

Bittern Countryside

Community Interest Company



Energy Fact Sheet 3.

“Woodfuel Wisdom”

Buying, storing and using wood

Save energy, Save money
Save the environment!



Supporting the

Arnside Silverdale AONB

Low Carbon Landscape Initiative

Bittern Countryside Community Interest Company
Registered Office: The Old Station Building, Arnside, LA5 0HG
Registered number 6363720



Website: <http://www.arnsidesilverdaleaonb.org.uk/AONB/Support/Bittern-Countryside-CIC.html>

Introduction

This is the third in a series* of leaflets prepared by the Bittern Countryside CIC to help you understand renewable energy and see how it can save you money on your energy bills and reduce your carbon emissions too.

** Fact Sheet 1 "Electricity From Sunshine" deals with PhotoVoltaic panels. Fact Sheet 2 deals with woodburning and multifuel stoves. The series will eventually cover woodpellet and woodchip central heating boilers, heat pumps and solar hot water.*

Why burn wood?

Woodfuel is a clean, low carbon renewable energy source which offers many benefits.

Saving money

Woodfuel can deliver significant cost savings because of lower fuel costs: woodfuel can be cheaper than fossil fuels when replacing electric, LPG, coal or heating oil. At the moment (2010) it is not cheaper than mains gas central heating. Used in a woodburning stove it can provide an alternative, competitively priced source of heat. Even for those who rely on gas for central heating, a woodburning stove will provide emergency heating and possibly cooking facilities if the main energy supplies are disrupted.

Saving carbon dioxide (CO₂)

Burning wood releases carbon dioxide but this is balanced by the carbon dioxide absorbed by the original trees and in the growth of new ones. The biggest savings of carbon dioxide occur when wood replaces carbon-intensive, fossil fuels, especially in areas that are not on mains gas.

Providing local jobs

The development of a robust woodfuel supply chain requires a skilled work force. Rapid uptake of renewable heating will contribute towards creating green jobs and the active management of woodlands presents significant opportunities for farm and rural diversification. We live in an area that is blessed with woodland that, if sympathetically managed, can provide woodfuel as well as benefit the landscape.

Encouraging wildlife

Bringing woodlands back into management, as the market for wood heat expands, has a positive impact on wildlife. Opening up space allows sunlight in, which enables a wider range of plants, insects and animals to live in the woodland.

Recycling and avoiding waste

Wood that could otherwise end up as waste can be used to provide energy. Twigs from the garden, if stored for a year, can be used for kindling as can offcuts from joinery. Logs from tree surgery can be stored for a couple of years and then burned.

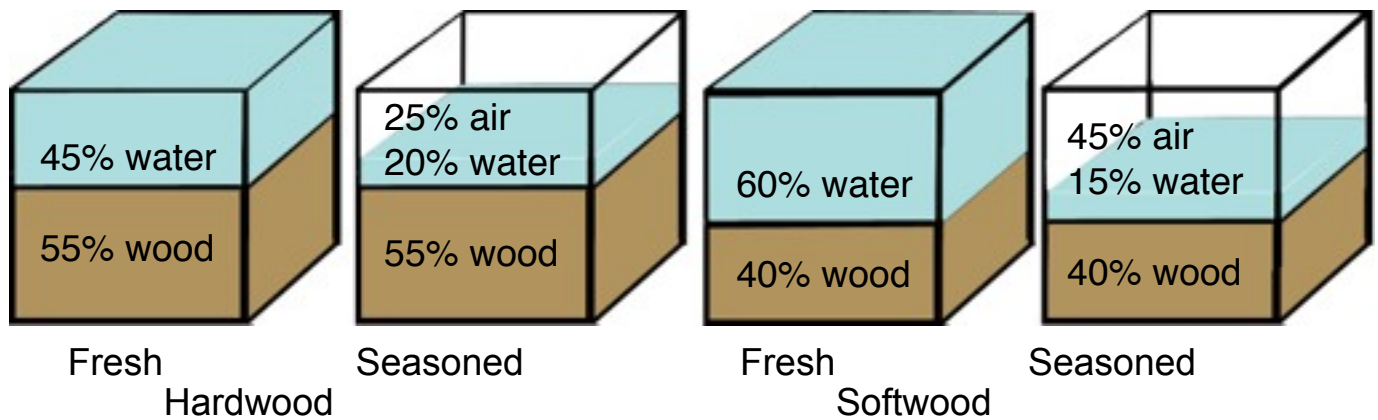
Any reputable tree surgeon will cut the logs into lengths for you and may even split them. Sawdust can be made into briquettes commercially. Newspaper can be made into logs. Do **NOT** use painted or treated wood or any form of chipboard. Driftwood from the beach should **never** be burned in a fire because the high salt content will damage the metal and glass of the stove as well as the chimney liner.

Improving air quality

Modern, wood-burning boilers and stoves can compete on ease of use, cleanliness, efficiency and convenience with fossil-fuelled alternatives. This can potentially lead to an improvement in air quality if replacing coal or oil boilers.

