EECA
Energy Efficiency and Conservation Authority
Te Tari Tiaki Pūngao

New Zealand Government

Biofuel Challenges and Opportunities in New Zealand 2014

Martin Brown-Santirso, APEC EGNRET 42 Meeting, Honolulu, 2014

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EECA energywise

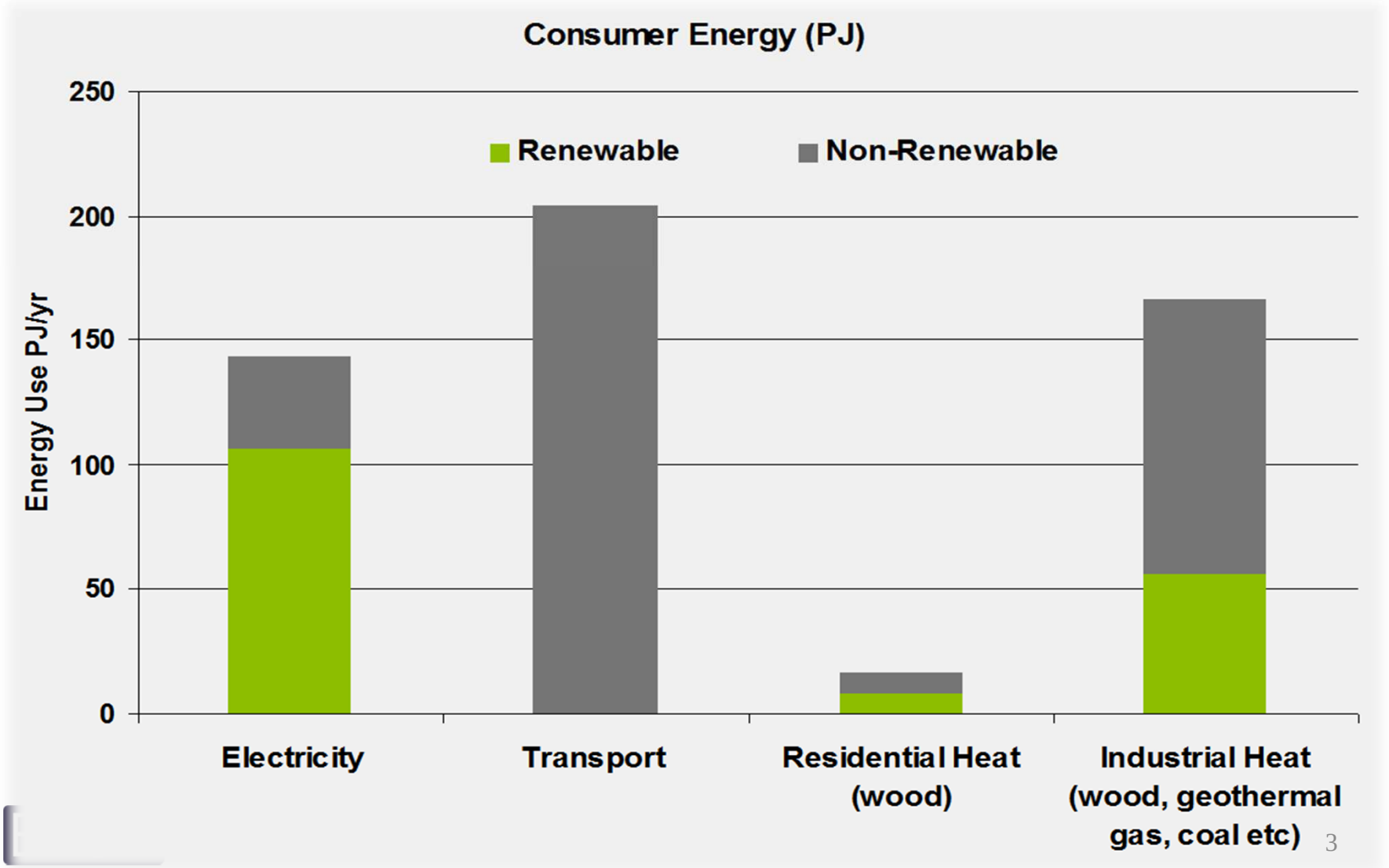
Energy: three key issues

- **Energy costs**
  We want least-cost energy to grease wheels of our economy, make exports as competitive as possible

