



## Horsefields

# Hybrid system provides better environment for Dorset family

When Amy Swayne-Shaw's old gas boiler became noisy and costly to run and she was concerned that the radiators were often too hot for her two small children to touch, she decided to look at alternative heating solutions.

Instead of choosing a straight boiler replacement for her 73m<sup>2</sup> three bedroom semi-detached house in Gillingham, Dorset, Amy decided on a renewable heating solution: the Daikin Altherma hybrid heat pump system.

The system, combining a high efficiency gas combi boiler and an air-to-water heat pump, keeps the house at a comfortable temperature and provides hot water for the family on demand.

Amy is very happy with her hybrid heating system because she wanted a cheaper, greener supply of energy and a more constant, comfortable temperature for her children. She says it will also help to counter the effects of future energy price increases.

The Gillingham system was one of the first installed in the UK, and it was included in a long-term monitoring programme to collect performance data

from a cross-section of installations.

Amy's new system, which is connected to a mix of existing and new radiators, is based on a design heat loss 5.6kW at -1.8°C and a design flow temperature 45°C at -1.8°C.

Monitored over the 11 months to 31 March 2015, the Daikin Altherma hybrid system demonstrated primary energy efficiency of 98%, while the heat pump produced a Seasonal Performance Factor of 3.1. The heat pump covered 48% of the space heating requirement, delivering 2,812kWh of the 5,890kWh total.

Based on the energy produced by the heat pump, Renewable Heat Inceptive income was £142. It cost £256 to run the Daikin Altherma hybrid for space heating – against an estimated £284 if only a gas boiler had been used for the full heating requirement. This is effectively an annual saving of 10%.

The Daikin Altherma hybrid heat pump system has two heating settings: 'ecological' or 'economical'. In the ecological setting, the system is set to limit carbon emission rates, potentially cutting 0.8 tons of

carbon every year. In the economical setting, the smart controller automatically searches for the most economical operating conditions for the lowest running costs, based on electricity and gas prices, heat pump efficiency and heat load.

At higher outdoor temperatures, when the heat pump has sufficient capacity to cover the heat load, it will operate alone. As temperatures fall, the boiler starts to support the heat pump in hybrid mode, only taking over on the coldest days, when using the heat pump becomes less cost efficient.

Daikin's unique and patented system comprises a heat pump and boiler working in series, rather than in parallel. This means that in hybrid mode, heating water is pre-heated by the more efficient heat pump, reducing the energy consumed by the boiler. The increase in efficiency over a stand-alone gas boiler means less energy is used.

For the Gillingham installation, a room-by-room heat loss calculation was conducted to ensure that an adequately sized heating system was installed and to ascertain whether or not the existing radiators could be retained. The analysis identified two radiators for replacement so sufficient heat could be provided. The system is designed to provide 21°C in the main living areas with 18°C in other rooms.

These calculations were carried out in accordance with MIS 3005, the Microgeneration Certification Scheme (MCS) standard covering the design, supply, installation and commissioning of a heat pump.

MCS registered installer, Gillingham-based Dorset Energy Solutions, carried out the installation over three days. The old gas boiler was removed from the kitchen and the new indoor unit – hydrobox and boiler with similar overall dimensions to a standard boiler – was repositioned. All the connections were easily accessible, allowing straightforward installation and commissioning.

As there was no need for any major change to the pipework and radiators, installation time and cost were reduced and disruption was minimised.

The outdoor unit has a 5kW capacity and was sited so that space in the garden was not taken up. The indoor unit has a 27kW central heating capacity and 33kW capacity for hot water.

As well as taking advantage of the cheapest fuel and guarding against future energy price rises, the Daikin Altherma hybrid system is eligible for RHI funding over a seven year period. This makes the Swayne-Shaws' investment even more worthwhile.

The new system provides the family with a constant source of heat, day and night, which is more comfortable, particularly for their young children, as it is no longer cold during the night.

There is also enough hot water for everyone to use at any time of day. A further benefit is that the radiators are working at an acceptable temperature, rather than being too hot to touch, particularly for small children.

