Global Drivers for Biofuels – Relevance for New Zealand

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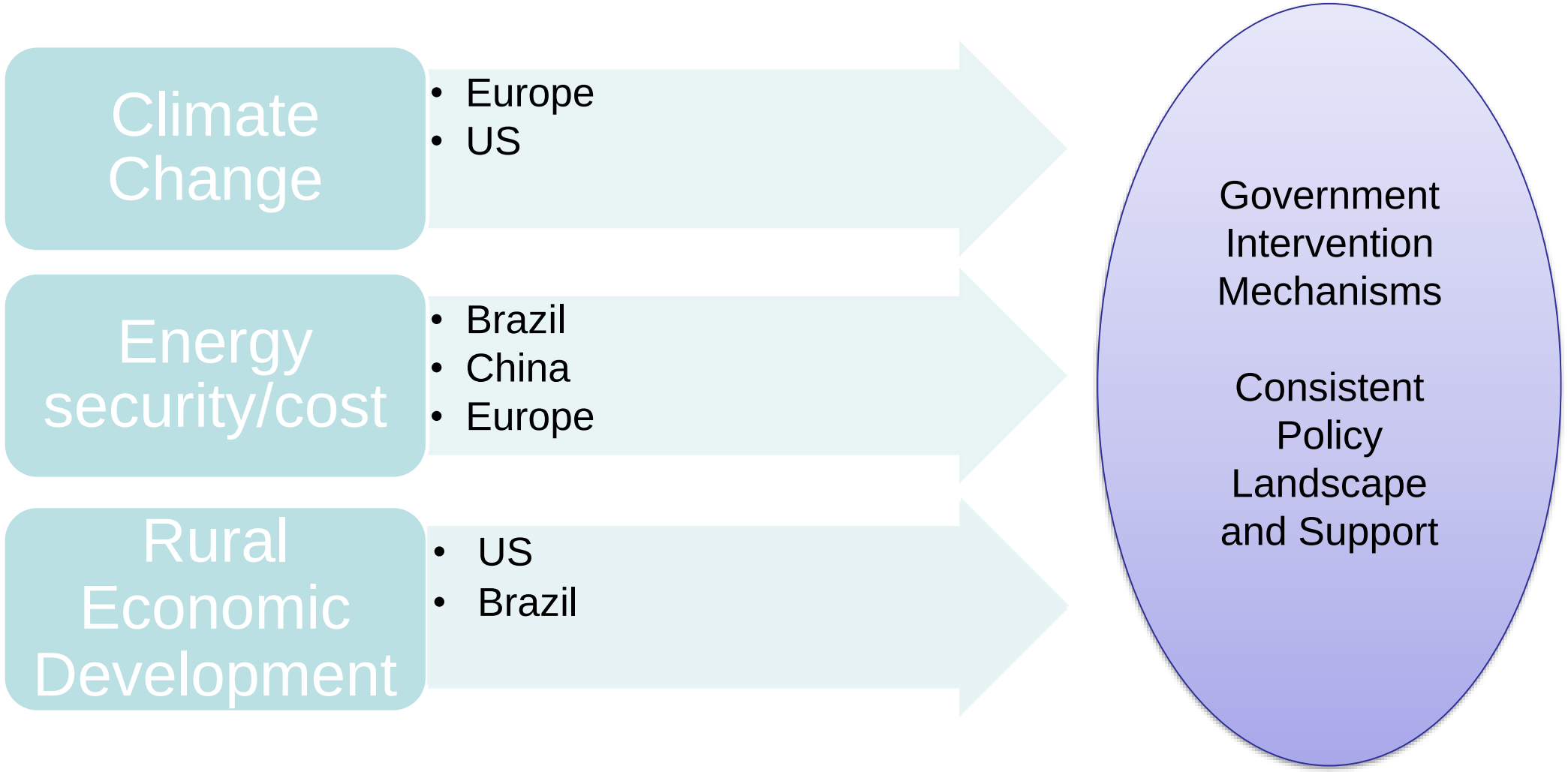
Drivers for International Biofuel Growth



