

Information Sheet 9

Domestic Heating with Logs (Firewood)

Logs (firewood) are often the first thing that people think of when using wood for fuel, and it's probably easier to find a good log supplier than any other type of woodfuel.

Open Fires

An open fire is the traditional way to burn logs, it can also be attractive and cosy. It is however, a very inefficient method of heating, as the uncontrolled air flow takes not only the hot air from the fire up the chimney, but also draws centrally heated air in from the rest of the house as well. This is replaced with cold, outdoor air drawn into the house through drafts and vents. Often an open fire will run at very low efficiencies (≈25%) resulting in large amounts of smoke and ash for very little heat output. Remember that when an open fire is not in use then the chimney will allow large amounts of cold air into the room, so an open fire may well be increasing other fuel costs.

Log Stoves

Traditional log stoves provide radiant heat to a single room. They offer an attractive, renewable, low carbon heat source that can be cheap to buy and to run. They achieve significantly higher efficiencies than open fires (~70%), lowering fuel requirements and less ash. Wood briquettes can also be used in a wood stove, as can pellets though they require a pellet basket. This cannot be refilled until it has burned out and cooled down. Log stoves need a flue if there is no lined chimney present.

Many stoves are also available with a back boiler option, allowing the generation of hot water to heat radiators or provide domestic hot water. Also solid fuel kitchen ranges can be run on logs, either specifically designed for wood, or requiring a specific grate option. Ranges allow both radiant heat and cooking from wood, and can include a back boiler option to heat water.



Log Boilers

Modern log boilers typically run on a batch feed system. These systems offer very high efficiency (up to 90%), which they achieve by burning a batch of logs in a high temperature environment. The energy from this quick burning system is then stored as high temperature water (~90°C) in a large, highly insulated 'accumulator tank.' The heat from the tank is then drawn off in a controlled manner through a heat exchange coil to supply heating and domestic hot water. When the temperature in the accumulator drops below a pre-set point (≈65°C for hot water and radiators or ≈30°C for under-floor heating) the boiler will fire again. This allows a flexible, sophisticated central heating and domestic hot water system to be available on demand. The boiler will need be loaded manually, typically once a day from a store of well seasoned logs.

Choosing Fuel

Logs and firewood represent the opposite end of the woodfuel spectrum from wood pellets. They are not consistent or dense, require manual loading into the boiler, and can be dusty. They are however, significantly cheaper than pellets and represent a fuel that can readily be obtained from a garden, farm or estate with minimal specialist equipment. A typical domestic house might require around 5 tonnes of logs p.a. at 20-25% moisture content. About 10-14 m³ of storage space.



Briquettes

Briquettes are similar in form to logs, and are used in much the same way. In consistency and properties they are simply a very large pellet. Briquettes are made from compressed, dry wood. They are clean and pleasant to handle, can be burned in log stoves and offer greater heat output per cubic metre than logs, but at significantly higher cost and embodied energy.





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Drying

The calorific value of 'fresh cut' or green logs is usually very low and it is important that logs are adequately seasoned before use. Burning insufficiently seasoned logs is not only inefficient, but also leads to excessive smoke and deposits in the flue, including both soot and tars. These tars can be corrosive, potentially leading to damage to the lining of the flue which may not be noticed. There is also the danger of a chimney/flue fire.



Green logs will be typically between 50 and 60% moisture and well seasoned logs may end up around 20-25% or less. This can more than double the amount of available energy in the fuel.

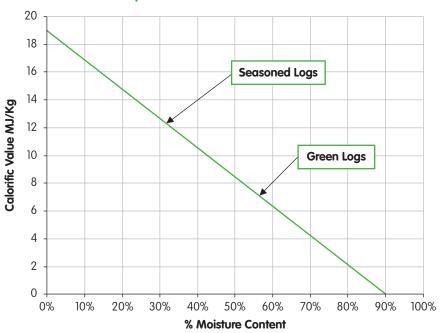
Green logs are considerably cheaper to buy than seasoned logs, but will be heavier and will require space to stack and dry before use.

For best drying results it is recommended that logs are stacked off the ground (on bearers) in a windy, sunny, location under some form of waterproof cover with open sides ideally for at least two years, which can bring the moisture content down to about 20-25%. Radial cracks and bark that comes off easily are signs of well-seasoned wood.

Smoke Control Areas

Logs and most briquettes are not approved for use in smoke control areas except in officially approved 'exempt appliances.' The website www.uksmokecontrolareas.co.uk gives lists of Smoke Control Areas, and the appliances approved for use in them. It is not permitted to burn wood on an open fire in these areas.

The graph below shows the significant difference in calorific value between wet and dry wood.



Useful Links and Further Information:

Biomass Energy Centre

"A 'one stop shop' to provide information to anyone in the UK with an interest in biomass derived solid, liquid and gaseous fuels and associated conversion technologies."

www.biomassenergycentre.org.uk

Logpile

For information on fuel suppliers and boiler installers.

www.logpile.co.uk

Forestry Commission

Further information on using wood as fuel and finding your regional contact: www.forestry.gov.uk/woodfuel www.forestry.gov.uk/yhwoodfuel



Expect to see quality suppliers signing-up to an assurance scheme run by HETAS. With consistent product labelling, it will be easier to choose appropriate logs for an appliance. See www.hetas.co.uk/ public/Solid_Biomass_Assurance_ Scheme.html for further information. This publication has been sponsored by CO₂sense yorkshire™

carbon sense 2 commercial sense

CO₂Sense Yorkshire is a not-for-profit company funded by Yorkshire Forward and the European Regional Development Fund. It is committed to helping businesses in Yorkshire and Humber to prosper in a low carbon economy. CO₂Sense's woodfuel programme is supporting and funding businesses and other organisations to develop the sourcing, supplying and use of woodfuel in Yorkshire and Humber.

www.co2sense.org.uk



The Region's
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