

## The dollars and sense of green retrofits

A joint study by Deloitte and Charles Lockwood

*Sooner is better than later, and it could cost less than you think*

A growing number of companies are implementing green retrofits of their buildings to save money, improve productivity, lower absenteeism and healthcare costs, strengthen employee attraction and retention, and improve their corporate sustainability reports and brand equity – all at a relatively modest cost. However, timing is important for companies seeking to use green retrofits as a point of competitive differentiation. The earlier a company performs a green retrofit, the more differentiation it stands to gain, as we believe that the increasing interest in green building among businesses and lawmakers will soon make green construction practices mainstream.

### Buildings and the environment

- In 2006, U.S. buildings accounted for 35 percent of the nation's greenhouse gas emissions at 2,521 million metric tons of CO<sub>2</sub> equivalent – more than the transportation sector's 28 percent (2,010 million metric tons).<sup>2</sup>
- Over the next 25 years, CO<sub>2</sub> emissions from buildings are projected to grow faster than those from any other sector, with emissions from commercial buildings projected to grow the fastest at 1.8 percent a year through 2030.<sup>3</sup>
- Buildings account for over 50 percent of greenhouse gas emissions in most cities and over 70 percent in mature cities, such as New York and London.<sup>4</sup>
- Buildings consume 70 percent of the electricity load in the U.S.<sup>5</sup>
- In the U.S., approximately 15 million new buildings are projected to be constructed by 2015.<sup>6</sup>
- If half of all new commercial buildings were built to use 50 percent less energy, it would save over 6 million metric tons of CO<sub>2</sub> annually for the life of the buildings – the equivalent of taking more than 1 million cars off the road every year.<sup>7</sup>
- Existing buildings outnumber new buildings by more than 100 to 1.<sup>8</sup> If the U.S. is going to reduce its greenhouse gas emissions, the greening of existing buildings must be included, too.
- The average building certified as green using the U.S. Green Buildings Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) rating system uses 32 percent less electricity and saves 350 metric tons of CO<sub>2</sub> emissions annually.<sup>9</sup>

There is substantial statistical evidence that green buildings are better for the environment than conventional buildings. Many forward-thinking companies are realizing that green buildings can be better for business, too. Green buildings offer their owners and tenants a number of bottom-line benefits, including reductions in water and energy use and costs; opportunities with respect to tax credits, permitting, and other regulatory incentives; and greater worker productivity and satisfaction, improved brand image, and better community relations.<sup>1</sup>

A building doesn't have to be new to be green. An empty building can undergo a top-to-bottom green renovation that incorporates green design, building products, and technologies. Or companies can choose a green retrofit, which enables them to introduce green benefits into their existing occupied workplaces at a reasonable cost and with only minor impact on their day-to-day operations. Companies that cannot afford to construct a new green building, or that cannot afford the cost and disruption of moving to a green building or of undertaking a top-to-bottom green renovation of their existing conventional workplaces, may find that green retrofits are a practical way to improve their sustainability, reduce their greenhouse gas emissions, and reap the many benefits of green workplaces.

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Figure 1. Respondent LEED category

