



# High-Tech Green Building Materials Are Transforming Construction

by Justin Moresco - Jun 30th, 2009

While cork flooring and bamboo furniture get all the attention in green homes, eco-substitutes for old-school construction products like concrete, lumber and insulation are where the real action resides in the growing green building materials market.

Spurred by shifting attitudes among consumers, government mandates, and the higher prices green buildings fetch on the market, the building industry is embracing more environmentally friendly materials.

The global market for these products is now forecast to grow 25 percent over the next five years to [\\$571 billion in sales](#), according to NextGen Research.

“Companies increasingly are looking at their products from cradle to cradle, from the material in the ground to when the building is remodeled or replaced,” said Larry Fisher, research director for NextGen Research.

While some of these green materials—engineered wood made from waste scraps, for example—aren’t new or hi-tech, others have emerged after years of research and development often backed by venture capital financing. And as is so often the case, nimble startups run by hungry entrepreneurs appear to be leading the way in bringing innovative products to market.



One of the most successful startups to date has been Sunnyvale, Calif.-based [Serious Materials](#), whose high-insulating windows and eco-replacement for drywall have [attracted the attention of President Obama](#) and a growing list of customers.

The company says energy-efficient residential windows exceed the Environmental Protection Agency’s Energy Star requirements by up to four times, and their installation can reduce utility bills as much as 40 percent. The company’s EcoRock is made from 80 percent recycled materials, including waste from steel and cement plants, and requires just one-fifth the energy to produce as conventional gypsum drywall.

One of the biggest opportunities in the green building materials market is in developing alternatives to conventional concrete.

The formable, high-strength material is one of the most widely used in the building industry, however the production of cement—a major component of concrete—contributes about [5 percent](#) to total man-made carbon dioxide emissions.

Beverly Hills, Calif.-based [iCrete](#) is one startup aiming to shake up the industry. The company says it has developed what it calls a mix design technology that leads to a higher performing and more economical and environmentally friendly concrete. Used in the construction of New York’s Freedom Tower, the high-tech concrete can reduce the overall carbon footprint of a construction project by 40 percent, the company says.

Carlstadt, N.J.-based [Hycrete](#) is taking a different approach to the concrete market. It’s developed a chemical that when added to concrete makes it waterproof.

Concrete walls that are underground, like those for basements or parking structures, traditionally are protected with a plastic membrane so water from the surrounding soil doesn't cause damage. The use of Hycrete's admixture removes the need for petroleum-based membranes, speeds up the construction process and makes concrete buildings last longer while cutting fossil fuel use.

Newark, Calif.-based [CalStar Products](#) says it has developed an eco-alternative for architectural facing bricks, non-structural bricks that account for the vast majority of the U.S. market. They are made with fly ash, a byproduct of coal-burning power plants, and generate about 90 percent less carbon dioxide in their production than conventional clay bricks.

[Aspen Aerogels](#) may take the prize when it comes to the nexus of sophisticated technology and the building industry. The Northborough, Mass.-based nanotech startup has developed a way to mass produce aerogels, gels with high air content that are one of the most effective insulating materials in the world.

All that air means the material is extremely light, and that has caught the attention of industries as diverse as national defense and outdoor gear and apparel. The building industry has also shown interest because Aspen Aerogels now sells an insulating product for walls, floors and roofs that is three times as effective as conventional fiberglass bats.

But while builders and consumers increasingly are turning to more environmentally friendly products, these startups still have a tough road ahead to grow their businesses and persuade people to trust their products. The construction industry is traditional and diffuse—even mid-sized cities can have hundreds of building contractors—so marketing will take serious boots on the ground.

"The greatest hurdle is inertia, getting people to change the process they've used for a long time," Fisher said.