

Why is woodchip the preferred fuel?

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Farmers, landowners or community groups with access to land all have an opportunity to utilise either existing woodland or indeed to plant new woodland. A good example in the North East is **Lee Moor Farm** who have developed existing mixed woodlands since the 1950's as well as planting in 1989, 1990 and 1991 numbering 3Ha of deciduous, native woodland. A further 4Ha of more diverse species (27) were planted in 1994 and subsequently in 2002, when it became apparent that biomass heating was going to become a more mainstream heating option.

Consequently, a further 10Ha of poplar trees were planted - 25 year lifecycle and thinned every 7 years and 6Ha of willow grown over the same time period and to be coppiced every 3-4 years. Thus, Lee Moor Farm with 25 hectares (just over 60 acres) of trees can sustain a **150kw woodchip boiler**.

1Ha or 2.5 acres of productive woodland can heat a building forever if managed in the right way.

Please ask if you wish to use our woodland consultant Roger Smith in order to create a woodland plan – this task can be **100% grant aided** by the Forestry Commission. Grants of 60% contribution are also available to manage woodland that has not been thinned if the timber is utilised for wood heating. There are also other planting and re-establishment grants that are available to be utilised.

Why choose woodchip over log?

There are some good sound reasons why the district heating system at Lee Moor Farm is run from woodchip:-

- **The Caretaker Factor.** Labour is expensive and automation is the best value long term option. Log boilers are not designed to be automatic. They typically operate on a daily batch system and lack flexibility - **no caretaker = no available heat.**
- Woodchip is now regarded as a **mainstream fuel** and due to Government/Corporate contracts plus European funding there are now standards and a reliable supply chain - see Newfuels and their training course <http://www.ruraldevelopment.org.uk/events/ignite-woodfuel-quality-standards-0?mini=>
- **Caretaker costs** - the labour costs to manage a boiler, based on one hour a day can reasonably be costed @ £3,000/year. Over the expected 25 year lifetime of the boiler this is the equivalent of c£85,000 (inflation linked) more than sufficient funds to justify the building of a woodchip bunker.
- It is easy to consider labour as already being present on a farm or estate but there are always costs and health and safety issues to consider which can add cost and complexity.
- Woodchip does not flow as well as more expensive wood pellet but this is offset by the fact that it can be augered effectively.
- Cost is a main advantage and benefit. if you are producing energy crops or low value thinnings this is cheaper to chip than the haulage costs involved to take it offsite.

Woodchip at 26% moisture can be harvested for below £25 per tonne, the equivalent of c.1p/kwh, much cheaper than oil or gas at in excess of 2pkwh. The equivalent "buy in" price of woodchip would be £80 per tonne.

Wood Storage

The secret to producing good woodchip is a timber which has been air dried in situ. Choose the windiest spot on the estate to stack the timber and if the trunks are bigger than 30cm consider splitting them or leave for 18 months.

Stack towards the prevailing wind to remove most moisture, don't cover but if heavy continued snow fall is expected then consider using a water retardant covering along the top of the pile while leaving the sides open. Stack the timber on 'bearers' to get the air under all the timber; it also keeps soil and stones off the timber.

FAQ

Can I use slab wood?

This is cheap off cuts from a saw mill. The answer is yes but beware you will have more ash because unless very dry (when the bark falls off) there will be a higher percentage of bark in the chip. Slab wood is usually banded in steel bands which can be a health and safety issue when cutting them.

Issues around the chipping of wood

The issues for chipping are similar to logging.

Common issues:

- **Timing:** Process only when wood is at the correct moisture, usually below 35% and ideally in the 20's. Chips and kiln dried logs are processed to get them to 8 - 15%
- **Contaminants:** make sure there are no contaminants in the fuel, e.g. soil, stones, objects. Bark can often be removed by forwarding and harvesting equipment leading to quicker drying.
- **Scale:** efficient chippers and logging machines are expensive to hire and to bring them to a site would not be effective for a small tonnage, e.g. 10 tonnes. Aim for 100/200 tonnes to reduce chipping costs to below £5/T.
- **Handling:** Timber should be able to be lifted onto the feed table/rollers of the chipper of the logging machine - 15cm and 30cm depending on make and model

Chipping: useful things to remember

Woodchip will not dry in a heap, only chip when dry enough to burn, be patient and carry out an oven test on the wood chip

$$MC\% = \frac{(\text{Initial weight} - \text{oven dry weight}) \times 100}{\text{Oven dry weight}^{**}}$$

**place woodchip in a thin layer on a baking tray and place in an oven for 24 hours at 100 degrees until all the water is all driven off

Store the woodchip in a cool dry shed. All fuel is a fire hazard, the dustier and drier the product the greater the fire risk.

What are the downsides of wood chip versus log?

- Woodchip will need to have feed augers and feed arms. Woodchip will not flow freely - unlike pellets(which are twice the price of commercial woodchip)
- Woodchip needs covered storage and bunkering. It is recommended to have a storage facility for 50% of your annual usage.
- It is recommended to have bunkering for a hard weather event such as November/December 2010, i.e. 20% of annual consumption. Woodchip is c.230kg per cubic metre.
- A feed auger may cost up to £5,000 and a bunker about the same price. Bunkers can be as simple as some big square bales and as sophisticated as a containerised solution - using shipping containers.

Other incentives

The manner in which the **RHI (Renewable Heat Incentive)** is set out results in a very good return on capital and there may also be other “soft loans” that can result in upgrading to a woodchip boiler being self-financing. Government initiatives will lead to decades of cheap and trouble free heating via a low maintenance boiler which will typically only require a monthly check to remove the ash and top up the fuel bunker. Good woodchip only produces 1% ash by weight, less than logs but higher than the more expensive yet higher quality wood pellet.

I hope this information helps to clarify the pros and cons of installing a wood chip boiler.

For more information, the best thing to do is to talk to us at **P&H Energy UK Ltd** and utilise our practical experience and knowledge.

Please ring us on **01665 577400** or **07836 722059** or email info@ph-energyuk.com