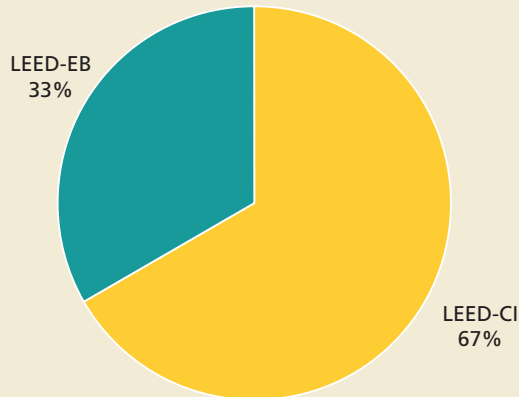


Figure 2. Respondent LEED certification level

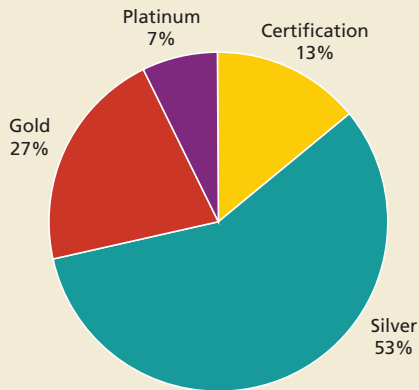
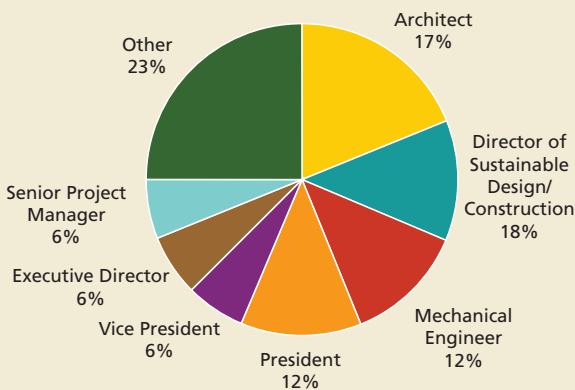


Figure 3. Respondent Title



**Deloitte survey respondents on LEED**

“Overall, we believe LEED is a really good tool to keep people focused and to keep the [project owner] committed to a certain level of performance. When you don’t have a certification system like LEED, it’s easy to say one thing and do something else – there are no consequences for cutting down on green features because of the expense.”

“There’s a marketing rationale for the [LEED] plaque, just speaking frankly. There’s no doubt that it adds an aura of legitimacy to the work that you’re doing.”

“[The LEED certification process] was pretty intense. The USGBC audits your credits, and then you have to provide backup documentation. We had one guy who worked as the link to our commissioning agent who did absolutely nothing but gather documentation and keep it in the right order for the USGBC to see.”

**About the USGBC and LEED**

The U.S. Green Building Council (USGBC), an independent agency founded in 1993 and headquartered in Washington, D.C., is a coalition of more than 12,000 professionals and organizations from the real estate industry, government, non-profit organizations, and schools and universities.

In 2000, the USGBC launched its rigorous Leadership in Energy and Environmental Design (LEED) rating program. LEED has four award levels, based on the number of points a green building earns: Certified, Silver, Gold, and Platinum. A LEED-Gold building has 50 percent less negative impact on the environment, and a LEED-Platinum building has at least 70 percent less negative impact, than a conventional building.<sup>10</sup>

LEED has a wide variety of building programs: new construction and major renovation (NC), core and shell (CS), commercial interiors (CI), existing buildings (EB), neighborhood development (ND), homes (LEED for Homes), LEED Retail, LEED for Schools, and LEED for Healthcare.

Green retrofits can be implemented using either LEED-EB standards, which evaluate operations improvements and maintenance, or LEED-CI standards, which focus on sustainable tenant improvements.

But for every organization that embraces green retrofits, there are many others that forego the many benefits of green in favor of conventional retrofits. Some of these may simply be unaware that a green option exists. Many others, however, contend that green adds too much to the cost of a retrofit, or that green’s return on investment (ROI) is too low or unclear.<sup>11</sup>

Deloitte believes that organizations taking this overly cautious approach should reconsider. We believe that within the next three years, companies that do not have green workplaces will be at a competitive disadvantage from higher operating costs, lower productivity, declining attraction and retention of skilled workers, and an increasingly negative brand image.

In addition, owners and investors in conventional buildings will be less able to compete in the marketplace as green buildings become tenants’ preferred choice. An April 2008 study of 1,300 buildings by the CoStar Group found that LEED-certified buildings are commanding rent premiums of \$11.24 per square foot over their conventional building competitors, and they have a 3.8 percent higher occupancy rate.<sup>12</sup> LEED-certified buildings also sell for an average of \$171 more per square foot than their conventional competitors.<sup>13</sup>

Finally, the tax and regulatory incentives now available in many areas to encourage green retrofits are likely to disappear as more cities institute energy-efficient green building construction and renovation regulation and as more organizations adopt green construction, renovation, and retrofit practices as a matter of course.

For all these reasons, we believe that companies pursuing value through green retrofits have good reason to act sooner rather than later.

**Green retrofits: Clear benefits**

What leads organizations to choose green retrofits over conventional retrofits, and what is their experience with carrying out green retrofits? To explore these questions, Deloitte performed a survey of organizations that had undergone at least one LEED-certified green building retrofit. 16 project owners or members of LEED-certified projects participated in the online survey, which was conducted in 2007. Each respondent answered the questions with respect to a specific green retrofit project of his or her choice that had received either LEED-EB or LEED-CI certification.

