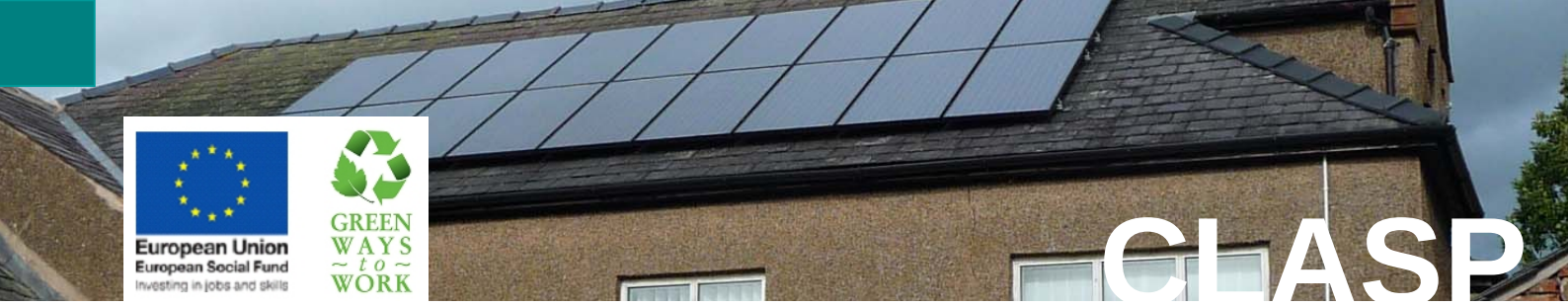


Improving energy efficiency in traditional buildings – Inspirational case studies from Cumbria

Case Study One – Domestic property

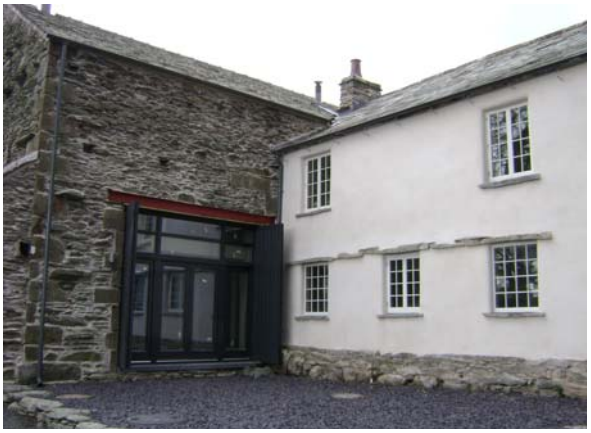
Scheme Summary

Vaughen Steel is an example of a complete refurbishment, creating a house with low energy use. The original farmhouse dates from the 1700s and has been derelict in recent years. With the work completed in 2011, a spacious 21st Century home has been created from the integration of the farmhouse with the adjoining barn and byre. The property is in an exposed location within the Lake District National Park and is not connected to the electrical grid, so renewable energy is a key part of the retrofit, with a wind turbine and photovoltaic panels installed.

Energy Efficiency Features

The refurbishment has been carried out using breathable materials wherever possible and with the retention of original features in the farmhouse such as beams and floor boards. The wall fabric of the barn and byre has been improved by the use of hemp lime internal wall insulation. Windows and doors are high specification, some of which have been made locally.

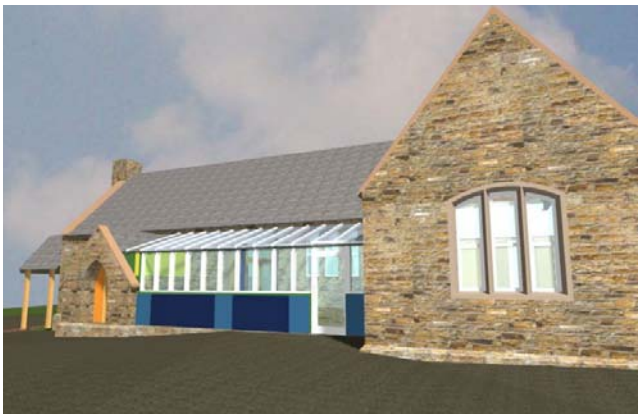
Particular attention has been paid to the airtightness of the building with the use of specialist tapes around windows and beams. This will enable the mechanical ventilation and heat recovery (MVHR) system to function efficiently. The original chimneys have been filled with vermiculite and two log burning stoves installed which have external air intakes.



