# Where May Gasification Fit in the NZ Bioenergy Market

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**Bioenergy Association of NZ**

**Presentation to Workshop: Biomass Gasification Technology and Biomass Energy**
**13 February 2008**

# Foresters Throwing $$ Away

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

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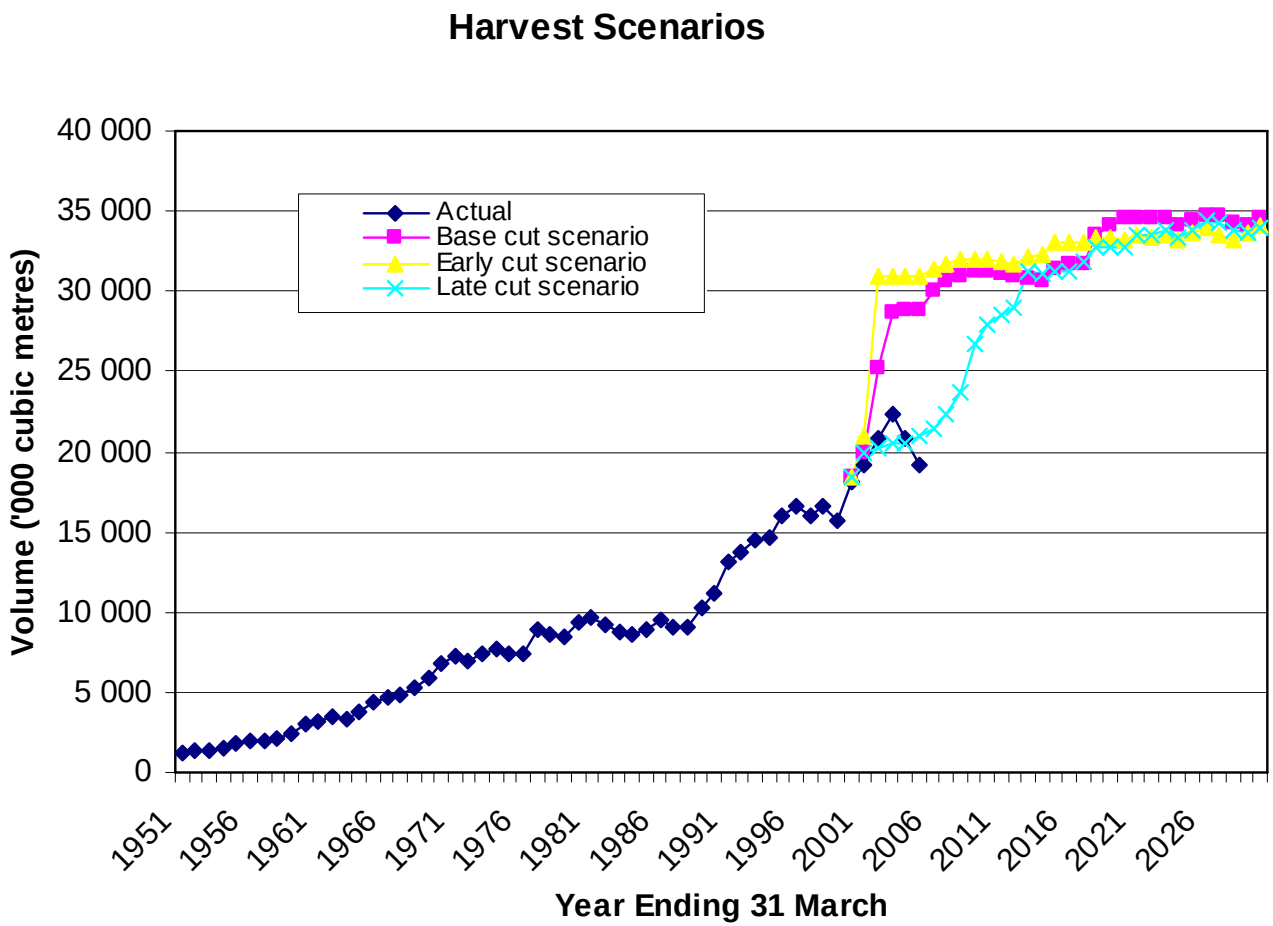
# Quantity of Resource is Not in Question