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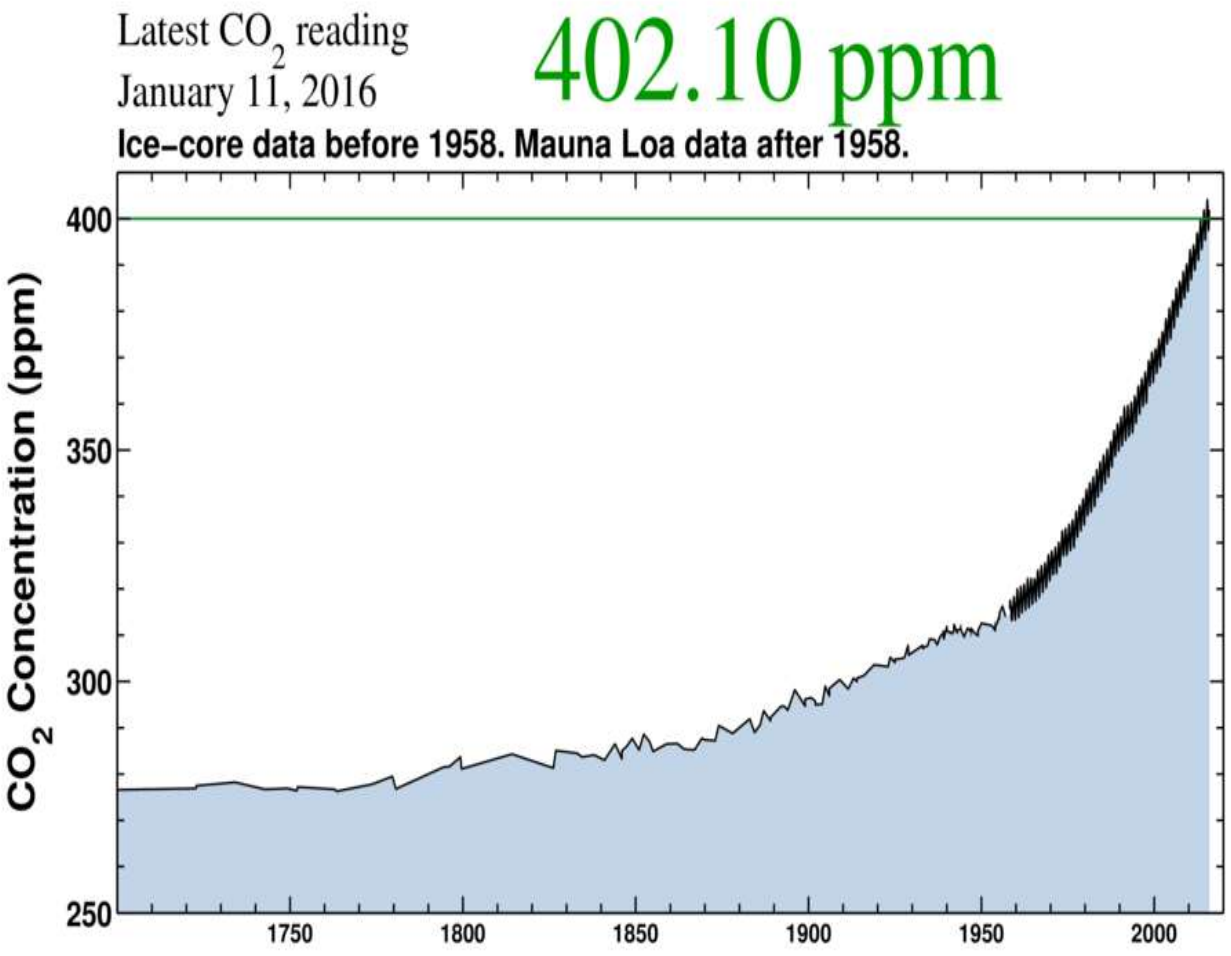
Climate Change



IPCC AR5 - 2014
Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

COP 21 –Paris Agreement
Members promised to reduce their carbon output "as soon as possible" and to do their best to keep global warming "to well below 2 degrees C"

