

AN INTRODUCTION TO BUYING & BURNING LOGS



Why heat with wood?

In the UK wood is an under-used fuel resource, but has environmental, economic and security benefits over oil, gas and coal.

Saving money: Burning logs efficiently can be cheaper than heating your home with other fossil fuels.

Helping the local economy: Local markets for wood support local livelihoods as well as local landscapes.

Environmental benefits: Logs can support sustainable woodland management, which in turn brings benefits for wildlife and woodland habitats. Opening up space allows sunlight in, which enables a wider range of plants, insects and animals to live in the woodland.

Security: A wood burning stove will provide emergency heating and possibly cooking facilities if the main energy supplies are disrupted.

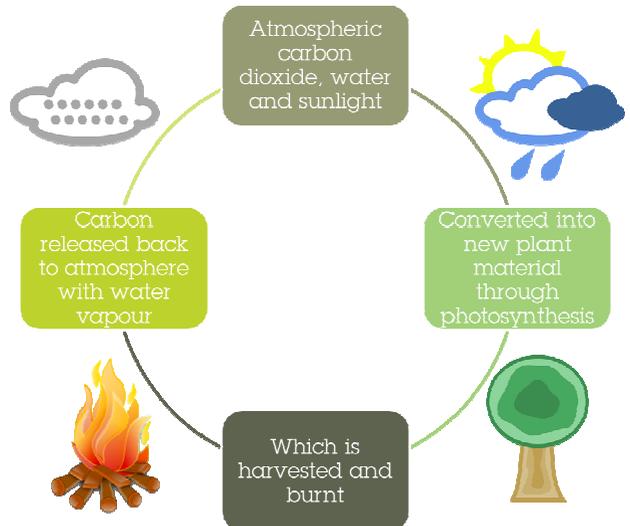
Climate Change: Wood is a carbon-lean fuel. Net CO² emissions are significantly lower than burning other fossil fuels.

Logs = 0.008kg
of carbon per kW

Gas = 0.198 (x 25)

Oil = 0.274 (x 34)

Electricity = 0.517 (x65)



Wood as a fuel

All wood, if properly dried and stored can burn well, but...

Hardwoods will burn longer and give out more heat than softwoods. The best common woods for burning are oak, beech, ash and birch.

Different density and moisture content are reasons species burn differently.

All wood has approximately the same heat content by weight, but oak is twice as dense as pine. Poplar is one of the wettest woods when freshly felled and ash one of driest. But more about that later...

Softwoods have a higher proportion of resins and oils that can mean more tar on your flue especially if the wood is wet. So always make sure soft woods are properly dried.

Some types of logs are prone to spitting, such as willow and most softwoods, and should not be burned on an open fire. They can be burned safely in a wood burning or multi fuel stove.

1m³ of properly seasoned oak is the equivalent of 190 litres of oil. The same volume of poplar is only the equivalent of 120 litres.



These figures are for the average hardwood

Wet wood

Moisture is not a fire's friend!

Every 1kg of wet wood adds half a litre of water to the fire which has to evaporate first before generating heat. This is inefficient and costly.

Fully seasoned logs have approximately double the calorific value of wet wood.

Tip: Bring your wood into the house a week before you burn it. This will bring the moisture content down and increase the heat you get from the log.

Tip: If you have to use some 'wet' wood then it can be burnt efficiently once the fire is very hot. Start the fire with dry wood and then mix the wet wood in with dry.

Water from wet logs is driven off up the chimney, where it condenses and causes tar deposits that can damage the flue liner.

Firewood is ready for use when its moisture content reaches 20% or less. You can use a moisture meter to check or look for:

- The wood is grey/darker in colour, meaning it no longer looks fresh cut.
- The ends of the wood are cracked and split.
- Logs feel lightweight for their size.
- When you bang two logs together, they make a ringing sound. Fresh cut logs will make a 'thud' sound.
- If you throw a test piece on the fire, you don't see a lot of steam coming off the log, and it burns well.
- Most wood will be ready for use after 6-12 months of seasoning, but certain hardwoods, like oak, may take up to two years.