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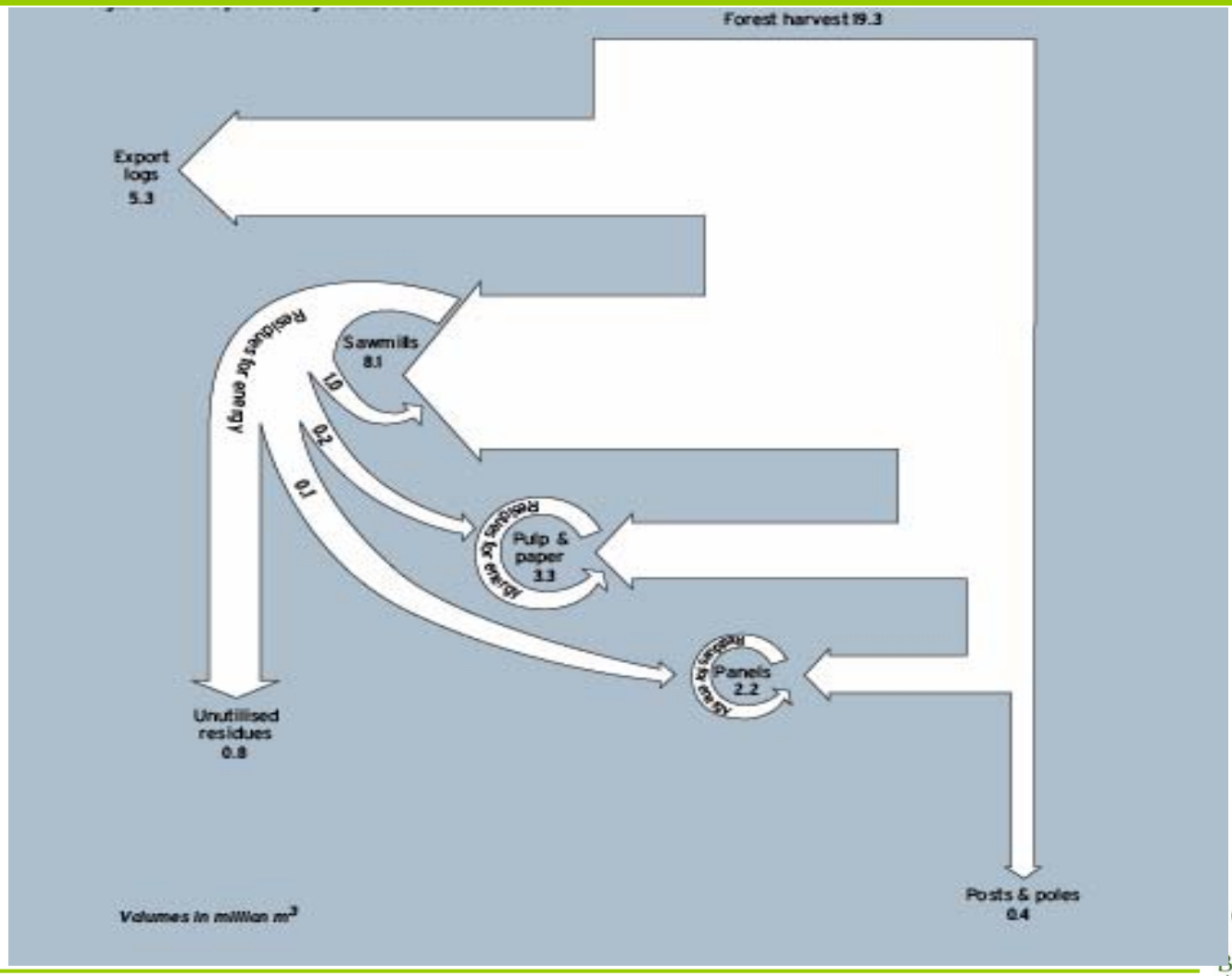
# Wood Utilisation




Source: Scion

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# The Resource

- NZ is rich in unused biomass resource
- NZ is rich in opportunities
- Bioenergy potentially a more significant contributor to the NZ energy supply mix
- However 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"
- But
  - the bioenergy market is starting 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.