Climate Action Tracker
With 158 climate pledges now submitted to the UN, accounting for 94% of global emissions, the Climate Action Tracker confirmed this would result in around 2.7°C of warming in 2100 – **if all governments met their pledge**

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Impacts of Climate Change

- New Zealand climate is changing.
- Warming is projected to continue through the 21st century along with other changes in climate.
- Annual average rainfall is expected to decrease in the northeast South Island and northern and eastern North Island, and to increase in other parts of New Zealand.
- Drought frequency could double or triple in eastern and northern New Zealand by 2040, and fire weather is projected to increase in many parts of New Zealand.
- Regional sea level rise will very likely exceed the historical rate (1971–2010), consistent with global mean trends.

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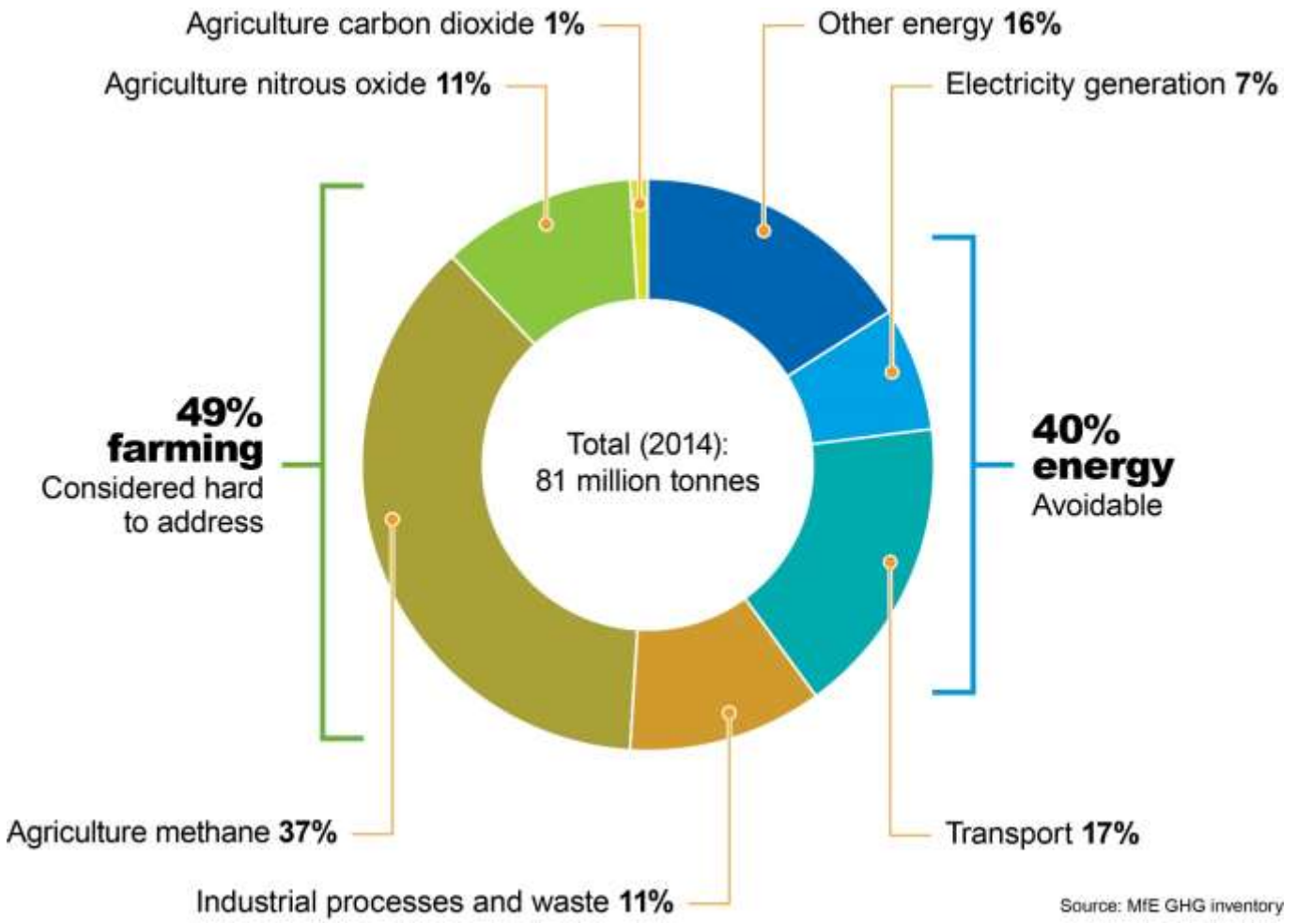
NZ GHG Emissions - Where's the 30% reduction going to come from?



