A buyer's guide to domestic wood fuelled heating

To find out more about installing wood fuelled heating call 0300 123 1234 or visit energysavingtrust.org.uk

energy saving trust®

What is wood fuel?

Burning wood releases heat through combustion which can be used to provide space and water heating in the home. It is the most common form of renewable energy with around a million tonnes of wood fuel used in UK homes every year. Most of this is used in traditional log stoves and open fires, but there is now a range of technologies available to use wood fuel to run modern central heating systems.

Is wood fuel sustainable?

Unlike many other renewable energy technologies burning wood does release carbon dioxide (CO_2). But this will only be the same amount that was absorbed by the plant when it was growing. There are some emissions associated with the production and transportation of wood fuel, but emissions should still be significantly lower than those from fossil fuels.

Using wood fuel is sustainable provided the wood is grown sustainably. The vast majority of wood fuel produced in the UK is sustainable, and suppliers of domestic wood fuel will generally use local sources whenever possible.

What are the key benefits of wood fuel?

Energy storage
Unlike other renewable energy options, wood can be stockpiled so you can use it when you need it.

Integration
A wood fuelled system can usually be incorporated into an existing central heating and hot water system.

Local benefits
Using local wood fuel creates and secures local jobs; ensuring money spent is kept in the local economy.

Savings
Heating with wood pellets can cost less than conventional heating fuels, but will be most cost effective when replacing an expensive heating fuel like electricity. Heating with logs and community heating with wood chip, can be cheaper still in some circumstances.

Is wood fuel suitable for my home?

A wood fuel heating system can usually be incorporated into an existing central heating and hot water system. Choosing the best wood fuelled system will depend on a range of factors and a competent professional installer should assess your situation and discuss your options with you. Before involving an installer consider:

Flues and ventilation
You will need a suitable flue to disperse the combustion gases, and a permanent vent to provide sufficient air for the appliance. Older houses with existing chimneys may be suitable but the chimney may need to be lined.

To find out more call free on 0300 123 1234.

Space
Whilst wood fuels provide heat by burning, similar to fossil fuels such as oil and coal, it has a lower energy content which means that you will need more wood and therefore space to provide the same amount of heat than if you were using oil or coal for your main heating fuel. The storage area for your wood fuel should be dry and have easy access for deliveries. You should have enough space to store the fuel you think you will need to last you between deliveries at the coldest time of the year or even a little more. A wood fuelled appliance will often be larger than its gas or oil equivalent and cannot be wall mounted. Improving the energy efficiency of your home will reduce the heat demand allowing you to select a smaller appliance and smaller fuel store.

Availability of a local supply
To ensure a reliable supply, you will want to make sure you have a choice of suppliers that serve your area. Wood suppliers are generally available everywhere, and their numbers are constantly increasing. To find your nearest supplier visit logpile.co.uk where contact details and fuel types supplied are provided using a simple postcode search. If local supply is limited, then a larger storage facility will help ensure availability throughout the winter.

Permission
All wood heating systems have to comply with the Building Regulations. Use an installer who is a member of a Competent Person Scheme such as HETAS to ensure your system complies. 'Exempted' appliances are required if you live in a 'smoke control zone'. Visit smokecontrol.defra.gov.uk for more information.

Wood burning boilers and stoves do not generally require planning permission unless the flue:

- Exceeds 1m above the roof height.
- Is installed on the principal elevation and visible from a road, in buildings in conservation areas and world heritage sites.

The Forestry Commission's Biomass Energy Centre publishes more detailed guidance on the technical requirements of small scale biomass heating systems on its web site

www.biomassenergycentre.org.uk

Heating your home with wood

Wood fuelled heating systems can, if correctly sized and installed, provide all of your heating and hot water needs. There are three main options available:

- Boilers that provide heating and hot water for the whole house.
- Stand-alone stoves that provide heating to individual rooms, often as a secondary heating system.
- Stoves with back boilers that heat the room directly but also provide hot water, and may also run radiators in the rest of the house.