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# Technology Options

- Technology is not a constraint to greater use of bioenergy
- Technologies are available or under international development
- As a technology gasification has to compete with
  - Combustion
  - 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
- Gasification needs to better the attributes of combustion

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# Current Bioenergy Priority Issues

- Continuity of supply of feedstock
- Classification of feedstock quality through adoption of feedstock standards
- Measurement of feedstock quantities on an energy basis
- Widening the range of feedstocks able to be used in pellet production
- Ability to cluster feedstock supply or have mobile collection/conversion/use
- Development of a trade in residues.
- Adapt technology to use variable feedstock to meet consumer demand
- Become end-user demand driven

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# Demand for Gasifiers

- Markets
  - Heat
  - Electricity
  - Liquid biofuels
- Absence of consumer demand due to competition from conventional fuels
- Potential users can’t see the benefits
- Perceived as too complex
- Unproven and high risk
- Size benefits
  - Large – economies of scale
  - Small – mobile to use disaggregated feedstock sources.
- Perceived as researcher rather than demand driven
- Need to manage feedstock consistency

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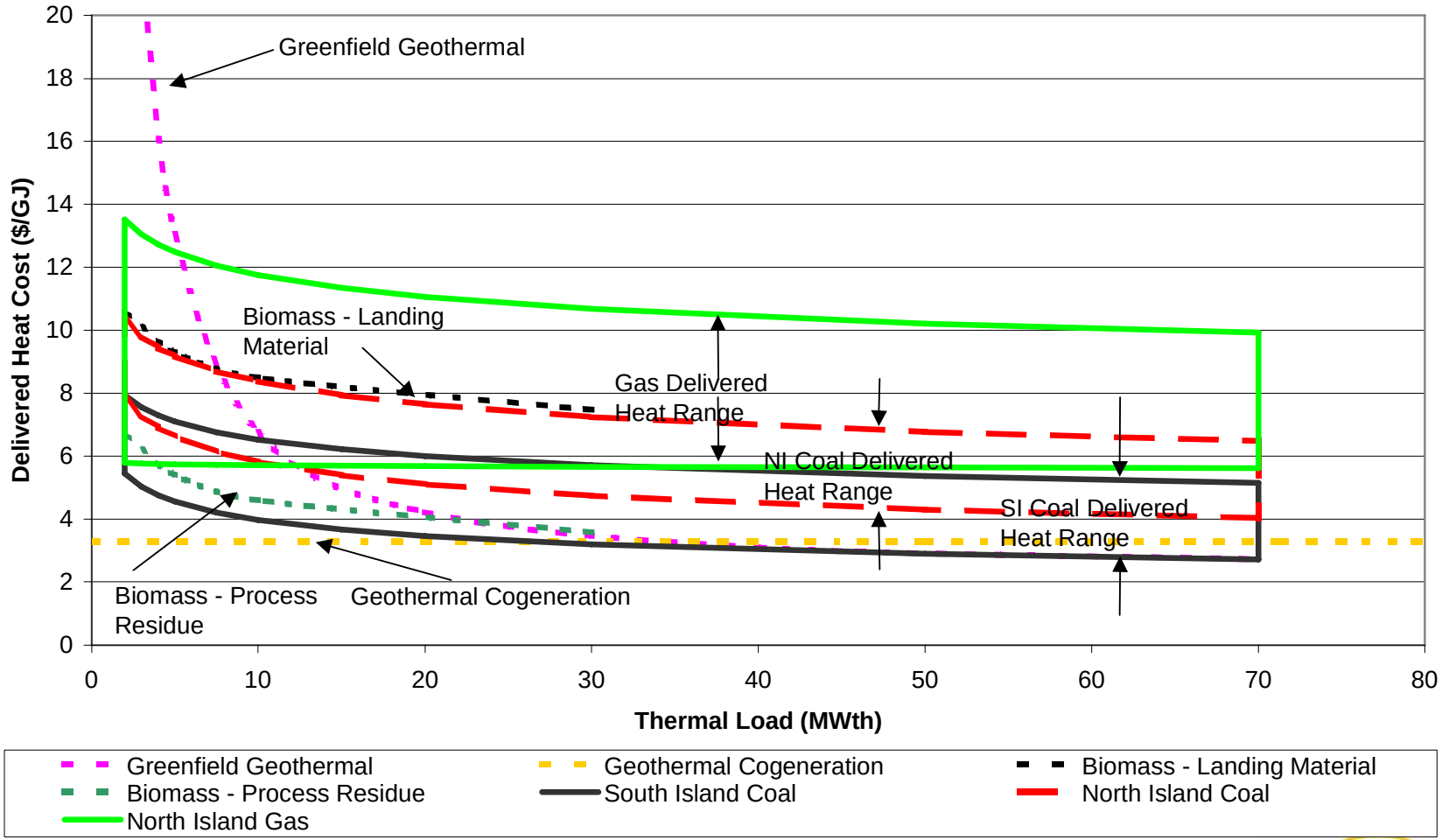
# The Relative Economics