We expected cost reduction to be the primary motive for most green retrofits. Instead, although savings from energy efficiency was indeed one of the top drivers (cited by 75 percent of the respondents), a number of other benefits unrelated to real estate and facilities costs were at least as important to our respondents (Figure 4). "Corporate environmental commitment" topped the list of motives for the green retrofit, and more than half the respondents also identified greater indoor air and environmental quality, public relations and publicity, improved employee productivity, and enhanced employee attraction and retention as important drivers. From these results, it appears to us that many businesses that are taking on green retrofits are doing so to achieve market rather than cost structure objectives.

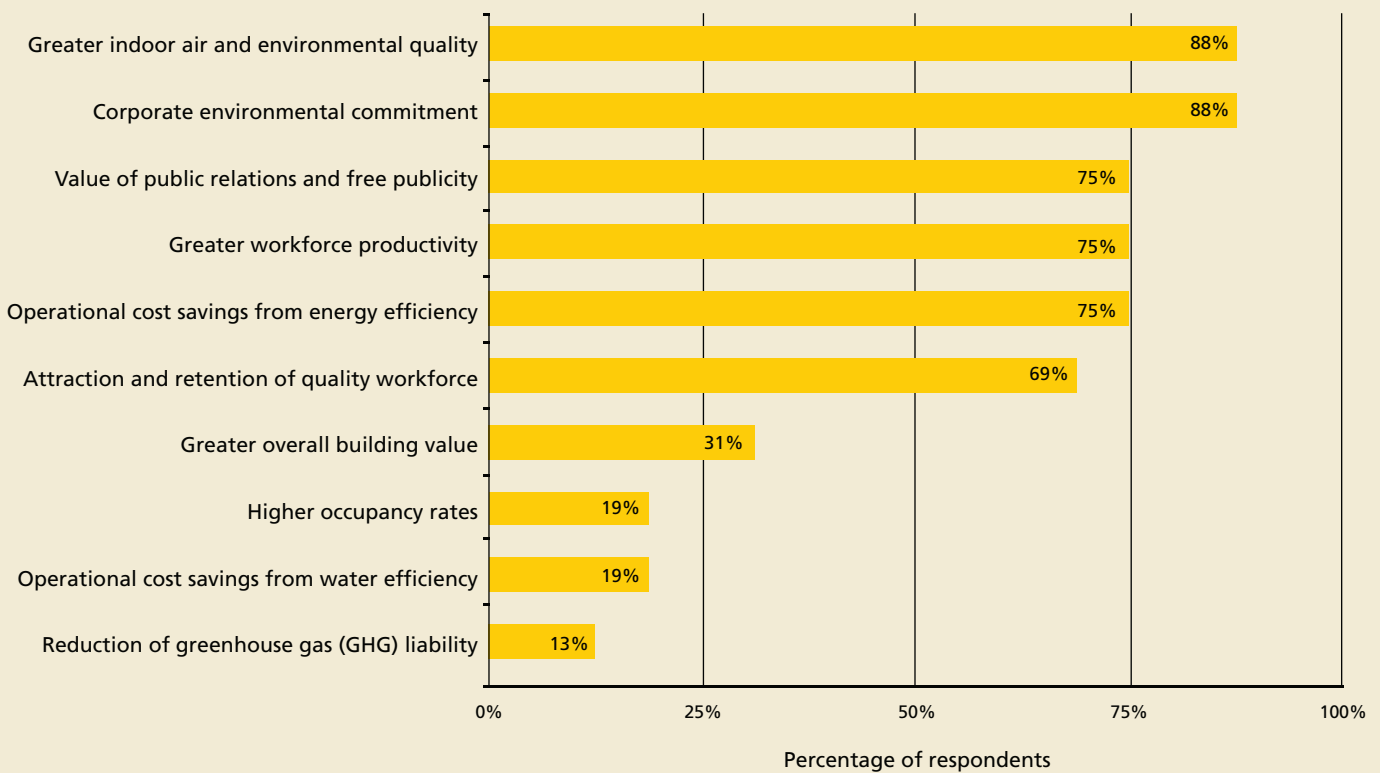
**Deloitte survey respondents on motives for their green retrofits**

"We are an architectural firm and we do green retrofits for our clients. Because we're trying to convince other people to do it, we felt we needed to understand it ourselves. We did it to show leadership, to walk the talk, to demonstrate that it's easy to do and that there's no real risk."

