

# 1. AEC Industry Continues to Embrace Green Building, But Is It Still Only a Niche?

## Methodology

In August 2007, *Building Design+Construction* conducted an online survey of a scientifically drawn sample of 10,000 recipients of BD+C to determine their opinions, perceptions, and actions relative to sustainable design and green building. Eligibility to enter a drawing for a \$100 gift certificate was offered as an incentive. Valid responses were received from 631 respondents, compared to 872 in 2006, 524 in 2004, and 498 in 2003. In general, survey respondents represent the broader US architecture, engineering, contractor, and building owner/developer community. For the most part, the 2007 survey questions duplicated those in previous BD+C Green Building Surveys conducted in 2003, 2004, and 2006; a few new questions were added this year. With more than 2,500 total respondents for all of the surveys conducted for this White Paper, the combined research represents the most rigorous data available on the attitudes and actions of the AEC community with regard to green building.

**W**hat a difference four years can make! In 2003, when *Building Design+Construction* conducted its first exclusive survey of where architects, engineers, contractors, and building owners stood on green building, fewer than one in 10 respondents (9%) said they considered their firms to be "very experienced" in sustainability. At the same time, one-third of those surveyed (33%) thought their firms were "somewhat" experienced in sustainable projects.

Over the course of succeeding surveys, in 2004, 2006, and this past August, the reported experience level moved up steadily (chart 1.2). By this year's count, one in six respondents (16%) felt their firms were now "very" experienced in sustainable projects—a steady climb from '04 (12%) to '06 (14%), and significantly greater than the 9% recorded in 2003.

Looked at from the reverse angle, the percentage of respondents who said their firms had "no experience" or "little or no interest" in sustainable design declined from 19% in 2003, to just 4% in the most recent tally—another heartening finding for the green building movement.

Other results reinforce the growing interest in sustainability. More than 42,000 AEC professionals can now put "LEED Accredited Professional" after their names, a phenomenon reflected in the steady rise in LEED APs in our surveys—from 4% in 2003, to 17% today (chart 1.3).

Yet the most tangible piece of evidence in support of green building is this: in our first survey (2003), with

LEED for New Construction in place for barely three years, only one in nine respondents (11%) said their firms had successfully completed a LEED-certified project; in the current survey, one in four (25%) said their firms had put at least one U.S. Green Building Council LEED

**Chart 1.1**  
Where respondents work

	2007	2006	2004	2003
Architecture firm	34%	26%	30%	23%
General contractor/CMfirm	16%	9%	7%	6%
Design/build firm	10%	6%	6%	7%
Owner/developer	8%	5%	5%	5%
Architecture/engineering firm	8%	12%	11%	12%
Government agency	5%	7%	7%	9%
Facility manager	3%	3%	3%	4%
Consultant	2%	2%	3%	3%
Project management	2%	1%	2%	1%
Engineering firm	2%	14%	10%	11%
Engineering/architecture firm	2%	5%	3%	5%
University/academia	1%	1%	2%	2%
Other	4%	5%	4%	4%
Base: 631	Base: 872	Base: 523	Base: 495	

BD+C Green Building Surveys, 09/03, 09/04, 09/06, 08/07

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BD+C's Green Building Surveys represent the most comprehensive long-range study of the opinions and activity of the US AEC community with regard to green building and sustainability. The 2007 survey, the fourth in a series of these longitudinal studies, shows a statistically significant increase in the number of architecture firm (34%) and contractor respondents (16%) compared to previous years, as well as a slight uptick in those from design/build firms (10%). The respondents represent a broad cross-section of the US nonresidential building industry.

## Principal findings of the 2007 survey

- Ninety-four percent of respondents said the trend in sustainable building projects is "growing."
- Nearly two-thirds of respondents (64%) said their firms were "very" or "somewhat" experienced in green building.
- One-fourth of those with green building experience were at firms that had achieved LEED certification for at least one project.
- "First cost" was a serious roadblock for respondents. Nearly four in five (78%) said their clients thought sustainability added "significantly" to first costs. By an even greater margin (86%), respondents themselves said they thought green buildings more costly to build than conventional buildings.
- Daylighting, automated lighting controls, recycled building materials, energy management, and low-VOC paints and finishes were the most highly used green elements in respondents' projects.
- Nearly a third of respondents (31%) said they have trouble sourcing green products. There is still uncertainty in the marketplace as to what constitutes "green."

plaque on a building (chart 1.3).

All of these results represent good news for the green building movement and for its advocates: the U.S. Green Building Council (promulgator of LEED), the Green Building Initiative (with its Green Globes rating program), the American Institute of Architects (whose Committee on the Environment has championed sustainability for more than three decades), and the numerous product certification systems that have sprung up to measure the “greenness” of building products—the EPA’s Energy Star system, Greenguard, the Carpet & Rug Institute, FloorScore, Scientific Certification System, and, more recently, MBDC’s Cradle to Cradle (C2C) Certification.

But while the curve in “market transformation”—the motto the USGBC uses to codify its chief goal—is up and to the right, the slope is a lot less steep than green building proponents might have hoped for. In launching LEED for New Construction in 2000, the USGBC stated that it would seek to have 25% of new projects certified under LEED; however, it has fallen far short of that mark, in terms of the total nonresidential construction market. Conservatively, something on the order of 20,000 commercial, industrial, and institutional buildings are constructed in the U.S. annually; that would put the total of such new buildings since 2000 in the 120,000–140,000 range. Thus, with 1,097 projects (including those outside the U.S. and Canada) certified

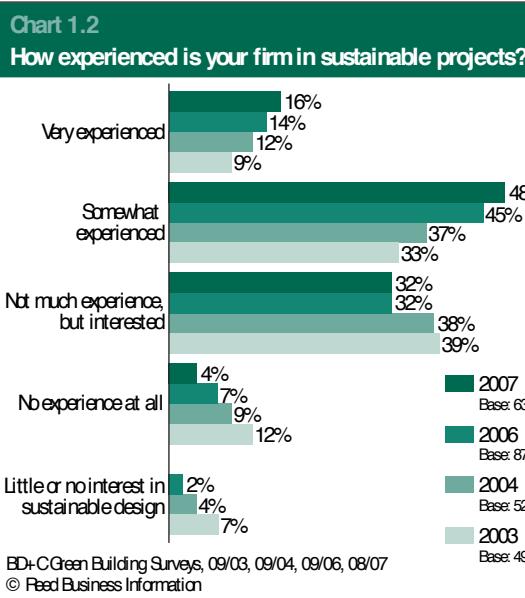
since 2000 for all programs—not just LEED for New Construction (820), but also LEED for Existing Buildings (59), Commercial Interiors (170), and Core & Shell (48)—LEED-certified buildings apparently represent less than 1% of the U.S. construction market.\*

It is true that the number of projects registered with LEED—7,711, as of October 4, 2007—would start to bring that impact factor more in the 5–7% range. However, many projects that register with LEED never complete the certification process—no one knows how many, since the USGBC doesn’t release that data. On the other hand, there are many projects that sidestep the LEED process but probably would have qualified for certification. To what extent these two factors cancel each other out is anyone’s guess.

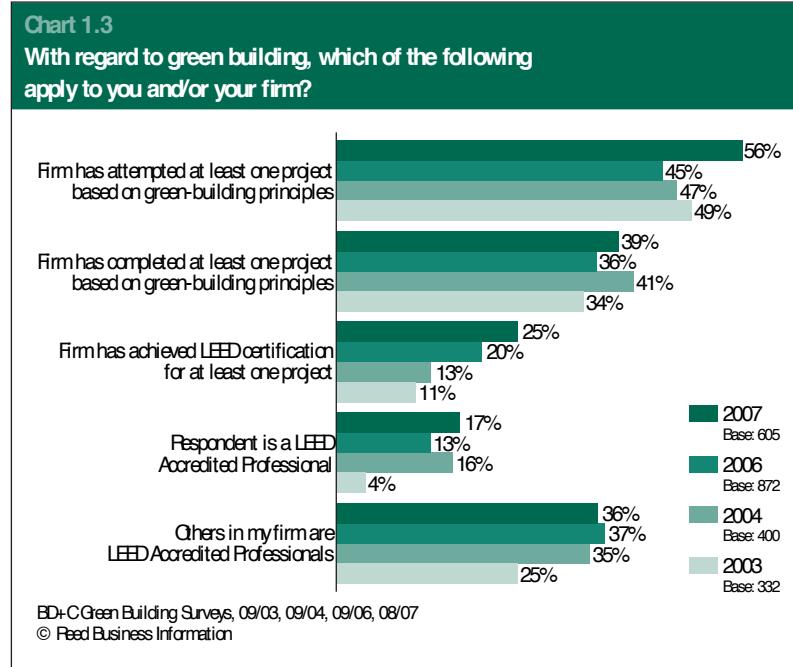
\*Another 336 homes have been certified under LEED-H, but this represents a minuscule portion of the 1.3–2.0 million annual U.S. new housing construction. Source: U.S. Green Building Council, October 2007.