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# Available Residue Processing Technology

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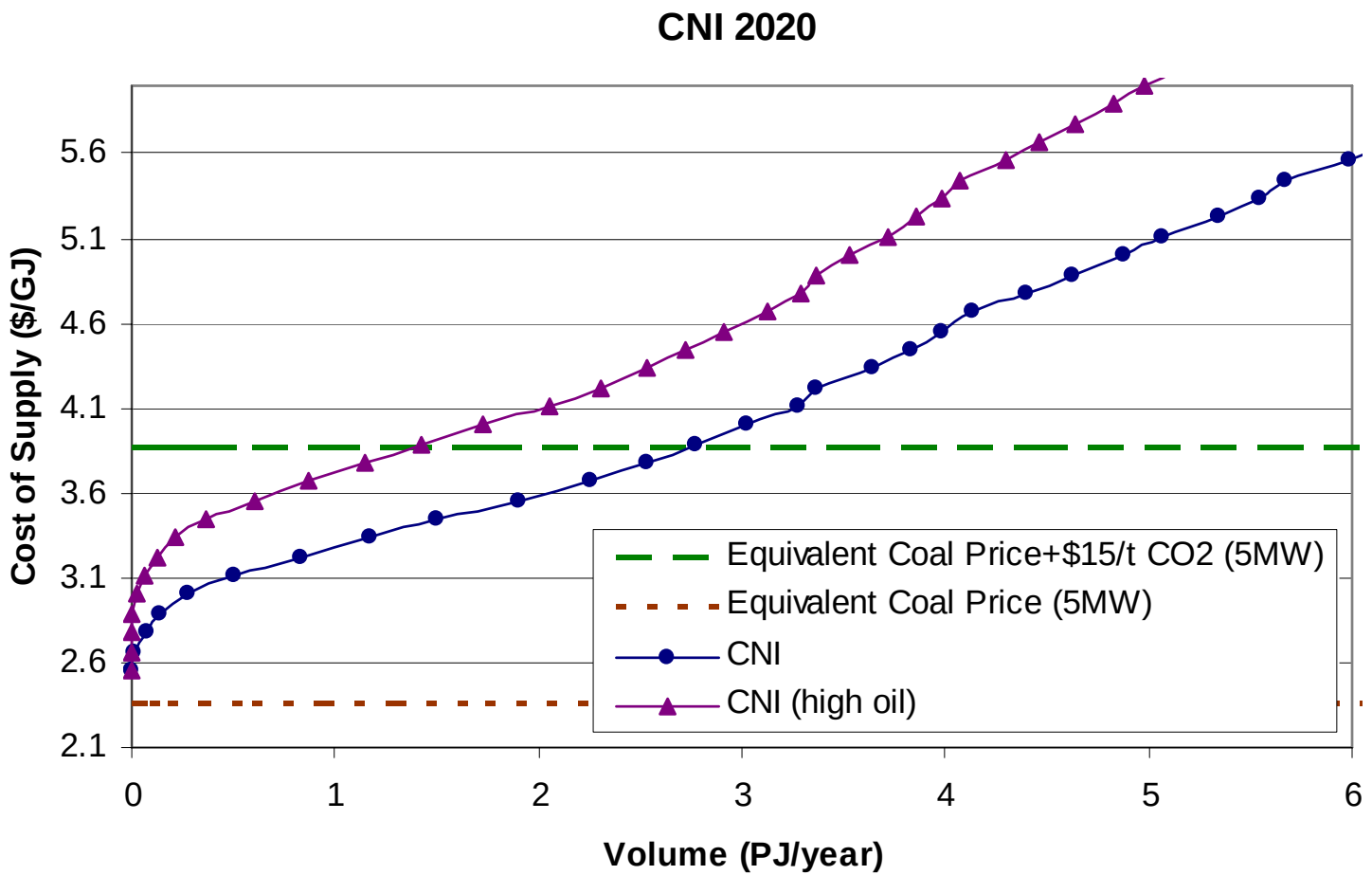
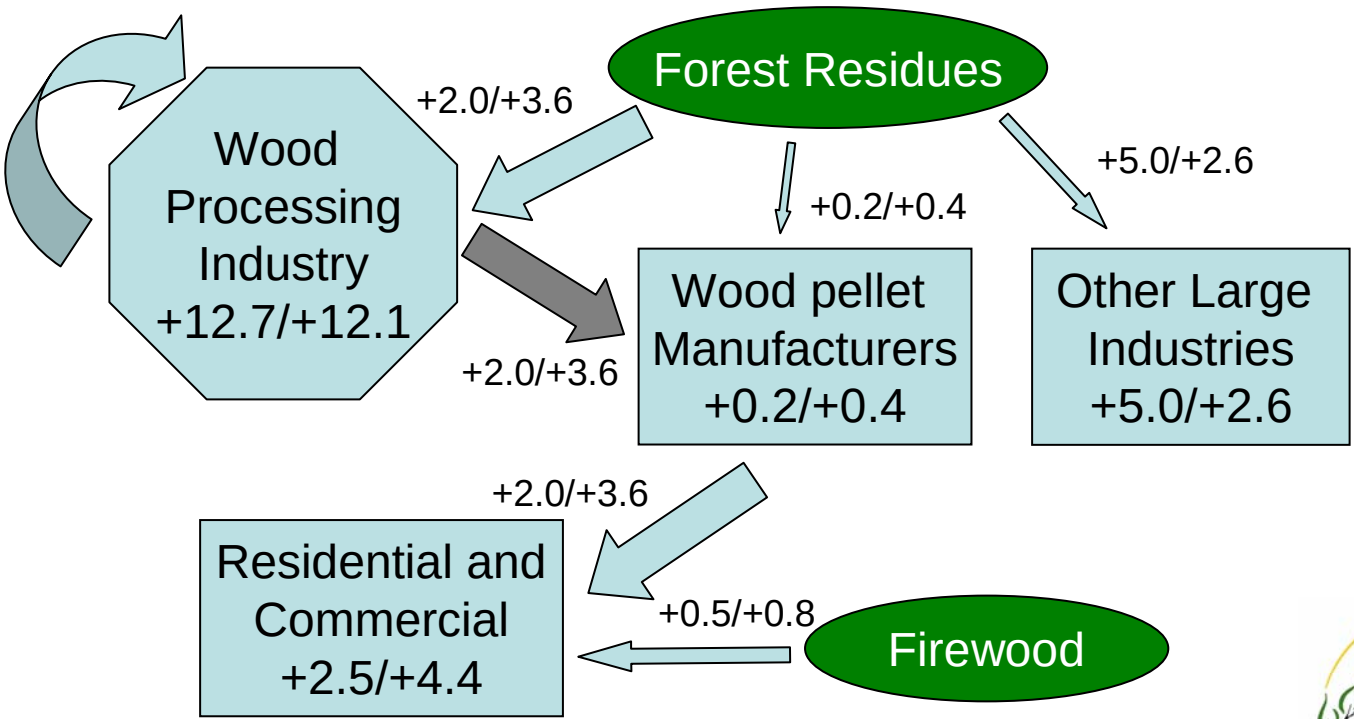
# Residue Costs are Reducing




