Beacon Community College

Green community college project is a winner

Forestry Commission England

The award-winning green heating system at Beacon Community College in Crowborough, East Sussex, was installed in 2006. Beacon's biomass boilers use sustainable wood chips from local suppliers to fuel the heating and hot water at the college, reducing carbon emissions by 600 tonnes annually. Crowborough is surrounded by the High Weald Area of Outstanding Natural Beauty (AONB) and in the middle of the country's largest concentration of ancient woodland. In 2006, the system – believed to be the largest of its kind at a school in the UK – scooped a South East Renewable Energy Award.

objectives

- To act as a pilot heating system to demonstrate and promote the potential of sustainably managed local woodlands to provide wood fuel – a priority of both the AONB and the Forestry Commission.
- To use a renewable energy source to provide heating and hot water and reduce the college's CO_2 emissions.
- To reduce the college's heating costs.
- To raise students' environmental awareness and understanding.

actions

- The boiler was installed over the winter of 2006/07 and is the UK's largest school biomass boiler installation. Southern Heating Group retrofitted the boilers and fuel store into the existing plant room. The dimensions of this space meant size was an important factor in choice of boiler.
- By choosing biomass heating for the college, East Sussex County Council hoped to make a strong environmental statement and reduce its carbon footprint.
- Timber is sourced from the Eridge Estate, local woodlands and tree prunings.
- The boilers need a minimum of 1000 tonnes of woodchip annually. This is set to rise as a swimming pool and further buildings are attached to the heat main.

achievements

For the college:

- The fossil fuel cost to heat the college was about £55,000 per year; the biomass fuel cost has been estimated at about £30,000 per year. It is estimated that the break-even point for pay back on the initial investment will be reached much earlier than the boiler's 20-year life expectancy.
- The college has reduced its CO_2 emissions by around 600 tonnes per year.

For the County Council:

- This woodfuel pilot project has been closely monitored by East Sussex County Council, and so far it has performed flawlessly. The council is keen to install woodfuel boilers in other properties and hopefully the groundbreaking approach at Crowborough can become a blueprint for other schools in the South East.

background

- South East Wood Fuels Ltd (SEWF) delivered the first load of chip in heavy snow on 25 January 2007. Between 20 and 60 m^3 of woodchip are now delivered into the fuel store each week, depending on the weather. An 8-metre auger feeds the chips from the fuel store into the boilers.
- SEWF worked closely with Southern Heating to advise on the design of the underground fuel store, the delivery schedule and the chip specification.
- The system burns woodchip from the Eridge Estate in two 500 kW Hertz Biomatic Boilers, generating up to 1 MW of power to heat the school. Once dry the round timber is chipped using a Heizohack chipper which is hired in. The demand for chip has created a much needed market for low-grade timber.
- SEWF is continually monitoring the fuel entering the system and has provided a moisture meter to the college so that regular moisture tests can be carried out at the point of delivery.
- The woodchip for the boiler is produced by Home Counties Wood Fuel Ltd at their wood yard and chip store 6 miles from the college. The company is focused on providing a reliable and consistent supply of high-quality woodchip to meet the specification of the Herz boilers. The wood chips have a moisture content of 30% (W30) and are 0.5–30 mm in size (G50), with low levels of fines in order to pass through the auger without causing blockages.

quotes

"This system is a winner in so many ways – it's good for the environment by reducing carbon emissions; it saves the college money by lowering their heating bills and helps the local economy by using wood chips from local suppliers. The council tax payer is also a winner in the long run as we won't be reliant on other sources of fuel which have been subject to heavy price rises over the last few years." Spokesman for East Sussex County Council

"This is an exciting venture which has seen our college and the County Council's Corporate Resources Department work together to install the biomass heating and hot water system. The initiative will, in time, yield financial savings but by being eco-friendly the project also sets an excellent example to our students and the local economy." Beacon Community College Head Teacher, Peter Swan

partners

Home Counties Wood Fuel Ltd
South East Wood Fuels
Rural Energy Ltd (boiler suppliers)
Southern Heating Group (boiler installation)
Hoare Wooten (managing design consultants)

funding

East Sussex County Council
SEEDA
Forestry Commission

lessons learnt

Forward planning is essential, as felled timber needs to be naturally air dried for up to two years to reach a moisture content of 30% – the level required by the boiler. Suppliers currently struggle to provide woodchip of consistent quality. By far the biggest challenge in this project was sourcing sufficient seasoned woodchip of the right quality at short notice. Initially 400 tonnes of felled timber had narrowly failed to reach the target moisture content.

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