

Low carbon life for terraced houses

A house that has fallen into disrepair is being refurbished to create a low carbon home with funding from the Small Business Research Initiative (SBRI). Pioneering energy reduction methods are being used to transform a three-bed end terrace house in Liverpool which is aiming to surpass the 80% carbon emission reduction target as well as bring the house back into use. About 27% of total UK CO₂ emissions come from domestic housing.

Sustainable living

The 32-month project, which began in June 2010, is part of the Retrofit for the Future programme which aims to test and measure whole-house energy efficient technologies in existing housing. Project leader, the Plus Dane Group, hope their prototype will pave the way for more families to live in sustainable, affordable homes in the future.

A key part of the project is not only retrofitting a house to strict environmental standards, but also enabling the future occupants to live a 'PassivHaus' lifestyle. This includes supplying low energy appliances and ensuring they understand how the house is designed and how it operates to the optimum performance.

The refurbishment incorporates a comprehensive package of energy reduction measures with many of the major components sourced in the UK.

Nearly 60% of all the heat lost from an uninsulated home is lost through the loft space and walls. A thorough process of sealing the building is being



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undertaken to ensure all air paths are eliminated using the Maple 'SupaWall' and 'Supafloor' insulation system which is provided by Maple Timberframe, an entirely UK-based operation. The material within the panels is 140mm thick polyurethane insulation and provides exceptional thermal properties.

The SupaWall panels are designed specifically for new-build construction. These retain the heat generated within the property so effectively that it removes the need for traditional central heating. The challenge for this project is to apply the technology to a retrofit house. This is restrictive as the floor and wall cassettes have to be manufactured in smaller sizes and put together like a jigsaw puzzle inside the house.

Windows will be triple-glazed while external doors will not contain glazing. Space heating will be provided by a mechanical ventilation unit with heat recovery, to take pre-heated air from the rear, south facing conservatory. The system takes care of the ventilation requirements while also significantly reducing energy consumption by recovering otherwise wasted heat. A small high efficiency gas-fired boiler will serve as a supplemental heat source.

Water heating will be by solar water heating panels on the south facing roof, supplemented by the same high efficiency gas fired boiler.

Key components such as solar pumps, glazing, silicone rubber pipe, aluminium frames and absorber plates come from UK suppliers.

'This pioneering approach will address all the energy needs of the property to achieve a significant emissions reduction. This is not only about 'making good', but also about making a fundamental change, which will bring the house back into use.'

MARTIN GLADWIN, HEAD OF ASSET MANAGEMENT, PLUS DANE GROUP
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COMPETITION

Low carbon living

The Liverpool project is one of 87 housing projects across the UK benefiting from a share of £17 million of government funding to demonstrate low carbon building technology in existing housing.

The Retrofit for the Future competition run by the Technology Strategy Board was launched as part of the Government's target to save 80% of CO₂ emissions from existing housing by 2050.

The retrofit prototypes each receive an average of £142,000 to demonstrate deep cuts in carbon emissions and showcase pioneering energy efficient measures. The funding is designed to stimulate the implementation of innovative, proof of concept demonstrator houses that may offer cost effective solutions for wider roll-out across the UK. Each demonstrator house will then be evaluated by the Energy Saving Trust for two years and its potential assessed for adoption across the UK.

The SBRI scheme is one of the tools that the Technology Strategy Board uses to drive innovation. SBRI competitions use the power of Government procurement to:

- provide innovative solutions to public sector challenges
- and business opportunities for technology companies.

KEY FEATURES

- Competition is demand driven by a defined challenge
- Stimulates the creation of innovative new products or services
- Operates under EU pre-commercial procurement guidelines
- Fully-funded development contract – not a grant
- Fast-track, simplified process
- Particularly suitable for small and medium-sized businesses
- Government department acts as the lead customer
- Intellectual property is retained by the company

The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life. It is sponsored by the Department for Business, Innovation and Skills (BIS). T: 01793 442700 www.innovateuk.org