Case Study Two – Gilcrux Village Hall, Gilcrux

Scheme Summary

The hall is being refurbished to achieve an energy rating of A compared to the G rating at present. The major works to the building consist of re-roofing, stone repairs to the existing fabric and a large extension along the rear elevation of the building.



Energy Efficiency Features

Additional insulation and energy saving measures will be incorporated in all repairs. New roof lights and windows will improve daylighting and a new glazed lobby and entrance will be created to give level access into the main hall and provide a sheltered community information point and bus shelter and help reduce heat loss from the building. The extension will be a super insulated steel frame volumetric construction. The whole building is being externally insulated as much as possible, with new thermally efficient construction insulating the main hall at its core to achieve a high energy rating. The remaining areas of external wall are being internally insulated to retain the original stone façade. A 16kW air source heat pump linked to underfloor heating together with zoning and weather compensation controls combined with a humidity controlled ventilation system will ensure comfort levels within the building and energy efficiency.

Case Study Three – mixed use Listed building

Scheme Summary

Idle Mill is the renamed extension and conversion of a Grade II listed mill cottage which lies in the centre of the Conservation Area of Ambleside.

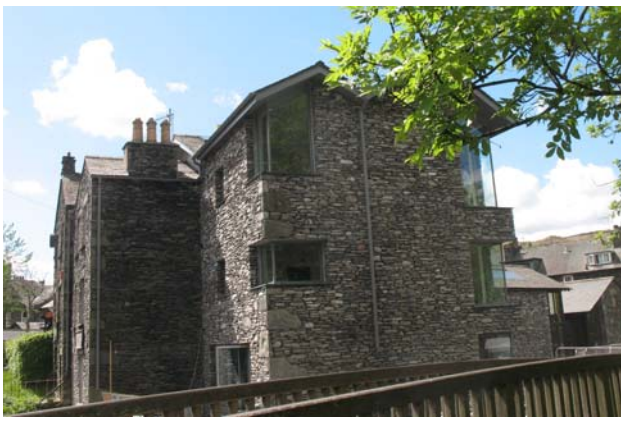
The scheme comprises of two holiday lets and retail use on the ground floor. Planning requirements meant that the extension required a stone façade to match the surrounding buildings. In order to maximise the commercial letting space, and also deal with a very constrained site, off site fabrication was used to construct the extension to the building.

Energy Efficiency Features

The main structure is formed from Structural Insulated Panels (SIPS), enabling a relatively thin structural wall to be built which complies with current Building Regulations and also achieves excellent airtightness. The extension effectively forms a new thermal envelope around two sides of the existing building which will dramatically improve its comfort levels and energy efficiency.

The existing building has been lined internally to achieve some thermal improvement. Windows have been refurbished and draught stripping added to old sash windows, with narrow pane double glazing used to improve insulation.

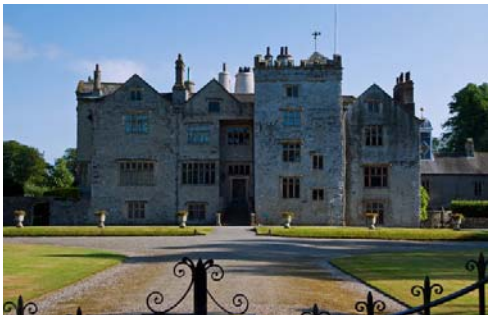
Mains gas was available and has been used to provide efficient space heating via conventional radiators with weather compensation and zone control.



Case Study Four – Listed Building

Scheme Summary

Grade 1 Listed Levens Hall is in the final stages of installing a 112Kw Biomass district heating scheme to replace existing expensive oil and propane boilers.



Energy Efficiency Features

Two 56Kw pellet boilers will supply heat to the main hall, the domestic wing and the shop, café and greenhouses. The system can modulate the heat output to match heat demand making the system 93% efficient. It has been designed with weather compensation and zone control and is carefully engineered to connect to the existing heating systems throughout the Hall to avoid expensive alterations of the existing fabric. The two boilers and two 6 ton pellet stores are located in existing outbuildings, with two heating mains supplying heat to the Hall and greenhouses.

Visit case studies like this during CAfS annual *Cumbria Green Build Festival.*

Where can I find out more information?

Historic Scotland www.historic-scotland.gov.uk Research and guidance into traditional buildings	Planning Portal for online planning advice www.planningportal.gov.uk
Cumbria Action for Sustainability www.cumbriagreenbuild.org.uk Local supplier info, events, training, case studies	Society for Protection of Ancient Buildings 0207 2475296 www.spab.org.uk

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