Facts about logs

Any fire or stove is only as good as the fuel that you put on it. A 10 cm cube from a hardwood log of freshly cut timber contains around 45% water. A similar cube from a log of softwood contains around 60% water.



A fire using wet or unseasoned logs will only give a small percentage of the heat that the same logs would give if they were dry and properly seasoned. This is because the fire must dry the logs before they can start to burn and release heat. The water is driven off up the chimney, where it will condense and cause tar deposits or cause erosion of the liner with expensive consequences.

Well seasoned (air or kiln dry) logs have a much lower moisture content and will be dry to the touch, the bark will come away easily and they may have cracking down the length of the log. Softwood logs will be much lighter and have a more open texture.

Hardwood
log



Softwood
log



Logs should not be more than 10 cm across and split logs burn better than round logs.

Is all wood the same?

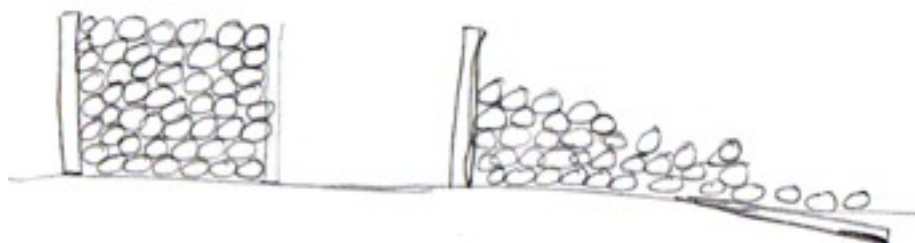
Different types of wood produce different amounts of heat. Some types of wood are very poor for burning and are best avoided. Hardwoods will burn longer and give out more heat than softwoods. The best common woods for burning are oak, beech, ash and birch. (see the table on page 7)

Cutting and storing wood

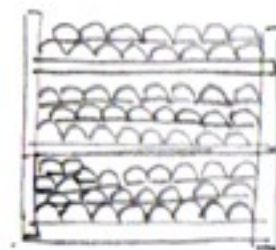
Trees should be cut in the autumn or winter when the moisture content is least. Ideally, the wood should then be left to air dry in stacks for at least 1 year. A tarpaulin over the top will keep the worst of the rain off but the sides of the stack must be open to the wind to allow the air to circulate. It can then be cut into short sections and split into logs not more than 10 cm in diameter. These should be stored in a roofed stack until needed. You may want to build a store against your house wall. If you do, make sure you stack the wood so that it doesn't touch the wall. You should also make sure it doesn't constitute a fire risk.

Making a safe woodstack.

The log pile must be stable. A wood pile 6 feet high may look impressive but its collapse onto someone removing wood from it can be lethal. The stack should be built on bricks or concrete blocks with gaps between them or on wooden bearers raised off the ground. Ideally, the logs should be split to aid stability and either chicken wire or wooden bearers should be placed every 3 or 4 layers. The ends can be supported by vertical posts joined to the bearers. This also allows more air to circulate. The practice of placing logs between stakes driven into the ground or having a pyramid shaped pile may look simpler but it depends on nothing rotting or being disturbed. If the logs have been cut into short lengths stack them 2 or 3 deep and have longer logs going through the pile every so often.



This pile is unstable and may well collapse



A stable woodpile

Buying logs

1 solid m³ of logs forms a loose pile around 1.8 m³. Neatly stacked it will be around 1.25 m³. Make sure you know whether the logs are sold by solid, stacked or loose volume. If buying by the tonne remember that 1 tonne of seasoned hardwood logs should make a loose pile of around 2.8 m³ or a stack of around 2 m³. 1 tonne of seasoned softwood logs should make a loose pile of around 3.3 m³ or a stack of 2.3 m³.

Unless you can store your wood for some months, buy well seasoned wood, which will have a low moisture content; 25% or below. It is worth buying a meter that will give you an instant readout of moisture content. These devices are reasonably cheap, around £20, and will save you a lot more money in the long term. If your log supplier delivers a load of damp wood which gives a high reading on the moisture meter – anything above 30% is not fully seasoned or has been stored in wet conditions – refuse to accept it and approach another supplier. Ideally any wood should be stored by you for at least a few weeks to allow surface water to dry off and reduce the water content to 20% or below.

Kiln dried wood.

Most wood is left to dry in the open air, stacked in covered piles. However some wood may be sold as Kiln dried. This does not necessarily mean it has a lower moisture content to seasoned wood. Only that the drying period has been shortened by heating the wood in a kiln. Check the moisture content. Only if it is 15% or less is it worth paying more for. While kiln drying does add considerably to the carbon footprint of the logs, it does tend to kill off any insects and fungi that may be under the bark.

What other wood based fuels are there?