Source:Scion

# 2020/2030 Wood Residue Market

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# Heat Plant Opportunities

- Most people focus on electricity and forget heat
- Heat opportunities are local
- Bioenergy, geothermal and solar heat is economic now
- Heat and cooling information is poor
- Few published role models or case studies

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# Woody Biomass as Fuel for Heat

- Heat is the biggest demand driver
- Biomass most within control of wood processors
- Can be produced from
  - Forest residue
  - Process waste
- May require backup from coal, gas, forest residue or imported fuel
- Need to focus on fuel handling and processing
- Economics improved when biomass processed to be homogenous fuel

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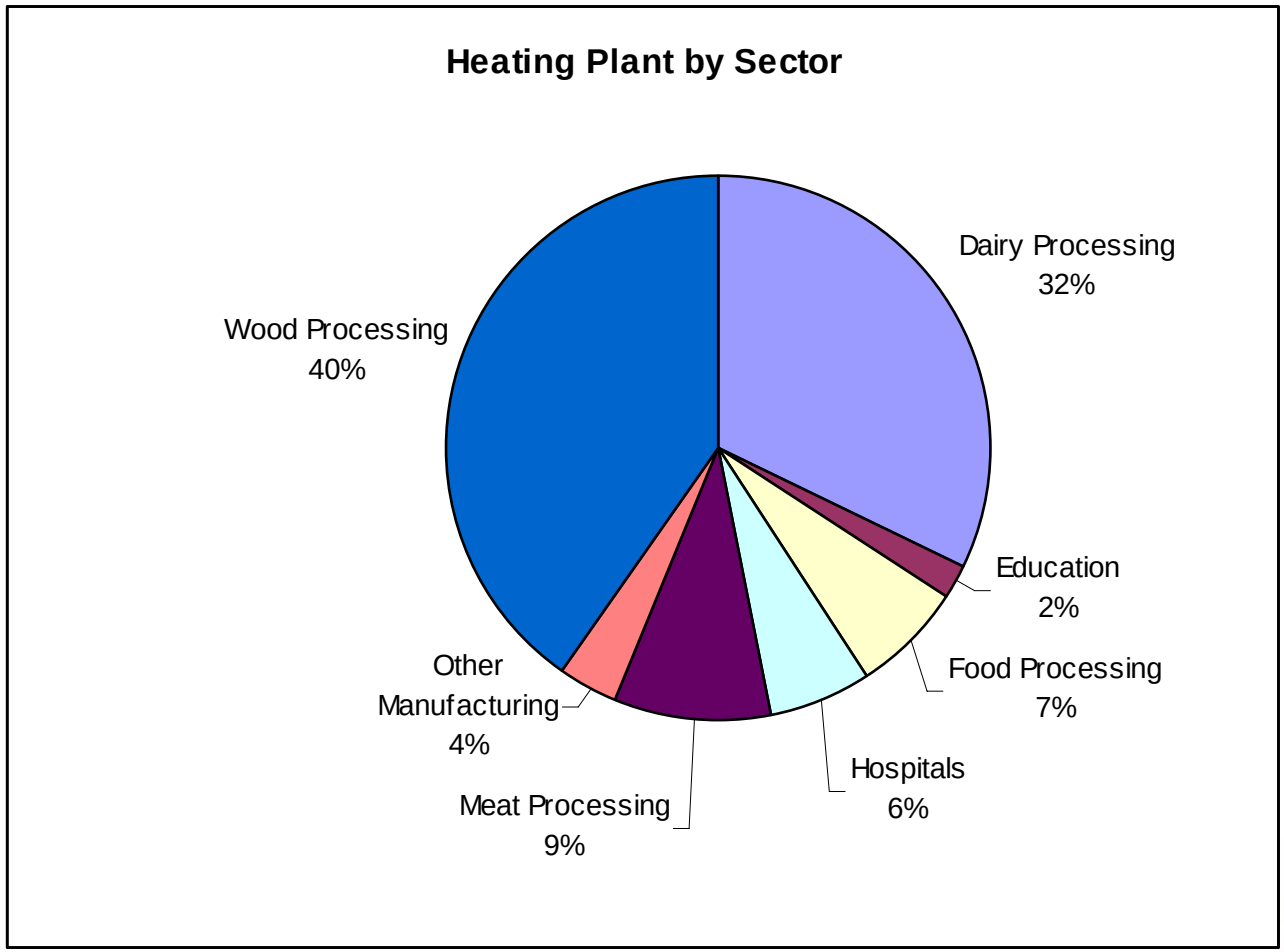
# Heat Plant in NZ




