



Wood is a smart choice

9 Mitigation: Woodfuel – renewable energy that grows on trees

Wood used for energy is woodfuel. When used in place of fossil fuels, woodfuel reduces the net amount of carbon dioxide released to the atmosphere. There is the potential for the expansion of woodfuel use in the UK, but it is essential that forests that supply wood are managed sustainably.

Woodfuel is a well-established form of heating, probably the oldest used by humans. Modern woodfuel systems burn the wood cleanly and efficiently and offer convenience and comfort.

Although burning wood releases carbon dioxide, this is balanced by the carbon dioxide absorbed by the growth of new trees planted in place of those cut down. It is a carbon lean rather than a carbon neutral fuel, as small amounts of fossil fuel are required for its production and transportation.

Fossil fuels locked up carbon millions of years ago in a very slow process. When fossil fuels are burned, the carbon is released very quickly. It takes millions of years for new coal and oil to form.

Coppicing

Coppicing is one type of traditional woodland management which is often used to produce woodfuel.

Coppicing is sustainable and involves cutting the stems from a tree to leave

a stump or 'stool' which regrows. Each section of woodland will be cut about once every 15–30 years, depending on the species being grown.

Willow and poplar species are also grown as short rotation energy crops over cycles as short as 3 years.

A never-ending harvest



If more trees are planted in place of those cut down, wood can be a carbon-lean fuel.

Fuel	Approx life cycle CO ₂ emissions kg/MWh
Coal	484
Oil	350
Natural gas	270
Large-scale wood chip combustion	58
Large-scale wood chip gassification	25
Wood chips (25% moisture content)	5.5-6.6
Wood pellets (10% moisture content)	20

These figures show emissions over the life cycle of the fuel. This means that they include supply chains, production techniques and transport distances. In the case of woodfuel, emissions during combustion are assumed to be compensated for by the future growth of trees managed on a sustainable basis. Figures from the Biomass Energy Centre.

Benefits of woodfuel

- Woodfuel is a carbon-lean fuel
- Producing and using woodfuel locally helps to minimise use of fuel in transport
- Greater self-sufficiency for local communities
- UK produced woodfuel contributes to fuel security
- Creates new business opportunities – stimulating the rural economy and providing employment
- Creating a market for woodfuel helps to bring woodlands into management
- Sensitively managed woodlands generally provide better habitats for a wider range of woodland plants, birds, animals and insects than unmanaged woodlands
- Woodfuel can save you money – it is often a cheaper option and has a more stable price than fossil fuels

Woodfuel in the UK

In 2008 the UK Government signed up to European targets to produce 15% of all energy in the UK from renewable sources, and the 2009 Renewable Energy Strategy proposed that 30% of that renewable energy would come from bioenergy.

Woodfuel in England

It is estimated that 60% of English forests are currently undermanaged. The Forestry Commission's Wood Fuel Strategy for England aims to bring an additional two million tonnes of wood onto the market annually by 2020. This will be achieved partly by providing woodland owners with practical advice so that they can make informed choices about managing their woodlands.

Woodfuel in Scotland

In Scotland the Forestry Commission leads the Woodfuel Task Force, set up with the aim of increasing the supply of wood for renewable energy production. The Forestry Commission also worked with the Scottish Government to develop the Biomass Action Plan for Scotland.

Woodfuel in Wales

The Welsh Assembly Government has set a target of a 10% increase in clean energy generation by 2010. The Assembly Woodland Strategy supports the development of renewable energy from woodfuel. The Wood Energy Business Scheme 2 (WEBS2) funds woodfuel heating schemes, small-scale electricity generation using wood, and woodfuel supply businesses.

Heat is the biggest energy demand in the UK – more than both electricity and transport. Therefore this is the best use of wood for energy in terms of carbon savings.

Frequently asked questions

Can woodfuel solve all of the UK's energy requirements?

There are simply not enough trees in the UK to provide enough energy through woodfuel for all our requirements. However woodfuel can provide a good, positive part of the solution to reducing carbon emissions in conjunction with other renewable technologies.

Isn't wood a dirty fuel?

Woodfuel systems produce very little ash, typically less than 1% and often much less. Woodfuel boilers typically run at very high efficiencies – up to 90% with some systems. This means that the fuel is converted to heat with very few smoke particles. The most important thing is to ensure that the boiler is well designed and well maintained.

Isn't it expensive to install a woodfuel system?

Although they are more expensive to buy than other boiler systems, running a woodfuel boiler is comparable to or cheaper than an oil boiler. There are also grants and other financial support available for those wishing to install renewable energy systems. Woodfuel works best on a local scale – using locally grown trees in efficient boilers to provide heat for business and community use reduces haulage costs and carbon dioxide emissions.

Summary

- Trees absorb carbon dioxide from the atmosphere. This is released back to the atmosphere when the wood is burned. More carbon dioxide is then absorbed by trees planted in their place.
- To reap the carbon benefits, woodlands producing wood for fuel must be managed sustainably: trees must be replanted if cut down.
- Woodfuel is carbon lean, rather than carbon neutral as some carbon dioxide emissions are produced during transport and processing.
- Modern woodfuel systems burn wood cleanly and efficiently with little smoke or ash.
- Woodfuel is a positive part of the solution to reducing carbon emissions.