

# GUIDANCE NOTES FOR COMPLETION OF BIOMASS FUEL SUPPLY CONTRACT (WEIGHT OR VOLUME)

These guidance notes are intended to assist with the completion of the specimen supply contract for biomass by weight or volume. Neither the specimen contract nor the notes are intended to be prescriptive, and consideration must be given to site specific issues and the supplier/end user relationship. Both parties are advised to seek legal advice before entering into a legally binding contract. For additional background information on biomass fuels, storage, handling and a range of other relevant information the Carbon Trust's guide to biomass heating is available for download via the website: [www.carbontrust.co.uk/biomass](http://www.carbontrust.co.uk/biomass)

## **Preamble.**

This section is normally straightforward. However, the end user may not necessarily own the site or the installation – they may be operating it on behalf of a client (the owner), in which case the owner of the site needs defining separately in this part of the contract.

## **1. Contract.**

The supplier and end user may mutually agree that clause 1.2 is overly restrictive – it may be necessary in terms of quality control, yet restricts the end user from sourcing alternatives should there be any doubt about the security of supply from a single supplier. Alternatively, the end user may choose a biomass co-operative (such as South West Wood Fuels) in which case, whilst only one supplier provides biomass to the end user, it will have been sourced from multiple suppliers earlier in the supply chain.

## **2. Biomass specification.**

The appropriate biomass specification will depend on the fuel type (see Section 6), and to some extent on the performance specification of the boiler. Standards are vital for biomass to become a commodity fuel which end users can buy with confidence.

The European Committee for Standardization (CEN) formed a technical committee (CEN/TC 335 – Solid biofuels) to develop standards to describe all forms of solid biofuels within Europe, including wood chips, wood pellets and briquettes, logs, sawdust and straw bales. The standards allow all relevant properties of the fuel to be described, as well as the physical and chemical characteristics of the fuel, methodologies for sampling and assessment of moisture content, etc. Whilst some

of these standards are still in draft form, they are becoming more widely used in the UK, and are readily available from several sources, including the Biomass Energy Centre ([www.biomassenergycentre.org.uk](http://www.biomassenergycentre.org.uk)).

Alternatively, the Austrian Standards Institute (*Osterreichisches Normungsinstitut*, referred to as ONORM) Standard M7 133 or the German Institute for Standardization (*Deutsches Institut für Normung*) DIN 66 165 tend to be *de facto* across Europe and are widely used in the UK.

Ultimately, the end user should seek advice from the boiler manufacturer so as not to compromise any warranties, then select the most appropriate biomass specification in line with the manufacturer's recommendations.

### **3. Duration of contract.**

The supplier and end user may agree an appropriate supply contract period of between 1 and 5 years. It is suggested that a sensible period of notice for either contract extension or termination would be three months, but this can be varied by agreement between the supplier and end user as required.

### **4. Quantity.**

This contract template allows for supply by either volume or weight subject to the end user and supplier agreeing their preferences.

Whilst the energy content of wood by weight varies very little between different timber species, the density varies significantly. Therefore, if the end user is purchasing biomass by weight, the species of timber should not matter (although clearly the moisture content of the biomass will). However, if purchasing biomass by volume, the energy content will be dependent upon the timber species; for example, the typical calorific value of softwood chips at 30% moisture content is 0.70 MWh/m<sup>3</sup>, compared to 1.02 MWh/m<sup>3</sup> for hardwood chip at 30% MC. In addition, the bulk density will vary considerably, resulting in a highly variable volume expansion from 1m<sup>3</sup> of solid wood to anywhere between 2 and 5.5 times the original volume when chipped.

Foresters tend to work in volume. Arguably though, purchase by weight is less problematic provided that the moisture content is specified and agreed in advance (based on the boiler specification), and that the supply complies with that agreed moisture content.

It is important from the supplier's perspective that a prescribed quantity (by weight or volume) is agreed contractually, whilst making provision for the end user to request additional biomass as required (but with reasonable notice).

## 5. Price.

It is generally accepted that fresh felled wood of most species weighs about 1 tonne per solid cubic metre, but as the wood becomes air dry it loses between one quarter and one half of its weight. Appendix 1 illustrates how this varies between species. However, the volume increases when wood is chipped. As a general rule of thumb, 1 tonne of woodchip will be equivalent to 4 cubic metres of chip. However, this conversion must be used with caution, as it does not take account of varying moisture content.

The final price (for either weight or volume) will depend on numerous factors, including the biomass quality, local market conditions, availability, and distance of travel. End users are recommended to appraise the local market to determine benchmark prices before negotiating the final price with the selected supplier.