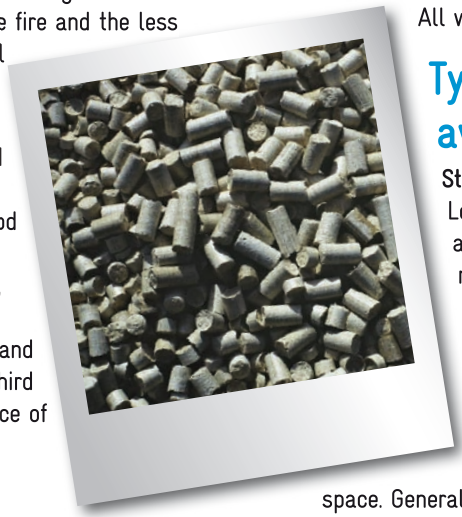
To maximise the efficiency of a wood fuelled boiler system it can be a good idea to incorporate a large heat storage tank (a buffer tank or thermal store) in the central heating system. This improves the way in which the boiler responds to a fluctuating demand for heat and hot water, and can allow integration of other heat sources.

Most wood fuelled heating systems operate at high efficiency levels which keep emissions comparatively low. A well installed system using high quality dry fuel will usually burn without any visible smoke.

Types of wood fuel available

There are three main wood fuel types. Each can be used in different ways and has different storage space requirements and availability.

Logs
Obtained directly from trees, with minimum processing involved. Generally, they are just covered to keep them dry and left for one to three years to 'season'. In this time, the moisture content falls from around 50% to 20%, and they become lighter. The drier the logs, the hotter the fire and the less smoke and tar will be produced.



Pellets
Derived from wood by-products from saw mills and wood manufacturing. Pellets are denser, drier (8 to 10% moisture content) and require around a third of the storage space of logs or chips. This makes them ideal where storage space is limited. A higher energy density and uniform shape makes pellets ideal for automated domestic heating systems.

Chips
Generally derived from forest or saw mill residues or from clean, untreated waste timber. They are typically used for larger scale applications such as leisure centres or community heating schemes. For problem free use in smaller systems they need to achieve high uniformity in size and have low moisture content.

All wood fuels need to be kept dry.

Types of technology available

Stoves
Log and pellet stoves are available, with efficiencies ranging from 60–80%. The higher the efficiency, the less fuel will be needed to heat the home. Pellet stoves are more sophisticated and provide automatic feeding of the pellets from an integral storage space. Generally they are used to heat the

room in which they are situated and can hold enough fuel for up to two days.

Higher output stoves can have an integral back boiler to provide hot water and space heating. Efficiencies range from 60-80%. When used for water heating, the fuel in the integral storage space will be used more quickly than a stove used only for heating a single room.

Some stoves have a controllable fan that can be used to regulate heat output. Pellet stoves use microprocessors which maintain temperature by regulating the rate of fuel to the stove.

Pellet stoves typically have an ignition to light them electronically and many are sealed units with an electric fan. Some have a back-up power supply in case of power failure.

Stoves and their flues have to comply with the requirements of Part J of the Building Regulations (England and Wales) or Part F in Scotland or Part L in Northern Ireland. You should check with your supplier that the system you are purchasing conforms to all relevant regulations before you buy.

Stoves are ideal for refurbishing older buildings where installing central heating is too costly but a functioning chimney still exists.

Log stoves are also ideal in rural areas with a decent supply of wood fuel.

New low energy housing may be able to receive enough heat for the entire house with one centrally located stove, provided it is in a room where most time is spent and the heat is able to move freely to other parts of the house.

Boiler systems

Log and pellet burning boilers are generally suitable for connecting to an existing central heating system. Efficiencies are around 80- 90%.

Log boilers

Are loaded by hand, but will not need stoking as frequently as a log stove. They are usually located in a separate boiler room and domestic models range from 20 to 50kW. They are designed to work in conjunction with a large heat store known as an accumulator or buffer tank. This allows the boiler to operate for shorter periods at higher loads which will improve its efficiency. If the boiler and buffer tank are large enough the system may only need loading every one to three days.


