Executive Summary

Environmentally-sustainable, or “Green,” buildings continue to be firmly on the agenda for real estate owners, developers, and corporate owner-occupants. Almost all respondents to the Turner 2010 Green Building Market Barometer expect to incorporate at least some Green features in their next construction project. The potential to reduce energy and operating expenses is the most common driver for building Green, although many companies are also focused on a broader set of benefits such as increased health and well-being of occupants and the positive impact on brand and corporate reputation.

Yet, concerns persist over perceived higher construction costs and the length of the payback period. In addition, respondents continue to look closely at the cost and perceived difficulty of LEED certification.

Key Findings

Many Companies Expect to Undertake Construction or Renovation Projects
Among real estate owners, developers, and corporate owner-occupants, 46% of executives said it was extremely or very likely that they would undertake new construction over the next 12 months, while 58% anticipated undertaking a renovation project.

Most Anticipate Incorporating Green Features
Almost 90% of those executives said it was extremely or very likely that they would incorporate energy efficiency improvements in their new construction or renovation project, while roughly 60% expected to incorporate improvements to water efficiency, indoor environmental quality, and Green materials.

Financial Considerations Most important
The factors most often rated as extremely or very important when companies decide whether to incorporate Green features were energy efficiency (88%) and ongoing operations and maintenance costs (86%).

Many companies also considered non-financial factors to be extremely or very important in their decisions to incorporate Green features such as indoor air quality (72%), health and well-being of occupants (72%), and the impact on brand/reputation (67%).

A payback period of longer than five years for Green features was considered acceptable by 45% of executives.

Long Payback Period and Higher Construction Costs Pose Obstacles
Despite the fact that almost half the executives were willing to accept a payback period of longer than five years, roughly two thirds of executives considered the perceived length of the payback period to be an extremely or very significant obstacle to incorporating Green features.

Roughly two thirds of executives also considered higher construction costs to be an important obstacle to the development of additional Green buildings.

Half of the executives believed that Green buildings have higher operating and maintenance costs, which they identified as another extremely or very significant obstacle to Green construction.

Views of LEED Certification
Fifty-three percent of the executives thought it was extremely or very likely that their companies would seek LEED certification if constructing a Green building.

Executives from real estate owners and corporations with portfolios of one million square feet or more were more likely to seek LEED certification, with 64% saying it was extremely or very likely.

Broad Commitment to Sustainable Practices
Ninety percent of executives said their companies were at least somewhat committed to following environmentally sustainable practices in areas beyond their real estate portfolios, including 56% of executives who said they were extremely or very committed.

The reasons most often cited as extremely or very important for companies to commit to following sustainable practices were two financial factors—cost savings (64%) and customer requirements (59%)—and two non-financial factors—impact on brand/reputation (64%) and the belief that “it’s the right thing to do” (63%).
Most projects include green features

The 2010 Market Barometer found that most owners, developers, and corporations continue to plan to incorporate Green features in their buildings. According to Engineering News Record, in 2009 the top 50 Green contractors generated $36.71 billion in revenue from Green projects, more than triple the $8.96 billion in revenue in 2006. At Turner Construction Company, Green projects have grown to 55% of sales revenues in 2009, up from 15% in 2006.

Reflecting the continuing commitment to Green construction, most executives said their companies would be extremely or very likely to incorporate specific Green features if they were undertaking a new construction or a renovation project. (Figure 1.) The expectation that companies would invest in energy efficiency was almost unanimous, with 87% of executives saying it was extremely or very likely their companies would incorporate energy efficiency improvements if their companies undertook a project. It is understandable that improvements in energy efficiency would be a high priority for any company since increases in energy efficiency result in lower energy costs.

More than half the executives also anticipated investing in other Green features including water efficiency (61%), improved indoor environmental quality (59%), and use of Green materials (58%). While each of these items can reduce a building’s negative impact on the environment, they typically have a less direct impact on operating costs than energy efficiency. For example, water usage constitutes a much smaller percentage of a building’s operating budget than energy. Improved indoor environmental quality may not directly impact the cost of building operations, although it can have an important positive impact on the health and well-being of occupants, creating more satisfied, productive, and healthy employees, thus reducing absenteeism, and making it easier to attract and retain qualified employees and increasing worker productivity.