### Assessing the financial benefit of green building on AEC firms

To get a more tangible—or more pecuniary—measure of green building activity in the AEC industry, this year for the first time we asked our readers to estimate the approximate dollar impact of green building on their businesses (chart 1.4). A significant majority of respondents (61%) said sustainable building projects represented less than 25% of their firms’ annual dollar volume, with another 15% saying they fell in the second quartile (25–49%). A minority of respondents (10%) stated that green building contributed half or more of their

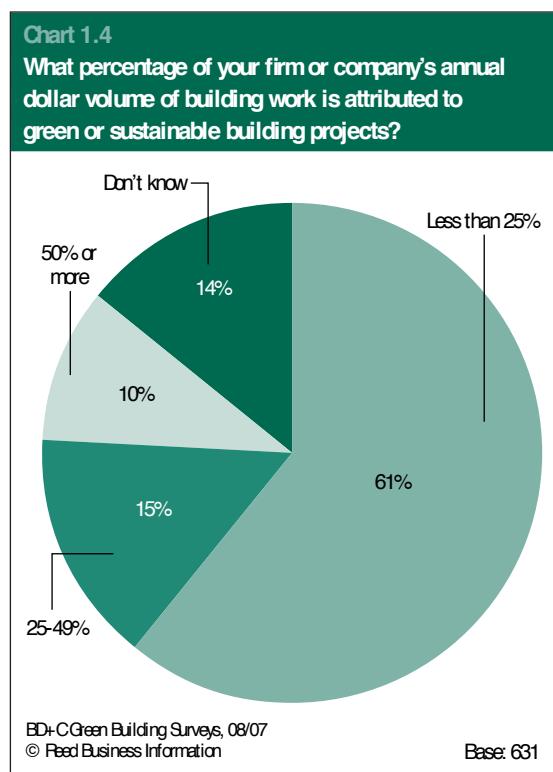


AEC firms’ experience in green building continues to grow, judging by survey data. The percentage of respondents who said their firms were “very” or “somewhat” experienced in sustainable projects grew significantly to 64%—nearly two out of three—reflecting a steady climb from 42% in 2003, 49% in 2004, and 59% last year. Still, those classifying their firms as “very experienced” remain a minority (16%), indicating that green building may still be considered a niche. At the same time, responses for firms that had no experience or little or no interest in sustainable projects continued to decline (4% in 2007, 9% in 2006, 13% in 2004, 19% in 2003).



One in four respondents (25%) reported that their firms had achieved LEED certification for at least one product, a significant step upward since 2003 (11%). For the first time, the percentage of respondents who stated that their firms had attempted at least one project based on green building principles tipped over into the majority (56%). The steady growth of respondents who had achieved LEED Accredited Professional status (4% in 2003 to 17% in 2007) also bespeaks greater involvement in green building among AEC professionals.

**'The most tangible piece of evidence in support of green building is this: One in four respondents said their firms had put at least one U.S. Green Building Council LEED plaque on a building.'**



This question, new to our White Paper surveys this year, adds weight to the argument that green building represents a niche opportunity for the majority (61%) of AEC firms, while an apparently aggressive group of firms (10%) seems to have jumped feet first into the sustainability fray.

**Chart 1.5**  
**Has acquiring sustainable building expertise helped your firm attract new clients or projects?**

	2007	2006	2004	2003
Yes	43%	39%	36%	32%
	Base: 631	Base: 856	Base: 468	Base: 423
<b>If so, how much?</b>				
Significant amount of new business	10%	11%	11%	6%
Some new business	41%	53%	40%	43%
Mnr amount of new business	49%	36%	49%	52%
	Base: 269	Base: 337	Base: 164	Base: 126

BD+C White Paper Survey, 09/03, 09/04, 09/06, 08/07  
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Over the past four years, expertise in green building has not led to a great influx of new business for AEC firms. The percentage of respondents who said that "being green" had helped their firms get new business was up slightly—to 43% in 2007, from 39% in 2006—but those reporting "significant" new business were a distinct minority (10%).

In response to a separate question, 45% said sustainable design expertise had helped their firms retain existing clients, compared to 42% in 2006—not a statistically significant difference; 46% said such expertise had helped their firms differentiate themselves from others, a significant difference from the 39% who reported this factor in 2006.

revenues. (Fourteen percent said they didn't know how much green building affected their revenue streams.)

This new set of findings seems to correlate with longitudinal data over the period 2003-2007. When we asked, "Has acquiring sustainable building expertise helped your firm attract new clients or projects?" (chart 1.5), 43% of this year's 631 respondents said it had, up slightly from 2006 (39%) and significantly from '04 (36%) and '03 (32%). In other words, green knowledge and skill could be viewed as bringing in the green.

But when we followed up with the 269 respondents who said such expertise had brought in new business, once again this group indicated a somewhat lukewarm response to green building from clients and prospects. Only 10% said green building expertise had brought in a "significant" amount of new business, with nearly half (49%) stating that they had benefited from only a "minor" amount of new business; the rest (41%) said expertise in sustainability had rung up "some" new business. These findings have remained fairly consistent over the last four years, and reinforce the argument that most AEC firms are not getting rich from their green building portfolios.

In fact, we know from anecdotal experience that a number of firms in *Building Design+Construction's* "Giants 300" list are betting that green building expertise and experience will differentiate them in the marketplace.

Large architecture firms are pushing their staffs to become LEED accredited. Among the *BD+C* Giants, Perkins+Will leads the way with 753 LEED APs, representing 61% of its staff. Gensler, the largest AEC firm by revenue (\$421 million in 2006), has 575 LEED APs, and such design firms as HOK, SmithGroup, HDR, Mithun, HKS, Harley Ellis Devereaux, and OWP/P are all planting the green flag. Among engineers, Arup, Environmental Services Design, and Stantec are strutting their sustainability credentials. Contractors Turner, Swinerton, Skanska, DPR Construction, Consigli, Gilbane, and Shawmut are making great strides in sustainable expertise. Today, the leading firms routinely divert 80-90% of construction and demolition waste from landfill—a remarkable achievement, considering that hardly any such recycling was going on as recently as five or six years ago.

Another factor that may be at work here is that more and more firms, both big and small, tell us that they are

just “doing green” routinely, without making a big fuss over it, or that they have “always” practiced that way; that is, they claim to have integrated sustainable design and construction into everyday practice. If this is truly the case, then it is a victory for those who advocate (as we do at BD+C) early and integrated involvement of the entire Building Team in projects.

Nonetheless, most of this year’s respondents claimed to perceive various forms of resistance to green building among their paying clients (chart 1.6). When asked to describe barriers to incorporating sustainability into their projects, more than three-quarters of respondents (78%) clicked the button marked “Adds significantly to first costs”—a remarkable (and statistically significant) jump from the year before (56%). This finding was backed up by the 60% who said the “market [is] not willing to pay a premium” for green building. Only a small percentage (4%) said sustainable design was not seen as a barrier among their clients and prospects.

### Still concerned about first costs

To drill down on the first-cost issue, this year we asked respondents (chart 1.7) whether they (not their clients) thought it would cost more to build a typical green project (for example, LEED certified) versus a “conventional” building. The result was astounding: 86% said they thought the green building would be more costly, with only a smattering (1%) saying a green building would cost less to build, and the remainder (13%) saying the costs would be about equal.

We then asked the 541 who replied that green buildings cost more to build than conventional ones what they thought the premium would be. The median differential range was an additional 6-10%; more than four in 10 (41%) stated that they thought green buildings would run more than 10% additional in cost compared to nongreen projects.