Pellet boiler

Pellet boilers
These may have an integral pellet hopper which is often topped up automatically from a larger store outside the house. Some boilers have an integrated silo big enough to supply fuel for a week or more. External silos or 'flexibags' typically hold enough fuel for two to 12 months. Domestic models range from 8 to 30kW and are usually installed in utility rooms, cellars etc.

Before installing a boiler you will need to think about where you will store your wood fuel. Fuel suppliers will need to be able to access this area easily and safely to make their deliveries.

Chip boilers
Operate in a very similar way to pellet boilers but they do not work effectively below 50kW. They are therefore not suitable for heating a normal single house. However they can be an appropriate low cost and low carbon heat source for community heating schemes and larger buildings.

Combination boilers
Some specialised boilers (not to be confused with gas combination boilers) can use a variety of wood fuels such as logs, wood chips, sawdust. They may be an attractive option if you have your own (varied) fuel resources.

Hot water
Any wood boiler will be able to provide domestic hot water by heating a hot water cylinder in the same way as a conventional gas boiler. Some systems will be able to do this even during the summer when only hot water for washing and bathing is required. However it may be more cost effective to use a well-controlled electric immersion or LPG for summer water heating possibly in conjunction with a solar hot water system.

Other wood heating technologies
Ceramic heaters are wood fired 'storage' heaters where the heat from burning fuel is absorbed by ceramic blocks with high thermal mass. The absorbed heat is released over time after the heat has been provided allowing a two hour burning period to provide heat for up to 24 hours. Efficiencies of 90% are reported for these systems provided they are operated correctly. Check with your installer for advice.

In some countries thermal storage stoves are often built as a permanent feature in the main living room. These can be made of stone, ceramics or other heavy material.

Some range cookers are designed to run on logs and can contribute to space heating and hot water. However many solid fuel range cookers in the UK are not designed for use with wood fuel and will not run effectively on wood alone.

For more information about renewable technologies call the Energy Saving Trust on 0300 123 1234.

Commissioning

When your system is installed it should have a high temperature cut-out test to check that if the boiler overheats – for example, because fresh air supply is restricted – it will shut down effectively. If a natural draught flue (a flue without a powered fan) is used a smoke test should be carried out to ensure the system is air tight and that the flue prevents combustion gases entering your home. Your installer should give you the results of these tests along with operating instructions and details of any maintenance requirements for the system. Always ensure that the installation meets building regulations.

Costs and savings

A number of things will affect the cost of installing a wood fuelled heating system:

Your heating requirements

A typical three bedroom semi-detached house needs around 15kW, whereas a large detached house may need 20kW or more. Your past energy bills will give you an idea of your heating needs in kilowatt hours (kWh) per year. An installer will then be able to suggest an appropriate system size to meet your requirements. Remember: ensuring your home is well insulated will reduce your heating requirements, which means you will need a smaller system.

Size

A wood fuelled system should meet your home's full heating needs unless a back up boiler or other renewable technologies are present. But remember not to choose a system that is too large, over-sizing reduces efficiency and will increase running costs.

- Individual pellet room heaters or stoves are usually around 7kW, and cost around £4,300.
- A fully programmable space and water heating system can be installed, costing around £11,500 for a 15kW pellet system, although costs will vary significantly between installations.
- A manually fed log boiler could be cheaper, but a sophisticated log boiler system with accumulator could cost just as much. The boiler is likely to be larger too – perhaps 20 to 30kW for the same house.

Fuel

- Drier, more processed fuels such as pellets are more expensive, but have a higher energy density and require less storage space.
- Fuel from a good local supplier is often more convenient and may reduce transport emissions. Some companies are now trading nationally, but may supply fuel through local agents

Other factors

- Wood fuelled appliances are heavy and get hot. If you have a stove you will need a suitable hearth and surround to protect your home and your family.
- Stoves need an adequate supply of air unless room-sealed, so air vents need to be of the right size and kept clear of obstructions.
- A suitable flue is required to allow the gases produced by the burning wood to escape. The flue must meet the requirements of the building regulations.
- Existing chimney flues can be checked and modified by suitably qualified professionals.
- You will need space around the boiler for adding the fuel, as well as sufficient storage space for the fuel.