Source: MfE GHG inventory

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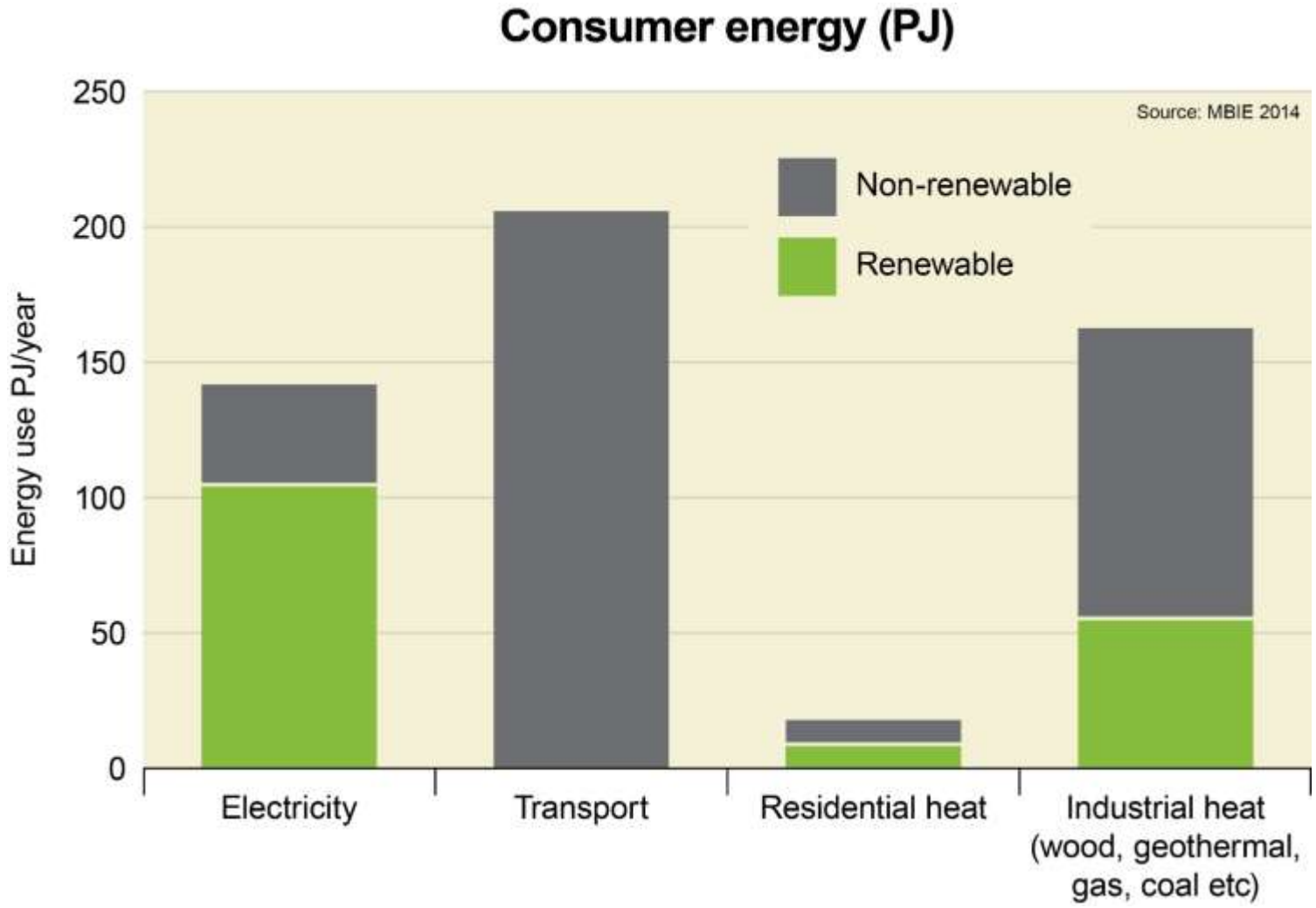
NZ Energy Consumption – Mitigation Options