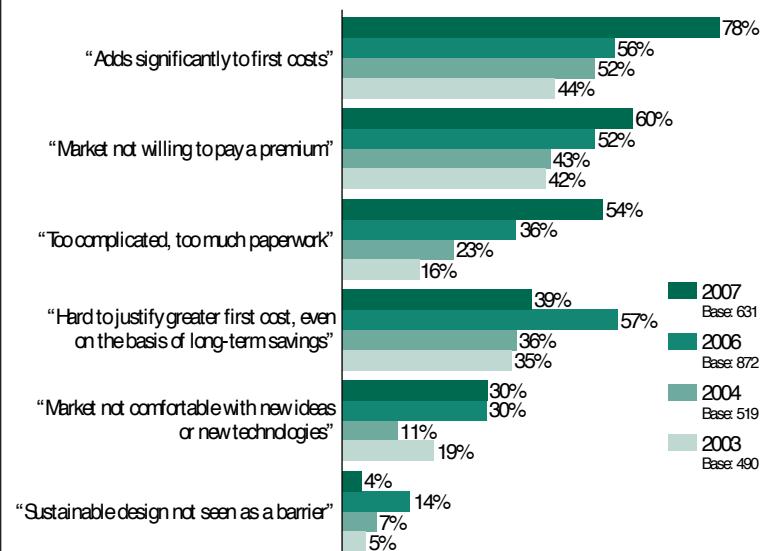
These findings are somewhat discouraging, especially in light of anecdotal evidence from experienced green building firms who tell us that a baseline green project—for example, one that could gain LEED certification or one Green Globe—should be deliverable within a conventional budget range. (The exception would be very high-end projects featuring a lot of elaborate “add-ons” with long-term paybacks, such as active photovoltaics.) Today, nearly a decade into the green building movement, the rule of thumb for experienced Building Teams is that most code-compliant new buildings probably could achieve 15 or 16 LEED points, and that getting another 10-11 points to achieve certification is usually not that difficult—especially when you get a point for having a LEED Accredited Professional on the team and another for the notorious “bike rack” credit.

This makes it even harder to understand why, accord-

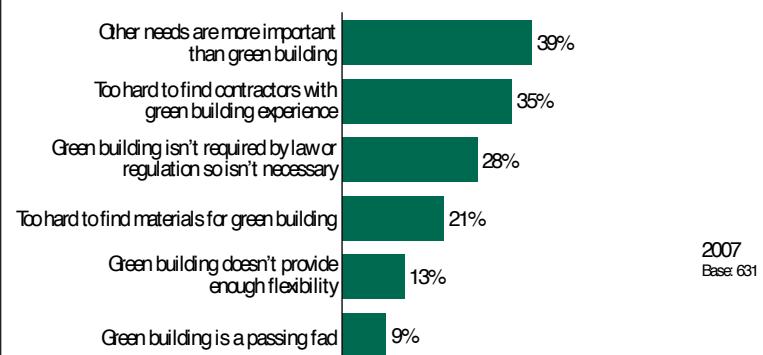
**‘If AEC firms misjudge the direction of the market and green building takes off, their laissez-faire stance could be a sure ticket to oblivion.’**

Chart 1.6

What are building owners and developers saying about barriers to incorporating sustainable or green design into their projects?



### Other concerns of owners and developers cited by respondents



BD+C Green Building Survey, Q3/07  
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When will the “first-cost bogeyman” go away? Despite numerous studies showing that green buildings need not cost more (or much more) than conventional buildings, and in the face of pragmatic experience from many AEC firms that are doing sustainable projects without cost increments, more than three-fourths of respondents (78%) cited client fear of additional first cost as the main obstacle to greening their projects. This is a huge leap from previous years (56% in 2006) and, coupled with the finding that 60% said the “market is not willing to pay a premium,” it indicates that the AEC community has a huge selling job on its hands to convince many owners and developers that sustainable development can be done affordably.

In answering a new set of questions for 2007, respondents pointed to “other needs” as being more important than green building to owners and developers.

<sup>1</sup> "The Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption," Lisa Fay Matthiessen and Peter Morris, Davis Langdon, July 2007.

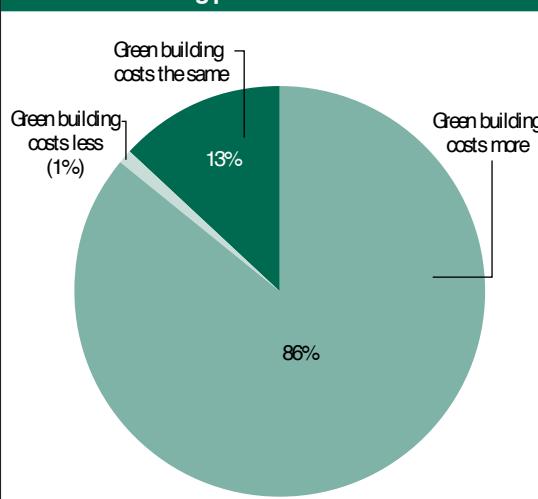
<sup>2</sup> "Costing Green: A Comprehensive Cost Database and Budgeting Methodology," Lisa Fay Matthiessen and Peter Morris, Davis Langdon, September 2004. [www.davislangdon-usa.com/pdf/USA/2004CostingGreen.pdf](http://www.davislangdon-usa.com/pdf/USA/2004CostingGreen.pdf)

<sup>3</sup> Of which two are notable: The "Kats" report, after its principal author, Greg Kats ("The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force," October 2003, [http://eetd.lbl.gov/emills/PUBS/PDF/Green\\_Buildings.pdf](http://eetd.lbl.gov/emills/PUBS/PDF/Green_Buildings.pdf), and "GSA LEED Cost Study: Final Report," Steven Winter Associates Inc., October 2004, [www.wbdg.org/cb/GSAMAN/gsaleed.pdf](http://www.wbdg.org/cb/GSAMAN/gsaleed.pdf).

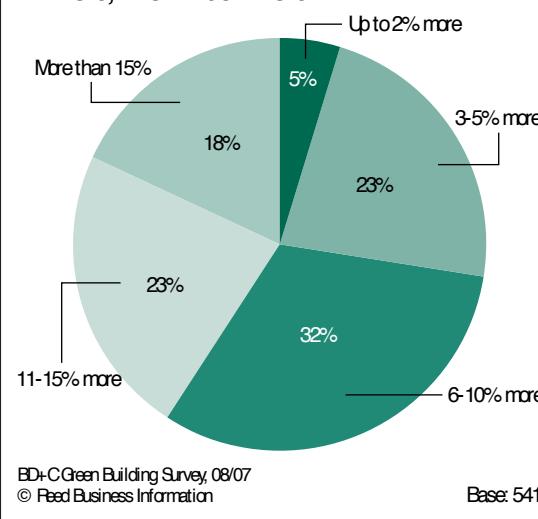
ing to our respondents, clients and prospective clients still seem spooked by the green "first-cost" specter. Added to the anecdotal evidence is more rigorous analysis that additional "first cost" is more apparition than reality. This comes from a recent report<sup>1</sup> by Lisa Fay Matthiessen and Peter Morris of Davis Langdon, a follow-up to the real estate consulting firm's earlier study of the costs of green building.<sup>2</sup> The authors' chief findings:

Chart 1.7

How does the initial cost of a green or sustainable building (i.e., LEED certified) compare to the cost of a building that does not employ green or sustainable building practices?



If "more," how much more?



The overwhelming belief among respondents that green buildings cost more than conventional buildings—86%!—is truly remarkable, especially in light of authoritative research studies showing that green projects, even ones in the LEED Silver category, can be done at little or no additional cost. Forty-one percent of this group put the additional cost at greater than 10%, despite evidence from the field that few green projects have had such a high incremental cost.

1. Many projects are achieving LEED within their budgets, and in the same cost range as non-LEED projects.

2. Construction costs have risen dramatically, but projects are still achieving LEED.

3. The idea that green is an added feature continues to be a problem.

The authors conclude: "The 2006 study shows essentially the same results as 2004: there is no significant difference in average costs for green buildings as compared to non-green buildings. Many project teams are building green buildings with little or no added cost, and with budgets well within the cost range of non-green buildings with similar programs."