The fact that most companies take a broader view of Green features than their impact on a building’s operating budget was also indicated by the focus among many companies on reducing the carbon footprint of their facilities, i.e., the amount of greenhouse gases produced. When executives were asked how important it was to their companies to minimize the carbon footprint of their buildings, 76% said this was at least somewhat important, including 38% who described it as being extremely or very important to them. (Figure 2.) Since a building’s carbon footprint is almost directly related to its energy consumption, reducing carbon emissions can also be considered a cost reduction strategy.

![Figure 1](image1.png) ![Figure 2](image2.png)
The Green decision

Investing in Green features remains on the radar of companies as they plan new construction or renovation projects. But there are a wide variety of Green features available, ranging from simple and inexpensive improvements like energy-efficient light bulbs to more advanced and costly enhancements like solar panels. The range of Green features is reflected in the different levels of LEED certification from Certified through Silver, Gold, and Platinum. Each Green feature has costs and benefits that companies must consider when deciding whether to incorporate it into the building design. Financial considerations were most often rated as important in the decision-making process, although most executives also said that a broader set of considerations were considered, such as the impact on brand/reputation, satisfaction of employees/occupants, and the health and well-being of occupants.

Energy efficiency and the ongoing operations and maintenance costs of the building were rated as extremely or very important by more than 80% of executives. (Figure 3.) The focus on energy efficiency is not surprising given its impact on building operating expenses. According to the Building Owners and Managers Association, on average 28% of a commercial building’s operating costs go to energy, totaling $24 billion annually for commercial buildings in the United States. Green features can have a major impact on reducing the costs of energy and of operations and maintenance. Analyzing 10 studies of 69 Green buildings, a 2009 report by Booz Allen Hamilton for the U.S. Green Building Council found that these two categories (energy and operations and maintenance) provided the largest savings from investments in Green features. The average savings in the Green buildings studied were $0.52 per square foot in energy costs and $0.32 per square foot in operations and maintenance costs. In comparison, savings in trash removal were $0.05 per square foot and in reduced water usage were $0.02 per square foot. Similarly, a 2008 study by the New Buildings Institute conducted for the U.S. Green Building Council of 121 LEED new construction buildings found that average energy use was 25 – 30% lower than the national average, with the average savings increasing at higher certification levels.

Next in importance came a series of additional financial considerations that were rated highly by roughly three quarters of executives, including the impact on building value, total 10-year costs, occupancy rates, and asking rents. Studies have found that Green buildings have higher occupancy rates and higher asking rents. A study of 3,000 Green office buildings by the real estate research firm CoStar Group Inc. found that the occupancy rate for Green buildings averaged 90.3% compared to 84.7% for non-Green buildings in the first quarter of 2009. Further, the average rent was $38.69 per square foot compared to $29.80 per square foot in non-Green buildings.

A number of non-financial factors were also rated as extremely or very important to their decision by roughly two-thirds or more of executives. These include the impact on indoor air quality, on the health and well-being of occupants, satisfaction of employees and other occupants, and employee productivity. Independent studies have indicated that improvements in indoor environmental quality can result in reductions in absenteeism and lost work hours due to asthma, respiratory allergies, depression, and stress.
Two-thirds of executives said that the potential impacts of a Green building on their company’s brand and reputation were important factors as well. With greater public concern about environmental issues, companies that can demonstrate their commitment to following sustainability practices can benefit from an improved reputation among consumers. These factors are less directly tied to immediate cost reductions or increase revenue but may impact a company’s financial performance over the long term.

Incorporating Green features may entail additional costs at the outset, but any higher initial design and construction costs that may occur can be recouped over time in the form of lower operating and maintenance costs. The length of the payback period, i.e., the time required before a Green feature pays back its additional cost, is key to the decision about whether to include the features in the building. When asked what would be the minimum payback period they would find acceptable, 45% of executives said they were willing to accept a payback period of longer than five years. (Figure 4.) This means that more green features can be considered that will yield savings over the long term.

