



SevernWye
ENERGY AGENCY

Woodchip Heating Basics

Key Points

- Burning wood does not contribute to climate change if felled trees are replaced.
- Wood-fuel is a renewable heating fuel if from a sustainable source.
- Wood fuel can help the local rural economy
- Fuel grade wood chip must be obtained to ensure reliable burn
- Typical efficiency of 90%, so minimal air pollution and minimal smoke

Why is it important?

Burning wood does not contribute to climate change as long as the wood is from a sustainable source (i.e. one tree is planted for each tree felled). Carbon dioxide (CO₂) is still released when wood is burned, but this is approximately equivalent to the CO₂ which is taken in by the trees over their lifetime.

Wood chip is usually processed from local forestry residues. Typically the low value timber is used, this might be the 'thinnings' timber which is too small to go for planking. The wood is chipped into pieces about 30mm long and stored ready for delivery.

Types of heating units available

Wood chip heating systems are available from 25kW upwards, including district heating systems. Combined Heat and Power (CHP) systems are also available starting at about 100kW electrical with 200kW heat.

Wood Chip systems are usually most suitable for large private houses and municipal buildings. They are very cost effective for heating loads like swimming pools that have constant heat demand.

Accumulator tank

An accumulator tank (like a large hot water tank) stores heat from the boiler to allow less frequent fire-up/cool-down cycles and enable large demands of heat for short periods. Heat from the boiler house can be pumped relatively large distances to the demand sites using thermally insulated pipe - however the cost of installing this pipe is around £100 per meter.



60 kW KWB Chip Boiler, with accumulator tank.
Photo courtesy of Midlands Wood Fuel



Is it new?

Woodchip heating is now common in parts of Europe and uses tried and tested technology. With good maintenance, initial teething problems can be minimized and long term reliability should be expected.

Features to look for:

Heat output rated in kW
Adjustable heat range
Fuel type flexibility — moisture content, chip size, pellets, grain, waste content.

Wood Chip Heating — Basics

Woodchip Grade

There are a number of specifications for chip grade, which define the sizes of chip allowed in a sample. Ensure that your supplier can deliver to the specification required by your boiler.

Moisture Content (MC)

The moisture content of the woodchips changes the energy content released during burning.

Typically woodchip is delivered between 25 and 30 % MC for boilers which cope with up to 35 % MC.

Buying your Woodchips

Woodchips can be purchased for about £60 per tonne delivered. For large systems there will be better prices. Chips will usually be delivered by lorry, so access needs to be planned.

Do start negotiations with woodchip suppliers at an early design phase, as the access, delivery method and storage design can have a big impact on the cost of your system.

Storage solution - a below ground wood chip store feeding the boiler via an auger. This is a good solution as the chips can be tipped directly into the store



Woodchip Storage

Woodchips are bulky for their energy content so need a large storage space and regular deliveries. A 400kW boiler with a 60m³ storage might want refilling once per week, with an extra 35 m³ load during winter.

Chip stores are usually built with a flat bottomed square base, a round mechanical sweeper sits at the bottom and pulls chips into an auger to feed the boiler. Larger systems use hook bins, moving push rods or an automated crane.

The store needs to be designed with delivery method in mind. Typical options are: below ground tip (as shown above), above ground tip (requiring a special delivery trailer), blown in or tractor bucket shovelled.

How to go about it

Grants are available through the Government Low Carbon Building Program (LCBP). To get this you will need to use one of the accredited installers from their list. There are numerous makes and models of wood chip heating units but only some have been accredited with the LCBP. Even so there is still plenty of choice of excellent units. Many installers limit their themselves to one or two makes of unit. So ideally:

- Choose your make of unit from the LCBP list
- Find your local installer who will install that make and get a quote
- Get quotes for associated works
- Apply for grants

Paying for Heat

Rather than paying by the tonne, some suppliers may quote by m³ or equivalent heat content. Alternatively, if you have a heat meter attached to the pipe supplying the hot water from the boiler, then you can negotiate to pay for the heat used - similar to paying for metered gas.

A 'hands-off' approach is to use an ESCO (Energy Supply Company) to deliver heat. The ESCO purchase and install the boiler, cover the maintenance costs and the fuel cost then bill the client according to heat delivered.

Grants

Low Carbon Buildings Programme (LCBP)

Domestic Installations - max grant £1,500

Businesses - 40-50% grants up to £100,000

Community Groups (Phase 2) - 35% grants up to £1million (max. 45kW installation)

Gloucestershire Renewable Energy Grants

With funding from all of the Gloucestershire Councils there is a further £1,000 available for wood chip fuelled central heating within Gloucestershire.

Further Information

Low Carbon Buildings Programme (LCBP)

www.lowcarbonbuildings.org.uk

0800 915 0990

Gloucestershire Renewable Energy Grants

www.swea.co.uk/grants_greg.shtml

Biomass Energy Centre

www.biomassenergycentre.org.uk

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