On the one hand, therefore, we have growing anecdotal evidence from the field (as well as data from various well-respected reports<sup>3</sup> cited in previous BD+C White Papers) to make the case that good-quality green building can be done within reasonable budgetary constraints. On top of that comes the highly respected consulting firm Davis Langdon stating categorically that there is no significant cost differential between green and non-green projects. Yet more than three out of four of our BD+C survey respondents see their clients unnerved by the prospect, however unrealistic, of higher first costs. This perceived client aversion to higher first costs from green building may be enough to keep AEC firms from structuring sustainable design and construction principles and practices into their proposals. If clients are fearful of the costs of green building, why upset the apple cart?

### The tried-and-true, the unconverted, and the bulge in the middle

Looking broadly at the data from all four Green Building Surveys, the argument could be made that the classic bell-shaped curve is at work here. At one end of the curve are the nonbelievers, perhaps 10-15% of AEC professionals and firms who couldn't care less about green building, or think it's a passing fad, or who are otherwise disengaged; at the other end are the 10-15% of true believers who see green in everything they do.

That leaves a dromedarian hump in the center of the frame, some 70-80% of design and construction professionals and firms who are "somewhat" interested or motivated, but who have yet to be convinced that green building is right for themselves or their clients. Many firms in this group are standing on the sidelines, waiting for a signal to enter the game. Others are dipping their toes into a green project or two to test the waters. For whatever reason, however, many firms are just not buy-

# 'Looking ahead, more than four in five AEC professionals said their firms would be "somewhat" or "significantly" more active in green building in the next two or three years.'

ing into the "transformational" aspect of green building. Why is this so? Why, assuming our data is valid (and we have no reason to doubt it), are so many AEC firms still spectators when it comes to green building?

One reason may be that, given today's hectic—some would say frantic—pace of construction activity, business is so good that these firms can simply ignore the sustainability issue and still get plenty of work. Maybe they and their clients have more overriding concerns; in fact, 39% of respondents said that their clients would consider "other needs" more important than green building (chart 1.6). Or perhaps inertia is the problem: "This is the way we've always done it," these respondents are saying, in reference to how their firms approach the market, "and until our clients tell us otherwise (or the world turns upside down), we'll keep doing it this way."

Of course, if AEC firms misjudge the direction of the market and green building takes off, their laissez-faire stance could be a sure ticket to oblivion. In fact, survey data indicates that they are aware of this dilemma. When we asked respondents to agree or disagree with the state-

ment "My firm or organization will be left behind if it does not become active in green building and sustainable design" (chart 1.8), 61% agreed; 29% gave it a 4 ("agree"), 32% gave it a 5 ("strongly agree"). Nor do we mean to imply that the great bulk of AEC firms are purposely ignoring market signals that point to greater client acceptance of green building.<sup>4</sup>

It is remarkable, however, that with all the publicity green building has received in the last few years, coupled with all the recent publicity about climate change, so many survey respondents still seem cowed by their clients' phobia of higher first costs for green buildings. Clearly, many AEC firms need to do a better job of informing their client base of the benefits of green building and their own ability to keep costs in line.

This shortcoming is especially troubling in light of the response (chart 1.8) to a new question in the 2007 survey. This year, we asked respondents to rate their agreement with this statement: "Clients are more willing than they were 3-4 years ago to invest in green building projects." Twenty-three percent of respondents gave

<sup>4</sup> *The growing acceptance of the "new reality" of green building by the financial, corporate, and real estate development sectors is more fully developed in our November 2006 White Paper, "Green Buildings and the Bottom Line."*  
[www.BDCnetwork.com/whitepaper](http://www.BDCnetwork.com/whitepaper)

\* See "40,000 LEED APs and Counting," *Building Design+Construction*, July 2007, p. 71. <http://www.BDCnetwork.com/article/CA6459403.html>

**Chart 1.8**

**Key finding: Green buildings seen as healthier for occupants than conventional buildings**

	2007	2006	2004	2003
Green buildings are healthier for occupants than conventional buildings	4.01	4.13	3.95	3.68
Owners should receive tax and/or other financial incentives for building sustainable buildings	4.00	4.27	4.14	3.86
Green buildings significantly reduce energy costs	3.92	4.13	3.92	3.76
The Federal government should devote more funding and support to green-building technology	3.77	3.98	3.76	3.41
My firm or organization will be left behind if it does not become active in green building and sustainable design	3.73	3.65	3.38	3.03
Clients are more willing today than they were 3-4 years ago to invest in green or sustainable building projects*	3.73	-	-	-
State and local building code authorities should adopt sustainability standards for new construction	3.65	4.08	3.77	3.57
Building a structure using sustainable design improves the overall quality and design of the building	3.65	3.74	3.59	3.32
Green buildings save money by reusing and recycling materials	3.41	3.67	3.40	3.34
Green buildings enhance worker productivity and job satisfaction	3.39	3.76	3.53	3.22
The life cycle cost of green buildings is less than that of comparable conventional buildings*	3.38	-	-	-
Green buildings are more profitable than comparable conventional buildings**	3.03	3.24	-	-
Green buildings cost no more to build than conventional buildings	2.49	3.00	2.63	2.74
Base: 631 Base: 872 Base: 523 Base: 495				

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\*New question in 2007 survey.

\*\*New question in 2006 survey.

Scoring 4 or more on a 5-point scale in these surveys is a strong indicator of belief on the part of respondents. Thus, the top two scores for 2007—that green buildings are healthier for occupants than "conventional" buildings (4.01), and that owners and developer should get special tax treatment for doing green buildings (4.00)—indicate strong support for these statements. Due to sample size, most differences from year to year are not statistically significant; overall results are largely consistent from year to year. Note: A mean score of 3.00 (on a scale of 5) would be considered neutral.

A new item for 2007—"Clients are more willing than they were 3-4 years ago to invest in green building projects"—gained a respectable 3.73 score, with 23% of respondents giving it a 5 ("strongly agree").

it their highest rating, 5 ("strongly agree"); overall, the statement garnered a positive 3.73. This finding should

## Green building and the Talent War

AEC firms are ramping up their recruitment of professionals with green building work under their belts. This year, 24% of respondents said their firms had made an effort to hire professionals with sustainability experience—a significant jump from the 15% recorded just one year ago (chart 1.12, p. 12). This may be a reflection of the industrywide talent shortfall, which is currently the greatest barrier to growth among AEC firms. In fact, staffing shortages were found to be a growing factor thwarting firms from doing green projects: Nearly one in four respondents (24%) stated that "insufficient staff" had led their firms to forgo attempting a green building project (chart 1.9).

**Chart 1.9**  
Have you tried to persuade clients or your organization to attempt a green building project?

	2007	2006	2004	2003
Yes	74%	66%	54%	42%
Base:	631	872	519	486
<b>If yes, what happened?</b>				
Incorporated sustainable elements				
in a project but did not register it	54%	54%	40%	37%
Working on a sustainable design project	43%	35%	36%	35%
Looked at sustainable design principles, but did not employ them	35%	39%	34%	40%
Completed a sustainable design project	24%	21%	28%	20%
Base:	468	571	277	205
<b>If no, why not?</b>				
"Perceived lack of interest by client or firm's own management"				
"Insufficient budget"	39%	39%	44%	41%
"Not sure of payoff"	36%	32%	31%	29%
"Not required"	34%	33%	26%	30%
"Insufficient staff"	31%	45%	35%	41%
Base:	163	301	231	260

BD+C Green Building Surveys, 09/03, 09/04, 09/06, 08/07  
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A steadily growing percentage of respondents (74% in 2007, versus 42% in 2003) reported "pushing" green to either clients or their own firms. Of those who were advocating sustainability to clients or their firms, 26% were rebuffed for various reasons, most interestingly "insufficient staff." This finding may be a reflection of the general shortage of qualified professionals being reported by AEC firms.

provide encouragement to those who, while aware of the brouhaha surrounding initial cost, are nonetheless sufficiently heartened to push the case for green building to their clients and prospects.

