Bishop's Castle Biomass Power Plant

Frequently Asked Questions

Q. What is proposed?

A. Bishop's Castle Biomass Power Ltd (BCBP) is proposing to build a combustion steam cycle combined heat and power (CHP) plant fuelled by wood chip and energy crops. The electricity produced will be fed into the local distribution network and heat will be available via an underground heat main for the Community College, SpArC leisure centre, church and industrial estates. Surplus heat will be used in the production of wood pellets.

Q. How much electricity will be produced?

A. The electrical output is 2.5 megawatts. This will be generated 24 hours per day throughout the year, apart from maintenance periods.

Q. Why has this size of plant been proposed?

A. 2.5 MW is enough to supply 2,500 houses and is roughly the requirement of Bishop's Castle and the neighbouring villages. When local demand is higher, extra power will be imported from the grid; when demand is lower, power will be exported to the grid.

Q. Why has this site at Bishop's Castle been chosen?

A. The proposed site for the power plant is on a vacant lot on the Crowgate Industrial Estate. It is close to the incoming 33kV power lines and about 500 metres from the sub-station. Its proximity to the Community College, leisure centre, church and the Love Lane Industrial Estate is important for the efficiency of the heat main. Road access is good.

Q. Who will pay for the heat main?

A. BCBP will pay for the installation and maintenance of the underground heat main to the Community College, leisure centre, church and industrial estates. Heat exchangers will interface with the existing heating systems in these premises. Their current boilers can remain in place to cover the power plant maintenance periods.

Q. What are the advantages of using the heat main?

A. The heating costs of buildings connected to the heat main will be reduced significantly compared to their current arrangements. There will be a saving of about 500 tonnes of CO_2 per year, as well as the other emissions from their boilers.

Q. What are the advantages of distributed generation of electricity?

A. Distributed (or Embedded) Generation means siting appropriately-sized power plants close to the supply of fuel and close to the consumers of the power. This minimises fuel transport costs and power line losses (currently about 1000MW of electricity is wasted in transmission line heating in the U.K.- enough to supply 1 million homes). Embedded generation also stabilises the voltage in remote locations. Large centralised power stations produce huge amounts of surplus heat which cannot be used to make electricity. Embedded power plants are ideally suited to distribute this heat to local buildings.

Q. Why do we need biomass fuelled power plants?

A. As older fossil fuel and nuclear power stations are de-commissioned, new electricity generating capacity has to be built. Reserves of fossil fuels are shrinking, and biomass power plants are a sustainable and almost carbon neutral means of electricity generation. They are sustainable because new sources of fuel can be planted as they are used, and they are essentially carbon neutral because the CO_2 released to the atmosphere during combustion in the power plant was absorbed by the biomass as it grew. However, account must be taken of the energy used in growing, processing and transporting the fuel, which in the case of wood chip amounts to about 2% of the energy released in the power plant. (If wood is left to decay in the forest it still releases carbon dioxide and methane to the atmosphere.) Net carbon emissions from the generation of a unit of electricity in a biomass plant are 10-20 times lower than emissions from fossil fuel based electricity generation.

Q. What will fuel the CHP plant?

A. The power plant will use approximately 20,000 tonnes/year of wood chip and energy crops, which will be delivered on 4 HGVs (or equivalent) per day. The wood chip will be derived from forestry brash and thinnings or other clean wood. BCBP are confident of the long-term sourcing of these fuels. Indeed, financial institutions backing biomass CHP projects require long-term fuel supply contracts.

The plant is not designed to handle waste and will not have a waste licence.

Q. What about emissions?

A. The fuel will be burnt in a highly controlled manner at high temperature, which results in much more complete and clean combustion than open fires, stoves or bonfires. The design ensures that the emissions are well below regulatory limits. Particulate and carbon monoxide levels will be less than half the MOT limit for one car. The level of NOx (oxides of nitrogen) at 200 metres from the stack will average one-quarter of the present background level caused by traffic. The emissions will be continuously monitored by SSDC Environmental Health Office and any breach of the limits would cause the plant to shut itself down. The exhaust gases will be filtered by a multi-cyclone system rather than 'wet-scrubbers', so there will be no waste water to dispose of and no visible plume from the stack. The velocity of the gases leaving the stack will be sufficient to punch through the temperature inversion layer which sometimes traps smoke over Bishop's Castle.

Q. Will I be able to smell the plant?

A. The gases leaving the stack have no odour because of the quality of the combustion. The vehicles delivering the fuel will unload inside the buildings. The buildings will be sealed, and the air pressure inside will be lower than outside to prevent any odours from the fuel escaping.

Q. Are there any residues after combustion?

A. Ash from the combustion chamber (amounting to about 1% of the input fuel) will be used as a soil conditioner.

Q. How visible will the plant be?

A. The ridge of the roof of the building will be 12 metres high and the stack (at the sewage works end of the site) will be 16 metres high. The existing trees along the A488 will screen the plant from the road and the houses beyond (Brick Meadow). Trees will be planted to screen the plant from other directions. The buildings will be clad in two shades of green.

Q. Will it be noisy?

A. The power plant will be contained within an acoustically insulated building. Exhaust gases will pass through a silencer before reaching the stack. The noise level at 200 metres from the stack (the A488 or the B4385) will be 30dBA - similar to the quiet room of a library.

Q. Why does the proposal include a wood pellet plant?

A. Wood pellet heating systems are becoming increasingly popular in domestic and commercial buildings as an environmentally friendly alternative to fossil fuel boilers. Much of the surplus heat from the CHP plant will be used to dry wood-chips or sawdust for pellet manufacture, particularly in the summer when the demands on the heat main will be low. This significantly increases the energy efficiency of the CHP plant.

Q. How will the plant be monitored when it is operating?

A. The Environmental Health Office of SSDC will monitor the emissions and other aspects of the plant while it is in operation.

Q. What benefits would the plant bring to Bishop's Castle?

1. A major contribution to Bishop's Castle's carbon neutrality; a saving of at least 7000 tonnes/year of carbon dioxide, which is equivalent to taking about 3000 cars off the road.
2. The offer of a large reduction in the heating costs of the Community College, SpArC, the church and nearby businesses.
3. A more robust and stable electricity supply for the town and surrounding area.
4. Stimulation of the local economy, the creation of new employment and the safeguarding of existing jobs in the area.
5. Support for local environmental projects: willow coppicing, short rotation forestry, riverbank protection zones.

Q. Can I have a say?

A. BCBP Ltd. are holding an open meeting on Tuesday, 23 October, 2007 at Bishop's Castle Community College. There will be the opportunity to ask questions prior to the meeting from 5 p.m. and the meeting proper will start at 7 p.m. The Chief Planning Officer of SSDC will be in attendance, as will the project's consulting engineer C. J. Day MSc MICE CEng CEnv.

Q. Where can I get more information?

A. Visit - www.bishopscastlebiomass.co.uk

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