



# **An Overview Of Recent FIDA Funded Projects & What is Needed to Unleash the Potential of Bioenergy from Woody Residues**

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**Presentation to Workshop: Assessment of Current Bioenergy from Wood Residues Opportunities  
12 March 2008**



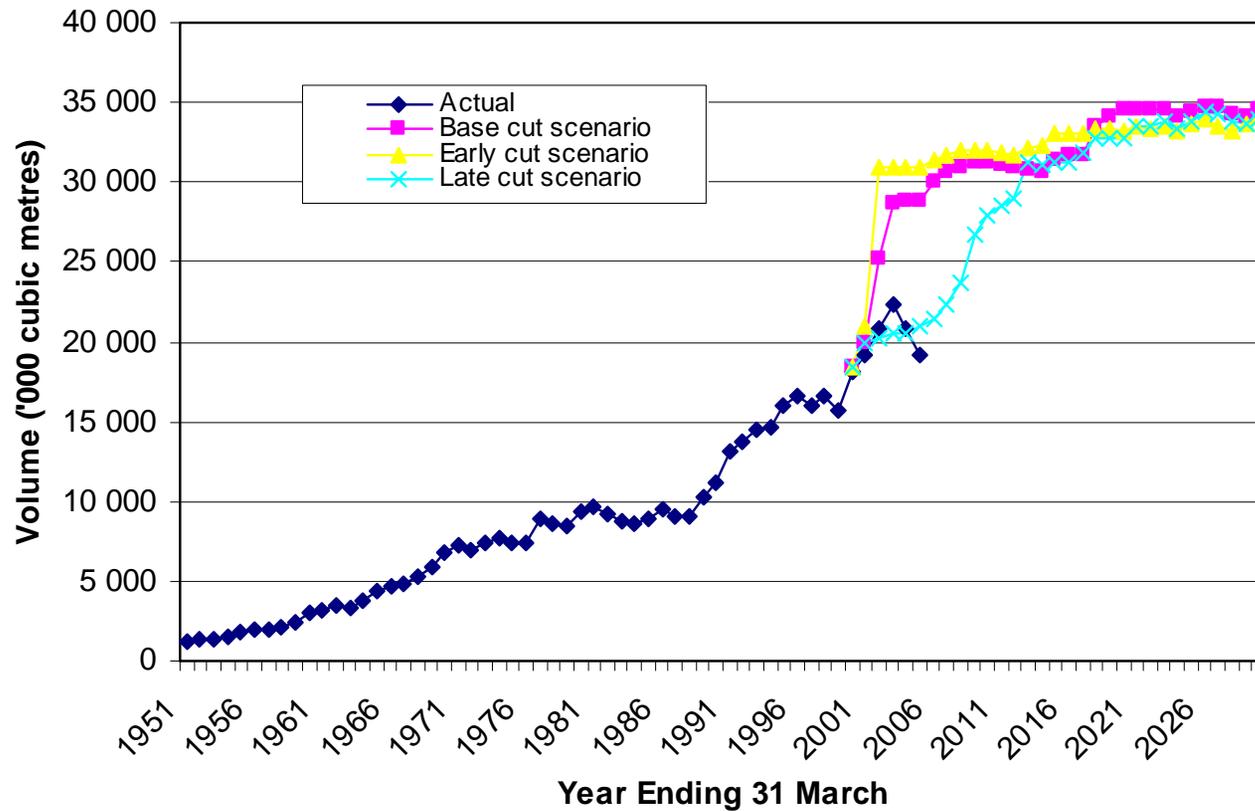
# Foresters Throwing \$\$ Away



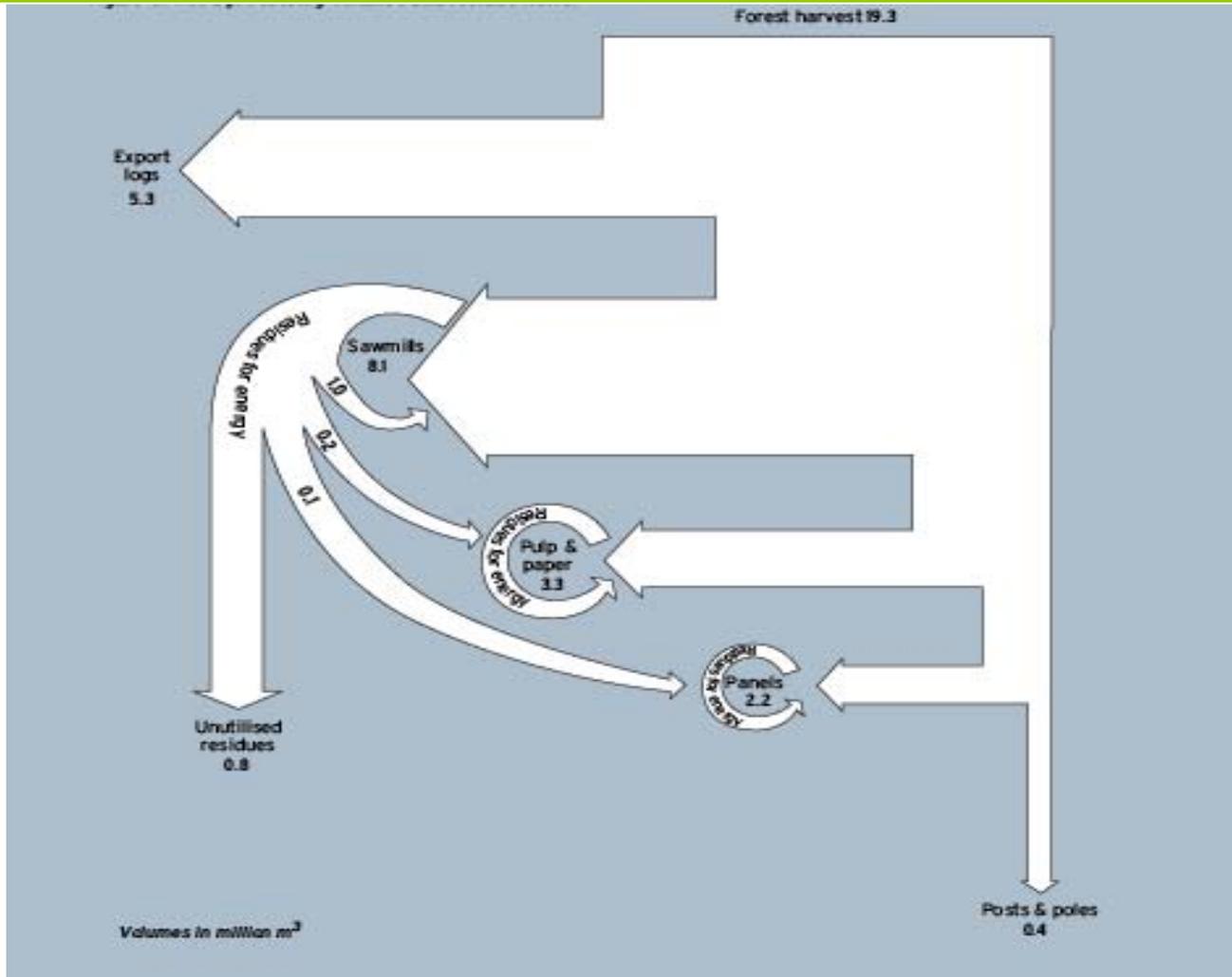
**The goal – to use energy  
to turn residues into  
wealth not waste**

# Quantity of Resource is Not in Question

## Harvest Scenarios



# Use of the 0.8 mill m<sup>3</sup> Unutilised Residues



# The Opportunities

- NZ is rich in unused biomass resource
- NZ is rich in opportunities
- Bioenergy potentially a more significant contributor to the NZ energy supply mix
- Resource
  - Forest residues
  - Process residues
  - Municipal solid waste
  - Purpose grown crops
- Opportunities
  - Heat
  - Electricity
  - Liquid Biofuels
  - Often driven by waste reduction.

# FIDA Projects

- The cost of extracting and delivering forest residues
- Bioenergy Knowledge Centre
- Heat Plant Database
- Feasibility studies
  - Installation of a wood waste fired steam plant at Tatura Dairy Factory
  - Installation of a wood gasifier to generate producer gas at Canterbury Clay Bricks
  - Options for sawmill residue at Ahead Lumber
  - Energy Centre options at TDC Sawmills Fortress Mill
  - Maximisation of benefits from the Blue Mountain Lumber combined heat and power plant.