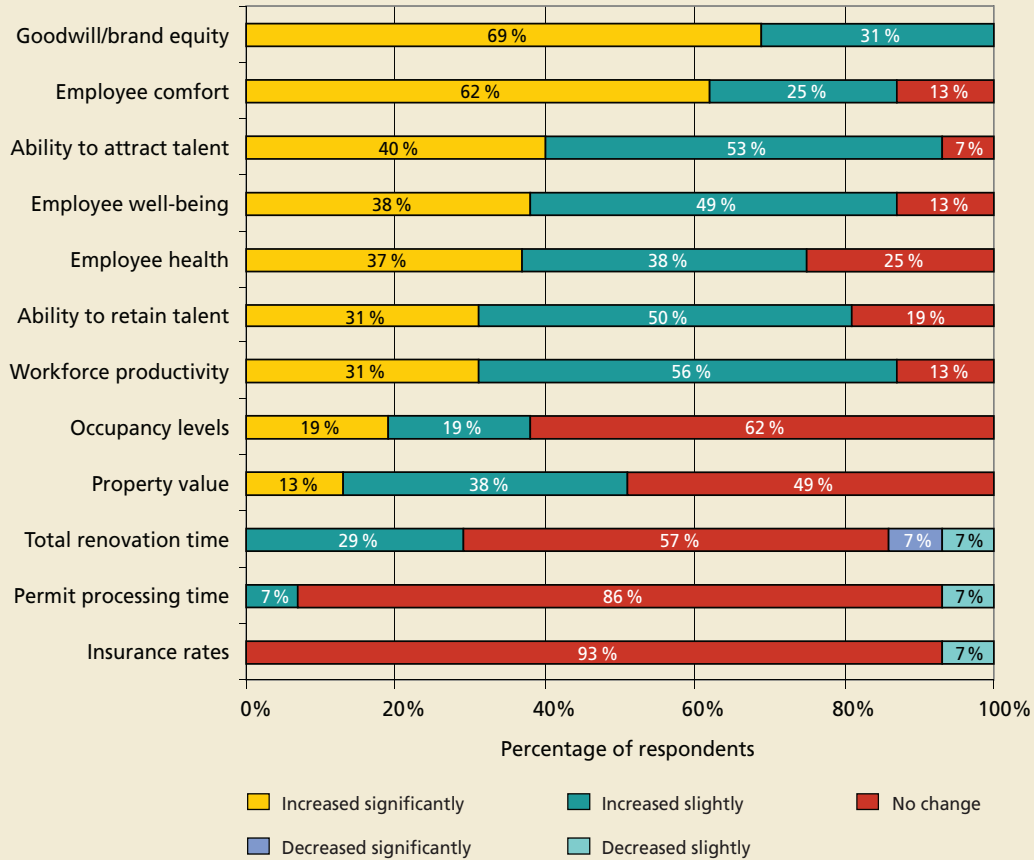
"We wanted to make a statement, not only to the people who work for us, but also to the business community and the community in general: 'Hey look, there is a way to be economically responsible to your business and environmentally responsible to your community.' "

"As a [state institution]-funded building, we don't see the savings. Hence, we did this because it was the right thing to do."

**Figure 4. Motives for undergoing a green retrofit**



**Figure 5. Impact of green retrofit**



By and large, our respondents' green retrofits achieved many of the stated objectives. Ninety-three percent of our respondents reported greater ability to attract talent, 81 percent saw greater employee retention, 87 percent reported an improvement in workforce productivity, 75 percent saw an improvement in employee health, and 73 percent reported that they had achieved cost reductions as a result of implementing green measures (Figure 5).

As a group, survey respondents displayed high satisfaction with their green retrofits. Seventy-five percent of the respondents reported that they were "very satisfied" with their retrofits, and 25 percent reported that they were "somewhat satisfied." Eighty-three percent also reported that they were "very likely" to implement green retrofits in the future, while the remaining 17 percent reported that they were "somewhat likely" to do so.