Wood briquettes are a good alternative if bought in bulk and if storage space is short. They are made from waste sawdust, compressed at elevated heat which causes the fibres to bind together without any added substances. They usually have less than 6 % moisture but must be kept dry. They are also easy to handle. If you have difficulties with storage or do not wish to pay for a large supply, why not share a load with friends. They are easy to carry in the back of a car. To get the same energy as 1 stacked m³ of Blazers (the wood based briquette sold locally) you would need between 3 and 4 stacked m³ of seasoned hardwood, 6 stacked m³ of softwood and at least 15 m³ of unseasoned softwood if you burned it when first felled. You can also get bark briquettes called Sleepers which will burn slowly overnight with the stove shut right down.

Half a Blazer log



Using kindling

You should not need firelighters to light a woodburning stove. Some crumpled newspaper and a few pieces of kindling or a handful of dry pine cones should be sufficient. You should store your kindling inside so that it is house dry. Pine cones should be fully open. If they are shut they are not old or dry enough. Collect them from the ground in the spring and dry them over the summer. Old wooden pallets also make good kindling if chopped up. Softwood is better than hardwood as it has a more open structure.

How can I get the most out of my wood?

Use a woodburning stove to burn it (see Fact Sheet 2) rather than an open fire. A stacked m³ of airdried hardwood contains around 2400 kWh of energy. This is of course not the effective energy which is around 1700 kWh in a stove and 600 kWh on an open fire.

Bring your wood into the house a week or more before you burn it. This will bring the water content down to around 15% and increase the heat you get from the log.

If you have to use some “wet” wood then it can be burnt efficiently once the fire is very hot. Starting a fire with wet fuel will not give any heat at all. Start the fire with dry wood or “Blazers” and then mix the wet wood in with dry once the fire is very hot.

What woodfuel stockists are there locally*?

Rebecca Oaks at rebecca.oaks@btinternet.com sells locally sourced logs in bags or in bulk. She also sells charcoal.

Brian Barker of Lindale, 01539 533177, sells locally sourced wood in bags or bulk.

Bulk orders of Blazers can be obtained from Cumbria Green Fuels at Natland much cheaper. <http://www.cumbriagreenfuels.co.uk/2.html>

You can buy Blazers and logs in small quantities from Houghtons, in Milnthorpe.

Other woodfuel stockists can be found through the local papers or from the web.

What should I expect to pay?

You should be able to buy seasoned logs in bulk locally for around £100 per stacked m³. Kiln dried wood may be around 30% more. At these prices you are paying around 5p per kWh. Wood bought in small quantities will be much more expensive.

Blazers cost between £340 a tonne if bought in bulk and £4.95 for a 10 kg bag. This works out at 6p per kWh when bought in bulk. Sleepers cost between £446 at tonne if bought in bulk and £7.50 for a 10 kg bag. (prices as at Nov 2010)

When comparing prices you should check wood sold in so called 1 cubic metre dumpy bags. Most of these are in fact only around 0.8 m³ and as the wood is jumbled in them it actually stacks to even less.

Where did the CIC get its information from?

All the information is drawn from recognised official websites, publications and from practical experience - contact us by email: bitternccic@arnsidesilverdaleaonb.org.uk or by telephone on 01524 761034 for more information.

Where can I find more information*?

<http://www.glasu.org.uk/en/uploads/documents/How%20to%20buy%20wood%20fuels%20eng.pdf>

<http://www.beacon-stoves.co.uk/wood/wood-as-fuel.shtml>

<http://www.forestry.gov.uk/forestry/INFD-7WVKA6>

<http://www.nef.org.uk/logpile/index.htm>

<http://www.woodheat.org/>

<http://www.cumbriawoodlands.co.uk>

** Neither the AONB nor the Bittern Countryside CIC are endorsing any of these particularly*

Woodfuel data.

Energy of different types of wood.

	Energy (kWh)	Effective energy (kWh)	
		in stove(70%)	in open fire (25%)
Airdry Wood(m ³)			
Beech, oak	2520	1764	630
Ash, birch	2440	1708	610
Sycamore,elm	2200	1540	550
Larch	2150	1512	540
Pines	2000	1400	500
Spruces	1840	1288	460
Poplar	1800	1260	450

(1 kWh produces 1 kW of heat for 1 hour).

1 kg of airdried hard wood contains around 4 kWh of energy.

1 kg blazer contains around 5.5 kWh of energy.

For comparison a litre of fuel oil contains around 10 kWh of energy.

Approximate weight in grams of a 10 cm cube.

fresh cut timber	airdry hardwood	oven dry hardwood	airdry softwood	oven dry softwood	Blazers
1000	750	550	550	400	1180

A solid cubic metre of logs will make a neat stack of 1.25 m³ and a pile of 1.8 m³.

The woodman's song

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 has good logs for sale
But read these lines and really learn
The proper kinds of logs to burn

OAK logs will warm you well
If they are old and dry
LARCH logs of pine wood smell,
But the sparks will fly
BEECH logs for Christmas time,
YEW logs heat well
SCOTS PINE 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 smoldering flax
No flame to be seen

