



Biomass

What is... Biomass?

Biomass energy is produced from wood, agricultural residues & wastes, and a range of organic wastes such as animal slurry and food wastes. Energy is produced using a variety of technologies and can take the form of heat, electricity and transport fuel.

The use of energy derived from biomass is likely to increase substantially over the coming years, as technology continues to develop and production costs fall.

The production of biofuels has already increased dramatically over the last few years, with thousands of hectares of land in Africa and Asia being used to establish fast growing crops which thrive in these dry climates.

This guide will focus on energy produced from forests and waste wood since this market is more established within the UK.

Wood as a fuel.

Until a few hundred years ago, wood was the main source of fuel for heating in the UK. This was replaced with coal, oil and gas as our knowledge and ability to mine and harness these resources developed.

Wood can be considered a source of renewable energy provided a few simple guidelines are followed:

- The wood should come from a sustainable source
- The wood should be burned in efficient appliances, and
- The wood should be used close to source

Providing these rules are followed, wood can be considered a renewable source of energy since the

carbon dioxide given off when the wood is burned had been absorbed from the atmosphere when the trees were growing.

Whilst other fossil fuels will be consumed during harvesting, processing and transportation, net CO₂ emissions are likely to be reduced by over 90%.

Wood used in the production of fuels can also come from recycled sources and waste produced in other industries.

Common types of wood fuel

There are no reasons why logs can not be used, but the most common forms of wood fuel are wood chips and wood pellets.



Typical wood pellets on left and wood chips on right.

In pricing terms, wood chips are already cheaper per kWh of delivered energy than natural gas and wood pellets are comparable. As manufacturing of pellets continues to expand, costs are expected to fall even further adding to the cost efficiency of these fuels.

Wood chips are cheaper than pellets but burn quicker, so more storage space is required to provide sufficient energy reserves during winter.



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Commercial Use

Wood chip and pellet boilers already provide a very efficient alternative to the traditional oil and gas boiler found in most businesses. When these systems are being replaced or upgraded, serious consideration should now be given to installing wood burning boilers for both heating and hot water services.

There is still a common misconception that wood burning boilers produce lots of smoke and ash during combustion. This is certainly not the case. Modern boilers, which typically have an efficiency greater than 90%, also have modern controls, allowing smoke free burning whilst the small amount of ash that is produced can be automatically removed.



Above:
Pellet boiler manufactured by
Josef Binder.
www.binder-gmbh.at



Below:
Pellet boiler manufactured by
Windhager Zentralheizung.
www.windhager.com

Small Business and Domestic Use

Small pellet boilers and stoves can provide an ideal way to heat open plan work areas and homes. Systems with built in back boilers can also be used for hot water provision. Modern controls can offer all of the comforts found in more traditional gas fired heating installations.



Pellet stove manufactured by Harman Stove Company. www.harmanstoves.com

Fuel storage

Wood fuels can be delivered by tanker in just the same way as oil deliveries take place, with storage provided by a hopper located close to the boiler room.

The type of storage hopper used can vary considerably depending on the layout of the site, availability of space and access restrictions. These can take the form of purpose built or converted brick built storage rooms/bunkers, sheet metal or fabric storage enclosures, or even underground tanks.

Wood pellets/chips are delivered automatically to the boiler via a special feed system consisting of a fixed or flexible auger inside a tube or by way of vacuum pickup and delivery systems.

Wood chip and pellet boilers offer an excellent alternative to the more traditional gas and oil fired boilers.

Contact us for more details on how Watt-Knots can assist you in reviewing this technology.