## AEC firms on the right road, although it may be a bit bumpy

Looking ahead, more than four in five AEC professionals (82%) said their firms would be "somewhat" or "significantly" more active in green building in the next two or three years (chart 1.10). Very few (3%) predicted their firms would be less active or not active at all in green building, with the remainder (14%) holding to the status quo (which itself could vary, depending on the respondent firm's current level of activity). On a more positive note, three in four respondents (75%) gave high scores (4 or 5 on a 5-point scale) to a new question in the 2007 survey (chart 1.11), "What level of consideration

**Chart 1.10**  
How active in green building will your firm be in 2-3 years?

	2007	2006	2004	2003
Significantly more active	37%	30%	24%	16%
Somewhat more active	45%	47%	46%	44%
About the same as today	14%	18%	21%	26%
Less active	1%	1%	2%	2%
Not active at all in green building	2%	3%	6%	12%
Base:	631	863	508	489

BD+C Green Building Surveys, 09/03, 09/04, 09/06, 08/07  
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Agrowing percentage of respondents (37% in 2007, versus 16% in 2003) saw their firms becoming "significantly more active" in green building in the next 2-3 years. Only a scattering (3%) said their organizations would be "less active" or "not active." The response "About the same as today" may be ambiguous, since it does not indicate how active in green building the individual respondent's firm already may be.

## More on first costs from the Davis Langdon study

In "The Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption," Davis Langdon's Lisa Fay Matthiessen and Peter Morris reviewed their own 2004 report on the initial costs of green building. Some additional findings from the new analysis:

- In many areas of the country, contractors have "embraced" sustainability and are no longer bumping up their bids to cover what they once perceived as higher costs for green building.
- Building Teams are using common sense in their choice of green strategies. In general, they are achieving LEED certification by using lower-cost technologies, while forgoing more elaborate and expensive strategies.
- Building Teams are taking a conservative approach to energy conservation. Matthiessen and Morris report that "few projects attempt to reach higher levels of energy reduction beyond what is required by local ordinances, or beyond what can be achieved with a minimum of cost impact."
- Some Building Teams, especially less experienced teams shooting for LEED Gold or Platinum, continue to see sustainability as an add-on that justifies added cost. "Until design teams understand that green design is not additive, it will be difficult to overcome the notion that green costs more, especially in an era of rapid cost escalation," the authors write.
- While average construction costs have risen 25-30% in the past three years, many projects continue to achieve LEED standards with budget.



### Defining Rooftop Sustainability

In the commercial roofing industry, reflectivity has been the dominant discussion point for several years, and the Duro-Last® Cool Zone® roofing system has set the standard for single-ply roof reflectivity and the resulting energy savings. Now the term “sustainability” is receiving a lot of attention, and once again, Duro-Last is raising the bar.

What does sustainability really mean for building owners, facility managers, architects, and other specifiers? For a roofing system to be considered sustainable, it must deliver the Five E’s of high-performance roofing:

- Energy – With energy costs continuing to rise, it’s more important than ever to select a roof that can reduce energy use and improve a building’s efficiency in any climate.
- Environment – High-performance roofing minimizes the impact on the Earth’s environment throughout the roof’s life, while also helping to maintain a healthy, productive environment inside the building.
- Endurance – A high-performance roof meets or exceeds performance requirements for long life: all-weather reliability; chemical, fire, and puncture resistance; and ease of maintenance and repair.
- Economics – A high-performance roof has to make economic sense, not just at the time of purchase, but also in the long run. A true economic comparison analyzes the cost of a roof throughout its life-cycle.
- Engineering – Utilizing the right materials, design, and manufacturing process is the key enabler of the other four E’s, resulting in a complete, integrated roofing system that can be installed quickly and easily and performs reliably over the long run.

Sustainable roofing is one of those rare cases where there does not have to be a tradeoff between “green” and performance, or “green” and cost. Sustainable roofing systems cost less over time because they reduce energy bills, minimize environmental impact, require less maintenance, and keep the weather outside, where it belongs. Case in point: the Cool Zone roofing system is a protective, performance-enhancing umbrella that protects buildings from the elements, reduces energy requirements, enables uninterrupted facility operations, and contributes to the health and productivity of the building occupants.

When you consider the Five E’s, alone and together, sustainable roofing takes on a new meaning, and one very good definition emerges: the Duro-Last Cool Zone roofing system.

To learn more about the Five E’s of high performance roofing, I invite you to visit our website at <http://www.duro-last.com/coolzone/>. Also, feel free to contact me with questions or comments at 800-248-0280, or [tholling@duro-last.com](mailto:tholling@duro-last.com).

Thomas G. Hollingsworth  
President  
Duro-Last Roofing, Inc.

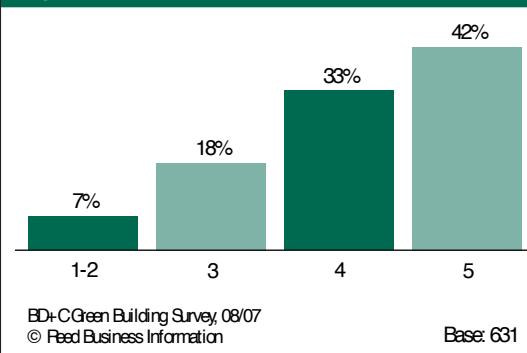
should be given to sustainable or green design when a major building project is being contemplated?" Forty-two percent gave this response a 5 "strong" agreement.

However, whether this positive attitude toward green building will translate into a windfall for AEC firms remains uncertain (chart 1.13). More than half of all

respondents (53%) stated that the trend line in sustainable building projects is either flat or declining (6%) or increasing by less than 25% a year (47%). In 2007, relatively more saw green building ramping up at a rate of greater than 50% a year than in 2006—9% in '07, versus 5% in '06.

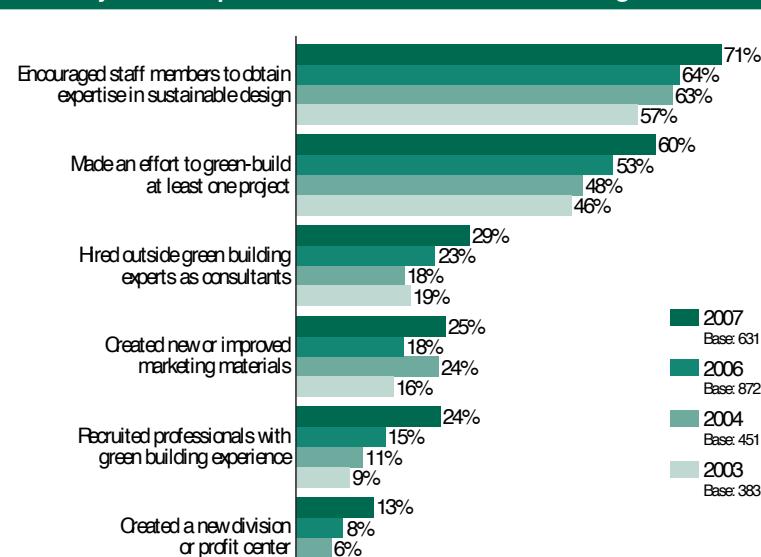
Putting the data together from the perspective of four years of surveys, it is fair to say that the green building movement has, in less than a decade, advanced from being just a gleam in its founders' eyes, to a highly visible subsector of the \$524 billion nonresidential construction

**Chart 1.11**  
What level of consideration should be given to sustainable/green design when a major building project is being contemplated? (5-point scale)



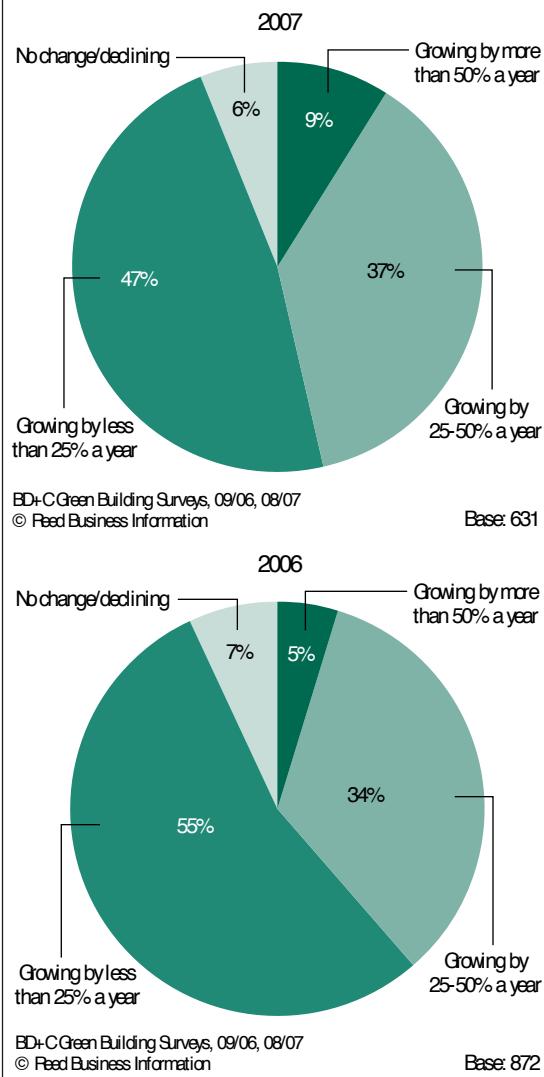
Three-fourths of respondents (75%) gave sustainability high marks for consideration (4 or 5 on a 5-point scale) when a project is just starting. Only a few gave it low marks (1 = 2%, 2 = 5%). However, based on other evidence, there is a significant gap between "consideration" of green design and actual implementation.

