

Case Study: 300kW Woodchip Boiler at Batsford House

Key Points

- Well-known Arboretum using its own woodlands to heat a large country house
- Pays back in around 7 years
- Uses existing buildings and no effect on outlook from house
- Expected to burn 200 tonnes of wood chip per year



The 300kW Austrian boiler

Batsford Arboretum

The house is the family home of Lord Dulverton. It has 36 bedrooms and an in-door swimming pool. The estate includes the very popular Batsford Arboretum, along with a Falconry Centre, Garden Centre and tea room, which are all open to the public.

Less well known is the commercial forestry estate, which adjoins. This includes 600 acres of woodland, forestry management for the estate and for contracting out, sawmill and a network of private bridle paths with a permit system.

Background

The escalating oil price was giving a yearly oil heating bill of an estimated £24,000+. This seemed ridiculous when the estate owned its own wood supply business. The economics made sense to install a wood chip boiler and use the estate to provide its own woodchip to heat the house, swimming pool and greenhouses. The estimated annual cost of fuel is £7,000 – £10,000 and this includes being warm in many more rooms than before!

The System

The boiler is manufactured by Binder, and was supplied and installed by Wood Energy Ltd with commissioning in October 2006. It has been installed with a 40 cubic meter hopper, which feeds the boiler under fully automatic control. The system is demand-led, just like a normal central heating system. The heat is carried 180 meters to the house in a buried, thermally insulated pipe.

To even out the heat load on the boiler, there is an adjacent 1,000 litre accumulator tank to store the hot water from the boiler, and a second accumulator up at the house. This enables the house to demand peak loads from the accumulator, while the cyclic need for the boiler to shut down / turn on is reduced.

Hot flue gases are used to pre-heat the combustion air, further raising efficiency.

Back-up

An oil-fired backup boiler is available, but the wood-fuelled system has been running so reliably that it has rarely been required!

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Costs and Funding Sources

Installation costs totalled around £120,000+, with an expected lifetime of 25+ years. A 20% capital subsidy was available through the supplier.

Woodchip conversion is subsidised through Gloucestershire Wood Fuels. This has a 3 tier system of 100% for year one, 80% for year two and 60% for year three.

Environmental Benefits

Wood fuel from a sustainable source is a low carbon fuel. Although combustion of wood fuel releases CO₂ this is offset by the CO₂ absorbed during tree growth.

The boiler is equipped with modern staged combustion controls which ensure that complete combustion takes place, eliminating smoke and minimising emissions.

Effect on Forestry Operations

This is providing value for low-grade timber from the estate, which would otherwise have been transported off-site. So the result is that this value can be ploughed back into better management of the woods, whilst there is also less transport of wood from the estate.

Woodchip Production

Batsford Estate has been working with other producers to form a network of woodchip fuel supply for the whole of Gloucestershire. With a Biomass Infrastructure Grant, funded by DEFRA, they have formed a supply co-operative called Gloucestershire Wood Fuels. Batsford will form one of the supply depots for other woodchip boilers in the county.

Public Access

The boiler is not within the normal access areas for the Arboretum. However, there are a number of events being held at the site to show off the equipment - please contact the estate office for further details.

Learning Point

Attention to detail is required for the pipes from the boiler to the destination. Ensure all junctions are properly insulated to minimise heat losses.



Logs drying before chipping



Processed wood chip

Maintenance

The hopper needs refilling every 2 weeks in winter. Maintenance tasks on the boiler take just 60 minutes per week, including removal of two wheelbarrow loads of ash. Servicing is required every 2,500 running hours, though they have run for longer intervals without problems.

Further Information:

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