# Wood Residue Standards

- Use of woody biomass fuel by non-wood processing industry parties
  - requires purchase of fuel from other parties.
  - market is undeveloped and generally doesn't exist.
- The cost and availability of purchased fuel has the biggest single impact on the economics and project risk.
  - more significant than possible capital cost variations.
  - uncertainty and risk also applies to wood processors but for them it is easier managed,
- Lack of availability of medium / long term contracts
  - supply of biomass fuel in known and consistent quality and at a known price for the term of the contract.
  - fuel generally needs to be sourced from a range of chipper/hoggers
  - lack of specification on what fuel characteristics may be received.
- Contracts for recognisable and specified quality woody biomass fuel would reduce the uncertainty for those purchasing wood residue fuel from a range of sources.

***Action: Develop wood residue standards for NZ covering residue characteristics including energy.***

# Methods For Measuring Energy Composition Of Wood Residue

- Difficulty of measuring energy content of any forest residue purchased as only weight is measured.
  - Sampling
  - Quick analysis
  - Non homogenous loads

***Action: Undertake international research on how contracts for biomass can be measured in energy terms.***

# Noise And Emissions From Bioenergy Heat Plant

- Noise and emission limits are critical as a number of close neighbours.
- Economics can be affected by ability to integrate bioenergy plant with a large footprint into an existing constrained site.
- Air emission control equipment which provides a significant increase in capital cost may be needed to meet airshed requirements.

***Action: Produce case studies and information for the public that demonstrates the methods used to limit noise and air emissions from bioenergy facilities..***

# Cogeneration

- Marginal cost of generation equipment greater than electricity price
  - heat has lower capital expenditure
- The price of any electricity set by the local spot wholesale price.
  - Embedded electricity has a higher value.
- Spot market wholesale prices are determined after the time of use
  - analysis can only be based on trends.
  - as cogeneration of electricity is on the margin of being economic it is difficult to provide robust analysis ahead of time of what the actual economics of cogeneration may be.
- The spot market wholesale price of electricity is very volatile.

