



wood stoves



LILI

what are they?

They are stoves for burning wood to heat your space, your water, and even to cook on. A basic stove will be of cast iron or steel (lined with fire-brick to retain heat), usually with a door at the front for loading, lighting and ash removal – but sometimes on top in small stoves.

Open fires are pretty, but most of the heat disappears up the chimney. Also, updraughts from below pass through the logs and draw off volatile gases (which provide most of the heat) and suck them up the chimney unburnt, which wastes heat and causes tar build-up in the chimney. The casing of a stove heats up and radiates heat out into the room. You can have a simple stove for heating, or one with a back boiler to provide hot water / central heating.

Ceramic stoves or kakkellovns (popular in Scandinavia and Eastern Europe) have a ceramic casing that acts as a heat store to radiate heat into the room for hours after the fire is out. These are much more expensive than standard log burners. Aga / Rayburn-type cookers are also much more expensive than a basic stove, and nowadays tend to be fuelled by gas, oil or electricity.

Pellet stoves burn pellets made of compressed organic material such as sawdust or agricultural plant waste, and can be automatically fed from a hopper.

Larger automatic-feed wood or pellet boilers can be installed in schools, hospitals etc.



a basic wood stove sitting on a slate base, with a flue at the rear, passing through a metal plate to the chimney; seasoned wood is stacked next to the fire to dry further.

what are the benefits?

CO₂ is the most important greenhouse gas; wood is a carbon-neutral fuel in that burning releases CO₂ (the same amount as if the trees died and rotted) but new trees absorb it. Growing trees absorb more CO₂ than mature trees, so as far as global warming is concerned, it is better to harvest mature trees and continually replace them with new ones. Wood is a renewable resource that provides a habitat for wildlife. It also has a good energy balance, i.e. can be locally produced, requiring very little processing or transport energy (logs more so than pellets, although pellets release less of the pollutants that cause acid rain).

Emissions are better than coal, oil or gas as regards NO_x and SO_x (acid rain) and carbon monoxide but worse for particulates. For space heating, emissions and energy losses from power stations make electricity the worst option environmentally; and wind and photovoltaics are as yet too expensive for heating.

Modern 'clean burn' stoves can be used in smokeless zones; they use secondary combustion, baffles or catalyts to maximise combustion of gases and particulates, reducing emissions and increasing efficiency.

what can I do?

stoves: basic stoves start at around £400, (c. £1000 for clean burn) - see suppliers list in 'resources', or cheaper second-hand (see Salvo – also below). If you have access to sheet steel, and cutting and welding equipment, you could even build your own, which would work out cheaper still. Your supplier should be able to recommend an installer, or you can install yourself: stand the stove on a slate or concrete slab (not too close to wooden fire surrounds), make a metal plate for the chimney (can be a thin sheet of stainless) with a hole for the flue pipe ('Copex' is useful because it's flexible), seal flue and plate with fire cement, put fire string round door (both from plumbers' merchants or online – see 'resources'. Old chimneys will need re-lining, as tar could be deposited, causing a fire hazard, plus gases could seep through into living areas. Chimneys must be swept every year to remove creosote and tar and avoid chimney fires.



splitting logs: in the background is a chain-saw horse where the cords are cut into logs.

wood: 5 tonnes of wood per year is more than enough for a basic stove in your main living area – but that's assuming it's in use most of the time from October to April; unseasoned wood is heavier because of the water content. Logs are the cheapest way of heating your space – around 1/5 the price of electricity per kWh. It will probably get relatively cheaper too, as fossil fuel prices rise, and carbon-neutral fuels get tax breaks.

You can buy logs split, or cords (lengths over 1m) and cut and split them yourself, in which case you'll need a chainsaw and a splitting axe from a farm / garden equipment supplier (ask about protective clothing and health & safety). Trees are best felled in the winter when moisture content is lower, then cut and split to dry better. Store under cover for at least one summer, which should reduce moisture content to around 25%.

Ash is probably the best firewood, as it has the lowest moisture content when green (c. 35%), but beech, cherry and hawthorn are also good. Don't use second-hand construction timber, unless you're absolutely sure it's untreated, as it will release toxic fumes; and certainly not chipboard, plywood or mdf – even for kindling – as it contains formaldehyde.

Bring some split logs in and stack them next to

the stove (not touching) – this will dry them more. Leave a layer of ash at the bottom of the fire, add paper, dry kindling (you don't need firelighters) followed by a few small, dry logs. There will be an air inlet to adjust air flow – have this open at first, and slowly shut it down as the fire becomes more established. Wood ash contains potash, and can be used as a fertilizer (best applied at the end of the growing season, and not on alkaline soil).

resources

- suppliers and installers of stoves, plus a database of wood (and kindling) suppliers - www.nef.org.uk/logpile, plus www.stoveland.co.uk / www.firesonline.com
- second-hand stoves – try www.salvo.co.uk
- www.chimneyworks.co.uk - National Association of Chimney Sweeps
- Willah Wedden, 1980, *How to Eat & Heat with Wood Stoves*, Eberly Press
- Ralph W Ritchie, 1998, *All That's Practical About Wood*, Ritchie Unlimited Publications
- Stephen Bushway, 1992, *The New Woodburner's Handbook*, Storey Books
- Dirk Thomas & Castle Jr. Freeman, 2000, *The Woodburner's Companion*, Alan C. Hood & Co
- www.nef.org.uk/greenenergy/biomass.htm - more information



stacking the split logs under cover for at least one summer will reduce the moisture content to around 25%.

Contact us or visit our website to find out more about our factsheets, manuals & books, residential weekend courses, presentations and shop. You can also become a 'Friend of LILI', and receive our biannual newsletter, discounts on our courses, and help us to make a difference.

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