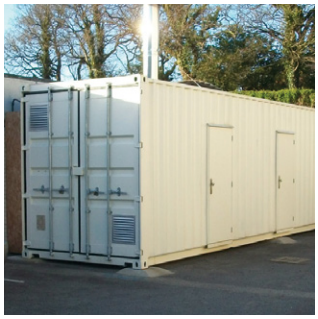
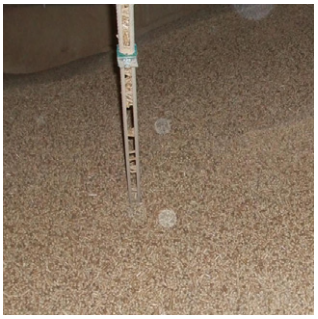
Department of Energy & Climate Change

Non-Domestic RHI
Case study – Fast facts

Technology type:	Biomass
Equipment manufacturer:	Hargassner
Equipment model:	HSV 199 kW pellet boiler in a containerised heat cabin
Capacity:	199kW
Energy consultant:	EDF Energy
Provider:	Woodenergy
Installer:	Aston Cord





Biomass fuels change at Devon College

Wood pellet biomass heating system set to reduce Okehampton College's gas bill by £18,000

Scenario

In 2008, Keith Webber was working as a physics and electronics teacher at Okehampton College in Devon. He was shocked when he found out by chance that the secondary school's annual energy bill ran to £100,000, sometimes hitting £1,000 in a single day. He suspected that better management of the school's heat and electricity supplies could result in dramatic savings. Confident that he could bring about the necessary changes, he made the head teacher an offer: take him off the teaching timetable for one year, and if the energy savings he delivered in that time didn't cover his salary, he would resign!

Cautiously optimistic about the possibility of saving on the school's running costs whilst also teaching an important lesson to its 1,400 pupils, the head teacher agreed. Keith's first step as Energy Manager was to install a sophisticated monitoring package to identify gas, electricity and water usage across the school's 27 acre site; where energy wastage was happening; the hours of the day that the most and least energy was being consumed and in which areas of the school grounds.

As part of its green, cost-cutting initiative, in 2008 Okehampton installed solar PV panels, adding to them over the years to achieve a capacity of 80 kW. This was followed by an 11 kW wind turbine to generate energy at night.

The effective net savings generated by these technologies come to £37,000 a year.

Good economic sense

As well as supplementing the school's electricity requirements, Keith was keen to find an alternative heating source to the gas being used. He was impressed by a biomass heating system fuelled by wood pellets which he saw at Exeter University and in a local hotel. As a result, Okehampton installed a 199kW pellet boiler in a containerised heat cabin in October 2013.

"The Government offers a range of incentives for switching to renewables, and with ever-tightening budgets it made good economic sense to make the change," says Keith. "Of course, the best way to reduce energy bills is to reduce the amount of energy you use and you have to monitor the situation before you can manage it. Amongst other inefficiencies, our monitoring revealed that the school's heating was coming on in the middle of the night. This was fixed by finding out how the building management system worked. We also put in place behaviour change campaigns with both the pupils and staff. Then we sought out renewable energy solutions that would make us even less reliant on fossil fuels. The solar PV panels were easy to install and produce energy during the day, which is when we most need it. The wind turbine followed, and together these technologies are doing a great job of reducing the college's electricity bills.

When I saw the biomass heating system, I reckoned that this would close the gap created by our use of gas to heat the school. A new, more efficient heating system would also mean that people wouldn't use electric heaters in their offices to supplement the central system, so we'd save some there too."

From pellets to heat

The biomass heating system burns pellets of sawdust or other waste from sawmilling. These are packed and uniform in shape and size, so they take up less storage space and burn more efficiently than say, wood chip. The pellets are stored in a storage silo and feed into the boiler, which burns the pellets, automatically adjusting the rate to keep the school at the desired temperature.

Okehampton's impressive results have been recognised with several awards, including the Ashden Award recognising pioneers in energy in 2010 and the international Zayed Future Energy Prize in 2013. The latter's US$100,000 prize money is being invested in continuing the college's renewable energy schemes, including the installation of the wind turbine.

"We would certainly endorse biomass heating system, along with the other renewable energy technologies that we use," says Keith. "Indeed, we are looking at investing in four more heating systems - one on our site and three more at primary schools which are part of our federation. Overall, the technologies and behavioural changes that we have put in place, together with the financial incentives received from the Government have reduced the school's energy bill from £100,000 to £10,000 a year and is reducing our annual carbon dioxide output by 300 tonnes. We are incredibly proud of this achievement. You need to find the right technology for your circumstances, and someone has to be allocated the task of checking that things are running as they should. But it's a very worthwhile exercise."

Adding up the savings

Okehampton College spent around £125,000 on installing the pellet boiler. Although the costs of the pellets compared to gas is £4,000 per year higher, the College is receiving payments under the Government's non domestic Renewable Heat Incentive scheme of £22,000 per year. This produces a net annual saving of £18,000. Given current gas charges, in around seven years, the purchase and installation costs of the new heating system will have been recovered.

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.

"Without the RHI offered by the Government, gas would be a cheaper heat source for us in the short-term," says Keith. "But, we need to take a long-term approach: the world's fossil fuel resources are at risk and we can't afford to sit around and wait for the day when these fuels are no longer available, either due to climate change or political factors. As a school, we are proud to be educating our pupils by example. They see renewable energy technologies in action on the grounds every day and we have developed a curriculum around this. This also frees up money to focus on our core services – teaching and pupil support. Meanwhile, we are re-investing some of the savings made and introducing other energy efficiency measures, for example secondary glazing for some of the school's windows."

"The Government offers a range of incentives for switching to renewables, and with ever-tightening budgets it made good economic sense to make the change"

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**

April 2014
URN 2014/14D/167