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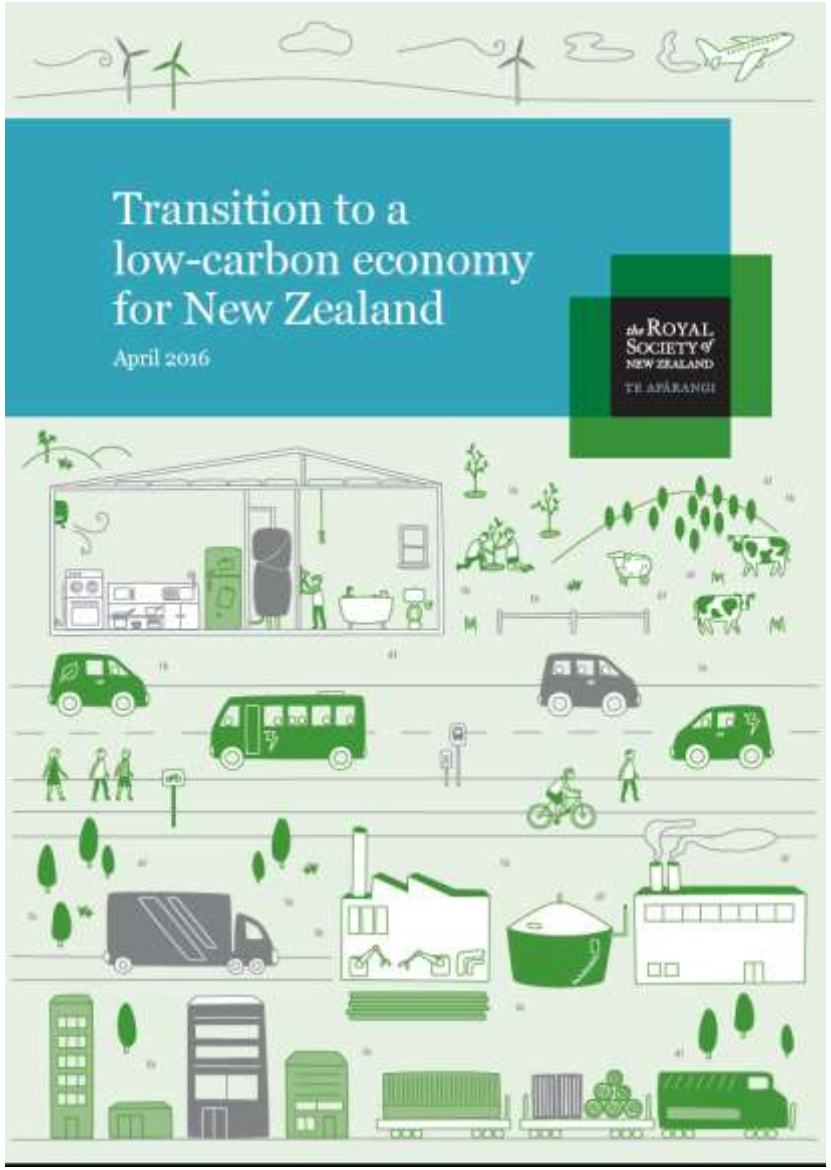
Royal Society Review - Mitigation Options April 2016



….there is one main highway to proceed towards net zero emissions;

1. Implement all feasible means of avoiding the burning of fossil fuels,
2. Compensate for unavoidable emissions through afforestation
3. In the longer, compensate with bioenergy coupled with CCS

This includes displacing the use of coal, oil and gas with renewable heat, renewable electricity and biofuels, and possibly green hydrogen. A strong focus on reducing demand and increasing efficiency is an imperative.