**Deloitte survey respondents on the benefits of their green retrofits**

"Last year, we saved approximately 17 percent on our utility bill over the existing structure that we were leasing."

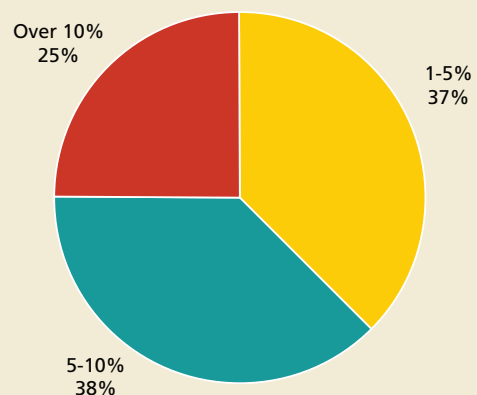
"We had a 23 percent savings on our utility bill based on the way our HVAC system and our electrical system were constructed. We cut our gas usage by about 17 percent."

"The value of the property has gone up. The appraised value of the property today, with the high-tech, computer-controlled HVAC system and electrical system, is about a half a million dollars greater than the appraised value when we completed the construction project a year ago. Selling the building at a premium would not be a problem."

"People want to do business with us now. It's the most amazing thing, the visibility that we've gotten and the opportunity that we've had to use this structure as a platform. [Our revenues increased by 31 percent in the year after we finished construction], and the reasons for that were our increased visibility and the feeling people had that 'you're the kind of company we'd like to do business with.' We've had people who were willing to pay a premium for us."

These high levels of satisfaction occurred even though most respondents paid a cost premium for going green. Sixty-three percent of the respondents reported that they spent 5 percent or more on their green retrofit project than they would have on a comparable conventional project (Figure 6).

**Figure 6. Cost premium of green retrofit project relative to a conventional (non-green) retrofit project**



Where did the cost premium come from? The most frequently cited factor was the cost of green-capable designers and engineers, followed by the extra time and longer learning curve needed to research and implement sustainability practices and products. Longer lead time, higher up-front systems/technology costs, and the limited supply or extra cost of environmentally preferable materials rounded out the list of factors increasing green's cost over conventional costs.

Taken together, these results show that despite the financial barrier to choosing a green retrofit over a conventional one, the overall benefits of green outweighed the costs enough for our survey respondents to be satisfied with their green retrofit projects. Somewhat surprisingly to us, benefits related to corporate image and employee relations were at least as important to our survey respondents as operational cost savings. Finally, the majority of survey respondents paid a cost premium of only 10 percent or less for their green retrofits – which, in our opinion, they are likely to recoup over time due to lower operating costs, higher property values, and/or the value gained through intangible factors.

### The green cost premium: perception and reality

The “green cost premium” issue deserves a closer look, as one of the most common objections raised to green building is the idea that it costs significantly more than conventional construction. Many studies document this widespread perception: 78 percent of architectural, engineering, and construction respondents to *Building Design & Construction* 2007 survey believed that going green “adds significantly to first costs.”<sup>14</sup> And in CoreNet Global/Jones Lang LaSalle's January 2008 survey, 30 percent of respondents believed that new green buildings cost 5 to 10 percent more than conventional buildings, and 22 percent believed that green costs more than 10 percent over the cost of conventional buildings.<sup>15</sup>

How accurate are these perceptions? Certainly, *some* green projects can cost more than a comparable conventional project, as shown by our survey respondents' experience. On the other hand, Davis Langdon's “Cost of Green Revisited” study in 2007 found that “there is no significant difference in average costs for green buildings as compared to non-green buildings. ... Average construction costs have risen dramatically the past three years – between 25 and 30 percent. And yet we still see a large number of projects achieving LEED within budget.”<sup>16</sup> Recent studies by the IFMA Foundation and Turner Construction also demonstrate that most new green buildings cost less than 1 percent more than conventional buildings. Some even cost less than conventional buildings.<sup>17, 18</sup>

