

Meadows Mill House, Weymouth, Dorset



Building type:

Georgian villa and period miller's cottage in the vicinity of a 16th century watermill

Technology used:

2 x 19kW flexoTHERM ground source heat pumps

2 x 800l buffer tanks

2 x 250l uniSTOR cylinders and 1 x 500l uniSTOR cylinder

Installer:

Vaillant and MD Group
www.vaillant.co.uk
www.mdgroup.co.uk

Project background

- District heating plant scheme serving three buildings
- Thermal energy provided by the River Wey that runs through the property
- Hydroelectricity plant provides power, enabling the heat pump system to run off-grid.

Projected fuel savings Georgian villa and miller's cottage

Annual fuel saving (vs oil)	£1,624
Projected lifetime fuel cost saving over 20 years	£32,499
RHI cash back (over 20 years)*	£109,400

*RHI cash back is estimated on heating and hot water usage

System specification

Sean Cooper, owner of the 16th century Radipole Mill in Weymouth, was already familiar with sustainable technology when he decided to upgrade his oil-based heating and hot water systems.

The mill was converted into a 5,000 sq ft residence and a modern hydroelectric plant was installed to supply electricity to the entire site, which consists of a 16th century watermill, a Georgian villa and a miller's cottage.

Andy Crookes, Director of MD group, worked closely with Simon Melbourne at Vaillant to design a system for using the River Wey to generate heat for the historic buildings. flexoTHERM heat pumps were chosen for their ability to generate heat and hot water from a water source, and were installed in a district heating plant system serving all of the buildings.

Running on a closed loop system, the flexoTHERM heat pumps are connected to specifically designed loop collectors in the river which runs through and around the mill. Thermal energy is absorbed from the river and converted to usable heating and hot water by the flexoTHERM heat pumps. The mill is able to vary the water level over the loop, ensuring optimum flow and submersion to meet the heating and hot water demands. The surplus hydroelectricity

generated by the mill, previously sold back to the grid, is now used to power the heat pumps, meaning the project is effectively able to run off-grid. Energy generated by the hydroelectricity plant, powers the heat pumps from 11pm (when electricity demand is at its lowest) which conserves electricity and drives efficiency.

The large site consists of three properties. Grundfos pumps were installed to pump the heated water from the flexoTHERM heat pumps to each property via zero loss pipes located underground. Underfloor heating was installed in all three properties and the system now caters for bespoke heating settings thanks to the use of Essco plate heat exchangers and third party controls. Although the overall plumbing at the site was a major installation, this was carried out with ease by Vaillant approved installers and MD Group.

Following the installation, the mill has been refurbished into a home and office and is now a focal point of the property. The oil boiler previously installed at the cottage and villa have been removed, and the integration of the flexoTHERM heat pumps with the hydro capabilities of the site provides electricity, heating and hot water across all three period buildings.

Outcome

Prior to the project going ahead, the Meadows villa and cottage were equipped with heating systems that were powered by an oil boiler and was costly to run.

The project has been an enormous success, equipping the buildings on site with cost-effective heating and hot water systems.

The total estimated running cost for the Meadows villa and cottage is **£870.25**. The original oil-based system was estimated to cost **£2,495.22**, meaning the heat pump will save the owners **£1,624.96** per year.

Due to the success of the project, MD Group are now investigating further projects using similar renewable technology.

In addition, the entire site qualifies for commercial RHI and will contribute approximately **£5,470** per year for the next 20 years.



Why Vaillant?

Sean Cooper
Chairman of MD Group

“Simon Melbourne at Vaillant was the only supplier-based technical expert who really understood what we wanted to achieve, and he held this at his heart throughout. Working hand in hand with MD Group (our MCS accredited designer and installer), Simon worked tirelessly to get to grips with the unique environment and deliver a design that optimised the site’s proximity to the River Wey for both power generation and heat exchange.

What stood out about Vaillant wasn’t just their technical expertise or their willingness to go the extra mile, but

their collaborative approach to working with MD Group, Essco controls and local tradespeople to truly make the whole process a resounding success.

Meadows is an Idyllic location and the whole design ethos was that we wanted to use the same power generation through hydroelectric generation to power the campus of three period homes, just as that same power capability had generated the wealth to build these buildings centuries ago. After a thorough search of the market, we decided to work with Vaillant on this exciting opportunity.”