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**Tool Kit**

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Building the Green Way

**A substantial body of experience and a set of tested standards have made “green” a realistic choice for most building projects. Here are ten practical design and construction rules that will help you conserve the Earth’s resources and your budget.**

*by*[*Charles Lockwood*](http://harvardbusinessonline.hbsp.harvard.edu/hbrol/en/includes/sasearch.jhtml?author=Charles+Lockwood)

The dramatic, 647,000-square-foot PNC Firstside Center in downtown Pittsburgh boasts a magnificent facade of curving glass, steel, and stone overlooking the Monongahela River. The winner of several design awards, the building rises from a large plaza graced with waterfalls and fountains. Its airy, light-filled interior has 11-foot ceilings, floor-to-ceiling windows, an atrium, an open floor plan, and all the latest building system technologies, including individual climate controls. What most observers don’t realize is that this is a “green,” or environmentally and economically sustainable, workplace—and that it costs 20% less per square foot to operate than its comparably sized “standard” sister building in Philadelphia.

Green buildings, as many know, have less negative impact on the environment than standard buildings. Their construction minimizes on-site grading, saves natural resources by using alternative building materials, and recycles construction waste rather than sending truck after truck to landfills. A majority of a green building’s interior spaces have natural lighting and outdoor views, while highly efficient HVAC (heating, ventilating, and air-conditioning) systems and low-VOC (volatile organic compound) materials like paint, flooring, and furniture create a superior indoor air quality.

Just five or six years ago, the term “green building” evoked visions of tie-dyed, granola-munching denizens walking around barefoot on straw mats as wind chimes tinkled near open windows. Today, the term suggests lower overhead costs, greater employee productivity, less absenteeism, and stronger employee attraction and retention. Companies as diverse as Bank of America, Genzyme, IBM, and Toyota are constructing or have already moved into green buildings. Green is not simply getting more respect; it is rapidly becoming a necessity as corporations—as well as home builders, retailers, health care institutions, governments, and others—push green buildings fully into the mainstream over the next five to ten years.

In fact, the owners of standard buildings face massive obsolescence. They must act now to protect their investments. “Building owners are starting to do reviews of their portfolios to see how green their buildings are and what they need to do to meet growing market demand,” says Ché Wall, chair of the World Green Building Council. Citigroup, for example, has already begun looking at how its 100 largest buildings stack up against accepted green standards. Based on those findings, the company will then review its worldwide real estate portfolio and create a green road map to help improve the efficiency of its buildings. Soon, financial institutions and investors will use new valuation methodologies to quantify important green building factors like productivity and long-term life cycle costs when determining real estate values.

**The Shift to Green**

Before 2000, companies generally regarded green buildings as interesting experiments but unfeasible projects in the real business world. Since then, several factors have caused a major shift in thinking.

First, the creation of reliable building-rating and performance measurement systems for new construction and renovations has helped change corporate perceptions about green. In 2000, for example, the U.S. Green Building Council (USGBC) in Washington, DC, launched its rigorous Leadership in Energy and Environmental Design (LEED) rating program. LEED evaluates buildings and awards points in six areas, such as innovation and design process. The program has Certified, Silver, Gold, and Platinum award levels. Other rating programs include the UK’s BREEAM (Building Research Establishment’s Environmental Assessment Method) and Australia’s Green Star. Certainly, companies can create green buildings without using these rating programs, and many that do follow program guidelines choose not to spend the time and money applying for certification. Nevertheless, certification assures prospective buyers and tenants that a building is truly sustainable. (For more on these rating programs, see the “Green Standards” sidebar.)

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Second, hundreds of U.S. and international studies have proven the financial advantages of going green. Well-designed green buildings, for example, have lower utility costs. In its first year of operation, Genzyme Center—Genzyme Corporation’s 12-story LEED-Platinum headquarters in Cambridge, Massachusetts—used 42% less energy and 34% less water than standard buildings of comparable size. Green buildings can also boost employee productivity by approximately 15%, in part because they use alternative building materials that don’t emit toxins, like formaldehyde, that are commonly found in standard building materials and workplaces. At Genzyme Center, 58% of the 920 employees report that they’re more productive there than they were in Genzyme’s former headquarters building. Employee sick time in the new headquarters is 5% lower than for all of Genzyme’s other Massachusetts facilities combined. Moreover, green design criteria—including abundant daylighting, individual climate controls, and outdoor views—raise morale and employee satisfaction, which also improves productivity.

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Finally, green building materials, mechanical systems, and furnishings have become more widely available, and their prices have dropped considerably—in some cases below the cost of their standard counterparts. According to Turner Construction chairman Thomas C. Leppert, four industry studies of more than 150 sustainable buildings across the United States show that, on average, it costs only 0.8% more to achieve basic LEED certification than to construct a standard building. The PNC Firstside Center was already under construction as a standard building when the owner, PNC Financial Services Group, decided to go green instead. Even so, the project was completed two months early, came in $4 million under the original (and only) construction budget, and earned LEED’s Silver rating. Now, PNC has constructed several of more than 200 planned green bank branches. The average construction time was 45 days faster than for PNC’s traditional branches, and the costs were the same or lower. In the northeastern United States, for example, PNC’s green branches each came in $100,000 below the cost of a competitor’s new standard branches.

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