Wood fuelled appliances currently cost at least twice as much as a conventional gas or oil fired appliance, and the total installed system will cost even more. They are generally more cost effective if you live in an area that doesn't have a gas supply and/or you are replacing or upgrading an existing heating system. You will also need to take fuel costs into account. The cost of logs can vary enormously between suppliers. Pellets now cost less than all the main heating fuels, but savings compared to gas will be small.

Renewable Heat Premium Payments

The Renewable Heat Premium Payment (RHPP) is a one-off fixed payment to householders installing renewable heat generating technologies, including wood fuel heating systems. This is available for installations that have been commissioned from 21st July 2011 onwards. For wood heating systems, the Renewable Heat Premium Payment Scheme will reduce the initial installation cost by £950. RHPP is available on a first-come, first-served basis, and is time limited, so visit energysavingtrust.org.uk/RHPP to find out more.

Savings for a wood fuelled boiler

Fuel replaced	£ saving per year	CO_2 saving per year (tonnes)
Electricity	£580	7.5
Solid fuel	£300	7.5

The Renewable Heat Incentive (RHI) is due to commence in 2013 for domestic heat generating systems. Owners of new eligible heat technologies will be paid an annual sum to reflect the amount of renewable heat they deliver. For the latest information on RHI visit energysavingtrust.org.uk.

This table shows the typical savings for a pellet central heating system in place of electric storage heating or coal fired heating, based on a three bed semi-detached property. Savings in Northern Ireland will vary. RHI payments are not included in these calculations.

Note: if your home is heated by gas, a wood fuel boiler may cost almost as much to run, although you would still save around 4 tonnes of CO_2 per year.

Maintenance

Wood fuelled boilers, stoves and room heaters should be kept clean and swept regularly to remove ash. A log stove requires ash removal every few days and the flue should be cleaned twice per year. Some appliances particularly boilers have self cleaning systems built in. Your installer should give you details of maintenance checks you need to do. These

shouldn't take longer than a day or two over a whole year. Wood fuelled appliances can last around 20 years if kept in good condition throughout their life.

Microgeneration Certification Scheme

The Microgeneration Certification Scheme (or MCS), exists to ensure that installers install to the highest quality every time, using MCS certified products that have met rigorous testing standards. All MCS approved products will come with a guarantee for a set period of time, which your MCS approved installer should clearly explain to you. To check that your installer is MCS certified, you can search for them on the MCS website or call the Energy Saving Trust for free advice on 0300 123 1234. For more information about the scheme, go to microgenerationcertification.org

All MCS certified installers must belong to an Office of Fair Trading-backed consumer code-of-conduct programme, and the REAL Assurance Scheme is currently the only one available. The scheme covers general business standards, such as protection against excessive deposit payments and workmanship warranties, which installers must always explain to consumers both in writing and verbally.

To check that your installer is a member of the REAL assurance scheme visit realassurance.org.uk or call REAL on 0207 981 0850.

Deposit and Advance Paym ent Insurance Scheme

All REAL members must provide protection for deposits and advance payments they take from domestic consumers. REAL members have access to insurance known as the Deposit and Advance Payment Insurance Scheme'. The scheme is designed to provide protection for payments made before works have begun, just in case the company ceases to trade before they deliver the goods to you. The Deposit and Advance Payment Insurance Scheme has been arranged between REAL and the insurance scheme administrator (QANW).You will not be asked to pay anything for the insurance cover, either to the REAL Assurance Scheme or to the company you're contracting with. The company can register your contract with the scheme administrator and you will receive an insurance policy by post. For further information on this scheme please visit www.real.qanw.co.uk/consumer-faqs.phpor call 01292 268020.