Storing, stacking, drying

It's important that you store and stack your logs properly so that they dry and burn well.

Felling and staking: Trees should be cut in the autumn or winter when the moisture content is least. The wood should then be left to air dry in stacks for at least a year. A tarpaulin over the top will keep the worst of the rain off, but the sides of the stack must be open to the wind to allow air to circulate.

Splitting: Once seasoned, the logs can then be cut into short sections and split. The maximum length you should use is approximately half the size of your firebox. You should be able to fit three logs in your burner.

Thickness of logs: Ideally, logs should be no more than 10cm thick. If they are more than this, they will need to be split again to ensure that they burn efficiently.

Log stores: Store logs off the ground in a roofed stack until needed. It needs a roof but ensure permeable sides so that air can circulate. Indoor or unventilated shelters are not recommended.



Cost of logs compared to other fuels:

Fuel	Pence per kWh
Electricity	16.02
Oil	7.03
LPG	6.82
Coal	6.22
Seasoned wood	5.30
Mains Gas	4.66

Prices accurate at 08/2014

Burning wood efficiently

There are good ways of burning logs and bad ways of burning logs, it is important to understand a few key principles to make sure you get the most out of your logs.

Different ways to burn logs:

Open fires are not efficient. 80% of the heat goes up the chimney!

Wood stoves are simple, cheap and have greater efficiency than open fires, with 70% of heat directed into the room and not up the chimney. They are also safer than open fires if used properly.

Wood boilers heat water for heating and hot water systems, but are big investment and require space for boiler, storage and more.

How wood burns:

Up to 80% of the heat comes from burning gasses driven out of the wood following the initial combustion. This is called secondary combustion. Only 20% of the heat comes from primary combustion, which is the phase that turns wood into 'char'.

There are three different phases in a fire:

Phase 1: The heat from the wood already burning heats up the water in the igniting log and evaporates it. This takes a lot of heat and keeps the temperature of the fire down.

Phase 2: Once the moisture has been driven off, the temperature rises and gases are released. These can burn if there is sufficient heat and oxygen. Most of the heat potential of wood is in these gases.

Phase 3: All gasses have been removed to leave charcoal, which burns with no visible flame, but has a voracious appetite for oxygen.

Manage the airflow:

Managing the airflow is key to efficient and economic burning and is controlled by air vents. Primary air feeds the bed of the fire, and secondary air feeds the flames above it. Nearly all the energy from wood comes from burning gases released when it is heated, so secondary air is much more important than primary air.

- **Never** completely close the secondary air vent. It's the easiest way to create soot and tar.
- **Don't** leave the stove door open, unless you have been specifically instructed to by the manual when lighting the fire.
- **Always** look for a hot, fast burn, as this will be the cleanest, most efficient way of running the stove. A small hot fire is much more efficient than a large slow-burning one.

TIP: Wood burns best on a bed of ash, so don't clean your stove out too regularly.

TIP: Never fully close the secondary air vent as this will create an inefficient burn and more tar, which damages your stove.

TIP: Clean the glass of your stove with newspaper and the ash from the fire. Too much soot on your glass means that your fire is not burning properly.

Buying logs

It's important to be clear on what you are getting before you buy. Make sure you get seasoned, dry, split wood by the cubic metre.

Find a supplier that can deliver quantity at good price.

Green wood is cheaper if you can buy ahead and store it. If you want logs to burn straight away make sure you buy well-seasoned wood, which has a moisture content of less than 25%. It's worth buying a moisture meter to check.

How much wood you need depends on fuel quality, weather, how you are burning it and heat demand.

Check the size of a 'load' before buying, a 'load' can mean pretty much anything, it depends on the truck of the merchant!

What is in a metre? Make sure you know whether the logs are sold by solid, stacked or loose volume. 1m^3 of solid round wood forms a 1.4m^3 stack of 1m long split logs. This will turn to 2m^3 of loose and chopped firewood and 3m^3 of medium grade wood chip.

