Park Center at Ithaca College.

## Affordable Green Housing is a Balancing Act

While much of the green building activity in New York is focused on high-end commercial and multi-family residential projects, there’s also a lot going on with affordable housing. One of the more active developers is **Blue Sea Development**, builder of the 76-unit LEED Silver Morrisania Homes in the Bronx. Blue Sea has also constructed about 400 two- and three-unit Energy Star homes in New York, and is now building another project in the Bronx, Melrose Commons Site 5, that is seeking a Platinum LEED rating.

Partner Les Bluestone said that even with assistance from NYSERDA and several other state and city programs, building green and affordable homes is heavy lifting. “In the affordable housing arena, our god is something known as the AMI, average median income,” said Bluestone. In exchange for subsidies, Bluestone guarantees its funders that it will produce homes and sell them for prices considered affordable to people earning from 40% to 110% of AMI. “It could be as long as two years before we put a shovel in the ground, and nine times out of 10 during that period costs have gone up. Yet we’re still trying to work on the old budget. So it’s a little bit of a balancing act to try to get the energy efficiencies that we like while covering our hard costs and still being able to sell the homes [at the prescribed prices].”

“Compared to condos, co-ops or fee-simple homes, there’s really no upside for [affordable housing] developers because you’re tied to a sale price based on the

## 10 Most Cost Effective Energy Efficiency Measures for Apartment Buildings in NY

Clean and Tune Burners
Install Low Flow Faucet Aerators
Install Low Flow Showerheads
Switch from Incandescent to Fluorescent Lighting in Common Areas
Weatherseal Interior Doors or Windows
Install CFL Lighting in Units
Seal Vertical Shafts
Upgrade Domestic Hot Water Controls
Insulate Domestic Hot Water Piping
Install Lighting Timers

Source: NYSERDA

AMIs and you can’t get a penny more,” said Bluestone. On the other hand, sales are virtually guaranteed. “Because the demand is so great, we usually get at least 10 applications for every unit.”

With such constraints on revenue, the company is often forced to trim green features in a process often called “value engineering”. One item that rarely makes the cut is solar energy. “We did PV on one project as part of a pilot with the US Department of Energy, but for affordable housing it was too expensive to justify,” said Bluestone. “There are other ways to spend that money to [cost-effectively] make the building more efficient.” Water efficiency always gets prioritized. “In the last three years, water and sewer rates in New York City have gone up 36%, and a 15% hike is projected for 2009.”

Bluestone said he and his partner Avery Seavey find satisfaction in providing energy-efficient homes for working families priced out of the housing market. “For our homebuyers it’s really about economics. One family that bought a home in Morrisania has an annual income of \$32,000 a year. If they can save \$1,000 a year on their utility bill, that’s a real piece of change for them.” For Melrose Commons 5, Blue Sea will be able to invest more in renewable energy because it will own the project and earn ongoing returns from electricity generated on site.

Not only will the building sport 10 1-kW Aerovironment wind turbines but also two Marathon combined heat and power (CHP) microturbines to generate electricity and provide a heat source for domestic hot water. As owners “we were willing to put some more money up front... We think they’ll help [the bottom line] but we don’t know for sure.” NYSERDA is partially funding the CHP installation as an R&D project.

## Looking Beyond Upfront Costs

The financial crisis will slow New York’s green building, but when the markets revive, Kneeland hopes that developers and builders will take a broader view of the balance between upfront costs and long-term value. “In new construction you’ve got the whole first-cost mentality,” said Kneeland. “To a certain extent it’s understandable. Especially in this tough economic climate it’s almost impossible for developers to go out and put more efficient equipment in the building and get their money back... especially because the savings aren’t going to accrue to them but to whoever occupies the building... We’ve got to break this first-cost mentality. Most people don’t look to buy their Sunday clothing at Wal-Mart... but yet when we go to buildings, that’s exactly what we look for. ‘What’s the cheapest thing I can do to get this up and sold. I’ll leave it to the next guy to pay the [energy] bill.’ This is one of the major challenges.”

Observers of the New York building scene say this challenge is especially difficult given the high costs of labor and materials. “Owners are always making decision on the energy or water conservation elements of a project based on return on investment or a payback period,” said Bradford Perkins, president of New York design firm **Perkins Eastman**. “In low construction-cost areas, some of those returns materialize quite fast. In high construction-cost areas like New York City, the return can be spread out over an unacceptably long time.” ⚙️

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