Source:East Harbour

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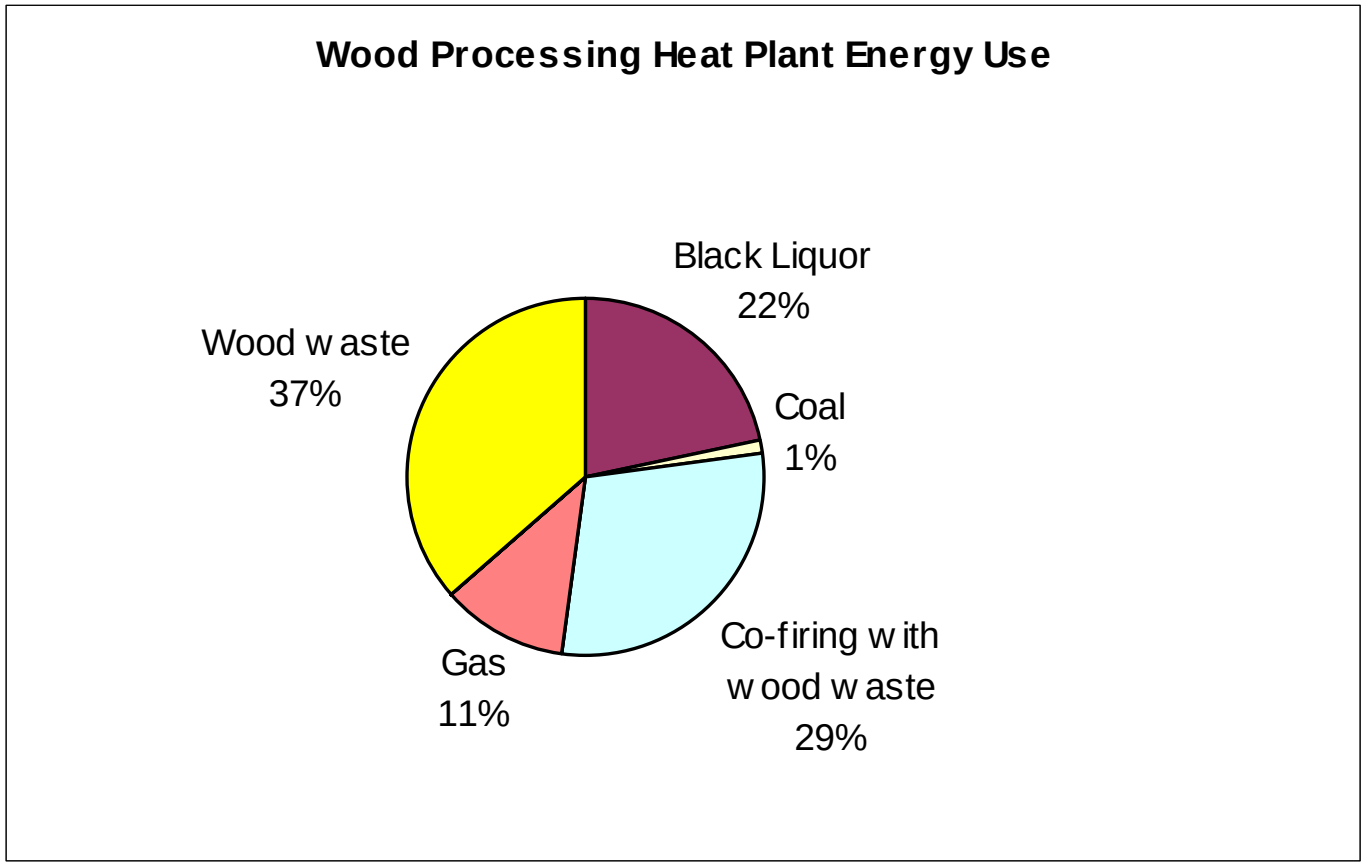
# Wood Processing Opportunities