The price should then be indexed by setting an initial price based upon the full costs of supplying the biomass to the site. The initial price then changes over time by periodically applying agreed indexation. However, the issue of an appropriate index for biomass is a complex one. Whilst it is important that biomass costs continue to be competitive vis-à-vis fossil fuel prices in order to maintain economic viability for the end user, biomass suppliers also need to be able to make a profit margin sufficient to maintain the economic viability of their business. The rising cost of fossil fuels will invariably have a knock-on effect to the price of biomass (i.e. with respect to harvesting, processing and transportation costs, all of which are processes reliant upon fossil fuels).

There are a number of different forms of indexation which could be applied:

- A price index for a major fuel such as the index for a heavy fuel oil (or gas) for [medium] sized manufacturing companies produced by the Department for Business, Enterprise and Regulatory Reform as contained in the Quarterly Energy Prices (e.g. Table 3.1.1: Percentage price movements between Q2 2007 and Q2 2008 for heavy fuel oil (HFO), electricity and gas, by size of consumer, for manufacturing industry) which can be found at <http://www.berr.gov.uk/files/file47741.pdf>;
- A general index as an agreed proportion of the Retail Price Index (RPI), except that if haulage costs (a critical cost factor for biomass fuel) increase by more than twice RPI in one 12 month period, the fuel supplier has the right to re-open discussions on prices;
- The price could simply increase at an agreed rate per annum e.g. 2% or 5%.

The most appropriate indexation should ultimately be mutually agreed between the supplier and the end user.

## 6. Fuel sources.

The source of biomass will depend to some extent upon availability in the local area. The contract is designed to be able to support the supply of a wide range of biomass fuels, including straw, cord wood, wood chip, wood pellet, short rotation coppice (SRC) such as poplar and willow, grass and non-woody energy crops such as Miscanthus (*miscanthus giganteus*), Switchgrass (*Panicum virgatum*), Reed canary grass (*Phalaris arundinacea*), Rye (*Secale cereale*), Giant reed (*Arundo donax*), and Hemp (*Cannabis sativa*).

## 7. Delivery of biomass.

Conditions for delivery of fuel will be site dependent, but need to fully take account of the health and safety risks to pedestrians, vehicles and property on the end user site. It is important that the supplier conducts a site survey well in advance, and identifies all risks and hazards on site before negotiating with the end user the most appropriate days and times of delivery. For example, if the installation is at a school, it may be considered more appropriate that delivery times to site are outside of normal school hours, in order to minimise the risk to pupils. Equally, the attendance during deliveries of an end user representative (e.g. Maintenance Operative, Site Supervisor) may be necessary for both health & safety and security reasons. Weekend deliveries may be acceptable or preferable at certain sites, depending on security policies and access arrangements.

7.4 In terms of notice periods for deliveries, the supplier may need 3-7 days in order to plan the delivery.

7.5 If the end user is remote and has no-one on site, responsibility for determining fuel levels may be assigned by prior agreement to the supplier.

## 8. Sampling.

Current relevant standards for sampling include CEN Technical Specification 14778-1, *Solid Biofuels – Sampling – Part 1: Methods for Sampling* and/or CEN Technical Specification 14778-2, *Solid Biofuels – Sampling – Part 2: Methods for sampling particulate material transported in lorries*. Both specifications may be considered unnecessarily complex for certain sites, however. Part 2 is most relevant to a large capacity plant receiving multiple lorry deliveries per day.

Where moisture content is the critical factor, CEN Technical Specification 14774-2:2004 *Solid biofuels - Methods for the determination of moisture content - Oven dry method - Part 2: Total moisture - Simplified method* may be considered the most appropriate methodology.

## 9. Terms of payment.

The date of invoicing may depend upon the end user's financial accounting periods, whilst payment terms will depend upon the supplier's standard terms and

conditions of sale. Both must be agreed in advance to avoid any dispute at a later date.

#### **10. Other terms and conditions.**

The level of the supplier's public liability insurance may depend on the end user's standard requirements. This must be agreed in advance to avoid any dispute at a later date.

It is important that the limit on liability at Clause 10.2 and 10.4 is agreed at an appropriate figure. This should be representative of the end user's possible total loss but market practice is typically that such a sum does not exceed the maximum value of the contract to the supplier (i.e. the value of the total volume of fuel to be supplied over the course of the contract).

#### **Appendix 1 – Relation between weight and volume of air dried wood**

<b>Air dried wood</b>	<b>Weight kg/m<sup>3</sup></b>
Beech, oak	750
Ash, birch	716
Sycamore	662
Elm	581
Poplar	486
Pines	550
Spruces	465
Larch	560
Douglas fir	580

Source: Keighley, G, Forestry Commission, 1996