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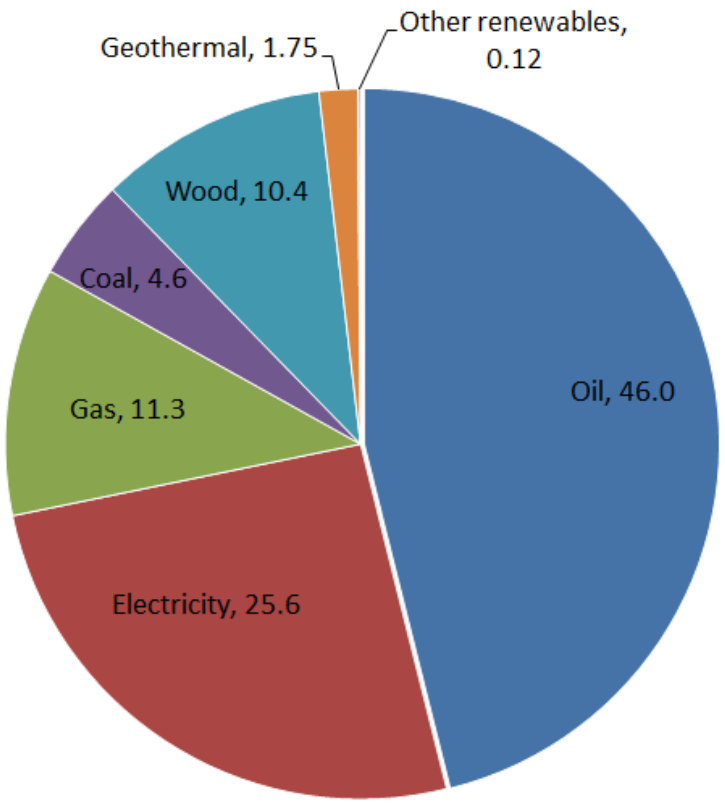
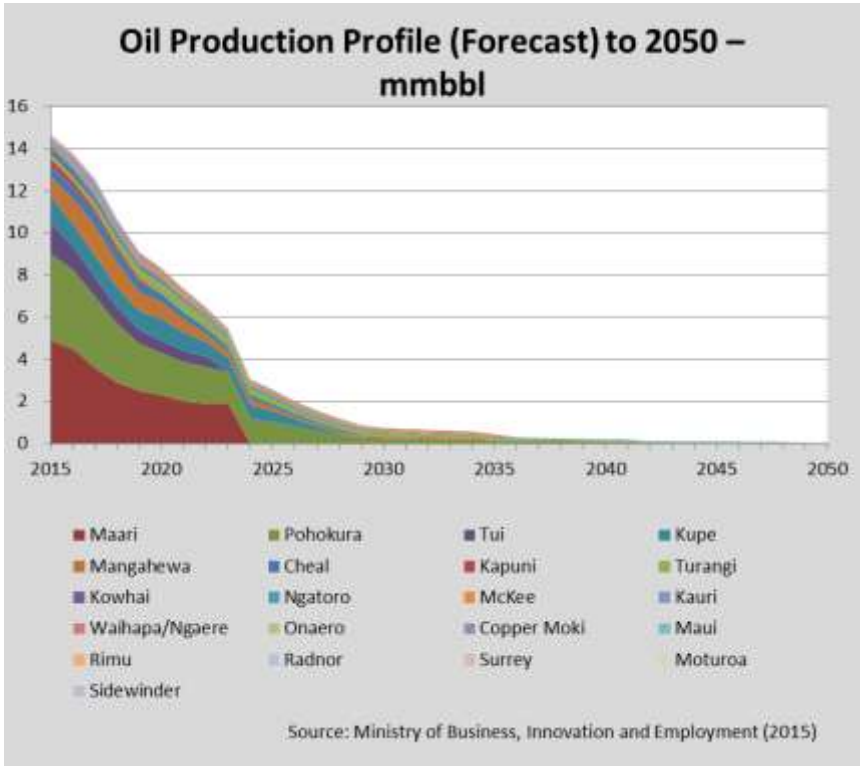
NZ Energy Security