![Figure 3](image)

Importance of factors when evaluating costs and benefits of green features

<table>
<thead>
<tr>
<th>Factor</th>
<th>Extremely Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency</td>
<td>88%</td>
</tr>
<tr>
<td>Ongoing operations and maintenance costs</td>
<td>86%</td>
</tr>
<tr>
<td>Building value</td>
<td>76%</td>
</tr>
<tr>
<td>Total 10-year costs</td>
<td>74%</td>
</tr>
<tr>
<td>Occupancy rates</td>
<td>74%</td>
</tr>
<tr>
<td>Indoor air quality</td>
<td>72%</td>
</tr>
<tr>
<td>Health and well-being of occupants</td>
<td>72%</td>
</tr>
<tr>
<td>Asking rents</td>
<td>71%</td>
</tr>
<tr>
<td>Impact on brand/reputation</td>
<td>67%</td>
</tr>
<tr>
<td>Satisfaction of employees/occupants</td>
<td>65%</td>
</tr>
<tr>
<td>Water efficiency</td>
<td>64%</td>
</tr>
<tr>
<td>Employee productivity</td>
<td>63%</td>
</tr>
<tr>
<td>Employee hiring/retention</td>
<td>44%</td>
</tr>
</tbody>
</table>

![Figure 4](image)

Maximum acceptable payback period when incorporating green features

- 1-3 years: 15%
- 4-5 years: 40%
- 6-9 years: 27%
- 10+ years: 18%
Given their perceived benefits, what are the main obstacles preventing more companies from incorporating Green features in their construction projects? The perception of a long payback period was considered to be extremely or very significant in discouraging the construction of Green buildings by 63% of executives, slightly higher than in 2008. Forty-five percent of the executives said their companies were willing to accept a payback period of longer than five years when considering incorporating Green features. While most executives were willing to wait a significant period to recoup their investment, they continued to believe that many Green features required even longer payback periods than they were willing to accept.

The obstacle that was cited next most often as discouraging the construction of Green buildings was higher construction costs. Although there can be an additional first cost to constructing a Green building, it is less than many believe. An analysis by Booz, Allen, and Hamilton found that construction of a LEED-certified Green building costs on average an additional $4.01 in hard and soft costs, ranging from $3.31 per square foot for Certified projects to $4.43 per square foot for Silver projects.10 In fact, some green buildings have lower first costs than comparable non-Green buildings. In 2009, the Ohio Schools Facilities Commission (OSFC) reported bid prices for 96 LEED schools. They found that 49 schools were 10% or more under estimate, 23 were 5% to 10% under estimate, and 23 were less than 5% under estimate. Only one school was over estimate and that was by less than 5%. In addition, OSFC reported that the average LEED school was $12 per square foot less expensive than non-LEED schools ($183 versus $195).

As in the 2008 Turner Market Barometer, roughly half of the executives felt that the difficulty in quantifying the benefits of Green construction was another barrier. While some benefits are easy to quantify, e.g., lower energy costs, other benefits are less tangible and more difficult to quantify, such as increased employee productivity, improved employee satisfaction, and the positive impact on a company’s brand and reputation derived from being seen as committed to sustainability.

One of the notable differences from the 2008 survey was that 50% of executives felt that a significant obstacle to the construction of Green buildings was increased operating and maintenance costs, compared to 23% of executives who cited this issue in 2008. This may be due to the perception that Green buildings have more complex operations, which was also considered a significant obstacle by 40% of executives. To derive their full benefits, the staff that operates a Green building may need to acquire the skills to manage new or different systems. There may also be a need for additional information about the operating and maintenance costs of Green buildings. The 2009 study by Booz, Allen, and Hamilton found that Green buildings actually save an average of $0.32 per square feet in operations and maintenance costs.11

Despite these perceptions, the attention paid to Green buildings over the last few years has increased awareness of the concept of Green buildings and the benefits they can provide. In 2010, only 36% of executives believed that a lack of awareness of the benefits of Green buildings was a very significant obstacle, down from 48% in 2008 and 64 percent in 2005.
Broad commitment to environmentally sustainable practices

The interest in Green buildings is part of a broader commitment to environmental sustainability at many companies. Fully 92% of executives said their companies were at least somewhat committed to following environmentally sustainable practices, with 56% saying they were extremely or very committed. (Figure 5)

When executives were asked what drives their company’s commitment to sustainability, four factors were rated most highly as being extremely or very important. Two of these factors were financial: the potential for cost savings (64%) and customer requirements (59%). (Figure 6.) The other two top-rated factors did not directly affect a company’s finances in the near term: the impact on the company’s brand or reputation (64%) and the belief that “it’s the right thing to do” (63%). Although these factors may not yield short-term financial benefits, they can improve a company’s financial position over the long term as it benefits from a reputation for following sustainable practices.

