

Low carbon materials to capture the imagination of homebuilders and owners

November 20 2015, by Angus Mcneice

Innovation in the construction industry will play an important role in reducing emissions and improving energy efficiency, though developing new materials and methods is only half the battle. Convincing architects and homeowners of the performance and long-term financial benefits of a new product presents a significant challenge.

In Europe, households are responsible for 32 percent of [greenhouse gas emissions](#) and 42 percent of energy. Cement production alone contributes to 5 percent of manmade CO2 emissions.

By contrast, bio-based insulation typically has much lower "embodied energy" levels compared with more conventional building materials. Furthermore, the source materials themselves sequester atmospheric carbon dioxide via photosynthesis.

"The beauty of bio-based materials is that they are often a byproduct of growing our food. We can build with carbon. Instead of seeing carbon as a problem, we can recast our relationship with it to one of positive innovation", says Craig White, director of ModCell, which produces straw-bale eco-homes.

The company is one of the 12 partners in academia, research and industry that are collaborating with the European project ISOBIO. It aims to deliver bio-based insulators with 20 percent better performance than conventional materials, leading to a 5 percent total energy reduction over the lifecycle of a building at reduced costs of 15 percent.

Producers of bio-based insulators have the advantage that users are both receptive to change and familiar with the products in some capacity. In a study conducted by the Architects' Council Europe (ACE) for the Low Embodied Energy Insulation Materials (LEEMA) project, 94 percent of architects surveyed said they would consider using a new and innovative insulation material. An overwhelming endorsement for what remains a niche application in the construction and renovation industries.

Renovations present a key market for producers of new insulation materials. According to the Buildings Performance Institute Europe (BPIE), more than 40 percent of Europe's existing homes were built before the 1960s, when there were few requirements for [energy efficiency](#), leading to low insulation levels.

Increasing awareness of the importance of insulation among homeowners is an important consideration. Homeowners may be inclined to, for example, upgrade appliances and install energy saving light bulbs, unaware that retrofitting wall and roof insulation leads to the greatest savings opportunities.

Veronika Schröpfer, lead author on the ACE survey, believes that bio-based insulation materials will continue to move from the niche into the mainstream and that new skill requirements will not present significant roadblocks.

Schröpfer says new building [materials](#) are often applied the same way as commonly used ones and manufacturers usually offer training when this is not the case. She states the main concerns involve pricing and regulations in different European countries.

"For architects it is important that a new material has all the necessary certificates and that the product information is transparent, to quickly compare its performance and price with traditional products," says

Schröpfer.

White believes that developers will be receptive to change. "The challenge that ISOBIO will overcome will be to bring [products] to market at scale at the price point that matches their performance to market demand," he says.

Europe's construction industry has experienced a turnaround over the last two years. After registering negative growth in 2013, the industry grew by 2.1 percent this year, and is forecast to grow by a further 2 percent over the next five years.

Evidence suggests that a growing minority of these builds will involve green projects. A market report from the World Green Building Council states the proportion of architects and engineers that dedicate 60 percent or more of their project load to sustainable builds more than doubled over a four-year period—from 13 percent in 2009 to 28 percent in 2013.

The report states that increasingly, industry consumers not only demand that new innovations improve performance, but also reduce environmental impact. Fertile territory for the right nature-inspired solutions.

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