- **Greenhouse gas emissions**
  Climate change potentially very significant; we can reduce the impact by emitting less GHG – and meet our international obligations

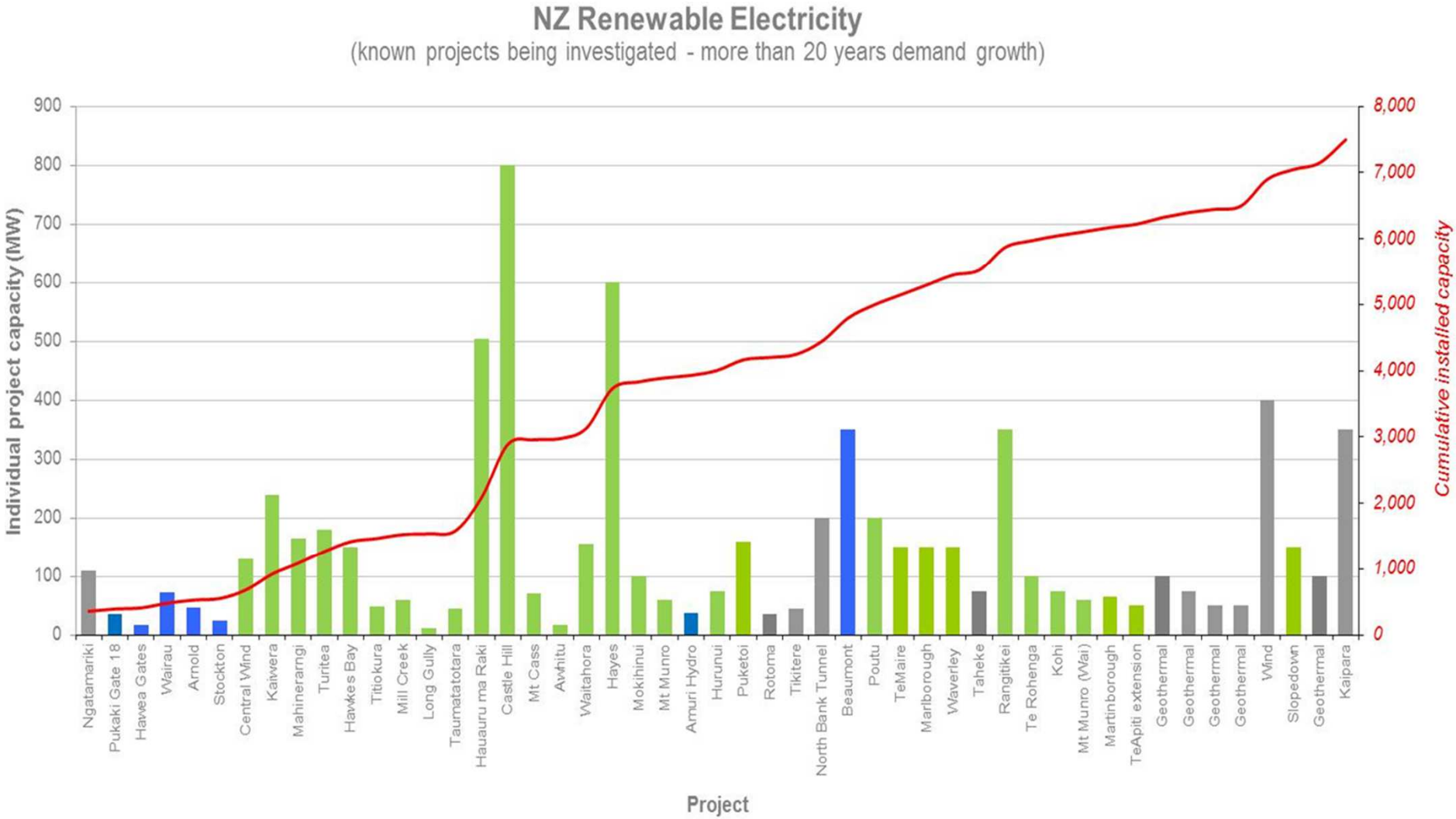
- **Energy security**
  Growing our indigenous supply decreases reliance on overseas-sourced oil and exposure to price volatility (e.g. look at what the US is achieving with shale gas)