With the current public interest in sustainability, it is reasonable to ask whether companies that claim to be committed to sustainability have really changed their business practices, rather than simply engaging in a public relations exercise. Most executives said their companies had changed their business practices evaluating and selecting suppliers of goods and third-party service providers. Roughly 75% of executives said that the sustainable practices of a potential supplier or service provider are considered in their company’s selection process. Some of the issues that companies might consider are whether their suppliers/vendors use Green materials, the amount of waste in their operations, and whether they use Green packaging. To what extent these factors affect the ultimate procurement decision is unknown.

Figure 5
Level of Commitment of Company to Environmentally Sustainable Practices

- Not/not too committed: 8%
- Somewhat committed: 36%
- Extremely/very committed: 56%

Figure 6
Reasons for Commitment to Environmentally Sustainable Practices

Percent Extremely or Very Likely

- Impact on brand/reputation: 64%
- Cost savings: 64%
- Belief that “it’s the right thing to do”: 63%
- Customer requirements: 59%
- Expected future legislation and regulations: 40%
- Investor requirements: 40%
- Current legislation and regulations: 40%
- Expectations of current employees: 36%
- Risk management considerations: 36%
- Ability to hire qualified new employees: 33%
Profile of survey respondents

Turner Construction Company’s 2010 Green Building Market Barometer surveyed 681 executives through an online questionnaire from July 28 to August 16, 2010. The survey was conducted by Bayer Consulting.

The executives surveyed represented a broad spectrum of different types of organizations involved with facilities including architects (24%), developers (22%), construction contractors (22%), consultants (20%), owners of rental buildings (16%), brokers and other firms providing real estate services (13%), corporate owner-occupants (7%), and corporate tenants (4%). (These percentages total to more than 100% since some companies are involved in more than one industry segment.)

The executives were from organizations that were active with a variety of different types of facilities including office (80%), retail (60%), industrial (51%), multi-unit residential (49%), and healthcare (48%). (Figure 7)

Among respondents who worked for real estate owners or corporate space users, 58% said that their real estate portfolios included Green buildings that had been certified by LEED or another Green-building certification system. In addition, 56% of the developers said they had developed buildings within the last three years that had received a certification as a Green building. Among respondents who worked for firms that provided real estate services (e.g., architectural, engineering, construction, consulting, or real estate brokerage firms), 77% said their firm had worked for clients over the last three years on Green building projects that received certification.

A number of survey questions were analyzed based on the responses by real estate owners, corporate owner occupants, and corporate tenants with larger and smaller real estate portfolios. Among respondents who worked for corporate space users, 56% worked for corporations with a real estate portfolio (both owned and leased) of less than one million square feet, while 44% worked for corporations with a portfolio of one million square feet or more. Among respondents from real estate owners, 59% had a portfolio of less than one million square feet, while 31% had a portfolio of one million square feet or more.

![Figure 7](figure7.png)

Types of facilities company is involved with

- **Office**: 80%
- **Retail**: 60%
- **Industrial**: 51%
- **Multi-unit residential**: 49%
- **Healthcare**: 48%
- **Higher education facilities**: 41%
- **Hotel**: 37%
- **K-12 education facilities**: 33%
- **Data centers**: 31%
- **R&D facilities**: 29%
- **Sports and entertainment**: 29%
- **Single family homes**: 26%
- **Aviation and transportation**: 24%
- **Other**: 10%

Note: Percentages total to more than 100% since respondents could select multiple selections.

**Notes**

2. Ibid
3. In questions on Green buildings, executives at companies that provide real estate services (e.g., architectural, engineering, construction, and consulting firms) were asked to respond based on how their clients typically address these issues.
4. “Carbon footprint” is defined as “a measure of the greenhouse gases that are produced by activities of a person, a family, a school or a business that involve burning fossil fuels.” United States Environmental Protection Agency, http://www.epa.gov/climatetrends/glossary.htm