

Technology Fact Sheet – Biomass heating facility

provided by Berlin Energy Agency

Information for the implementation of a feasibility study to proof the use of biomass

Designing a complete biomass heating system requires an in depth knowledge of each of the component systems. Successful biomass installations depend on careful calculations of heat load and must take into account a host of site specific features, so every biomass system is different. In addition, regulatory requirements and incentives can vary nationally and regionally so what works in one case may not work in another.

A good and detailed guideline was prepared during the IEE-project FOREST (http://tea.ie/wp-content/uploads/2010/11/Forest-Specifiers-Guide_Ireland-Annexe-v11.pdf).

Questions in the preliminary stage

Is the heat load and pattern of demand at the site suited to a biomass system?

Biomass boilers work most efficiently when they can run at close to their operating capacity for extended periods. Sites with low heat demand or where loads are highly variable will need more careful consideration.

Is there a suitable fuel supplier in the area?

Access to high quality fuel, preferably from a range of suppliers, is vital. Comprehensive fuel standards exist to ensure that boilers are fed properly. Poor quality or incorrectly specified fuel is a common cause of faults in biomass systems.

Is there space to accommodate the boiler, thermal store and fuel store?

Biomass boilers are considerably larger than their fossil fuelled counterparts and thermal storage and ancillary equipment will also require space. Wood fuel is less energy dense than oil or coal so there also needs to be sufficient space for storage.

Is there good access to the site for delivery vehicles and space for them to turn and manoeuvre?

The size and type of vehicle will depend on the fuel that is specified, while the number of deliveries will depend on the energy density of the fuel, the size of the fuel store and the heat demand of the site.

Question in the feasibility

What size boiler will be required?

Boiler sizing is critical and has implications for every other element in the system. Oversized boilers run less efficiently and have higher emissions levels and will add significantly to the project costs.

How much space is needed for the plant room?

Using existing buildings can help to keep project costs down but allowance needs to be made for thermal storage, additional pipework and, in some cases, an additional boiler for peak lopping. Biomass equipment must also be maintained regularly so enough space must be left for routine tasks such as ash handling and cleaning.

How much space is needed for fuel storage?

This will depend on the size of the boiler, the type of fuel, capacity of delivery vehicles as well as the heat demand on site. Undersized fuel stores with difficult access can limit the options for fuel supply and will increase the frequency of deliveries to the site.

What will be the requirements for the flue?

Regulations regarding the position, size and height of flues ensure the free dispersion of flue gases and ensure there is no fire risk.

Is the boiler in an air quality management area?

Areas where air quality is a concern may place restrictions on the type of equipment that can be installed or on acceptable levels of emissions.

Can all statutory requirements be met?

Compliance with building regulations and planning regulations may need to be considered as well as environmental permitting.

Is the system financially viable?

The capital cost of biomass boilers is generally higher than fossil fuel boilers, and project costs can quickly escalate with the additional fuel handling equipment and fuel storage. However boilers can last 20 to 25 years and lower unit prices for wood fuel mean that the full lifecycle cost of a biomass system may be cheaper.

Are grants or other incentives or available?

Low carbon heating technologies such as biomass can be eligible for a range of financial incentive as well as having environmental and social benefits which can also have an impact on the decision to install.

A market overview incl. current investment costs and main operating figures for biomass heating boilers (woodchips) with a rated thermal input between 35 and 2.100 kW are listed in the following brochure (in German) on pages 40-93:

http://www.fnr-server.de/ftp/pdf/literatur/pdf_293-mu_hackschnitzelheizungen_2010_web.pdf