How is our energy used?

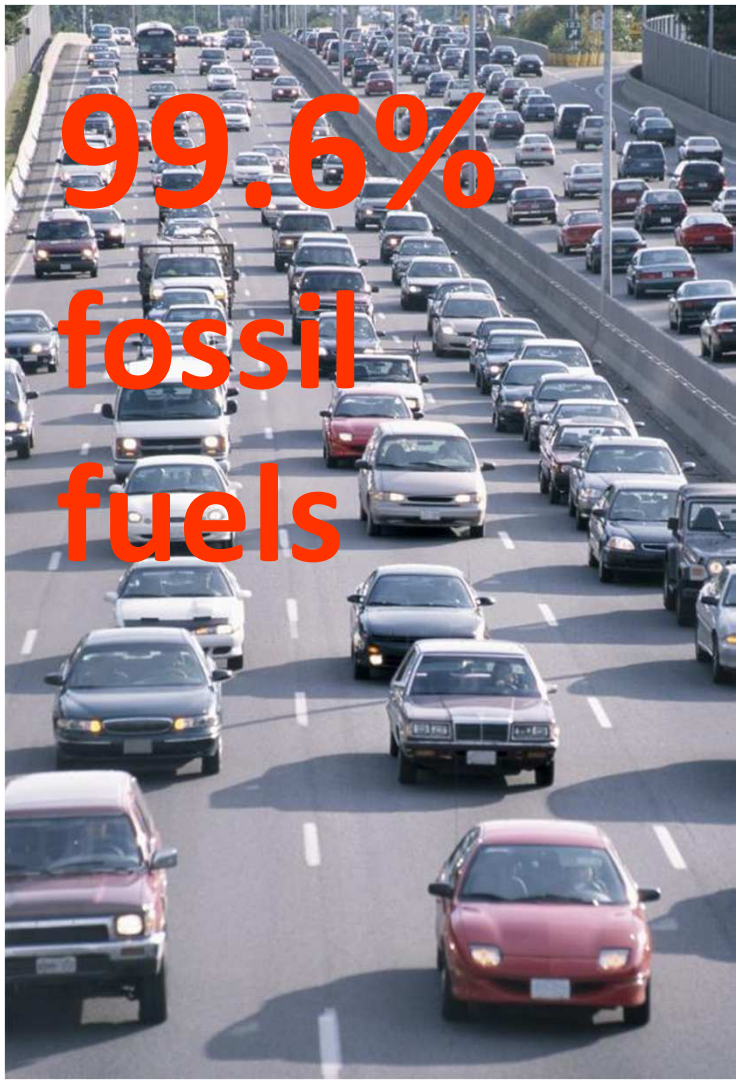


Our electricity system

- 90% renewable electricity target – well on track
- 20 years demand growth already consented