**Chart 1.12**  
How has your firm responded to the market for sustainable design?



According to survey respondents, the overwhelming majority of AEC firms (71%) are encouraging their staffs to gain green building expertise, presumably through such means as LEED accreditation training and continuing education efforts. Yet while firms clearly are encouraging green training, only a small minority of respondents (13%) said their firms have set up a special unit or profit center devoted to green building—perhaps an indication that more firms are integrating sustainability into firm-wide day-to-day activities.

**Chart 1.13**  
In your view, what is the trend in sustainable building projects?



Relatively modest growth in sustainable projects seems to be the predicted pattern based on BD+C Green Building Survey responses for the last two years. Only a small percentage of respondents (9%) predicted explosive growth (more than 50% a year) for green building.

**Chart 1.14**

**Which of the following have you incorporated into recent building or renovation projects?**

**Which do you plan to incorporate in future projects?**

	Have used	Plan to use
Daylighting	71%	74%
Automated lighting controls	58%	68%
Recycled/renewable building materials	57%	64%
Energy management	56%	69%
Low-emitting paints/finishes/adhesives	55%	63%
Acoustics/soundproofing	52%	57%
Low-emitting carpeting	47%	59%
Environmentally sensitive landscaping	46%	58%
High-reflectance, high-emittance roof surfaces	45%	57%
Energy analysis/modeling tools	44%	54%
Environmentally responsive site design	43%	57%
Building commissioning	35%	44%
Reused construction and demolition waste	35%	51%
Green furniture, fixtures, equipment	32%	45%
Passive solar	30%	48%
Stormwater harvesting	29%	51%
Environmentally preferred purchasing	27%	35%
Waterless urinals	22%	37%
Geothermal heating/cooling	21%	35%
Green (vegetated) roof	19%	34%
Photovoltaics	18%	37%
Underfloor air distribution	13%	24%
Other	4%	4%
<b>None of the above</b>	<b>6%</b>	<b>5%</b>

Base: 631

BD+C Green Building Survey, 08/07

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market, and all signs point to its continuing growth. It remains to be seen whether that growth will be realized more in terms of rhetoric than activity on—or above—the ground. Let's hope it is less of the former and much more of the latter. **BDC**

**Chart 1.15**

**How important are the following attributes when planning a sustainably designed or green building? (1 = Not important at all, 5 = Extremely important)**

	Mean
Energy management	4.60
Elimination of toxic materials and substances	4.45
Indoor environmental quality	4.37
Daylighting	4.36
Building envelope design	4.33
Long-term operations and maintenance	4.27
Environmentally responsive site design	4.26
Water conservation	4.23
Environmentally sensitive landscaping	4.10
Life cycle cost analysis	4.06
Natural ventilation	3.96
Use of energy analysis/modeling tools	3.93
Recycled/renewable building materials	3.91
Building commissioning	3.75
Reused construction and demolition waste	3.69
Safety and security	3.66
Views of nature	3.61
Innovative design	3.60
Geothermal heating/cooling	3.47
Acoustics/soundproofing	3.42

Base: 631

BD+C Green Building Survey, 08/07

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The strong showing (4 or more on a scale of 5) for many commonsense building features or techniques, such as energy management (4.60), provides strong evidence that AEC professionals support their use in sustainably designed projects.

## AEC firms still struggling with fear of paperwork in LEED

The recent Davis Langdon study "The Cost of Green Revisited" calls out yet another concern of building owners and developers—the cost of documenting LEED credits. The authors note that this factor "remains a concern for some project teams and contractors," especially the less experienced ones. Our recent Green Building Survey confirms this fear. The majority of respondents (54%) said their clients and prospects see green building as "too complicated" and requiring "too much

paperwork" (chart 1.6). In the last couple of years, the US Green Building Council has attempted to overcome this barrier by putting LEED documentation online; the Green Building Initiative's Green Globes rating system has historically been online.

The Davis Langdon authors state that the concern about documentation requirements becomes abated "somewhat" among Building Teams as they become "accustomed" to the requirements. Nonetheless, our research, coupled with Davis Langdon's findings, shows that AEC firms have a huge hurdle to overcome to convince their customers that the red tape associated with green building (in particular, the documentation necessary for LEED certification) need not be overly burdensome or costly.

# AEC Professionals Speak Out

## The role of AEC professionals in green building

Green building is rejuvenating the profession and giving clients better buildings.—Michael Furoll, assistant university architect, American University, Washington, D.C.

If we are truly being green, we should renovate and not build new.—Scott Thomas, partner, Zagrodnik + Thomas Architects, San Diego.

Too many people are paying lip service to green construction, but not following through. We should try harder in designing energy-efficient systems without the hype.—Hector Aroelus, GM, Powdersville Air, Easley, SC.

The “green” movement is becoming an opportunity for a few people to make a lot of money on the backs of those who have always designed with the environment and the good of the end users in mind.—James Howard, LWPB Architects, Norman, Okla.

Many sustainable strategies will soon become standard practice in the industry.—Ron Matalski, project manager, Strang, Inc., Madison, Wis.

Green building needs to be more about design than green-labeled materials. Good design should always be good to people and to the environment.—Edgar Montañez Perez, project manager/architect, IWGroup, San Juan, PR

In the late 70s and early 80s, I was architect for many “green” buildings using passive solar and photovoltaics. After Reagan dumped the tax credits, nobody wanted it anymore. I am 72 and have always designed “sustainable” buildings that rest upon the earth lightly.—Edward D. Shaw, architect/owner, Whithrop, Mass.

Green building should be standard if the planet is to survive!—John B. Adams, owner, JGArchitecture, La Mesa, Calif.

We need to get people to understand that the current energy sources are heavily subsidized and that buildings are a major source of emissions and consumption.—Keith Strand, owner/architect, New York, NY.

It's long overdue. Integrated practice should be SOP for all design firms.—Oran Mills, senior project architect, Antinazi Associates, Bridgeport, Conn.

## Green building market considerations

I don't think it's a passing fad. It is here to stay.—Jeff Marrow, senior project engineer, Atus Lend Lease, Fort Campbell, Ky.

The green benefit of healthier and more productive employee workspaces doesn't get enough attention. Another benefit of green workspaces is increased employee retention. The jury is still out on how much more productive and healthy green workspaces are, but I think we'll find that this is overwhelmingly true.—Pierre Covart, VP, LEED AP, Leopardo Construction, Hoffman Estates, Ill.

Our healthcare clients are now demanding green buildings. The marketplace has profoundly changed. There's no going back.—Billy Tindell AIA, LEED AP, BSALifeStructures, Chicago.

Sustainable design is growing steadily, because we as designers have no other choice, and clients are beginning to realize this. It is the way of the future, as we are rapidly depleting our natural resources more and more each day.—Christopher Tabaknek, designer, Harley Ellis Devereaux, San Diego.

Owners are the drivers. If they ask up front for green design and are willing to pay a little more for the design and construction, they can get it. Few owners ask and are often too tight-fisted to consider it.—Randall Boyd, architect, Fuqua & Partners Architects, Huntsville, Ala.

