



# Biomass Wood Pellets versus Wood Chip

## 1. Renewable Heat Incentive

### Fuel Supply

Boilers using wood pellets supplied in accordance with EN 14961-2 / EN Plus are eligible for Non-Domestic RHI funding.

As of 2015, for wood chip biomass boiler installations to be eligible for RHI, the fuel must be supplied by companies registered and accredited with DECC as a Sustainable Supplier. This also applies to self-supply companies.

### Emissions

In order for wood chip biomass boilers to be eligible for RHI, the wood chips used must be in accordance with the boiler manufacturer's specification i.e. moisture content – which must not exceed that on the installation MCS certificate. Wood chip boilers must also be operated in with manufacturer's instructions relating to the control of particulate matter and oxides of nitrogen emissions.

RHI is also dependent upon the biomass boiler meeting air quality requirement – particularly in smoke control areas. Move2Green Ltd has a preference for Windhager wood pellet biomass boilers, which are exempt of Smoke Control Areas.

## 2. Efficiency

Wood pellets are a very efficient source of heat as they are prepared and stored to ensure very low levels of moisture (Less than 10% moisture content) and ash production compared to woodchips (15 – 60% moisture content).

When wood pellets are burnt, virtually all of the material is burned and converted to heat. When burning wood chips however, a significant amount of energy is lost converting the moisture content into steam, resulting in inefficient combustion, greater volumes of ash and “tarring” of the combustion chamber and flue system – necessitating continuous servicing.

## 3. Biomass Fuel Energy Yield

As described under efficiency, moisture can have a drastic effect on energy yield of biomass materials. Biomass wood pellets are prepared in accordance with EN 14961-2 and are stored in dry conditions thereby ensuring very low moisture content (<10%) and consistent energy yield. Wood chip however, is less predictable in terms of moisture content and energy yield due to varying moisture content and consistency, due to age and wood source. The table below compares the calorific values of biomass wood pellets against typical wood chip at varying moisture contents.

### Typical Energy Density: -

Biomass Fuel Type	Net Calorific Value
Biomass pellets (EN 14961-2 & moisture content <10%)	17.65 GJ/Tonne
Wood chip (moisture content 25%)	14.30 GJ/Tonne
Wood chip (moisture content 60%)	7.40 GJ/Tonne



#### 4. Storage

Wood chips require considerably more storage space, typically 3 – 4 times that of wood pellets for the same energy content. Also, it must be noted that in order to obtain the most efficient combustion wood chips must be dried for at least two years to obtain a moisture content of less than 30%.

*30% being the typical requirement for most wood chip boiler manufacturers to ensure efficient running and RHI compliance.*

When considering fuel storage for wood chip, consideration must be given to the storage requirements for the boiler fuel supply as well as fuel drying storage - which will also need to be carefully managed to ensure the wood chip selected as fuel, has been allowed to dry for the correct period of time.

#### 5. Preparation and Transport

As discussed above, the transport of wood chips requires volumes of 3 – 4 times that of wood pellets. It therefore does not make economical sense to transport wood chips over any long distances.

Biomass pellet suppliers can install fuel management systems in the client's fuel stores where they monitor and maintain the fuel stock. This is feasible due to uniform size, volume and consistency of wood pellets.

##### Preparation

Wood pellets can be purchased from a network of suppliers throughout the UK, who will deliver to the client's fuel store – providing fuel management services if required, offering a hassle free fuel management service – requiring no effort from the client.

Wood chip fuel requires the resources for: -

- Organising the growing, care and replenishment of suitable stock
- Harvesting and transport
- Safe storage and drying for at least 2 years
- Material segregation i.e. removal of leaf, non-woody material and bark, all of which will result in excess ash production.
- Chipping
- Dry storage / transport to fuel store

##### Pellet Feed Systems

The uniform size of wood pellets also lends itself more to automated feed systems, automatically feeding the boiler from the fuel store, where damp wood chips can lead fuel transport systems becoming clogged or blocked resulting in additional wear and tear of the system.

#### 6. Hazards - Health and Safety Issues

Unless woodchips are reasonably dry, typically less than 30% MC, they may decompose in storage due to the development of fungal spores – which can be released when disturbed, which can result in the incurable disease “farmer’s lung” if inhaled.

## 7. General Advantages of Biomass Wood Pellets Over Wood Chip

- **Cost Effective** - Wood pellet boilers are generally cheaper than wood chip systems
- **Consistent** - Wood pellet systems tend to be more reliable, allowing for greater periods of consistent use without cleaning and generally requiring less maintenance.
- **Convenient** - Wood pellets can be provided by a national network of fuel suppliers with the option of fuel management systems offering the user hassle free system management
- Eligibility for RHI is far simpler to manage using biomass wood pellet systems as a result of the regulation of fuel suppliers, specifications, and boiler emissions.
- Wood pellet systems generally run more efficiently, providing more consistent levels of heating
- Wood Pellet systems require less maintenance as a result of better running efficiency, less ash production and less wear and tear