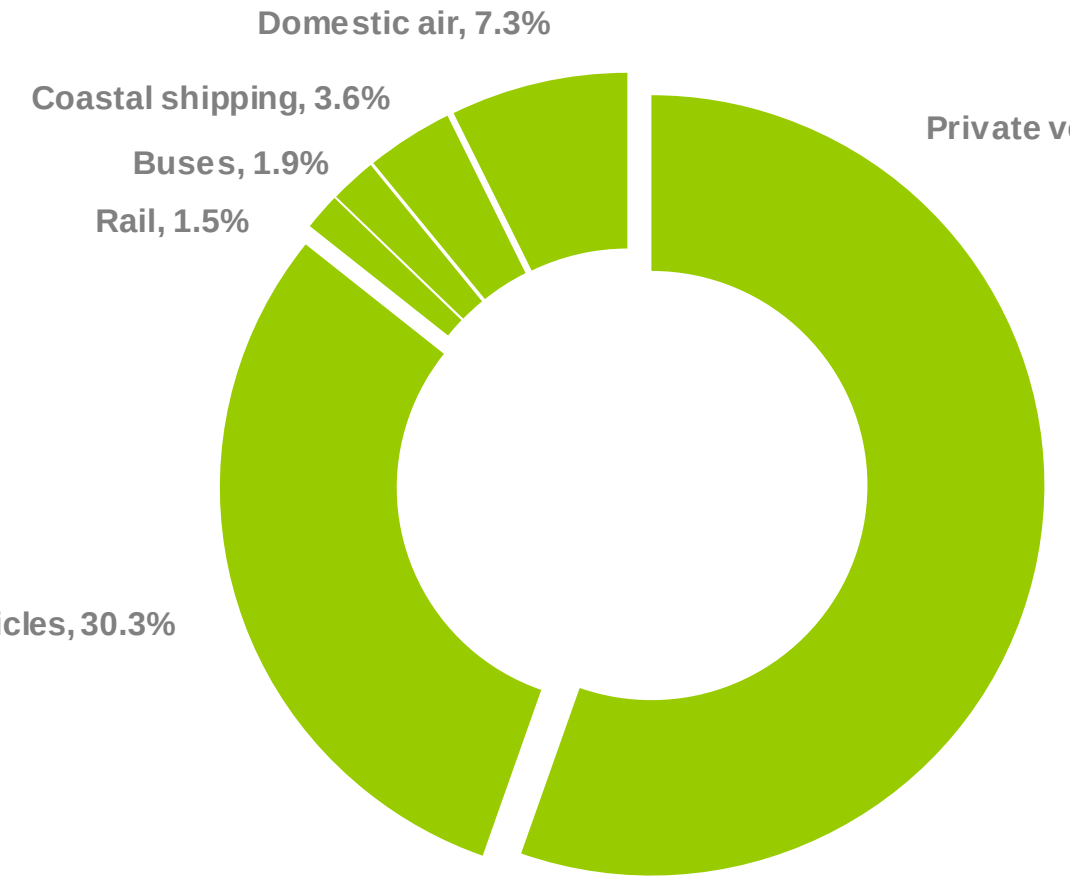


Transport & business heat



‘Greening’ our road transport

biomass



EVs

biomass

Scion report: enough marginal land to fuel 100% of our heavy fleet with renewable diesel (i.e. trees in the tanks)

Current Situation

- 7 Million litres in 2012 (0.1% of total transport fuel supply) of biodiesel and bio-ethanol
- First generation technology, key feedstock are
  - Biodiesel – waste cooking oil and tallow
  - Bio-ethanol – whey
- Largely used by niche markets

Policy

- 2007 – Biofuel sales obligation
  - Requiring a minimum percentage of oil company sales to be from biofuels
  - Repealed in 2008
- 2009 – 2012 Biodiesel grant scheme
  - Provided a 42.5 per litre
  - Aim to create a demand by provide a cost competitive option
  - Low uptake
  - Supported 1st generation biofuels
- New Zealand Energy Strategy

Current Policy: Advanced biofuels

- Bringing forward advanced biofuels
- Investing NZ$42 million on advanced biofuels
- Renewable diesel, Bio crude
- Variety of non-food feedstocks including wood, wood-waste, waste pond algae ‘farming’
- Stump-to-pump project
  - NZ$13.5 Million
  - Establishing a modular test plant to process wood waste in to biofuels

