CASE STUDY | DOMESTIC
REFURB | PRIVATE

Hafod Caves, Wales

Renewable energy solves key heating issues in Welsh valley cottage

Key issues for the new owners of Coed y Glyn Uchaf – a cottage in a remote Denbighshire valley – were not just the noise and poor efficiency of the oil-fired heating system, but also uncertainty over the fluctuating price of oil and a keen desire to move away from fossil fuel energy and towards renewable sources.

The cottage, near the village of Glyn Ceiriog, is much modernised and extended, but its core dates back more than 200 years. It stands at the foot of a steep, wooded hillside which hints at its Welsh name. The other main feature of its 10 acre 'back garden' is a disused quarry – consisting of caverns said to be 120 feet deep – where granite and slate were extracted up to 1907.

After living with the oil system through one winter, new owners Greg Brash and Tim Dean opted for a cleaner and quieter renewable solution to secure their future heating needs.

They now have a Daikin Altherma High Temperature air-to-water heat pump that's largely powered by solar energy. This fuel-saving combination is reckoned to save them at least £700 a year – and that's before domestic Renewable Heat Initiative payments.

According to Daikin, 65% of the system's output is free energy, extracted from the air, and 35% is electricity.

Oil tank and boiler have gone and in their place stand a 16kW outdoor unit and the indoor hydrobox. The outdoor unit extracts heat from the air, steps it up via the primary R410A refrigerant and transfers it to the hydrobox. Using Daikin's Cascade technology, the secondary R134A refrigerant circuit raises the temperature further, enabling the system to deliver up to 65°C to satisfy peak demands for heating and domestic hot water.

Year of installation

› 2017

Project requirements

- ☐ LT Split
- ☐ LT Mono
- ☑ HT Split
- ☐ Hybrid
- ☐ Combustion
- ☐ Smart Controls
- ☐ Solar Thermal
- ☐ UFH
- ☐ Heat Pump Convector

Installed systems

› High Temperature Split 16 kW

Of the 14 radiators in the three bedroom cottage, just one had to be replaced to maximise performance with the new system.

Installer David Jones, Managing Director of Hafod Renewables, Denbigh, says the most challenging aspect of the installation was drilling a single hole in an ancient granite wall to connect the two Daikin units – it took three drill bits and a day and a half to get through.
He says: "It's a remarkable property and now it has a reliable heating system as well, which brings it right up to date.

"It used to be really difficult to retrofit renewable systems to old properties but there have been such amazing advances that – apart from granite walls – it's now much easier."

The 160m^2 cottage consists of a double storey core building with two bedrooms and a bathroom over the kitchen, entrance hall, and a third bedroom. Beyond the kitchen is a living/dining room, leading to a more formal lounge. An extension at the other end of the core provides an annex bedroom with shower.

Greg, a procurement consultant, and Tim, an accountant who trades in crypto-currencies, both work from home so the improved heating is very welcome in winter.

Greg says:

"We're really pleased with it. The system does exactly what it's supposed to do and is so much cheaper. There's even an app so we can control the heating from our phones from anywhere in the world."

Daikin promotes its Altherma High Temperature system as an ideal solution for home renovation and boiler replacement. Its compact design means minimal installation space, and the system integrates seamlessly with existing piping and radiators. With A+ energy efficiency and fast heat-up times, the system ensures comfort and reliability, even when it's below zero outside.

Kit list

Code	Description	No of units
ERSQ011AY1	Daikin Altherma HT Outdoor Unit	1
EKHBRD011ADY1	Daikin Altherma HT Indoor Unit	1

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