

BISHOP'S CASTLE BIOMASS POWER PROJECT

The project and its sustainable heat and power

Embedded, sustainable power generation

Bishop's Castle Biomass Power Project (BCBPP) is responding to EU and UK government objectives to increase embedded generation. Advantage West Midlands (AWM) and the county and district councils support the same sustainability objectives. Projects deliver these policies at local level.

Embedded generation is power from local fuel sources for local power demand, generated continuously at high voltage (11KV) and connected to the Distribution Network Operator (DNO)'s substation. Central Networks (CN) (the DNO) distributes the power, on local overhead lines, to the industrial and domestic consumers of Bishop's Castle. The DNO ensures the quality of the power supply. CN imports power from the National Grid from very large nuclear, coal

and gas-fired (fossil fuel) Centralised Generators.

The government has imposed a 10% Renewables Obligation on fossil fuels. These Centralised Generators can (simplistically) buy these credits from renewable fuel Embedded Generation plant - BCBPP.

The policy objectives have further, secondary benefits. The 'line losses' from distribution are eliminated. The use of local fuels supports the local economy displacing imported fuels. A further benefit appears to be increased attention from all the parties to power sourcing, supply and quality when the Embedded Generation is proposed - and especially in the rural network.

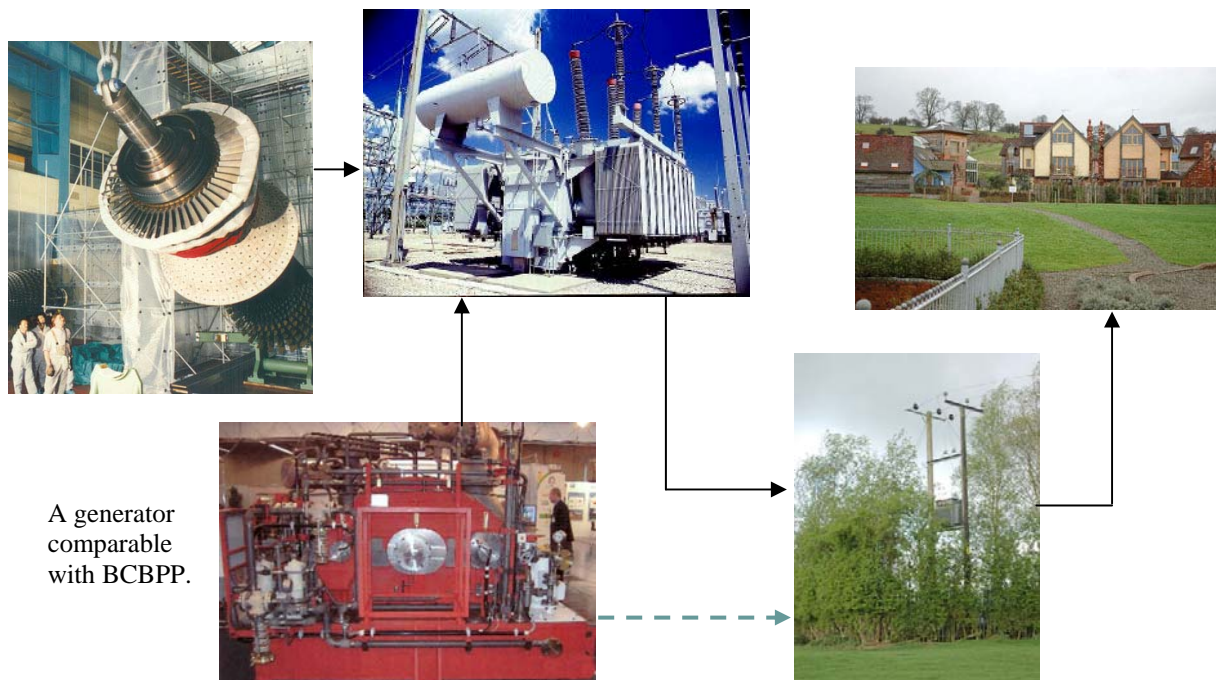


Figure 1. Embedded and Centralised Generators.

The sustainable project

BCBPP has presented posters, discussions and two previous brochures on the environmental engineering and mitigation of impact. BCBPP designs also place emphasis on control of visual impact. (Figure 2).

