

Overview to New Zealand Bioenergy

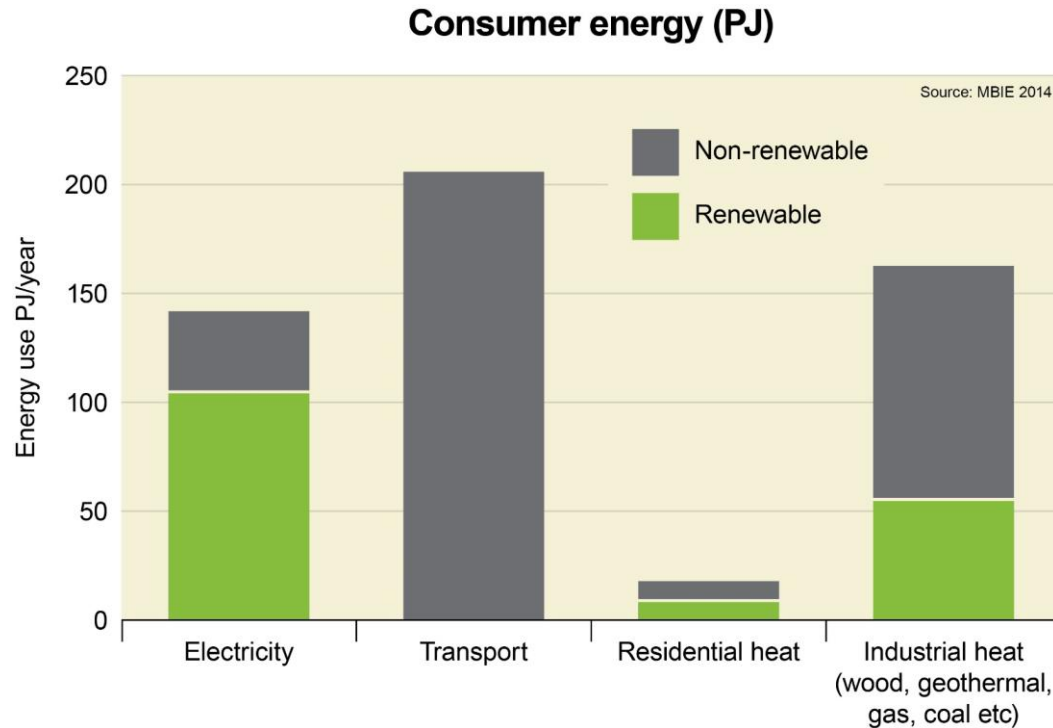
Paul Bennett - September 2018



Content

- Overview to Bioenergy in New Zealand
- NZ Forestry Industry
- Feedstock Availability
- NZ analysis capability

NZ Energy Consumption – Reduction targets



Biomass mostly used in industrial heat in New Zealand, but new Government policy and targets:

- New renewable energy targets,
- Net zero carbon by 2050,
- One billion tree policy

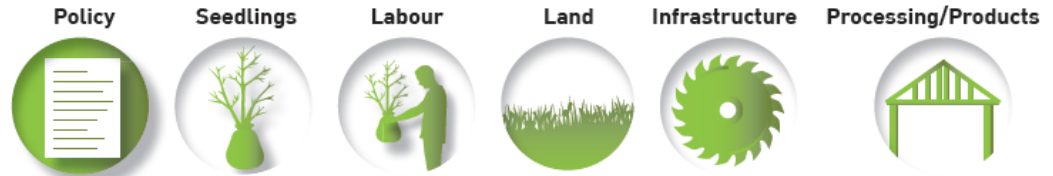
One billion trees – Reclaiming our forest heritage

New Zealand Government

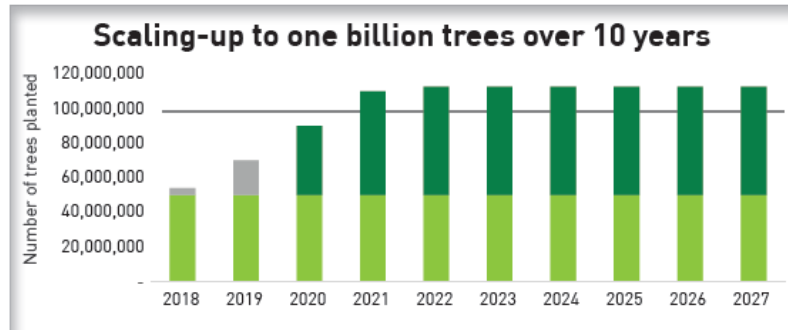
It's about:



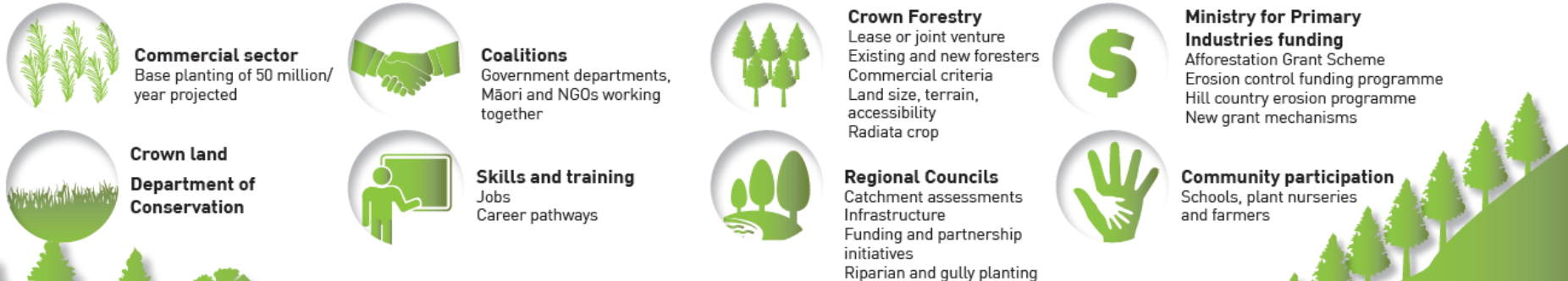
It requires:



It's a 10 year programme:



We'll do it together:



We'll plant:

Natives and exotics in traditional and innovative locations

Forestry Information

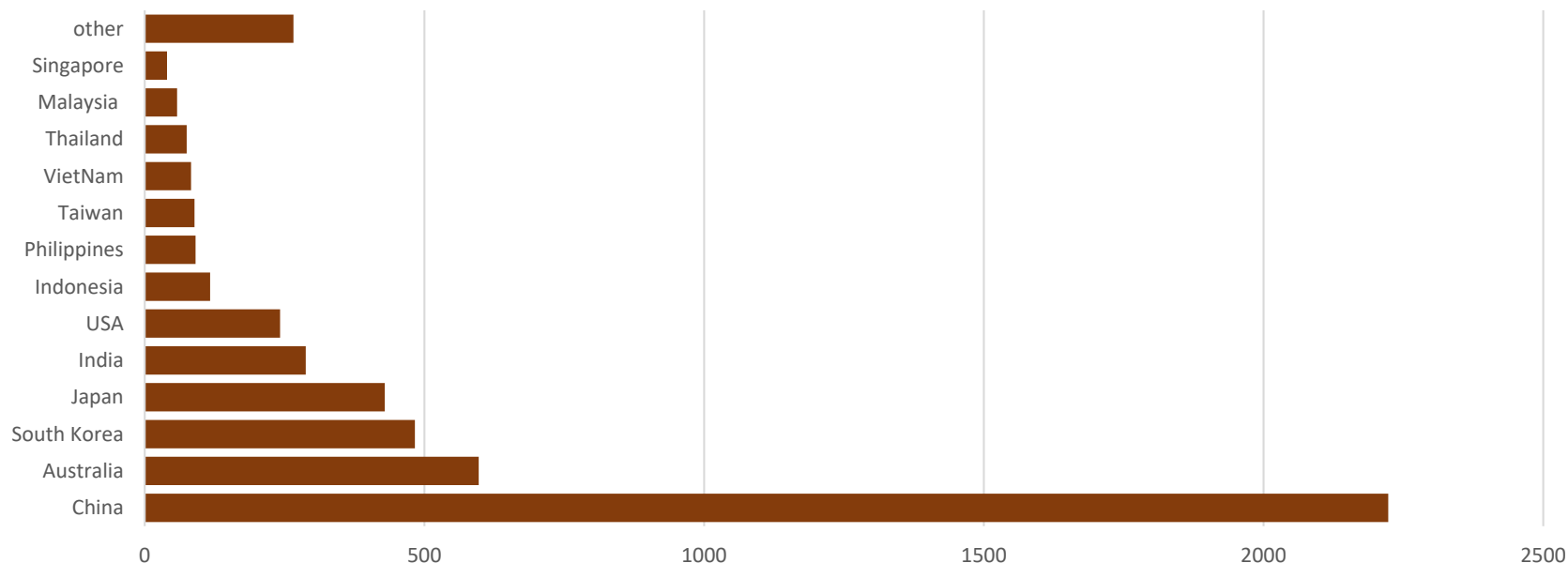


- 1.7 million hectares Planted Forestry
- Currently 30 million M³ pa harvested
- ~100% FSC or PEFC
- 92% privately owned
- 90% Pinus Radiata
- NZ\$6.3 Billion Exports (MPI 2021 prediction)
 - 50:50 logs:products

NZ Government initiative - 1 Billion trees programme
2x current planting rate

2016 Forestry Products Export Destinations

(NZ\$ millions)



Over 50% as logs, remainder sawn timber, pulp and paper, wood chip
No major bioenergy product export, but interest

Biomass for fuel export potential

Issues being investigated

Biomass feedstocks

- Assessment of residue resources
- GIS based modelling of delivered volume and costs
- Forest crop modelling and assessment of biofuel crop options
- Residue recovery system assessment

Densification of biomass

- Pellets (only 2 pellet mills in NZ)
- Briquettes

Torrefaction (and densification)

Good understanding of residual resources

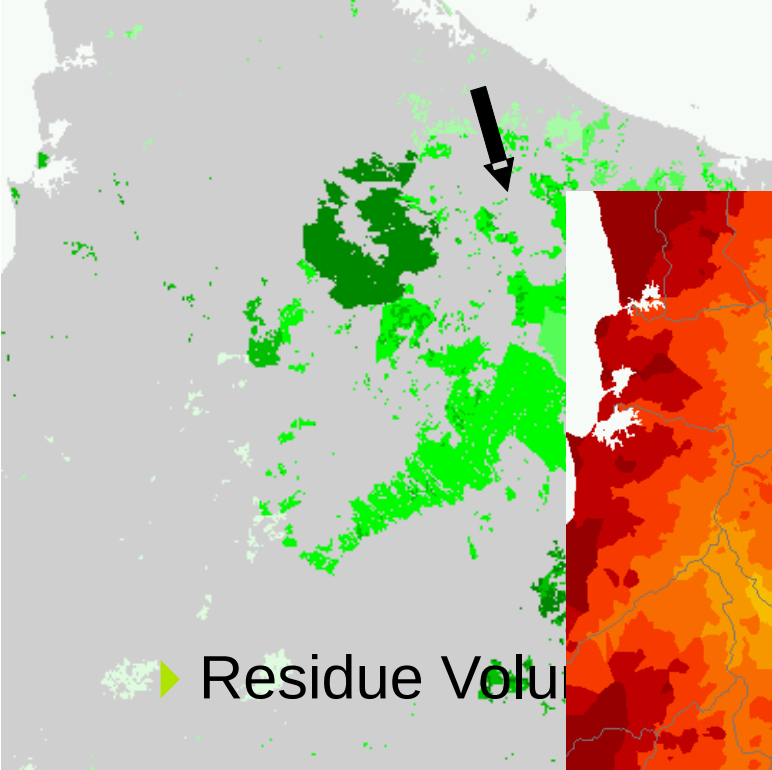
- National data sets
 - Forestry (NEFD, WAFs)
 - Municipal waste
 - Data from forestry harvesting operations on residuals
- GIS based landcover data (LCDB V. 1 to 4)
 - Forestry
 - Cropping
 - Orchards



Underlying data on area, age, location and yields allows estimation and modelling of the volumes of residuals based on the harvest volume and area