Workmanship Warranties

When you purchase a renewable energy technology, your MCS installer is obliged to provide a workmanship warranty for a minimum of one year. However, typically speaking many companies offer warranties for longer than this. Members of the REAL Assurance Scheme are required to put in place arrangements to ensure that the warranty they provide will be honoured if the company ceases to exist during the warranty period. Under the Deposit and Advance Payment Insurance Scheme consumers are given the opportunity purchase warranty insurance for an additional £35. This insurance provides protection should the company cease to trade and is valid for the period of the installer's original workmanship warranty.

If the installer company has not already provided an insurance backed warranty the

Energy Saving Trust recommends that you pay this additional £35 for the workmanship warranty insurance. For more information about this scheme visit real.qanw.co.uk/consumer-IBG-faqs.php, or call 01292 268020.

What should I expect from my installer?

All MCS approved installers should be able to provide a detailed breakdown of the specification and costs of their proposed system. They should:

- visit in person and complete a technical survey before quotation.
- explain how they have calculated the size of the system to be appropriate for your space (and hot water usage if applicable) including calculations for system efficiency.
- comply with the latest MCS MIS 3004 standards.
- provide an estimate of how much heat will be produced by any proposed system.
- supply clear, easy to understand and detailed information and advice on how best to use the system and operating instructions.
- explain how the system will be installed and if there will be any disruption to your property.
- install and set controls and settings to ensure you get the most out of your system.
- provide clear and easy to understand information on product and workmanship warranties.
- provide a full breakdown of costs in their quote and include the terms and conditions.
- not ask for more than a 25% deposit. You also have the right to cancel the contract within seven days with no penalty.
- To help you make an informed decision we suggest you get as much information as possible from product and installer brochures, which may include background information on performance testing.

Check list:

- Before making the decision to go ahead and install a wood heating system, we recommend that you use the following check list:
- I have checked how energy efficient my home is and installed any necessary measures to improve insulation. YES/NO
- I have considered my current heating system including heating circuit. YES/NO
- I have considered available space for the wood fuel system and fuel storage YES/NO
- I have considered my current fuel use YES/NO
- I have received at least three quotes (however, do not compare installers on cost alone; the cheapest may not be the most appropriate option for you) YES/NO
- I have checked any proposed works with the local authority planning and building control teams YES/NO
- I have chosen an MCS certified installer that uses MCS certified products and is a member of the REAL assurance scheme YES/NO
- I have checked which warranties are on offer – both product and workmanship, including post installation services YES/NO
- I have checked that I have received a briefing from my installer on how to operate and perform basic maintenance checks YES/NO

For more information about renewable technologies call the Energy Saving Trust on 0300 123 1234.

How the Energy Saving Trust can help

The Energy Saving Trust is a non-profit organisation providing free, impartial advice to help you stop wasting energy and money and help fight climate change. To find out what you can do to generate your own energy visit **energysavingtrust.org.uk** or call us free on **0300 123 1234**.

Our advisors will:

- Give you personalised advice on what's practical for your home.
- Put you in touch with local certified installers.
- Tell you about grants and offers available.

All measure costs and savings are correct at time of printing. However financial savings will change as energy prices rise or fall. Please refer to our website for the most recent measure costs and savings.

To start generating your own energy visit

Energy Saving Trust
www.energysavingtrust.org.uk

Microgeneration Certification Scheme
www.microgenerationcertification.org

REAL Assurance Scheme
www.realassurance.org.uk

Information on wood fuel and local suppliers of fuel and systems
www.logpile.co.uk

Hetas
www.hetas.co.uk/nearest_member

Energy Saving Trust
21 Dartmouth Street, London SW1H 9BP
Tel. 0300 123 1234 energysavingtrust.org.uk

energy saving trust®

REAL
RENEWABLE ENERGY ASSURANCE LIMITED

MCS
The Certification Mark for Onsite Sustainable Energy Technologies

Photo on page 6. courtesy of Treco
Printed on Revive Silk which contains 75% de-inked post-consumer waste and a maximum of 25% mill broke.