Almost all of our clients are nonprofits. They know we will design a building that is far greener than a conventional building. Do we typically incorporate features like PVs, grey water systems, and reclaimed materials? Not yet. We design “green” to produce a high-quality, low-maintenance, lower impact, and lower energy building.—Ana Gordon, project architect, Blue Sky Collaborative Architecture, Beverly, Mass.

We build speculative office/warehouse buildings in a very competitive market, so green is slow to phase in.—WWatt Neal, partner, Wilson Hull & Neal, Atlanta.

This is a movement which is inevitable. It could more usefully be associated with intelligent, responsible design.—Patrick Mirey, team coordinator, Perkins + Will, Dallas.

There's still a challenge trying to connect energy savings and efficiency with sustainability. The link hasn't been made that green building and energy efficiency fit hand in glove.—James L. Hoff, DBA, VP of quality, technology and product development, Firestone Building Products Co., Indianapolis.

LEED certification helps as a marketing tool.—Howard Alan, president/chief architect, Howard Alan Architects, Chicago.

Less green hype, more energy conservation.—Cliff Chisholm, senior architect, Place Architecture, Bozeman, Mont.

We see the future of green building as a strong market asset. We have integrated sustainable principles throughout our business.—Neil Boyle, director of sustainable practices, Breskell Inc., Roanoke, Va.

It takes either real financial incentive or environmental calamity to change the way Americans do things. One of the two will create greater interest and growth in sustainable, green development and construction.—Phil Pagan, project manager, Stonestreet Construction, Providence, RI.

## Green building certification systems

LEED certification is time-consuming, cumbersome, very bureaucratic, and not conducive to new work or commissions.

—Quentin Dart Parker, Archwork.com, Pacific Palisades, Calif.

The various green building rating entities give much of their credits for newly manufactured material and equipment, which means brand-new carbon dioxide in the air. The greenest building is the existing building one preserves and reuses.—George Sekkinen, historic preservation architect, Washington, D.C.



### BUILDING GREEN? THEN BUILD IT RIGHT.

The Construction Specifications Institute (CSI) is the only industry organization providing the framework for integrating the entire building team. This is achieved by the preparation, administration and interpretation of construction documents, encompassing the *whole* building life cycle, from conception to deconstruction. An integrated building team offers the greatest opportunity for success in delivering green building design concepts such the U.S. Green Build Council's LEED™ rating system.

CSI's Certificate & Certification program is widely recognized and accepted throughout the industry as providing invaluable project administrative documentation skills. This knowledge and expertise is vital to projects striving to meet sustainable design criteria; it results in improved project efficiency and can reduce associated liabilities and costs. CSI certifications help minimize errors and omissions and increase coordination between drawing and specifications.

The CSI Certificate & Certifications are:

- CDT (Construction Document Technology) Certificate
- CCCA (Certified Construction Contract Administrator)
- CCS (Certified Construction Specifier)
- CCPR (Certified Construction Product Representative)

When selecting sustainable project building team professionals, CSI Certification designations are additional qualifying considerations along with LEED AP to assure delivery of integrated whole building design strategies.

CSI's commitment to sustainability is further demonstrated by the formation of the CSI Sustainable Facilities Task Team and the subsequent development of *GreenFormat™*. Now in development, GreenFormat will provide an online data-reporting guide and format for collecting sustainable information on construction products. Manufacturers will be able to easily report on their products, and A/E/Cs will be able to easily compare products and accurately assess their potential affect on a sustainable project.

CSI continues to lead the industry in standards and formats, and to adapt to the needs of the building team as it faces the evolution of sustainable design.

Sincerely,

A handwritten signature in black ink, appearing to read "Walter Marlowe".

Walter Marlowe, P.E., CSI, CAE  
CSI Executive Director/CEO

P.S. Visit CSI at Booth #1290 to learn more about *GreenFormat™* and  
CSI's certificate and certification programs or visit us online at [www.csinet.org](http://www.csinet.org).

The logo for GreenFormat features the word "GreenFormat" in a bold, sans-serif font. To the left of the text is a graphic element consisting of three stylized, upward-pointing leaf or plant shapes.

The most measurable thing in buildings is energy use. Buildings that are LEED certified, when you check them a year later, are they really energy efficient? I'm convinced that performance is where we need to go, not a prescriptive approach.—Paul R Bertram, Jr., FCSI, CDT, LEED AP, director of environment and sustainability, North American Insulation Manufacturers Assn., Alexandria, Va.

It is extremely important to work with a LEED consultant that understands construction cost. Sustainable construction does come with a premium. The only way to break this premium is to push the industry to the next level, and challenge ourselves, consultants, subcontractors, and suppliers.—Mark Baird, associate project manager, Quus Northwest, Denver.

There's nothing for durability in LEED. You should get 10 points for doing a slate roof, because it will last 90 years. It's a joke in the roofing industry that a LEED-certified building means more future work. They all leak like a sieve.—Tom "Hutch" Hutchinson, AIA, FCSI, FRC, founder, Hutchinson Design Group, Barrington, Ill.

We're at that maturing point, not past the peak, for the whole green market and environmental issues. Some laggards aren't paying attention, but every convention has some green theme. When it's routine in a year or so, there's going to be a mad dash to find something new in green.—Drew Ballensky, GM, Duro-Last Roofing, Inc., Sioux City, Iowa.

It is imperative to develop a LEED category for parking structures.—Chris McRae, director of architecture, Walker Parking Consultants, Elgin, Ill.

Most clients that are educated about the benefits of building green don't have any reservations about building to LEED requirements—even if the building isn't registered or certified. It just makes sense financially.—Amy Pearce, project manager, Bovis Lend Lease, Houston.

After six years of architectural training, I find it somewhat of an insult to have to "get accredited" as a green professional—in much the same way a doctor would be affronted to have to get accredited as a "needle stick-in-ner." This movement supports our professional goals of better, more socially and ethically responsible design.—Paul Bedington, president, Paul S. Bedington Architects, San Diego.

### Defining and choosing green products

Are green-labeled products truly green and sustainable, not just a scam?—Daniel Osborne, architect, San Francisco.

Accessing green building materials regionally, so that shipping costs don't unduly affect total project cost, is sometimes challenging. We are working hard to get upstream of the process to help owners make intelligent site selections.—Rob Graves, principal, Flad Architects, Madison, Wis.

Biggest issue is defining what is green—where to purchase materials, what is green to certain regions, delivery distances, resources, etc., what materials will be long-lasting and of quality over many years.—Kenneth E. Vives, FAIA, Tulsa, Okla.

The challenge is understanding which products are the best green products. Every product is "green" according to the manufacturer, but the best products are often difficult to distinguish.—Peter Levasseur, director of sustainable Design, EwingCole, Philadelphia.

Our work is developer driven, so green is determined on a strict cost/value

basis. Value is starting to lean toward green perception if not fact.—Jack Ablon, AIA, Dallas.

The downside of the green movement is this: Younger and less experienced staff see "green" as the end-all of their decision making. Once a product makes environmental claims for itself, any question of fitness for purpose, usefulness, or track record goes out the door. "Green" needs to be seen as one component of design, and certainly not the most important one.—Anne Whittier, FCSI, specifications writer, Gehry Partners, Santa Monica, Calif.

I find overpriced materials and gimmicks every day. I have no problem finding all materials but it requires many hours of research to weed out the junk.—Thomas Bragg, environmental consultant, Habitat for Humanity, Dallas.

The reason I have trouble sourcing green materials is because many manufacturers aren't aware of the environmental attributes of the products they sell, or don't make the information available.—Jed McKellar, research assistant, LS3P Associates, Charleston, SC.

No product with an intended life less than the design life would generally be green. Certainly not a 15-year roof on a 30-year building. The idea of a less-than-100-year construct is not in accord with basic sustainability.—Mark Delany, Ghafari & Co., Prescott, Ariz.