Advanced biofuels – it's happening

- US company KiOR: commercial-scale bio-crude plant in Mississippi
- 13 million gallons
- Ability to produce renewable petrol or diesel (drop-in)
- Not at expense of first-generation feedstock
- NZ has significant resource – we can be 'fast followers'

KiOR refinery, Mississippi

Advanced biofuels – it’s happening

- Feedstock – specially grown or waste wood
- Utilise geothermal energy for process heat
- Norske Skog bio-crude venture / Z Energy partnership

Norske Skog

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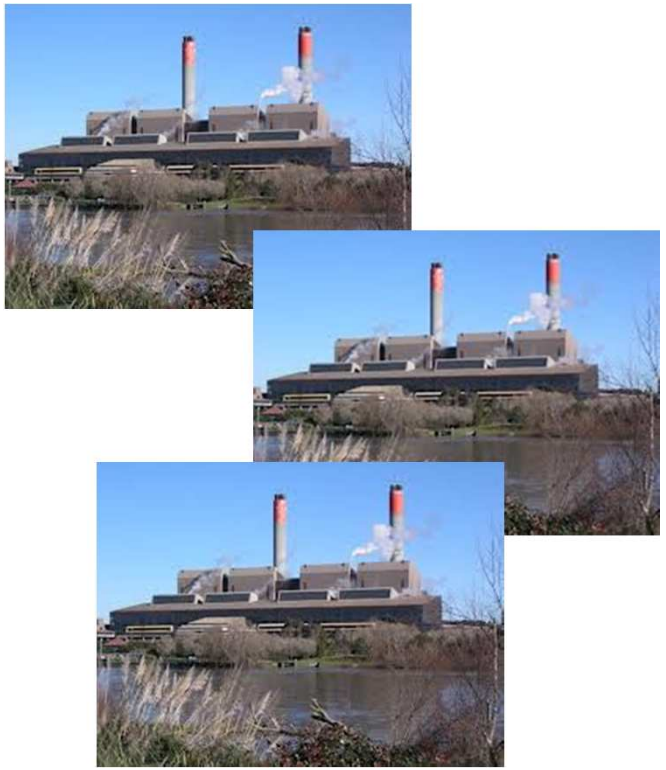
The ‘size of the prize’?

- 40PJ / yr in residues alone – wood processing and forest residues (*Scion bioenergy options*)
  - @ $30m - $50m / PJ = $1.2bn - $2bn / yr of energy
- Residues and purpose-grown biomass – 100PJ / yr approx
  - @ $30m - $50m / PJ = $3bn - $5bn / yr of energy



Roughly equivalent to three Huntly power stations

Market barriers to bioenergy for heat

- Lack of effective long-term carbon pricing signal
- Perceptions of security of supply
- Knowledge
- Lack of access to capital
- Industry capability
- Quality
- Regulatory

Source: SKM (2011)

How do we get there?

- Better understanding of value proposition for forest owners
  - eg BANZ, Woodscape research – sector collaboration – tools and resources
- Be clear about costs and benefits before making capital investments
- Facilitate regional cluster development
- Address consulting industry capability through knowledge
- Better understand both the opportunities and risks

Biomass - who's doing it?

- Golden Bay Cement, Whangarei: wood waste for industrial heat
- 1/3 of fuel burned is now wood sourced from demolition and construction
- reduced 58,000 tonnes CO_2 / yr

Golden Bay Cement

We Commit. We Do.