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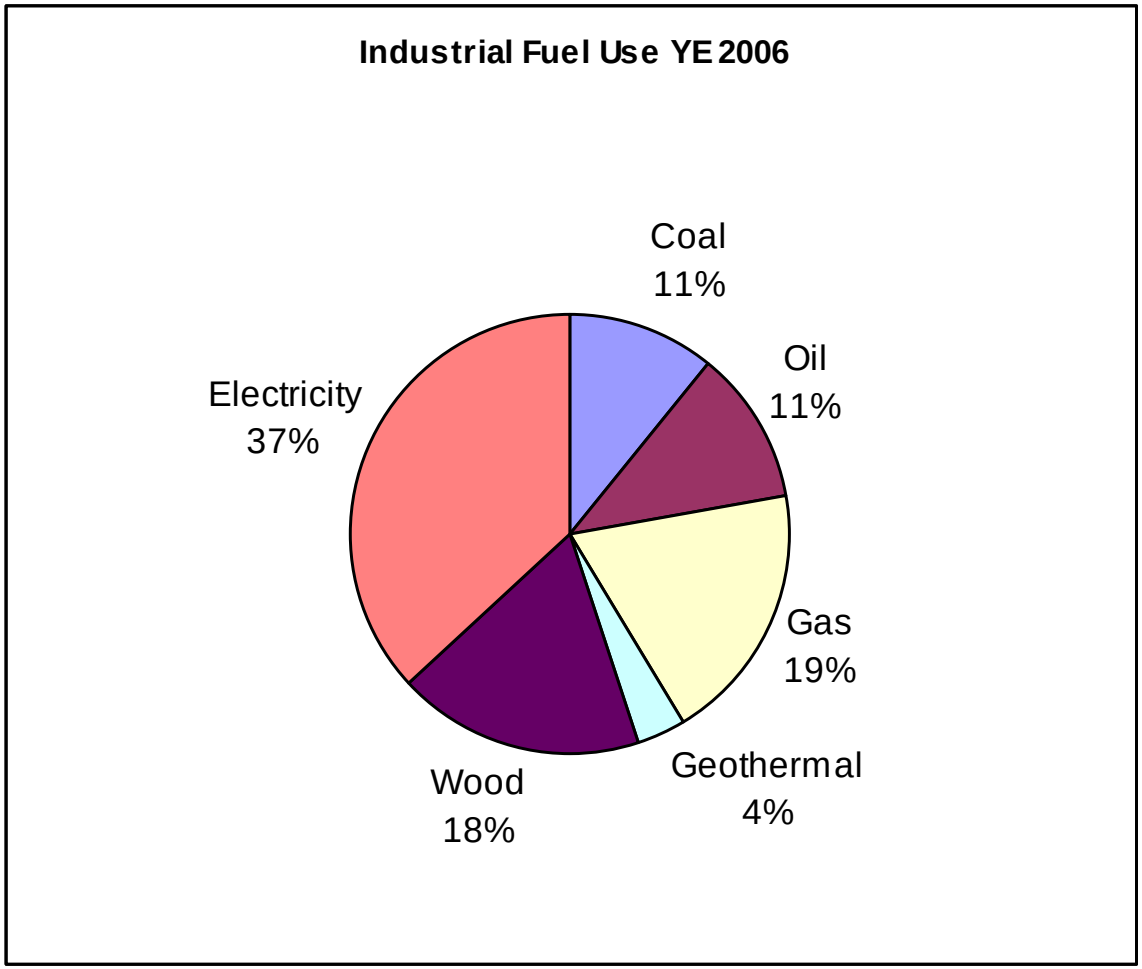
# Opportunity for Fuel Substitution

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# What Is The Challenges To Using Gasification to Increase Use of Bioenergy

- Alternative energy sources are still cheaper
- Complexity of operation
- Few role models
- Unknown cost structure
- Lack of long term contracts for feedstock supply
- Lack of market demand - Where is the benefit to the end-user?
- Currently researcher rather than market driven

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