***Action: Produce a guide to analysis and negotiation of electricity supply contracts from cogeneration plant..***

# Technology Options

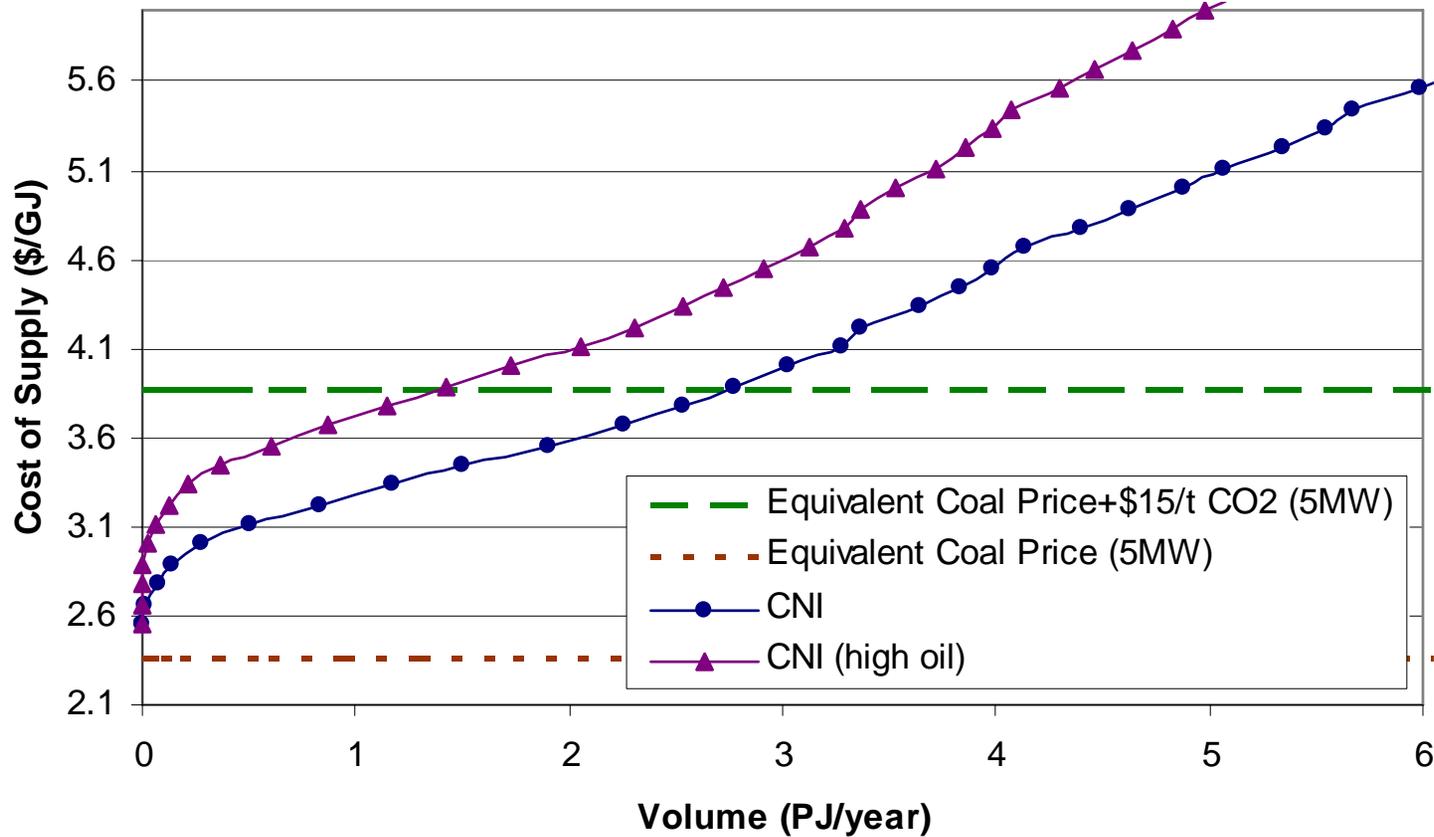
- Technology is not a constraint to greater use of bioenergy
- Technologies are available or under international development
  - Combustion
  - Gasification / Pyrolysis
  - Biochemical / enzyme conversion technologies
  - Chemical and mechanical processing to liquid biofuel
- Combustion has advantages that makes it often the technology of choice
  - Simple to use
  - Ease of maintenance
  - Easily understood
  - Robust
  - Low risk
  - Handles variable quality feedstocks