Chart 1.16				
Do you have trouble sourcing or obtaining green building products?				
	2007	2006	2004	2003
Yes	31%	33%	55%	55%
No	46%	38%	19%	16%
Don't know/Not involved	23%	30%	26%	29%
Base: 631	Base: 872	Base: 519	Base: 486	

If yes, why do you have trouble? (2007 respondents only)	
The term "green" is not always clearly defined	72%
Can't get certain green products	43%
Don't know what's really green	42%
Don't know where to look	35%
Don't trust green labels	32%
Base: 195	

If no, why not?	
Green products are readily available	73%
Certification labels (e.g., Greenguard, Energy Star) provide sufficient guidance	47%
Green-labeled products are well known in the market	38%
Base: 293	

BD+Green Building Survey, Q3/07  
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Even though most building product manufacturers have come out with "green" products in recent years, nearly a third of respondents (31%, down from 55% in '03 and 46% in '04) said they still have trouble sourcing green products. The big bugaboo seems to be semantic: What does "green" mean? AEC respondents who have trouble sourcing sustainable products said they had trouble defining "green" (72%), and a substantial group (32%) said they don't trust green labels. However, 46% of respondents said they had no trouble sourcing green products.

# The Hardwood Council

## SUSTAINABLE SOLUTIONS FOR GREEN DESIGN AND BUILDING

In a recent readership survey, a whopping 94 percent of *BD+C* readers agreed that the trend toward green, sustainable buildings and materials is growing, along with client interest in creating a greener, healthier world.

And the marketplace is responding. It's easier to build green than ever before. Product manufacturers are coming up with new green product lines almost every day – for everything from paints and finishes to carpeting and lighting fixtures.

But American hardwoods have been the preeminent green building material — the first choice of builders, architects and designers — for centuries.

- Healthy, non-toxic natural hardwoods bring a warm, enduring aesthetic to floors, furniture and cabinetry. They add character and health-enhancing, non-allergenic qualities to the home.
- Eco-conscious architects and designers use hardwoods because they are the definition of sustainability. Harvesting levels are far below levels of growth. Nearly twice as much hardwood grows as is harvested each year. Hardwoods renew themselves abundantly and naturally, sprouting from stumps, roots and seeds.
- Virtually every part of the log is used as lumber or by-products, and finished products are reusable, recyclable and biodegradable.
- Well-managed, sustainable forests are part of the solution to climate change and global warming. Trees produce oxygen, protect wildlife and water supplies, and reduce greenhouse gases in the atmosphere.

The American Hardwood Information Center at [www.hardwoodinfo.com](http://www.hardwoodinfo.com) offers a variety of practical, innovative ideas with American hardwoods. It's your one-stop Web portal to one of the greenest building resources available – hardwoods from continuously renewing American forests.

We're living in an era where people are more concerned than ever about the environment, and our connection to the natural world. Projects using green design and products foster this connection and help create a more sustainable world. Using renewable American hardwoods, the original green building material, is part of the solution for a healthier planet.

The Hardwood Council  
[www.hardwoodcouncil.com](http://www.hardwoodcouncil.com)

American Hardwood Information Center  
[www.hardwoodinfo.com](http://www.hardwoodinfo.com)

## Wrestling with the cost of green building

How much more a green building costs depends upon the specific site, the building needs, and the limitations. With some buildings, the "easy/cheap" credits aren't available and thus the more expensive credits have to be taken. Other times, there's no additional cost.—Krista Nelson, CSI, LEED AP, CDT, Anderson Brûlé Architects, San Jose, Calif.

Green building is over-hyped in terms of its costs and benefits. Life cycle cost needs to be considered, and on a discounted cash-flow basis. True green building practices involve better use of space, which may actually avoid the need for construction or reduce project size.—Jeffrey Edinus, AIA principal, The Edinus Collaborative, Atlanta.

While our retail tenants would benefit from reduced utility costs associated with green buildings, they find it difficult to pay higher rents required by the premium for increased construction costs to build their facilities.—Bob Frazier, VP of development, WS Development Associates, Chestnut Hill, Mass.

Economics is the issue—net present value. Most people are in the game for the maximized profit and sale of the building to others as soon as possible. It's the money, stupid.—C. Thomas Williams, GM, Dubai Isles Development, Los Angeles.

Some architects are taking advantage of the sustainability trend by requesting additional fees even though their level of design effort hasn't changed from conventional design.—Mark E. McDowell, VP of development, The Alter Group, Skokie, Ill.

Of course green buildings will cost more. We professionals need to better represent and promote what we receive in return—lower long-term operating costs; better quality air, lighting, and work environment; lower environmental impact; and usually better overall design.—Denis Delahanty, project manager, Gwinnett County, Lawrenceville, Ga.

Green building advocates argue that green design adds only up to 3% to the cost of construction. While this may be correct with regard to institutional-quality buildings, on our commercial projects—such as speculative office buildings and light industrial structures—the premium is significantly more.—Rob Thrun, VP of architecture and engineering, A/E/C Inc., Cincinnati, Ohio.

Green building is a commitment to preserving our environment and should not be looked at solely on a "first-cost" basis.—Dennis E. Bopp, principal, Dennis E. Bopp Architect, Lexington, Ky.

## Regulatory aspects of green building

We have problems with recycling of some materials—specifically, drywall. We need to educate the government so there can be tax incentives not only for the builder but for those who handle/recycle the materials.—Adair B. Owen, LEED AP, preconstruction coordinator, Elkins Constructors, Jacksonville, Fla.

The more enforcement there is from the top, the more green buildings will happen and the more our world will pull back from the edge of environmental disaster.—Deborah MacPherson, specifier, WDGA Architecture, Washington, DC; projects director, Accuracy & Aesthetics, Vienna, Va.

Green building will never be a standard unless the government steps up and creates guidelines, codes, and standards that force new construction to adhere to green principles.—Jarrison Martin, estimator, Haselden Construction, Denver.

The private sector should drive this, with the federal government only giving tax breaks for truly energy-saving designs and materials. Too much of what is being done is feel-good stuff.—E. Ray Kothe, owner, Kothe Contractors and Construction Management, Baton Rouge, La.

I do not support the notion that green should be mandated by the government, nor should it be supported by tax incentives; neither of these is as "sustainable" as market demand, which may take longer to develop, but will likely stand the test of time.—Deter Nummerger, president, Deter Nummerger Associates, Westlake Village, Calif.

A key factor in the increase of green building would be implementation of federal and state tax incentives or grants. Tax incentives should be transferable to the designer/builder in the event that the owner is a tax-exempt organization.—L. Brunson Russum, Jr., project architect, FreemanWhite, Charlotte, NC.

Green building is quickly becoming standard practice. Any responsible architect, engineer, landscape architect, or planner will readily embrace this commonsense approach to building. Current green building practices will soon be mandated by local, state, and federal codes as the baseline building standard.—Alfred Vick, assistant professor, University of Georgia, Athens.

**'While the curve in "market transformation" is up and to the right, the slope is a lot less steep than green building proponents might have hoped for.'**

## LIFE (CYCLE) LESSONS

Green building gets a boost from life-cycle analysis, which looks at the life-long impacts of building products, materials and services and helps interested builders and designers make informed choices. PVC/vinyl has been extensively studied in comparison to other building materials and how these materials perform in competing products. The clear verdict: many vinyl building products offer the best choice for low-impact, high-performing applications. Why?

- PVC/vinyl is more than half derived from common salt, so it takes less fossil fuel to manufacture vinyl than many other building materials.
- Products made of PVC/vinyl are themselves highly energy efficient. Examples are reflective roofing membranes and window frames.
- PVC/vinyl is durable. It does not corrode. Siding and pipe can hold up for many decades without treatments or extensive repairs.
- PVC/vinyl is easily cleaned and maintained. Hospitals, schools and other institutions count on vinyl composition tile, sheet flooring, wall coverings, railing and cove base for a healthful environment as well as durability.
- PVC/vinyl is tough and reliable in hard-to-reach locations. Vinyl-jacketed wire has been the product of choice inside building walls for more than 50 years.

The affordability of low-impact products can also contribute to improved environmental performance. Savings from low-cost, low-impact products can be reinvested by building designers and owners in additional environmental improvements elsewhere in the construction or maintenance of their building.



Tim Burns  
President  
The Vinyl Institute  
Arlington, VA  
[www.vinylindesign.com](http://www.vinylindesign.com)

*The Vinyl Institute represents leading U.S. manufacturers of vinyl plastic and additives and advocates for the responsible management of vinyl resins, life-cycle management of vinyl products and promotion of the value of vinyl to society.*