The industrial estate has existing substantial tree screens and these will be enhanced. There will be no visible steam plumes, from the stack or cooling plant.

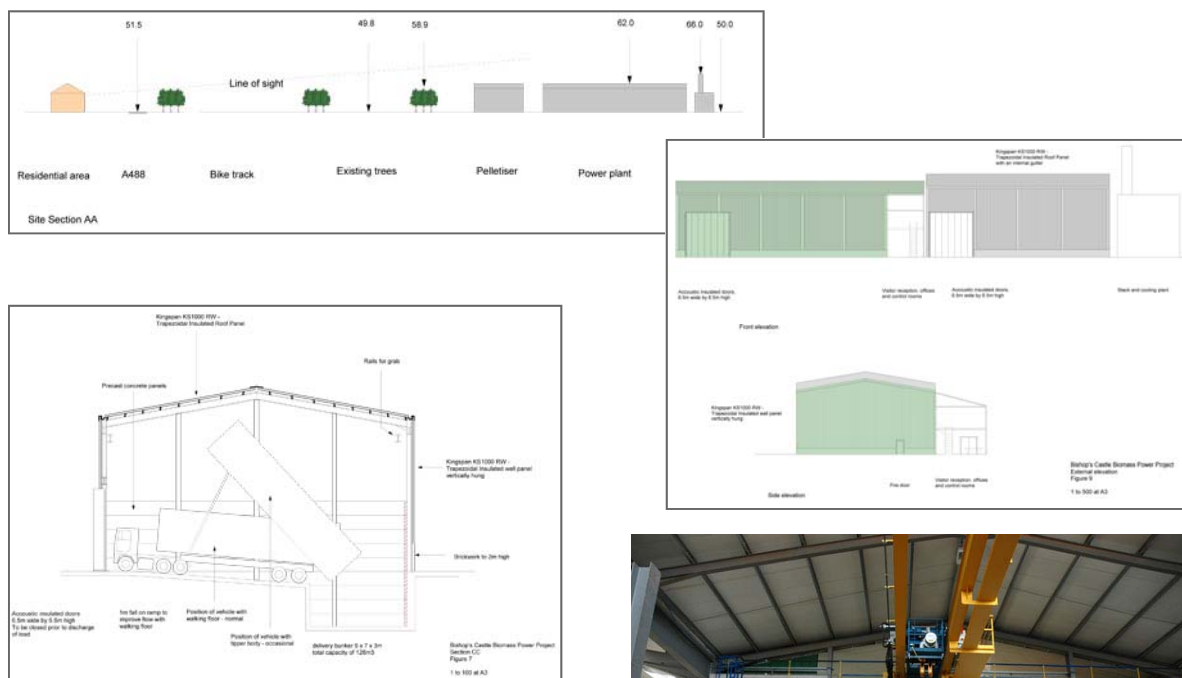
Traffic will be limited to less than 4 HGV (or equivalent) deliveries/day.

The project includes a reception and visitor area, control room and engineering offices of good architectural quality. The elevations

in line, level and appearance will integrate with the business park standards.

The project includes a rainwater harvesting arrangement to contribute to its cooling needs which total a relatively small 10m³/hour. There is no run-off or effluent from the site which is all contained within the perimeter retaining wall and drain. The air pollution control equipment is a high-efficiency multi-cyclone which is a dry process. There are no 'wet scrubbers'.

The ash from the wood chip fuel is a good soil conditioner. Wood ash can be added to improve garden compost and can be used in horticulture and farming.



Construction of the delivery bay, bunker and grab/crane for a comparable plant.



Figure 2. Visual impact, control of operations and appearance

Embedded, sustainable heat use

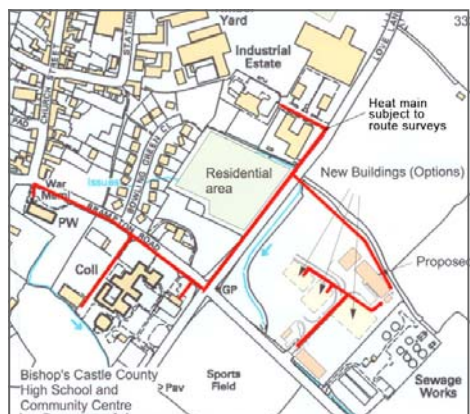
Heat in Bishop’s Castle is presently generated from gas, oil and coal (with some use of wood). The use of wood itself includes imported pellets.