Whether or not a green retrofit costs more than conventional, it's clear that the ROI can be substantial. Adobe Systems, for instance, implemented a green retrofit of its downtown San Jose, California headquarters complex at a total cost of \$1.4 million.<sup>19</sup> Although the headquarters' staff grew by 35 percent between 2001 and 2007,<sup>20</sup> Adobe's electricity consumption has *dropped* by 35 percent, natural gas use by 41 percent, domestic potable water consumption by 22 percent, and landscape irrigation water use by 76 percent.<sup>21</sup> In addition, Adobe received \$389,000 in grants and equipment purchase rebates from the city, state, and local utilities for the newly installed energy-conserving technologies.<sup>22, 23</sup> The green retrofit boasted an average per-project payback of 9.5 months, generated a 121 percent ROI, and saves Adobe \$1.2 million annually.<sup>24</sup> And Adobe earned LEED-Platinum ratings for its headquarters buildings in 2006.<sup>25</sup>

### Green retrofit costs and trends

We believe that green retrofits are on the same track that new green construction was five years ago. Just as new green construction costs have dropped greatly in the last five years, any green retrofit cost premium that organizations encounter today will likely decrease over the next few years as more real estate industry professionals become knowledgeable about and experienced in green retrofit design, construction, materials, and technologies. Since 2001, for example, the USGBC has certified more than 43,000 LEED Accredited Professionals, and it has reported a 20 percent increase annually in the number of real estate industry professionals earning LEED accreditations.<sup>26</sup> Too, companies that have completed at least one green retrofit project will have the experience to lessen the time and cost of future green retrofit projects.

### Deloitte survey respondents on green construction's cost premium

“If there was a 30 or 40 percent price differential between green and conventional, it would have been a tough decision. When you're in the 6 to 10 percent range, it becomes a pretty easy decision.”

“If you look at only the capital costs, there is a cost premium for green. But when you extend your definition of the value added, such as productivity increases and better retention, you'll find that it's actually cheaper to go green.”

“A lot of the cost differential between doing it traditionally and doing it green revolved around the fact that we had a lot of education to do. We had to find venues to recycle dry wall, recycle carpets, recycle vinyl wall covering, everything that came out of the building, because nobody was doing that kind of stuff. We spent an awful lot of time educating our general contractor and our architect, and the waste management folks.”

“If you want to tackle green in a way that will significantly decrease operational costs, you usually have to increase your building envelope performance by a significant amount, and also look at the mechanical and electrical systems. That will cost a premium because you have to pay a little more to set them up properly. If you don't tackle those elements, you can get away with a lower cost premium, but you won't reap the operational cost savings.”

### Green buildings: a growing trend

- A 2007 survey of corporate real estate professionals by the trade magazine *Building Design & Construction* with CoreNet Global found that 8 in 10 respondents had incorporated some level of sustainable design in recent construction and renovation projects; 32 percent had done so “extensively,” and only 3 percent had no plans to incorporate green elements into future projects.<sup>27</sup>
- A 2007 survey of architectural, engineering, and construction professionals by *Building Design & Construction* found that 25 percent of the respondents' firms had completed at least one Leadership in Energy and Environmental Design (LEED)-certified project by 2007, up from only 11 percent in 2003.<sup>28</sup>
- In 2003, just 84 buildings had received LEED certification, and 1,203 buildings had been registered for certification. As of April 1, 2008, however, 1,422 buildings had received LEED certification, and another 10,762 buildings (not including LEED for Homes projects) had been registered for LEED certification.<sup>29</sup>

### Deloitte survey respondents on green retrofit trends

“Green retrofits are really coming into the mainstream fairly quickly. There's a huge buy-in from the [construction] industry. There's a shift in the market.”

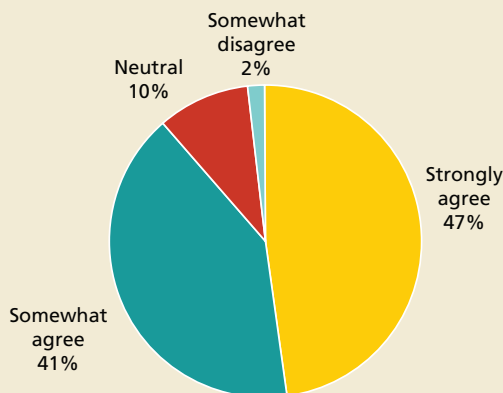
“There has been a significant drop [in the cost premium for green]. Staff costs have decreased because of an increase in availability and knowledge. There has been a small decrease in construction costs as well. Also, the perceived risk of building green has decreased over the years.”