# Available Residue Processing Technology



# Residue Costs are Reducing

CNI 2020

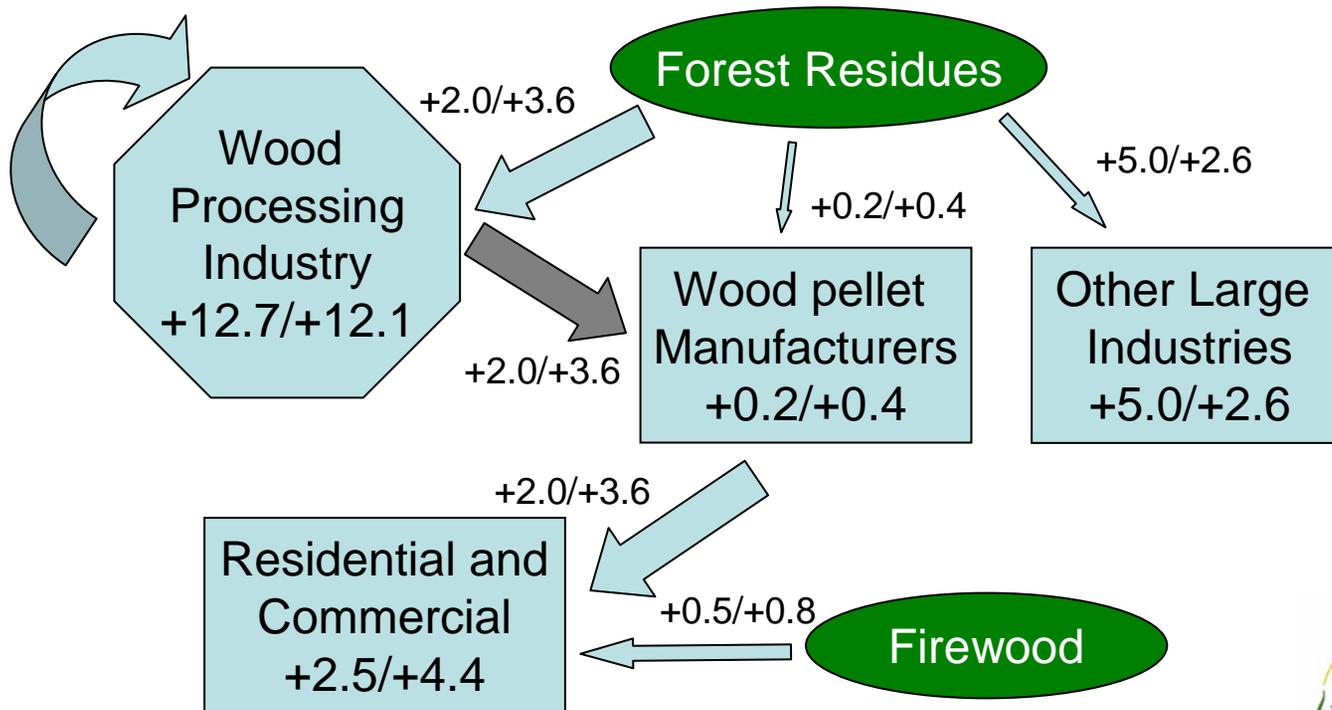


# Cost And Quality Of Residue

- The amount of residue extracted from a forest depends on type of harvesting and processing system used.
- Choice of combustor technology affected by expectations on availability and characteristics of specific wood residues.
- In most studies there was little attention to fuel storage and handling.
- Value of using high quality process residues for other uses
  - supply to wood pellet production rather than combustion in a boiler
  - economic to use lower cost imported forest residue in the boiler and sell quality process residues to pellet makers etc.