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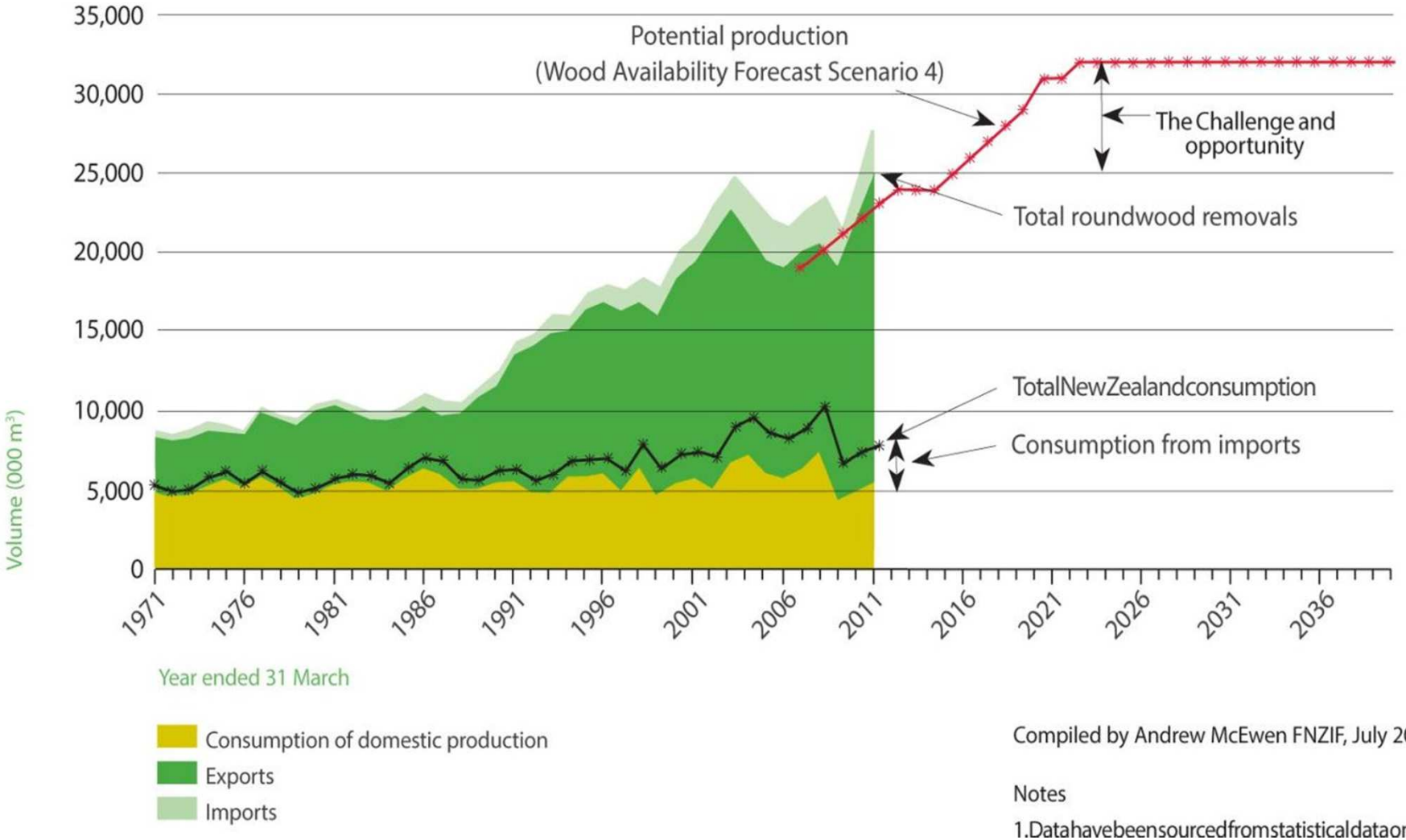
The ‘wall of wood’ is here



Compiled by Andrew McEwen FNZIF, July 2012

Notes

1.Datahavebeensourcedfromstatisticaldataonthewebsitesc

Opportunity for biorefining

- (Wall of wood) + (transport CO2 emissions) + (security of oil supply) = ?
- WoodCo Strategic Action Plan:
  - integrated harvesting
  - co-products on brownfield sites
  - economic advanced biodiesel plants
- WoodScape study – economic opportunities for biofuels?
- Improved competitiveness through combining traditional and energy biomass
- Integrated fibre and energy businesses?