Department of Energy & Climate Change

Non-Domestic RHI
Case study – Fast facts

Technology type:	Anaerobic Digester
Equipment manufacturer:	Greenfinch/Marches Biogas
Capacity:	198 kW thermal, 170 kW electrical
Installer:	Greenfinch/ Marches Biogas

Norfolk farm turns waste into heat and power

Biogas plant warms large dairy and grain farm with extra heat and electricity to spare.

Scenario

Stephen Temple grew up on a family farm in Norfolk, which he now runs. Before taking over at Green Farm, he spent 23 years working in Malawi, lecturing and doing research in agricultural engineering, only returning to the UK in 1998. In Africa, Stephen saw first-hand how renewable heat and energy systems saved the farmers time and money. When he came back to the UK, he was determined to implement some of the practices he saw there in his own operation.

Green Farm was started in 1912 by Stephen's great-grandfather and has grown to 500 acres over the years. With 100 cows, it focuses on its dairy operation, using 35 per cent of the milk produced to make cheese. It also grows barley, maize and other crops for livestock feed. More recently, it has starting exporting energy as well.

Stephen wanted to install an anaerobic digester to supply the farm with heat and power. Anaerobic digesters take in farm waste, including manure from cows, by-products from the cheese factory and grain. The digester uses the materials to produce biogas, such as methane and carbon dioxide, which then gets sent to an engine that converts it into electricity and heat. After the digester is finished with the materials it takes in, they can be used as fertiliser for the farm.

"As farmers we feel a particular responsibility to care for the land around us and to use all of the materials our farm produces," says Stephen. "We are also close to a chalk stream that is sensitive to pollution and felt very strongly that we didn't want the manure and other waste from the farm to get into the river. Setting up a system that uses farm waste made sense for us both practically and morally."

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Added benefits

In 2008, Stephen submitted the paperwork needed to change over the farm's systems, including planning permission and Environment Agency permits. He worked with Marches Biogas, a manufacturer and installer of anaerobic digesters, to design a system that suited the farm's needs. Construction on the plant started in early 2009. It took about a year to install and just before Christmas in 2009 it started producing gas and heat. Electricity followed in 2011. Around 20 per cent of the electricity produced powers the farm and residential cottages on the site, with the remainder feeding into the grid. The biogas plant now generates up to 170 kW of electricity and 198 kW of heat.

"It was not a simple process to get the plant up and running, but it was worth it," says Stephen. "We need to feed the digester three times a day and that has become part of our normal farm operation. We also need to perform regular maintenance on the machinery about every six weeks. It produces enough heat for all of the buildings on the farm, as well as several homes across the road, with more to spare. When the digester is finished with the waste we put in, we are then left with a rich fertiliser that has resulted in faster growing crops, an added benefit we didn't expect. We couldn't ask for a better result."

Financial savings

Installing the biogas plant cost the farm £800,000, with a further £12,000 spent on the indoor installation of the heating system in the dairy, cheese factory, farmhouse, cottages and grain dryer. Before the installation of the plant, the farm paid well over £10,000 a year for heat and is now paying nothing. With the plant producing enough electricity to power the entire farm, it is saving a further £15,000 a year in electricity bills. Meanwhile, feed in tariffs for energy put into the grid bring in £200,000 a year.

The farm is also receiving payments of about £12,000 per year under the Government's non domestic Renewable Heat Incentive (RHI) scheme. Launched in 2011, RHI is part of the Government's commitment to increasing the UK's renewable energy use. It provides long-term financial support for installing renewable heating instead of a fossil fuel system, with payments being made over 20 years to reflect the amount of energy used. As the farm finds new places and ways to use the heat generated by the plant, the money it receives from the RHI increases. Its energy savings, plus the Government payment, come to more than £37,000 a year.

"Installing the new plant was without doubt a worthwhile undertaking," says Stephen. "It wasn't only about the financial return, but also protecting our environment. Our efforts have been recognised around the UK, and we've won awards every year since installing the new system. We strongly believe that if farming is not sustainable, it has no future."

For more details on the non-domestic scheme and free information on how to apply visit: **www.ofgem.gov.uk**

- Or call **0845 200 2122** (RHI enquiry line open Monday to Thursday 9am-5pm and to 4.30pm on Fridays).

If you are interested in receiving RHI updates or providing DECC with RHI feedback, please email: **rhi@decc.gsi.gov.uk**