***Action: Research the issues affecting the production from chipper/hoggers of known and consistent fuel feedstock.***

# 2020/2030 Wood Residue Market

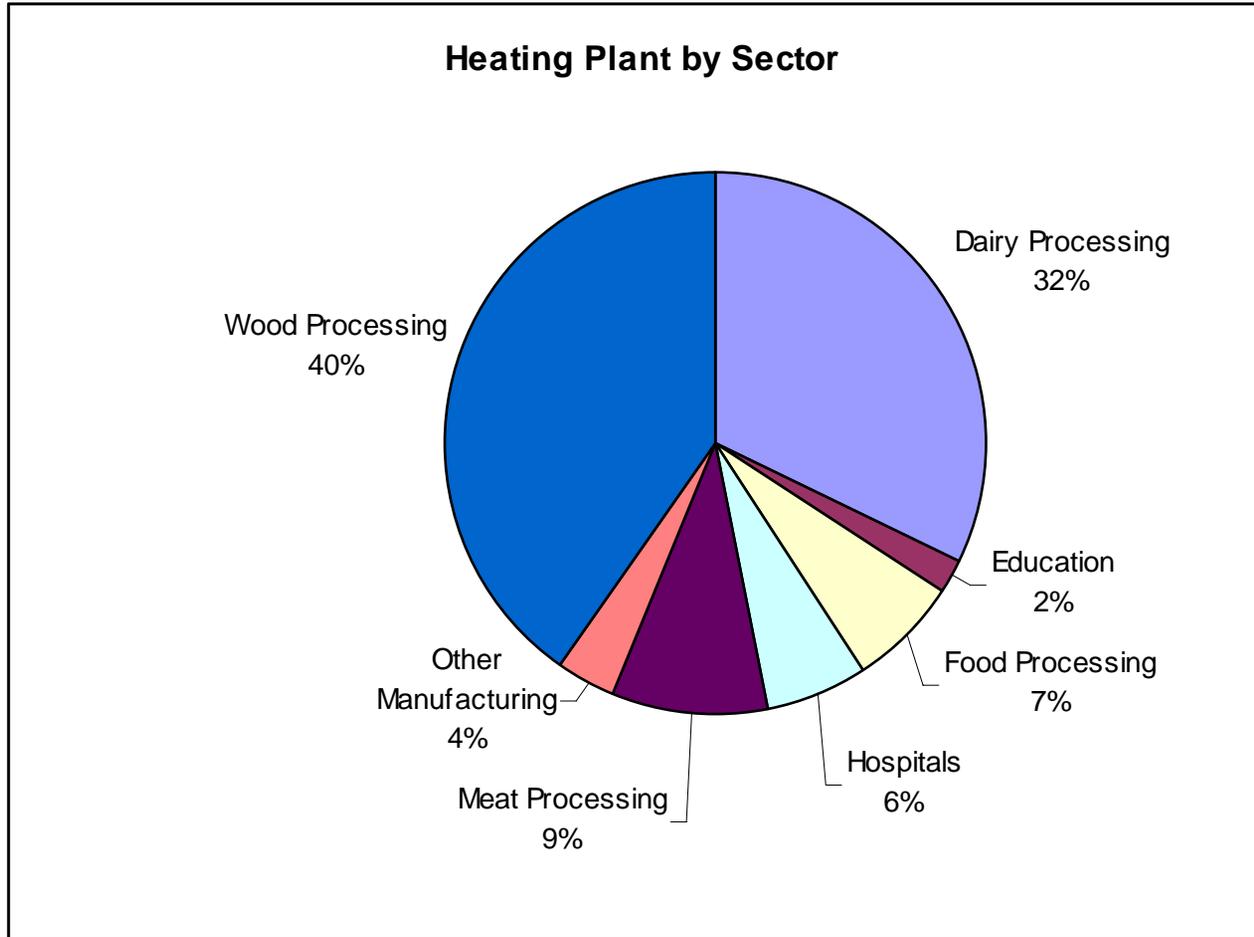


# Heat Plant Situation

- Most people focus on electricity and forget heat
- Heat opportunities are local
- Bioenergy heat is economic now
- Heat and cooling information is poor
- Few published role models or case studies
- Focus has been on large plant
  - wood pellets/chip widen market
  - quality feedstock opens opportunities



