GUIDANCE NOTES FOR COMPLETION OF BIOMASS HEAT SUPPLY CONTRACT

These guidance notes are intended to assist with the completion of the specimen supply contract for heat from biomass. 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

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.

It will be necessary in terms of quality control and consistent heat output that the end user does not purchase biomass from any other source.

2. Biomass specification.

The appropriate biomass specification will depend on the fuel type and performance specification of the boiler. Whilst biomass quality may be considered less important to the end user because it is the heat output that is being purchased, it will nevertheless be important in terms of not compromising the boiler in any way, as biomass boilers are generally very sensitive to the quality of fuel used.

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).

Alternatively, the Austrian Standards Institute (*Osterreichisches Normungsinstitut*, referred to as ONORM) Standard M7 133 or the German Institute for Standardization (*Deutsches Institut fur 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, select the most appropriate specification in line with the manufacturer's recommendations, and ensure the supplier can provide biomass to that specification.

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 the contract should run for a minimum of two years – possibly more to allow the fuel supplier to manage cash flow and invest in logistic / plant. Formal contract review should take place on an annual basis. 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.

4. Quantity.

In theory, it is easiest to purchase biomass as energy. The energy supplied is easily recorded via a heat meter. However, in practice, it is not that straightforward, as it will depend on numerous factors, such as the net calorific value of the fuel, the optimum sizing of the boiler, and the seasonal performance of the boiler. For example, where the thermal load demand varies significantly, this will mean the boiler load is ramping up and down. Ramping up and down means that the boiler is running at part load, and therefore at reduced efficiency (see Section 5). The supplier will get less money for his biomass if the load profile is anything but constant, and clearly this will be something outside of the supplier's control.

It is important therefore from the supplier's perspective that a prescribed quantity of heat off-take is agreed contractually, whilst making provision for the end user to request additional biomass as required (but with reasonable notice), otherwise the economic viability of the contract from the supplier's perspective may be jeopardised.

5. Price.

Ultimately, the key to successful heat contracts will be transparency between all parties on the pricing tariff. 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.

A key factor will be the seasonal performance of the boiler, which is a factor of the efficiency of the plant at part load and the load that the plant experiences in response to the seasonally varying building heating demand. Since most boilers operate most efficiently at full capacity, the longer a boiler operates at full capacity, the higher the seasonal efficiency. When a boiler shuts off, the heat in the boiler continues to radiate through its jacket. In addition, boiler-room ambient air continues to flow throughout the boiler after the burner ramps down. When the boiler ramps up again, it must reheat the boiler medium to the operating temperature or pressure. A boiler that is smaller than required will more closely match the heating load of the building for a larger part of the season because of fewer on and off cycles. Whilst many biomass boilers have a stated seasonal efficiency of 90%, this should be ratified against the boiler size and subsequent actual boiler efficiency.

Boiler systems must be optimally sized to meet the maximum facility demand during the normal heating season. Essentially, the system must provide the heat output required to meet the facility's total demand at the lowest expected temperature of the heating season. Systems that are sized beyond the optimal output capacity will have a lower seasonal efficiency. Properly sized boilers will also reduce maintenance costs by starting and stopping less frequently. Oversized boilers waste fuel and, because of short cycling, ultimately shorten the life of the system. Calculating the pricing tariff will therefore require some working out between the fuel supplier and the end user.

The pricing tariff is similar to how fossil fuel fired energy is provided to the customer; namely, a unit change, and a standing charge, with an additional component amount payable for *reconciliation*:

- The first tariff component, payable monthly, is the unit charge (£X/MWh), and will account for the fluctuations in monthly use;
- The second tariff component, payable monthly, is the standing charge (£X/MWh), and allows for all administrative costs of the supplier;
- The third tariff component, payable annually or twice annually (depending on the preferences and agreement of both parties), is the reconciliation tariff. This will account for variations in the operating efficiency of the boiler. A nominal charge should be set based on the boiler manufacturer's certificated boiler rating at a constant load. It is this element of the tariff structure that should be reconciled by cross checking monthly efficiencies to show variations due to fluctuating operating regimes. It is most important therefore that the end user maintains accurate and up-to-date records of the MWh heat output in order to support the reconciliation.

The end user and supplier may mutually consider it desirable to assign responsibility to operate and maintain the boiler and associated plant to the

supplier; therefore an optional clause (5.2) has been added to this section. This will allow the supplier to ensure operational efficiency of the boiler (subject to it having been optimally sized), and would transfer the end user obligations set out in Clause 8.5 from the end user to the supplier.

The price should then be indexed by setting an initial price based upon the full costs of supplying the biomass to the site (5.3). The initial price then changes over time by periodically applying the agreed indexation. However, the issue of an appropriate index for biomass is a complex one. 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. Delivery of biomass.

Conditions for delivery of biomass 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. Weekend deliveries may be acceptable or preferable at certain sites, depending on security policies and access arrangements.

6.4 In terms of notice periods for deliveries, the supplier may need 3-7 days in order to plan the delivery.
6.6 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.

7. 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.

8. Heat output.

In theory it is easiest to sell biomass by energy (p/kWh or £/MWh) – it eliminates all the contractual agreements on fuel quality, times of delivery, etc. In practice, it does not eliminate these issues. Biomass quality may still be critical to the boiler operation; delivery times will still be relevant to site health & safety considerations. What the sale of heat does provide for is an assurance to the end user that they are paying only for the heat output generated from the biomass, rather than paying for the moisture content if purchased by weight, for instance.

However, what is very pertinent to the supplier is the lack of control they will have over the operational efficiency of the boiler, where this falls outside of the supplier's responsibility. It is therefore recommended that the end user purchases a minimum amount of heat per month to maintain financial viability of the contract from the supplier's perspective. It is also normal for the end user to have a standby system, and for the supplier to pay the alternative heating bills if the boiler goes down as a result of lack of, or poor quality, biomass.

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. In addition, qualified advice must be sought and an agreement reached on the monthly reconciliation of the variation in boiler efficiency versus the contractually agreed quantity of heat supplied.

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 10.3 is agreed at an appropriate figure. This should be representative of the end user's possible total loss and market practice is typically that such an amount 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).