What is in a tonne? If buying by the tonne remember that one tonne of seasoned hardwood logs should make a loose pile of around 2.8m^3 or a stack of around 2m^3 . One tonne of seasoned softwood logs should make a loose pile of around 3.3m^3 or a stack of 2.3m^3 .

You want to be paying between £90 and £120 per cubic meter delivered. Split logs are more convenient and drier, but remember they take up more space than in the round so the price will be higher.

Buying by weight is problematic as wet wood weighs more. So better to buy by volume than weight.

Questions to ask when buying wood:

- *What is the species?*
- *What is the moisture content?*
- *What size are the logs?*
- *When was the wood cut and split?*
- *Where has it been stored?*
- *Was it stored undercover?*
- *What is the price per cubic metre? Is that as solid wood, stacked logs or loose logs?*



Firewood poems

The Firewood Poem

*Beechwood fires are bright and clear
If the logs are kept a year,
Chestnut's only good they say,
If for logs 'tis laid away.
Make a fire of Elder tree,
Death within your house will be;
But ash new or ash old,
Is fit for a queen with crown of gold*

*Birch and fir logs burn too fast
Blaze up bright and do not last,
it is by the Irish said
Hawthorn bakes the sweetest bread.
Elm wood burns like churchyard
mould,
E'en the very flames are cold
But ash green or ash brown
Is fit for a queen with golden crown*

*Poplar gives a bitter smoke,
Fills your eyes and makes you choke,
Apple wood will scent your room
Pear wood smells like flowers in
bloom
Oaken logs, if dry and old
keep away the winter's cold
But ash wet or ash dry
a king shall warm his slippers by.*

Celia Congreve, 1930

Logs to burn, logs to burn

*Logs to burn; logs to burn;
Logs to save the coal a turn.*

*Here's a word to make you wise
when you hear the woodman's cries;
Never heed his usual tale
That he's splendid logs for sale
But read these lines & really learn
The proper kind of logs to burn.*

*Oak logs will warm you well,
If they're old and dry.
Larch logs of pinewoods smell
But the sparks will fly.
Beech logs for Christmas time;
Yew logs heat well;
'Scotch' logs it is a crime
For anyone to sell.
Birch logs will burn too fast;
Chestnut scarce at all;
Hawthorn logs are good to last
If cut in the fall.
Holly logs will burn like wax,
You should burn them green;
Elm logs like smouldering flax,
No flame to be seen.
Pear logs and apple logs,
They will scent your room;
Cherry logs across the dogs
Smell like flowers in bloom,
But ash logs all smooth and grey
Burn them green or old,
Buy up all that come your way
They're worth their weight in gold.*

Honor Goodhart, 1926

Resources

Books

- [Rolls, W. \(2013\) The Log Book: Getting the most from your woodburning stove.](#)
- [Reynolds, A. \(2009\) Heating with wood: Wood fuel, stoves and home heating.](#)
- [Bushway, S. \(1992\) The new woodburner's handbook: A guide to safe, healthy & efficient woodburning.](#)
- [Butterworth, J. \(2010\) Woodburning: The Greener Way to Fuel your Home.](#)

Websites

- www.biomassenergycentre.org.uk
- www.woodsurre.co.uk
- www.southwestwoodshed.co.uk
- www.nef.org.uk/knowledge-hub/wood-fuel-logpile/buying-wood-fuel
- www.bretagneboisbuche.com (French)
- www.landscapesforliferesources.org.uk/resource-library/tools
- www.blackmountainwoodfuels.co.uk/
- [www.nottenergy.com/energy cost comparison](http://www.nottenergy.com/energy_cost_comparison)

Factsheets

- www.arnsidesilverdaleaonb.org.uk/images/stories/pdfs/buying_logs.pdf
- www.arnsidesilverdaleaonb.org.uk/images/stories/pdfs/woodburning_stoves.pdf

Moisture meters

- www.stovesonline.co.uk/firewood-moisture-meter.html
- <http://bit.ly/1wfxvBU>



This information leaflet was produced on behalf of the community energy training partnership by Dr Ruth Fuller with input from Kit Vaughan and Ian Rees.

For more information see www.dorsetaonb.org.uk and www.primecoppice.com.

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