Life Cycle & LEED: Out Now in EDC's January Issue

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701 Bishop St., LEED Platinum. Photo credit: Oliver Koning

Editor's note: Browse the January issue of EDC, the official magazine for the LEED Professional - and preview the piece "Life Cycle & LEED" by Joel Ann Todd below. Sign up today to get your free digital edition of EDC.

Since its inception, the LEED Green Building Rating System has been based on one overriding goal: To reduce negative environmental and human health impacts of the built environment by promoting innovation and transforming the marketplace. USGBC believes the built environment can be used as a positive force in our communities and for the planet as a whole. With each new version of LEED, the scope of the environmental and human health impacts addressed by the rating systems has grown as our understanding of these issues and their interrelationships has deepened.

LEED v4, the proposed version of LEED scheduled for member ballot in mid-2013, continues that upward momentum by calling on all professions within the building industry to use the best practices and materials available and to keep pushing the envelope to find new and better ways to improve our built environment. Nowhere is that clearer than in the proposed Materials and Resources (MR) credit additions and changes.

Why propose such significant changes? First, the materials we use to construct our homes and workplaces have impacts that reach far beyond the building itself —they are important. Many of the energy and environmental impacts of buildings comes from the materials used to construct them. In fact, it takes 20 to 30 years for the energy and emissions from building operations to outpace the embodied energy and emissions from the materials and construction of a building, according to the 2030 Challenge for Products. And energy use is just one of the negative impacts of the extraction, manufacturing, material ingredients, transportation and other life-cycle steps of building materials.

Second, we need better metrics for materials within LEED. LEED has always encouraged use of “environmentally preferable” materials through credits in the Materials and Resources category. Throughout the last decade, project teams have driven demand for more sustainable products and fostered market-driven innovation in the building products industry. From responsibly harvested wood to green cleaning products, the progress has been significant. These credits have used a common formula since LEED was introduced into the market—rewarding the use of products that perform well on a specific criterion, such as recycled content. But while these attributes are valuable, they only tell part of the story. A product could perform very well on one attribute but far lower on others. The LEED v4 approach paints a more complete picture of materials and products, enabling project teams to make more informed decisions that will have greater overall benefit for the environment, human health and our communities, while also encouraging manufacturers to improve their products through innovation.

And finally, as the market that LEED has addressed transforms, USGBC believes it is time to expand the conversation about materials in new directions. The market is ready for this expansion. Life-cycle approaches to assessment of materials have been available since the 1990s. Life-cycle thinking addresses major environmental impacts throughout the complete life cycle of a product, from extraction of raw materials, the processing of those materials, manufacturing of the product, transportation, use and final disposal, reuse or recycling. In Europe and a few other parts of the world, manufacturers, regulators, specifiers and consumers in many fields have used life-cycle information to improve their product selections and product environmental profiles. Until recently, the U.S. was not able to support wide-scale use of life-cycle thinking due to lack of data and tools. Now, however, the USGBC sees a growing number of manufacturers that are ready to document and publicly disclose the environmental profiles of their products, as well the emergence of

programs to assist manufacturers in this effort and to enable users to easily understand the results.

Introducing Life-Cycle Thinking

Under LEED v4, project teams will find credits that support a life-cycle approach in their designs and building material choices, deliver improved performance, and provide for the most resource-efficient building overall and over time. Life-cycle thinking means that the entire life cycle of a product should be examined, the processes and constituents identified, and the impacts of those processes and constituents assessed—both upstream, from the point of manufacturing or use toward raw materials extraction, and downstream, from that point toward end of life. This type of thinking is sometimes called "cradle to grave" to illustrate the inclusion of the whole life cycle, or "cradle to cradle" to emphasize recycling and reuse at the end of life rather than disposal.

Life-cycle assessment (LCA) is a methodology for implementing life-cycle thinking. LCA methods have been developed by international standard-setting organizations and include rigorous requirements to ensure data quality, comparability and objectivity. LCA is data-intensive and generally requires a trained professional. LEED v4 is not asking project teams to conduct LCAs, to become LCA experts or to hire LCA experts. Instead, the proposed MR credits are similar in many ways to previous credits for the project team—for example, instead of obtaining certification of recycled content from a manufacturer, the project team now will request an Environmental Product Declaration (EPD) or another approved form of reporting that discloses the required LCA-based information. USGBC is asking product manufacturers to gather life-cycle information on their products if they are not already doing so as part of their product development and innovation process, and to disclose relevant portions of that information in standard formats.

Life-cycle thinking also encourages using less materials and more efficient use of materials. In addition to awarding credits for reuse of all or part of an existing building, LEED v4 now allows project teams to use a whole building LCA to optimize decisions on structure and envelope. It provides the most points for reuse to account for the large environmental—and, in many cases, economic and social—benefits associated with reuse strategies. When reuse is not possible, projects are rewarded for using less material while maintaining building function, durability and reducing environmental impact.

Life-cycle assessment and various forms of Environmental Product Declarations do not address all environmental and human health impacts adequately. Therefore, LEED v4 includes credits that are intended to better address human and ecological health impacts of material extraction and the human health effects of constituents used in the product life cycle.

The new LEED rating system will encourage product manufacturers to begin with disclosing information about a variety of product attributes, which will influence the industry's material selections and lead to more sustainable products in the marketplace. And, it will give project teams the tools and information to enable them to make product selections that are optimized across a broad range of impacts.

USGBC Strategies

Use of life-cycle thinking and the expanded approach proposed in LEED v4 requires reporting or disclosure of information, as well as tools for comparative evaluation of materials and products. Reporting allows for evaluation and comparison, which enables preferential selection, which drives further innovation to create more competitive products with improved profiles.

Encourage More Reporting and Disclosure

Specifying better materials is impossible without an understanding of what goes into the products themselves. The life-cycle approach to MR credits provides incentives for project teams to specify products from manufacturers that provide a product's full backstory.

"Just like nutrition labels in the grocery store, project teams want to know what's in the building products they are using," says Brendan Owens, vice president of LEED, USGBC. "By providing this information, innovative manufacturers will gain a competitive advantage in the market, as they will be differentiated from 'business as usual' manufacturers."

Both project teams and manufacturers benefit from the availability of good information in the marketplace. Project teams can improve their product choices to minimize negative impacts and encourage manufacturers to strive toward improving their production practices or highlighting their best-in-class innovations.

Product manufacturers that report on the environmental, human and ecological health impacts of their products demonstrate market leadership. With time, markets are expected to function more effectively and freely through the open sharing of this information.

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