

### Biomass Boiler

As part of the renovation of old farm buildings as Mucknell Abbey, a woodchip boiler was installed to provide most of the heating and hot water.

## Technical Details

### Wood Chip Boiler

Manufacturer and model:  
Hargassner WTH 80, Austria, [www.hargassner.at](http://www.hargassner.at)

Installer:  
Wood Energy, Devon, [www.woodenergy.com](http://www.woodenergy.com)

Maximum heat output: 80 kWth

Efficiency: approx. 90%

Fuel injection and ignition are automatic, as are detection of fuel quality and cleaning system and ash extraction. The ash box needs emptying about every week. There are many electrical and mechanical safety features, including protection against burnback into the fuel store.

Lessons learnt: design and specification of the boiler's integration into the rest of the system is important; set up regular fuel deliveries, which can be changed if necessary; check that the fuel is the correct specification and does not contain too many 'finings' (small pieces).

### Fuel Specification and Supply

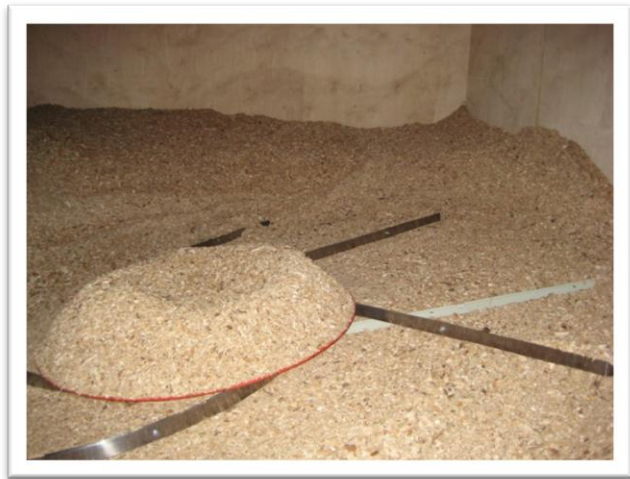
Wood chip specification:  
G30 (maximum cross-section 30mm<sup>2</sup>)  
W30 (maximum 30% water content)  
ash content ½-1%

Fuel store:  
5m×5m×2.3m high, accommodating 6.5 tonnes

Chip is blown from lorry to store

Fuel is supplied by Midlands Wood Fuels, [www.wood-fuel.co.uk](http://www.wood-fuel.co.uk), from their Worcester depot 8 miles away. Timber is from sources within 10 miles.





## About Mucknell

Mucknell Abbey is a contemplative monastic community of nuns and monks living under the [Rule of St Benedict](#) and part of the [Church of England](#).

More information on [sustainability at Mucknell](#), and further factsheets on the renewable technologies and grounds are available at [www.mucknellabbey.org.uk](http://www.mucknellabbey.org.uk).

## System Integration

The heating flow from the boiler and return to the boiler is a closed loop, which heats water in an accumulator tank to 80 °C. Water is pumped from the accumulator tank to hot water cylinders in two plant rooms in the north and south of the Abbey, which are pre-heated by solar water heating. Heating and hot water are supplied from the cylinders. An LPG (liquefied petroleum gas) boiler is a back-up for heat supply to the plant rooms. It is slightly smaller, at 65 kW, and supply of hot water is prioritised when it is running.

The biomass boiler has its own control panel. There is a building management system for the rest of the system, with control panels in the boiler shed and each plant room.

## Environment

Wood chip is produced from quick-growing trees that fix carbon dioxide from the atmosphere, so biomass boilers are almost carbon neutral. The exceptions are emissions from fuel processing and transport, and electricity consumed by the pumps and operating panel, supplied by Green Energy.

Carbon dioxide makes up about 15% of the flue gas, and there are also low emissions of carbon monoxide, nitrogen oxides and dust. The [Wood Energy website](#) has more information on emissions test results for a slightly different model. The [Clean Air Act](#) gives local authorities powers to declare “smoke control areas” in which emissions of smoke from domestic properties are banned. Defra provides [guidance for the public](#), which includes locations of smoke control areas and a list of appliances which are exempt (i.e. boilers which can be installed), and conditions for exemption (i.e. fuels which can be burnt). There are no smoke control areas in Wychavon District Council area. Hargassner WTH 80 boilers are exempt when burning wood chip or pellets.

## Revenue Funding and Grants

The boiler was part-funded by the [Low Carbon Building Programme Phase 2](#), a government grant scheme which has now closed. The [Renewable Heat Incentive](#) (or Clean Energy Cashback), due to be launched in June 2011, will instead provide income for generating heat from renewable sources. Or investigate:

DECC – Bio-Energy Capital Grants Scheme	Naturesave Trust – Community Renewable Energy Project
EDF Energy – Green Fund	Malvern Hills AONB – Sustainable Development Fund
ScottishPower – Green Energy Trust	Cotswolds AONB – Sustainable Development Fund
E.ON – Sustainable Energy Fund	Worcestershire LEADER Programme (Local Action Group)
Big Lottery – Awards for All	Landfill Communities Fund