VISION2020

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Do You Know What's Really In Your Products?

By ALLISON EWING

If we are to become carbon neutral, we need consider not only the energy performance of a home or structure, but also the embodied energy of the materials that go into construction of the dwelling—the cumulative embodied energy. The average home has 300 mWh hours of embodied energy, roughly 25 percent of the total energy used over the lifetime of the building. While the operational usage outstrips the embodied energy in the long term, if we are to truly talk about net-zero energy, embodied energy needs to fit into the equation.

But how should we choose the best materials? Should we focus on renewable, recycled, low-maintenance, local, or a combination of all of these attributes? Embodied energy takes into account the total energy used throughout a material's lifecycle—not only the energy used to extract the raw material, but also the energy used for the transportation involved along the production chain, processing and manufacturing, construction, and maintenance over the years, as well as disposal and recycling. The full path is often called "Cradle to Grave."

It can be complicated. While the embodied energy of one recycled product might look promising, when you consider that material might travel from a factory in China to a construction site in the U.S, the embodied energy literally becomes a moving target. In an effort to disentangle these complex issues, we at Hays Ewing initiated a materials mapping project, called SpecLocal.

We decided to initially focus on mapping bio-based materials in the United States. Bio-composites are either plant-derived fibers, or crop-derived plastics. Our idea was to build a database of bio-based construction materials that will eventually be available to the construction industry. The goal is to increase the market accessibility of locally extracted and produced materials, while helping to expand manufacturing jobs in rural America. An embodied energy calculator will also be incorporated in the database to assist the user in determining the energy inputs for transportation.

This is how we anticipate SpecLocal working: Say an architect is exploring rigid board insulation options. Rigid board is typically a petroleum-based product—not preferable. What are the bio-based options? The SpecLocal search would come up with a mushroom-based insulation made by Ecovative (currently in the testing phase). Using a patented technology, this bio-based material converts agricultural waste such as corn stalks and cotton burrs into a variety of products such as acoustic panels, insulation, packing material—all of which are low-cost, renewable, and low in embodied energy. The transport calculator would then assist the architect in determining whether the material is a preferable alternative to conventional rigid board if it would need to travel from Green Island, N.Y., to Greenville, Texas.

Others are also at work on bio-based material mapping and cataloging efforts. A bio-preferred program was established in the Farm Security Acts of 2002 and 2008, and the U.S. Department of Agriculture has established the USDA Certified Biobased Product label. Currently there are 900 products certified. It's our goal that our database would include both certified and non-certified products . We are currently seeking grant funding to carry the project forward and anticipate completion of the database in 2014.

Click here to read a companion article on the USDA's Certified Biobased Product Issue.

Building on its successful launch in 2012, ECOHOME's Vision 2020 program continues in 2013, focusing on eight critical areas in sustainability. Track our progress all year as our panel of visionary focus-area chairs, our

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editors, and leading researchers, practitioners, and advocates share their perspectives on initiating, tracking, and ensuring progress toward sustainable priorities and goals in residential construction between now and 2020. The program will culminate in an exclusive Vision 2020 Sustainability Summit in Washington, D.C., in September 2013, and with a special edition of ECOHOME in Winter 2013. Click here to see the 2012 Wrap-Up.

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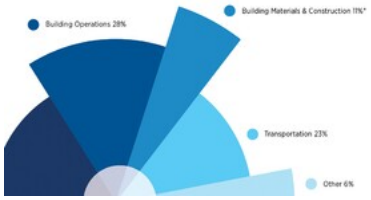

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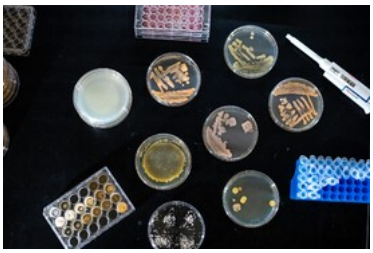

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