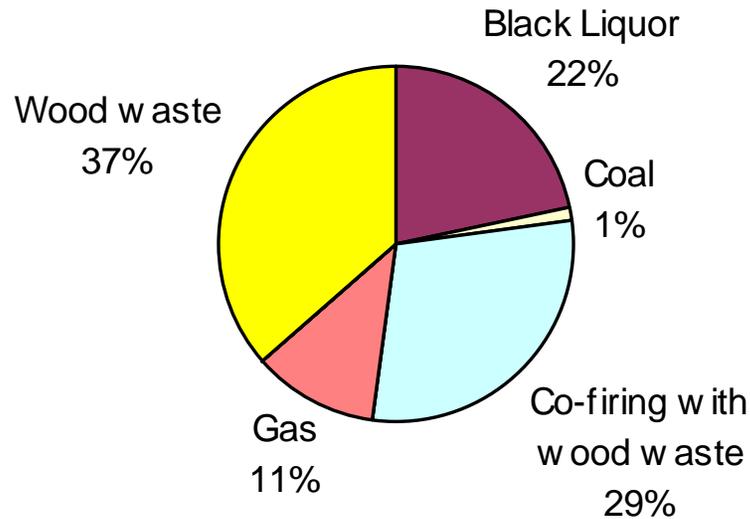
# Heat Plant in NZ



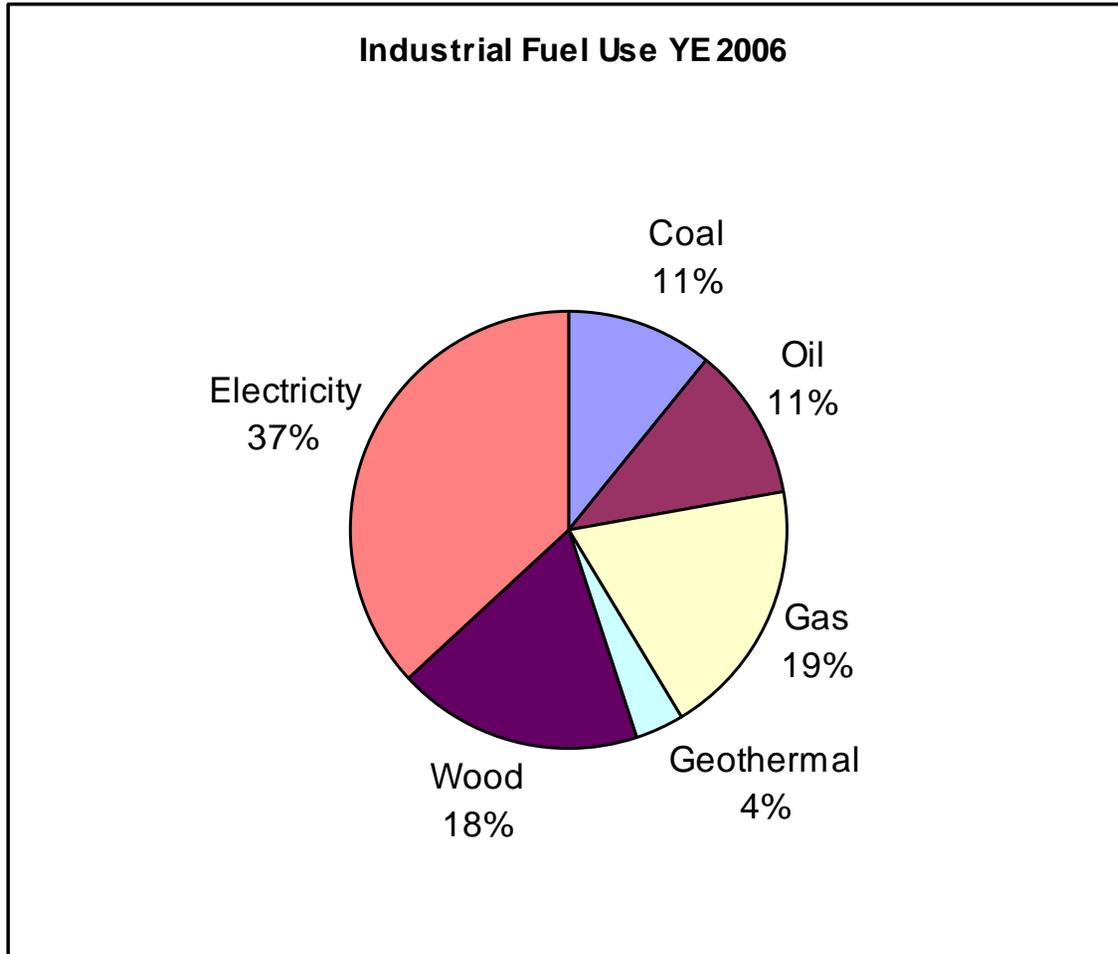
Source: East Harbour

# Wood Processing Opportunities

Wood Processing Heat Plant Energy Use



# Opportunity for Fuel Substitution



# The FIDA Portal

## Bioenergy Gateway

Energy from wood

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The Bioenergy Gateway is an information service provided by



Energy Efficiency and Conservation Authority  
Te Tari Tiaki Pūngao

### Welcome to the Bioenergy Gateway

This website provides tools and information for utilising wood waste as a renewable energy source.

The forest industry frequently burns wood waste to produce energy for processing. As the market grows for bioenergy production, there are opportunities to expand the use of this renewable resource.

This website can help forest growers and wood processors or bioenergy investors to assess the potential value of wood waste and harvesting residues.

Bioenergy offers value to different people in different ways:

- [Sawmilling](#)
- [Forestry](#)
- [Dairy or other food processing](#)
- [Home heating](#)
- [Heating for schools or commercial buildings](#)



To speak with a specialist about whether bioenergy is an option for you phone:

0800 BIOENERGY (0800 246 363)

Register Login



**Woody Biomass**



**Energy Production**



**Benefits**

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# What Has To Happen

- Many opportunities not likely to be achieved in the short term
  - constraints related to the supply risk of feedstock.
  - supply constraints affect the cost of bioenergy in an end-use market
  - alternative energy sources very cost competitive (gas and coal).
  - supply related to “whatever biomass feedstock is delivered”
- To increase uptake
  - the bioenergy market needs to focus on classification and quality
  - specific quality of feedstock is critical to the choice of equipment,
  - quality of feedstock is necessary to assist broadening into non wood processing sector uses,
  - development of a market for feedstocks requires that buyers and sellers be able to specify what they are contracting for.