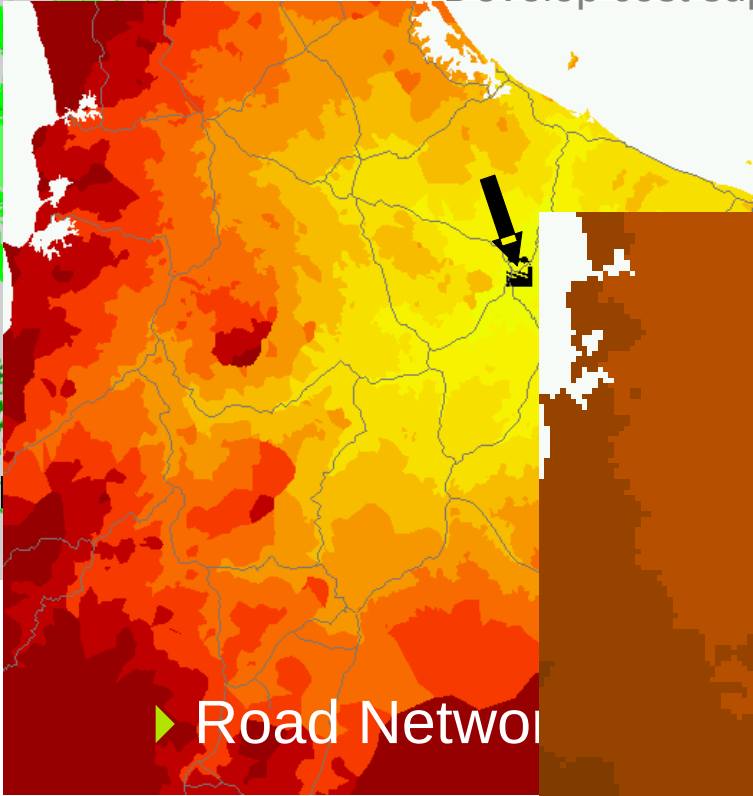
GIS Systems for feedstock delivery analysis

Integrate GIS model outputs
(spreadsheets of volume by distance)
with costing model outputs;
Develop cost supply curves for wood residues



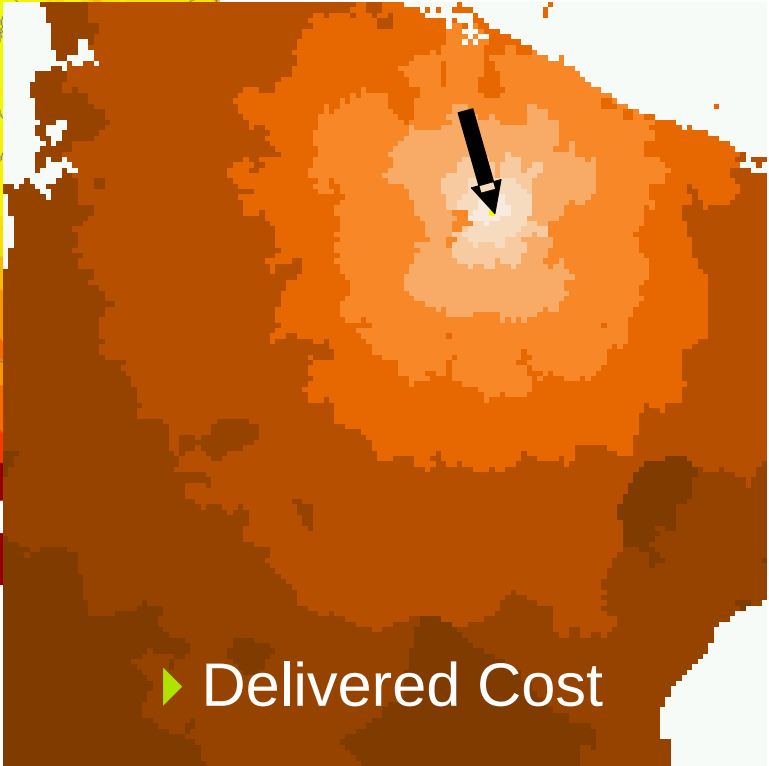
► Residue Volume

This map shows the spatial distribution of wood residue volume. The land area is colored in shades of green, with darker green indicating higher volume. A black arrow points to a specific location in the upper right quadrant of the map.



