Harper Adams develops a state-of-the-art generator.

Centre for Rural Innovation
at Harper Adams University College

Talbott's

PROJECT SUMMARY

HARPER Adams University College has shown commitment to alternative energy through involvement in developing a state-of-the-art generator.

The BG100 biomass generator, developed by Stafford-based company Talbott's Heating Ltd after 10 years of research and development, began testing in December 2005 at Harper Adams. The Combined Heat and Power (CHP) generator is the first system in the world to incorporate an indirectly fired micro-air turbine and uses air rather than steam to power. The generator is capable of producing 100kW of renewable electricity and between 150kW and 250kW of heat from the combustion of biomass. It has an estimated biomass requirement of 2.5tonnes a day and can be fuelled by forestry and agricultural residues, wood chips and pellets, and energy crops such as miscanthus and short rotation coppice. It can generate enough energy to provide 25% of Harper Adams' electrical demand and could provide 50% of heat needed for the students' union building, the conference building, students' union bar and two student halls of residence.

Installation of the generator led to Harper Adams receiving the Green Gown Award for renewable technologies and sustainable design. The university college is committed to the renewable agenda. It aims to be at the core of future energy development and provide a springboard for the delivery of rural community benefits.

The objective is to demonstrate a fully vertically integrated on-farm CHP system which includes the production, harvesting and utilisation of a range of biomass energy sources and the subsequent distribution of the thermal energy generated through an on-site heat network. This will create an exemplar reference system that identifies the positive attributes of this approach and the disadvantages that need to be addressed. The technology provides an opportunity to the agricultural community for diversification revenues and added value energy producers by selling green power to the grid.

It is estimated the annual CO_2 savings will be 600 tonnes a year assuming an operation time of 8000 hours a year. The generator is fuelled by the biomass and hot air from the combustion chamber enters a heat exchange system, which is a network of tubes. Clean air on the other side of the tubes is superheated to 800°C. As the air is heated it expands and the pressure increases. The superheated air is fired through the turbine before returning to the combustion chamber. Renewable heat from the generator is captured in a water jacket placed around the flue. The generator is designed for rural and urban settings and is ideal for installation on farms, large estates and public buildings.

Scott Kirby can be contacted on 01952 815465 or skirby@harper-adams.ac.uk
Further information on the generator is available from Talbotts website www.talbotts.co.uk

KEY FACTS:

Lead Group: Sustainable Technologies Network

Key Theme: Sustainable Technology

Contract Value: £500,000

Project Leader: Scott Kirby

Project Duration: Two years

Sponsor/Client: DTI/Talbott's Heating Ltd