The Wood Fuels Market

Introduction

Wood fuels are sustainable and carbon-neutral and offer a real opportunity for New Zealand to become greener and less dependent on fossil fuels. We grow trees as quickly as anywhere in the world but currently do not make full use of this value resource.

Wood fuel is a solid biofuel and can be produced from any source of woody biomass. Until recently the parts of a tree left over after processing were often considered as waste (also often referred to as forest residues or wood processing residues). Today this so called 'waste' is recognised as a valuable source of energy and reference to it as waste in particular under-values its economic potential. Considering wood fuel on the same basis as fuels such as coal or gas reinforces that it is a valuable commodity (which we often overlook).

Types of wood fuel

The different types of wood fuel include:

- Chip from forest residues
- Process residue hog chip
- Process residues such as shavings and sawdust
- Demolition chip
- MDF dust briquettes
- Domestic firewood
- Wood chip and other fuels from purpose grown biomass crops

Other sources of solid biofuel

Wood fuel is the most common form of solid biofuel available in the market. Solid biofuels can also be produced from any organic matter including herbaceous plants (Miscanthus, hemp, straw, and agricultural crops), and arboreous pruning's.

Wood fuels is an untapped market and poised for growth

Estimates of the availability of woody fuels in New Zealand are around 3.8 million tonnes annually, made up of 2.1 million of forest harvesting residues, 1 million wood processing residues, 0.5 million of straw and the balance from municipal wastes and horticultural industries. Other sources may include farm woodlots, shelter belts and the urban forest.

Over the last 12 months several wood fuel projects were commissioned from Bioenergy Association members, the projects covered a range of sizes and required a source of wood fuel. There is significant potential to rapidly expand the wood fuels market by supplying wood fuels to larger heat energy projects (up to 15 MW).

It has been estimated that around 60% of total demand for biomass for heat can be sourced from existing plantation forestry there is a need for another 40% of total demand. This latter quantities are expected to come from agriculture in the form of managed shelterbelts, managed erosion control, managed riparian planting and the 6-9% of a farm such as slopes and gullies which are currently not productively used.

In addition there are some hill country land which is currently in agriculture which may be more productively used for forestry.

It is expected that the export of logs to Asia will at some stage become less profitable for forest owners in which case the logs may divert to domestic processing which produces more residues which is ideal as wood fuel.

Strategies such as supplier collaboration will mitigate risk, diversify supplies, and potentially provide economies of scale. Bioenergy Association facilitates the development of such collaborations by ensuring participants in the wood fuel sector are well connected and fully informed.

Forest residue harvesting for wood fuel

There is a variety of machines available off the shelf for chipping and shredding woody residues. Most configurations have been tried in New Zealand and each has its pros and cons. Your choice of the best machine will depend on the type of fuel and logistics of the proposed operation. Aggregation of residues may be necessary in some instances to get a sufficient quantity of residues at one place to make their processing viable.

Current transport, handling and compaction technologies do not make transporting of unprocessed residues viable over longer distances. In order to develop a viable business, the fuel processor (supplier) needs a good scale of operation and reasonable continuity of work. Indicatively 50,000 tonnes per annum or more makes it viable to invest in a hogger capable of processing logging residues.

The Ripper working in forest to farm conversion near Ohaaki.

Quality wood fuels improve market potential

Producing fuel with consistent quality is critical to getting widespread acceptance of woody fuels. Fuel quality issues that can be affected by harvesting and processing systems are moisture content (storage and drying times), fuel sizing including fines (processing and screening) and dirt contamination (handling, loading, screening and storage).

Moving to payment by energy content, not weight, is fairer to both producers and buyers and may drive improvements in fuel quality.

Bioenergy Association guidelines for classification of solid biofuel (www.bioenergy.org.nz/resource/tg01-solid-biofuel-classification-guidelines) provide a common methodology for classifying, specifying and declaring the quality and properties of the traded wood fuel.

Use these guidelines to specify particle size, moisture, ash, bulk density and energy density for wood fuel supplies when pricing fuel.

Replacing or installing a wood fuel energy plant or considering co-firing?

Bioenergy Association's tender guidelines for wood energy specification, supply and installation of wood energy plant and SNZ PAS 5311:2021 Biomass boilers for small and medium heat loads set out the key elements that must be taken into account prior to the specification, selection and installation of a new wood fuel boiler, or consideration of co-firing coal and biomass. They have been written so engineers tendering for wood fuel boiler installations or conversions and those seeking such services (typically non-experts such as school staff or school/hospital boards) can understand what is required.

The guidelines present pre-tendering information for the client or heat plant owner so that all parties understand the information that should be sought and provided throughout the tender process. This information will assist with the process of selection between tender offers and in finalising the specification and associated agreements.