Title: Maximizing LEED, Minimizing Your Building's Energy Footprint on the Environment: A Changing Business Climate Signals a New Era for Sustainable Design and Construction

Author: Ms. Karen D. Stelling, PE, LEED® AP, Burns & McDonnell

Date: July 2007

Sustainability, green credits, carbon offsets, renewable energy certificates, high-performance buildings, LEED. All of these are terms that increasingly have become everyday factors in our design decisions — and to providing real, lasting greenhouse gas emission solutions. That, coupled with the spiraling cost of energy, has put Leadership in Energy and Environmental Design (LEED) squarely at center stage in the design and construction of sustainable buildings worldwide.

In spring 2007, it seemed everyone — big city mayors, major corporations and many important states — signed on to reduce energy usage and help stem the tide of rising carbon emissions. On May 8, the recently formed U.S. Climate Action Partnership (US CAP) added 14 companies, doubling the group's roster. New members include market leaders like Alcan, Dow, Johnson & Johnson, PepsiCo, ConocoPhillips, and General Motors Corp. (the first automaker to join). This partnership is asking Congress to adopt a mandatory, comprehensive greenhouse gas cap-and-trade system that reduces emissions by 60% to 80% from current levels by 2050.

May 9 saw the creation of the U.S. Climate Registry, with 31 states joining forces on voluntary reporting of statewide carbon emissions as a critical step toward mandatory federal regulations. And one week later, mayors from around the globe arrived in New York for the "C40 Large Cities Climate Summit." Their goal: to discuss ways that urban areas can achieve significant reductions in greenhouse gas emissions while better leveraging technology for carbon-sensitive alternative fuels.

MORE KEY INDICATORS

This attention to carbon is unprecedented. Yet two recent, lesser-known news items may have even more immediate implications for the adoption of LEED and other green standards.

The Supreme Court ruled in April that the U.S. Environmental Protection Agency (EPA) violated the Clean Air Act by improperly declining to regulate new-vehicle emissions standards to control pollutants that contribute to greenhouse gases. This decision is especially significant as it could give states the authority to force the federal government to reduce emissions or do it themselves.

Another key development was a proposal from the U.S. Green Building Council (USGBC) to its members in mid-May, suggesting immediate changes to commercial LEED Green Building Rating Systems with a focus on optimizing energy credits for LEED certification. This vote would bring a critical change that directly impacts greenhouse gas emissions related to a building's annual energy use. Implementation is scheduled for projects registered after June 26, 2007.

Finally, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) just launched a special project group addressing the calculation of carbon emissions from buildings.

WHY LEED? WHY NOT LEED?

Not so long ago, requests for LEED came mostly on new state, county and federal government projects — and mostly from top officials, mayors and governors — as a way to reduce energy use and showcase sustainable design principles in commercial types of facilities. That was then.

Today at Burns & McDonnell, we're seeing a dramatic rise in the number of private industry clients asking that sustainability or LEED be incorporated into industrial and process designs. What's driving this? For one, a rapid shift in the mindset of investor groups who are asking: "What's sustainable?" "How can new building projects incorporate renewable energy sources?" "Can sustainability improve our bottom line?"

Increasingly, utilities and public corporations are responding to the demands of stockholders who want the companies they invest in to be good stewards of the environment as well as provide positive return on investment. More and more companies are finding that high-performance buildings incorporating sustainable design techniques are good for business, too, because they provide for higher productivity and sales, lower absenteeism and employee turnover rates, and increased property values.

INTEGRAL ROLE OF OWNERS

The best owner is an educated owner.

Owners and client representatives may not always be well-versed in USGBC requirements concerning LEED levels. Yet it's our job to teach, inform and provide guidance about sustainable design principles resulting in a space within budget that truly meets their needs and offers the best possible life cycle value.

Often we must address cost — and perceived costs — first. LEED projects are still seen as much more expensive than conventional buildings. In fact, national statistics indicate the average premium for a green building generally is less than 2 percent, and it can be net neutral. The cost of green design has dropped in the past few years as the number of green buildings, and industry's experience with green construction has continued to rise. Much of this added cost is upfront — through increased architectural and engineering design time, daylight and airflow modeling, etc. Attention should also be given to backside energy cost savings and increases in productivity.

LEED is a holistic approach, benefiting most from intensive coordination up front and throughout the design and construction process. LEED is most effective when you break down the traditional "silos" between owners, users, engineers (all disciplines) and the contractor, enabling earlier informed decisions and a better understanding of activity requirements. More options can be explored. Design packages are more cohesive. Collaboration is simply smart design — and that can result in better energy performance and lower lifetime costs for new buildings.

CHOICES, PRIORITIES, TRADE-OFFS

An owner who's committed to LEED plays a crucial role as chief decision maker — even before a site is selected. Because LEED is evolving, with updated and specialized standards (new construction, existing buildings, commercial interiors, etc.), the checklist of credits should be reviewed carefully.

LEED can also be used as a brainstorming tool to get the design team and owners thinking outside the box of traditional design approaches. This checklist can be used to determine which LEED credits are intuitive, which can be readily applied and are "maybes," and which are simply not viable for a project. Credits can then be prioritized. As owners understand each potential credit, they need to be aware that each choice may also limit their options later. "Extra credits" should be included (three to four) for plans that do not materialize.

articles@burnsmcd.com

Here are several quick rules of thumb to consider:

The Building: What is a building's intended form and function?

- For example, once a program dictates the level of daylighting and daylight control, that will impact: sizing of air conditioning and other mechanical systems; selection of high performance windows; choice of insulation, etc.
- LEED points are awarded for spaces where occupants have greater control over their indoor environment — further influencing decisions about temperature controls or task lighting to reduce overall lighting levels; that in turn can improve productivity and reduce energy use.

The Location: If the site for a new facility hasn't already been chosen, the list of available LEED credits is extensive. Otherwise, the owner's site options are limited.

- Credits are awarded for selecting brownfield sites and for new construction in denser urban areas.
- Siting on greenfields or farmland may cost points. Likewise, new construction near wetlands requires special measures to preserve sensitive areas.
- Access to mass transit — bus lines, rail lines, subways — and promoting bike-to-work programs opens up a number of credits. Encouraging carpools and vanpools leads to design decisions about multi-use parking.

The Materials: Where and how materials are sourced can affect LEED points and impact a project's timeframe.

- Timing can be everything, as certain materials and technologies will take longer to acquire than others. If solar is a priority, for example, it's worth noting there is currently a high demand for photovoltaics in the market so availability may be limited.
- LEED also places a strong emphasis on using resources that are readily available within a given region. Examples include using locally manufactured products, employing people within the local community, and avoiding the pollution associated with long distance transport.

And finally, it's important for owners to think *upfront* about the *future* of their facilities. Someday those needs will change. If a building's form and function cannot be adapted later, consider whether it can be deconstructed wisely and the materials reused or recycled. By focusing on the life of a building even before it is built, owners make a real difference in how that space will be used by future generations.

Karen D. Stelling, PE, LEED® AP, is associate vice president with Burns & McDonnell's Aviation & Facilities Group in Kansas City, Mo. With 19 years at the firm, she has been involved in the progression of energy efficiency and sustainable design and coordinates LEED accreditation efforts.

articles@burnsmcd.com