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Material Decisions

WITHOUT LIFE-CYCLE ASSESSMENTS, ARE GREEN BUILDING STANDARDS REALLY LEADING TO GREEN?

How certain can we be of the true environmental impacts of our choices? There are, after all, complicated and complex systems at work. These same debates and complexities apply to the selection of alternative construction materials.

Some builders, architects, governments and consumers have turned to green building standards for guidance. Green building standards are supposed to advance environmentally friendly design and construction. The idea is to minimize our “environmental footprint” by embracing certain building practices.

Green Building Programs

Throughout the last several years, the market for green building has officially exploded into the mainstream. However, green building standards are only “green” to the extent that the practices, materials and products they promote are actually environmentally better than the alternatives. Unfortunately, many of today’s green building standards, including those of LEED and other accepted rating systems, fail this simple test.

Intuition has led to programs that today promote various popular building materials over products like wood framing, engineered wood composites, domestic hardwoods, plywood sheathing, and almost anything over solid-sawn lumber. Yet, systematic analysis shows no clear environmental advantage of these products that are being promoted, and some favored products can be clearly demonstrated to be environmentally inferior.

For instance, environmental life-cycle assessment has shown that construction of interior walls using

one of the preferred (non-wood) methods of framing requires twice as much energy and results in the release of three to 41 times more carbon dioxide and monoxide, sulfur dioxide, volatile organics, cyanide, phenols, ammonia, and methane, among others.

For exterior walls, the differences could be even greater. If, from this point forward, every new home built in the United States that would normally be framed in wood were instead framed in an alternative product, the difference in energy consumption could be roughly equivalent to continuously operating a fleet of 950,000 SUVs, each driving 20,000 miles each year.

Considerations for Life-Cycle Assessment

So, how can it be that well-known green building programs, which are in business for the stated purpose of improving environmental performance, promote the use of high environmental impact materials versus materials that result in substantially lower impact?

Moreover, why do most of these programs not consider the total energy implications of material selection choices or emission of greenhouse gases or other emissions when designating environmentally preferable materials? The answer is: As currently structured, they have no capacity to accurately determine environmental impacts. That inability, in turn, is because nearly all green building programs fail to make use of environmental life-cycle assessment (LCA) in the selection of materials.

Life-cycle assessment (LCA) offers a broader perspective on green building than prescriptive standards

and provides a comprehensive decision support matrix. LCA is a scientific methodology, based on a set of international protocols, that considers energy, raw material and other inputs in manufacturing. It addresses all products, emissions and wastes from raw material extraction through product manufacture, use and disposal.

It is important that green building standards in fact lead toward lower environmental impact. It is likewise important that the nation’s green building programs move as rapidly as possible to incorporate the use of the best available tools, including life-cycle assessment, in identifying environmentally preferable practices and building materials.

Furthermore, variability in the standards is causing confusion, and proliferation of scientifically unsubstantiated prescriptive standards is occurring as new programs are developed and existing programs are revised. Despite the strong adoption rate for green building programs, there is much room for improvement.

Incorporating life-cycle assessment as a required element of all programs would be a significant step in the right direction. [ed+c](#)



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