► Road Network

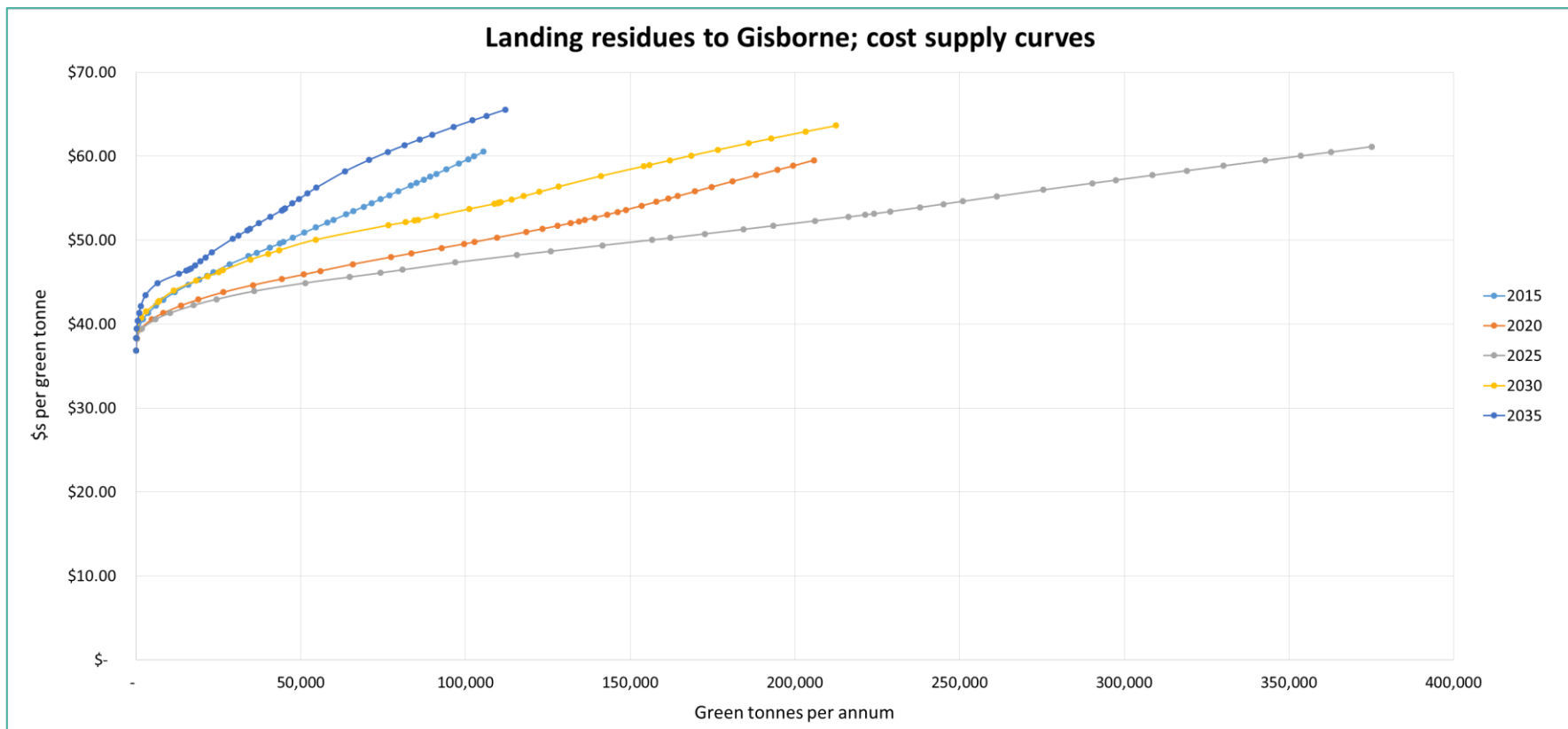
This map displays the road network overlaid on a color-coded background. The background colors range from red to yellow, likely representing distance or cost. A black arrow points to a specific location on the road network in the upper right quadrant.



► Delivered Cost

This map shows the delivered cost of wood residues. The land area is colored in shades of brown and orange, with lighter colors indicating lower costs. A black arrow points to a specific location in the upper right quadrant of the map.

Cost supply curves; - now & future



Woody Biomass Availability and Costs

- Up to 3.9 million dry tonnes woody biomass
- Current costs range from -\$40/te for municipal wood waste (landfilled) to \$75/te for sawmill chip (feedstock for pulp mills)
- Cost depends on location (easy of extractability and distance to market/processing)
- Forestry waste (from harvesting) is largest proposition
- High quality sources, such as pulp logs and sawmill chip are in demand by pulp, paper, MDF and particle board manufacturers in most regions

Summary

- Woody Biomass is available, and expected to grow with One billion tree policy
- Limited wood pellets currently but expansion likely
- Policy initiatives encouraging more feedstock production and more bioenergy.

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Prosperity from trees *Mai i te ngahere oranga*

Scion is the trading name of the New Zealand Forest Research Institute Limited