But even though waiting for costs to come down before going green may be attractive from a financial standpoint, companies that do so risk missing out on many of green building's potential intangible benefits: improved brand image, greater attractiveness as an employer, and better community relations. The reason? Our research indicates that many industry observers believe that the green building trend is growing – and as green building becomes more widespread, the marketplace differentiation crucial to such intangible benefits as brand image will become more difficult to achieve.

The evidence is mounting that green building is indeed gaining momentum. Ninety-four percent of the respondents in the 2007 *Building Design & Construction* survey of architectural, engineering, and construction professionals reported that the trend in sustainable building projects is “growing,”<sup>30</sup> 82 percent reported that their firms would be more active in green building in two to three years than they are today,<sup>31</sup> and almost 90 percent reported that their clients were more willing to invest in green building projects in 2007 than they were three to four years ago (Figure 7).<sup>32</sup>

Green buildings can now be found in every building category, from office buildings, stores, warehouse/distribution centers, hotels, and restaurants to universities, car dealerships, police and fire stations, and even convents. The rapid recent increase in USGBC membership, which has swelled from just over 1,000 in 2001 to over 12,000 in 2007,<sup>33</sup> is another testament to green building's increasing popularity.

**Figure 7.** Indicate your agreement with this statement: “Corporations are more willing today than they were three to four years ago to invest in green/sustainable building projects.”



A growing number of local and state governments are mandating energy-efficient green building construction and renovations, first in the public sector, and now increasingly in the private sector. As of April 2008, 28 states, 24 counties, and 96 municipalities had mandated some level of LEED criteria for new and renovated public buildings. And as of May 2008, Boston, Dallas, Los Angeles, Washington, D.C., Montgomery County, Maryland, and other jurisdictions had mandated LEED criteria for some private new construction and renovations.<sup>36, 37, 38, 39, 40, 41</sup> On Earth Day (April 22) 2008, for example, the City of Los Angeles passed a private-sector green building ordinance that requires new commercial buildings and high-rise residential structures with more than 50,000 square feet of floor space, as well as major renovations and low-rise developments of 50 units or more, to build to LEED standards.<sup>42</sup>

### Deloitte survey respondents on talent

“Shortly after the completion of our office renovation, we did attract quite a few talented staff. I think it created a huge positive image change for our company.”

“The comments we hear are, ‘This is a great place to work.’ We have more people wanting to work here than we can hire.”

“A lot of our folks here are younger folks, and sustainable interior design and the ability to work in a [socially responsible] place is very important to them. The younger generation really is sensitive to that, and they get it. It’s important to them to be able to say, ‘I’m an environmentally responsible person.’ And as the 20-somethings come of age in corporate America, what you see today is just the tip of the iceberg of what we’re going to see going forward.”

Companies forced into green retrofits by such mandates stand to lose many of the potential benefits available to companies that go green before such laws take effect. A jurisdiction that passes laws requiring companies to green their workplaces may, at the same time, eliminate tax incentives, rebates, and other financial perks that exist now for companies that undertake green retrofits of their own free will.

The potential benefit in terms of talent attraction and retention is another compelling reason to consider going green sooner rather than later. Many human resource specialists believe that companies across all industries will face a growing talent crunch as members of the Baby Boomer generation begin to retire in increasing numbers in 2008 and onward.<sup>43</sup> To replace these retiring employees, companies will need to appeal to younger generations of workers for whom environmental and social responsibility is an important factor in their choice of where to work. A 2007 MonsterTRAK.com survey found that 80 percent of young professionals are interested in securing a job that has a positive impact on the environment, and 92 percent would be more inclined to work for a company that is environmentally friendly.<sup>44</sup> Because a green workplace can be a convincing way to establish such a reputation, companies that adopt green retrofit practices ahead of the curve may be able to create an image of environmental leadership that will stand them in good stead in their future search for talent.

The bottom line? Companies that want to stay ahead of the green regulatory curve, reap the many green building benefits, and remain competitive in the marketplace should implement green retrofits of their workplaces sooner rather than later. All things considered, we believe the business imperative is clear: The earlier a company adopts green building practices, the bigger the gains it stands to reap.



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