

Reinventing the humble brick to cut carbon emissions

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A technological breakthrough may be about to help the humble brick play a small but significant part in helping to reduce greenhouse gas emissions.

The makers of a new "green brick" say that the chemical manufacturing process requires up to 90 per cent less energy and generates 90 per cent less CO₂ than traditional bricks.

The brick is made mostly of fly ash, a powdery residue that is a by-product of coal-fired power plants. It is usually considered a pollutant, with costs and environmental risks associated with its disposal, often in landfill sites.

Clay bricks have been made much the same way for 3,000 years, fired for 24 hours at 1,093C (2,000F) as part of a process that can last a week, while the new green bricks are heated at temperatures below 100C (212F) and take only ten hours to manufacture.

The fly-ash brick is being developed by CalStar Products in California, after research conducted at the University of Missouri.

Buildings account for almost half of CO₂ emissions. While most green efforts have gone into conservation — improving buildings that spill all the heating and cooling energy poured into them — companies are beginning to look at providing more environmentally friendly construction materials, including concrete that absorbs carbon dioxide and windows that insulate better than walls.

In Britain, The Green Brick Company, based in Surrey, has licensed the

manufacturing process and is in the process of testing sources of fly ash in Britain and Ireland to see if they are suitable for production.

The UK has some of the most ambitious targets for reducing carbon emissions, especially for new buildings. New houses have to be zero carbon by 2016 and other buildings by 2019.

Last week the UK Green Building Council (UK-GBC) called on governments to recognise the importance of carbon savings from buildings in the Copenhagen climate change talks, coming up this year. Paul King, UK-GBC's chief executive, said that,

90%

Cut in CO₂ emissions with new brick

Source: CalStar

because of the large carbon footprint of the built environment, there was no bigger and more cost-effective option for achieving global cuts in carbon emissions.

"The Kyoto Treaty rightly acknowledges the role that deforestation, transport and energy generation play in contributing to climate change. However, buildings have been poor relations up to now. Inclusion of buildings within the Copenhagen agreement would encourage the setting of ambitious targets for carbon reductions for the building sector," he said.

CalStar will market its products as

an environmentally friendly choice for the construction industry.

The manufacturing process swaps baking in a kiln for a curing process with chemical catalysts. CalStar mixes fly ash, sand and its chemicals, which are then poured into moulds to shape it and eliminate voids. The bricks can be formed and coloured to resemble any brick or paving material.

Michael Kane, the chief executive, said that his products looked and performed exactly like traditional bricks. "The technology of brick-making has not changed in thousands of years and the industry is not used to new entries. This is a sea change for the industry."

Yet thousands of years of tradition will be difficult to leave behind. The Brick Industry Association in the United States, for example, said that its members had been working to improve energy efficiency in the manufacturing process and had increased the percentage of recycled materials.

Dick Jennison, president and chief executive of the association, said that he objected to CalStar calling its product a brick, accusing the company of hijacking a name that had a long and illustrious history.

"While I admire their innovation, to call it a brick is an insult to the brick industry," he said. The association would prefer the name "fly ash modular unit".

CalStar's headquarters and research facility is based in a warehouse on the shores of San Francisco Bay. Its first



DAVID LAWSKY / REUTERS

Michael Kane, CalStar's chief executive, watches samples undergo tests

plant is under construction in Caledonia, Wisconsin. It is near a Wisconsin Energy plant that can supply calcium-rich fly ash and is due to begin production by the year's end.

The company, backed by venture capital, has signed 16 distributors to sell 12 million or more bricks in the first year and plans to make 100 mil-

lion bricks for sale throughout the Midwest and the South of the US.

Nor is it alone in the sector: Serious Materials, a clean-tech start-up based in Sunnyvale, California, has secured \$60 million (£38 million) in

third-round venture capital funding for its energy-saving windows, drywall and other products.