BCBPP proposes underground heat mains to the school, leisure centre and industrial estates where the heat delivered may displace about 1MW of fossil fuel use. This will save about 500 tonnes/year of CO₂ and the emissions from the boilers. There will also be some cost savings.

There is no need to replace the existing heating system. The renewable heat source feeds into the heat storage tank.

BCBPP also plans to use the heat to dry wood chip from its delivered wet state to a dry pellet with an increase in heat value from under 5,000 KJ/Kg to over 15,000 KJ/Kg. Over 1,000 tonnes/year will be dried continuously throughout the year for use in the winter in wood pellet stoves. The process amounts to inter-seasonal heat storage.

The dry, high energy density pellets in a modern stove burn very cleanly and efficiently. The total household saving of CO₂ is then another 500 tonnes (about) with cleaner emissions and use of local resources.



Heat mains to schools and industries



Short rotation poplar and willow for wood chip.

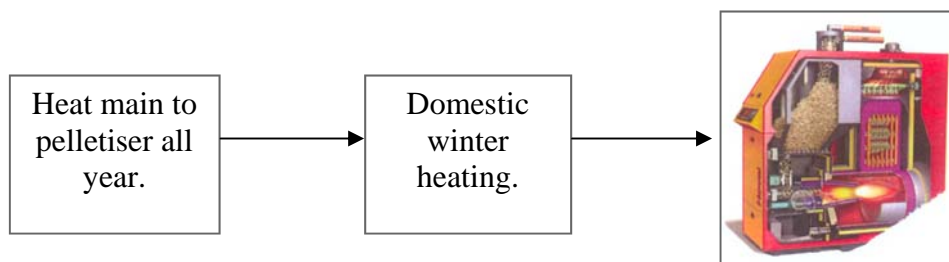
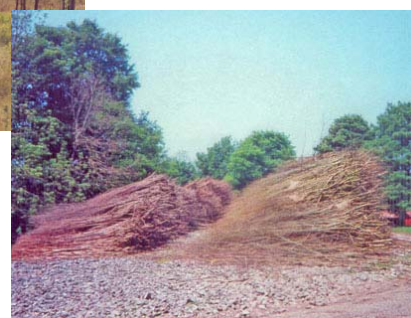


Figure 3. The storage and distribution of heat.

Embedded, sustainable power use

The power generated will be sold to a Licensed Electricity Supplier (LES) - to whom households pay the electricity bills. BCBPP plans arrangements for Bishop's Castle households to be able to buy the locally generated green electricity through an LES.

Power generated at the Crowgate Business Park will also be available for local industrial use on 'private wires', allowing businesses to present their green energy credentials to their clients.



Figure 4. Construction of the turbine/generator and control systems for a comparable plant.

Carbon-neutral power without compromising the environment

BCBPP will generate 2.5MW of power and 2.5 MW of heat for local use, using local fuels and supporting the local economy, as audited by OFGEM (the electricity and ROC regulator) and SSDC (the planning and environmental authority).

7,000 tonnes/year of CO₂ will be saved relative to coal-fired power - as the carbon credits off-set the highest polluters. While contributing to global climate change objectives BCBPP will not compromise the local environment. An Environmental Report will support the Planning Application.

Summary

The Planning Application will be submitted in late May 2007 for a determination over the following few months. Subject to determination, construction will start in 2007 for completion in 2008.

The project will begin with local building construction and fuel supply contracts.

The project will generate power using renewable fuels. It will support local farming and forestry industries in the production of energy crops and wood chip with long term contracts, including multifunctional uses for biofuels. The project will contribute to the objectives of embedded, local power generation and to a carbon neutral community.

Contact Details:	
Ed Whately	
Chris Day	cjdayassocs@yahoo.com
Website:	www.bishopscastlebiomass.co.uk
	Tel. 01588 680265
	Tel. 01844 351123

May 2007