

Low Carbon Wood Heating Solutions: Woodchip Vs. Pellet

As increasing numbers of homes and businesses are recognising the benefits of switching to wood-fired heating systems and moving away from a fossil fuelled heating system. This sheet explains the merits of wood chips versus pellets. It highlights what is suitable for one site may not be practical for another and how the choice of fuel can make a significant difference to how much the homeowner or business could save when a wood-fired system is installed – meaning that the right fuel is crucial to the efficiency of the system.



Recent government statistics show there is now over 2GW of renewable heat the UK. While this growth in renewable technologies is positive, it has led to examples where less experienced installers have favoured pellet systems over chip systems seemingly because of the comparative complexity of woodchip compared to wood pellet. Moreover, there is evidence of pellet systems being promoted over chip at sites where chip is better suited only because it gives an easier sales and installation processes - passing higher fuel costs to the customer in the long run.

Suitability

When deciding on which fuel source is most suitable, it is imperative to consider the following factors:

- The size of the area to be heated (the heat load);
- What is the use of the site (business or domestic), and;
- The physical opportunities and constraints associated with the site.

Pellet Vs Chip

Wood pellets are the most highly-refined form of solid wood fuel available; as such they are more energy-dense and consistent than wood chips. This makes them better suited to smaller-scale heating systems where space is at a premium; access may be difficult and the end user needs to store as much energy as possible on site.

Pellets have a density of 650kg per cubic metre, compared to 200–250kg per cubic metre for woodchip. This means that a cubic metre of wood pellets can contain over three times the energy of a cubic metre of woodchip.

In most cases, pellet systems are most suitable for domestic and small scale systems. They are generally only used in larger commercial heating systems of over 100kW when space is at a premium or where it is too expensive or impractical to build a store for woodchip.

Where pellets are used in commercial installations this is often because they require fewer deliveries and give off slightly lower emissions – the latter being an important factor if you live in a town or city, where emission controls tend to be tighter than in rural areas.

Woodchip boilers tend to be more costly to install because the fuel-feed system needs to handle the non-standard nature of wood chip. However, chips tend to be more economical in their manufacture, transportation and handling. However, they do require greater storage space making the fuel more suitable for larger applications.

The most suitable sites for large chip-fuelled boilers are those that either have their own woodland or can source feedstock within a 30-mile radius. Pellets are now made by around a dozen UK manufacturers, however they are often still imported, from abroad so the delivery distances can be greater.

It is important that whichever fuel is chosen your supplier must be registered on the biomass fuel suppliers list for you to qualify for Renewable Heat Incentive. <http://biomass-suppliers-list.service.gov.uk/>

Nottingham Energy Partnership provides regular updated energy price information in cost and carbon emissions for delivered heat. Although data is limited to the East Midlands Region, it provides indicative prices for elsewhere. Check their comparisons. http://www.nottenergy.com/energy_cost_comparison

Cost of Delivered Heat

At the end of 2014 the indicative cost per kilowatt hour (kWh) of bulk deliveries ranges from 2.9p to 3.5p per kWh for wood chip to 4.1p to 4.9p per kWh for wood pellets. 10kg bag deliveries of wood pellets typically cost around 5.5p/kWh.

When this is translated into annual costs, using a 100kW boiler delivering 150,000kWh of heat would cost around £6,750 per year on pellets compared to £4,950 for chips.

This £1,800 per annum cost difference would soon pay back the higher capital cost of a woodchip system. Over the design life of the system – intended to be 20 years matching the non-domestic Renewable Heat Incentive – the cost difference could be £36,000 (where cost differentials are maintained between the two fuels). All figures are correct October 2014.

To assist with domestic RHI decision making, Government have provided an online calculator to help the assessment and choose applicable technologies for your property. <https://www.gov.uk/renewable-heat-incentive-calculator>. Non-domestic RHI calculators provided by installers can be found online.

Operation and Maintenance

It is important to consider the resources available for O&M across the lifecycle of a boiler system. As with fossil fuelled systems both chip and pellet require regular maintenance - including the emptying of ash. A woodchip system is typically more 'hands on' than a pellet system, even a well-designed woodchip installation with modern remote monitoring will typically need a minimum of a visual check on the boiler at least once a week. A pellet boiler could run for a fortnight or even slightly longer without the need for direct operator intervention other than monitoring the remote telemetry.

A good installer will discuss all these issues with customers before deciding which option to go for. The decision is not always straightforward, so it's essential you look at all the factors before signing on the dotted line and get more than one opinion based on your circumstance.