

Forestry Commission Project Report 9 - Extended summary
Woodfuel supply chain case study – medium scale woodchips supply

To identify and promote good practice in terms of woodfuel supply chain organisation, Technical Development studied the operations of Midlands Wood Fuel Ltd, a woodchip supply company based in the West Midlands, and Worcestershire County Council, one of their customers.

This work highlighted three main aspects key to the good functioning of the supply chain:

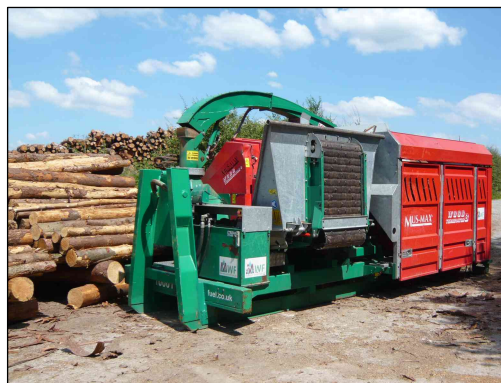
- Effective communication between end user/operator, fuel supplier and boiler installer is critical to ensure a good understanding of mutual requirements and of how they translate into technical and practical terms
- Good quality control on the fuel supplier's side, to ensure fuel meets agreed specifications
- Suppression of all unnecessary costs by optimising logistics and developing contracts based on the quantity of heat generated



Wood chip store

Good communication between boiler installer, fuel supplier and end user during planning and installation is critical to ensure smooth day to day functioning of wood-fuelled boilers. Three main issues that need consideration during the planning stages are:

- Optimum boiler sizing, appropriate access, delivery and storage facilities
 - an optimally sized boiler and a well matched hot water accumulator tank (where appropriate) will ensure maximum efficiency and carbon savings
 - access for deliveries needs to be adequately sized, located and accessible - sufficient storage capacity should be specified to minimise the number of deliveries required during the heating season
- Agreement on the required fuel specifications, delivery size and frequency of deliveries required. On this basis the supplier can adequately:
 - select best suited equipment/machinery for production and delivery
 - organise procurement and processing of round wood and other raw materials so that appropriate quantities of fuel will be ready for delivery during peak demand periods



Purpose built woodfuel chipper

The compatibility of the woodchips with the boiler specification is critical to the appliance performance, which in turn is critical to the perception of woodfuel as a potentially reliable option in the renewable heat sector. The fuel supplier therefore needs to have a good understanding of, and control over, all aspects of fuel production and delivery that can affect woodfuel quality. These aspects include among others: characteristics of different tree species and raw materials during drying and chipping, edge retention of blades within the chipper and particle size produced by the chipper, and moisture content of the raw material and processed fuel. In this case the supplier:

- Sources material and species with 'adequate' properties (no rewetting, no mechanical problems when chipped)
- Is familiar with the chipper outputs both in terms of quality (especially how the blade condition influences chip quality) and quantity
- Stores the woodchips in rain proof and well ventilated facilities to avoid rewetting, on concrete floors to minimise the risk of contamination
- Monitors and controls any hot spots in chip stores to prevent risk of self-ignition
- Assesses moisture using a range of methods to ensure the fuel is fit for use



Grain spear used to control hot spots

As the current value of woodchips is relatively low, well planned logistics are required to keep transport and handling costs to a minimum and to ensure equipment used in the supply chain is used most efficiently. The key points identified were:

- A network of depots allowing shorter transport distances, hence lower costs, to the chipping yard and to the end use location.
- Drying of most of the material before chipping but at the chipping yard, reducing later transport/handling.
- Optimisation of air drying of the material using bearers to improve air circulation.
- Adoption of a chipper use pattern that limits the travel for the chipper and optimises its work time

Other related work

The work summarised here is part of an ongoing programme of research funded by the Forestry Commission aimed at improving the efficiency with which fuel is produced from sustainably managed forests in the UK. For further information on this project and related work:

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