Consumer energy, %



Source: MBIE 2014

NZ Oil production only 24%total and in decline



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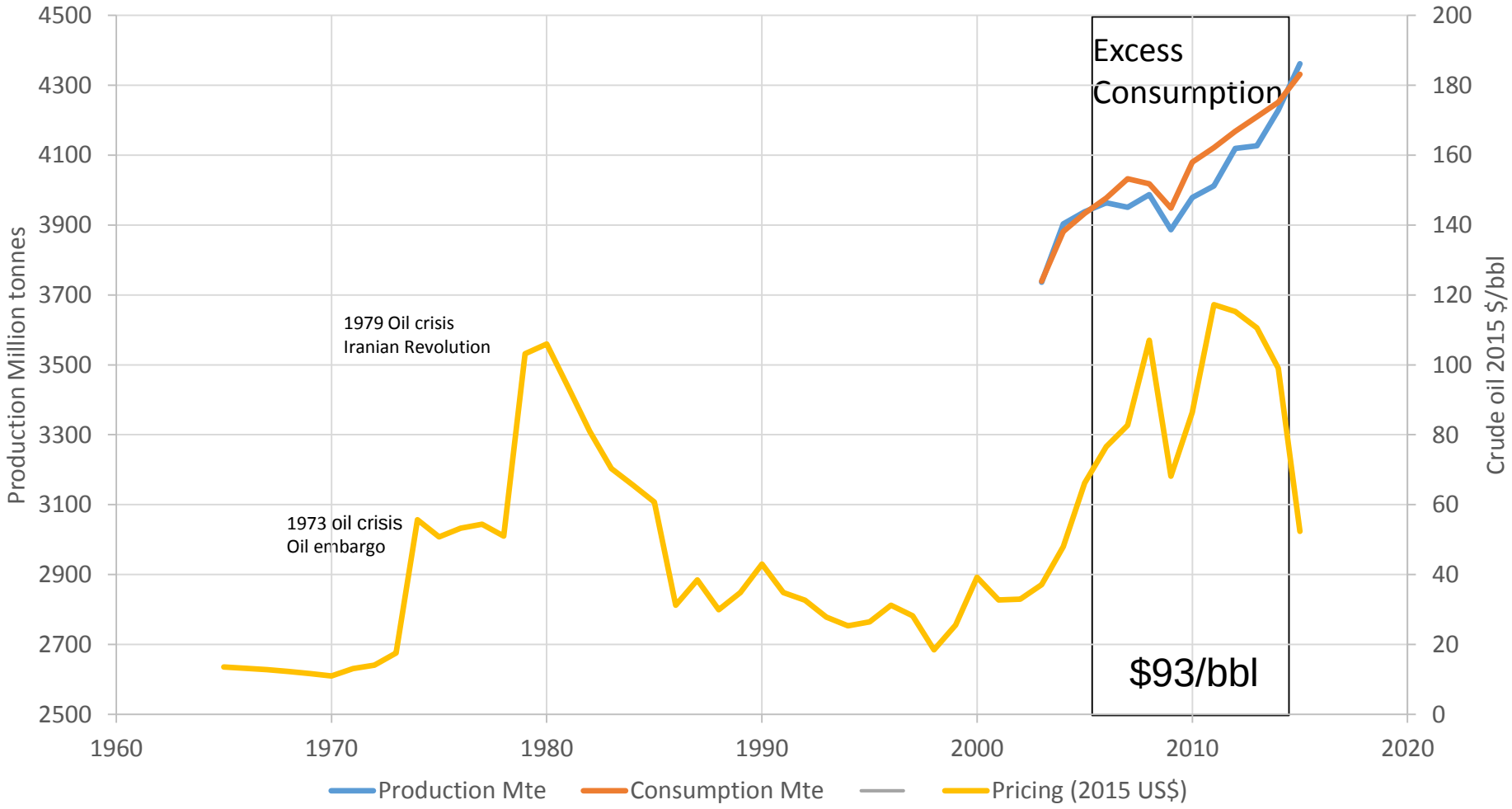
Energy Security/Price

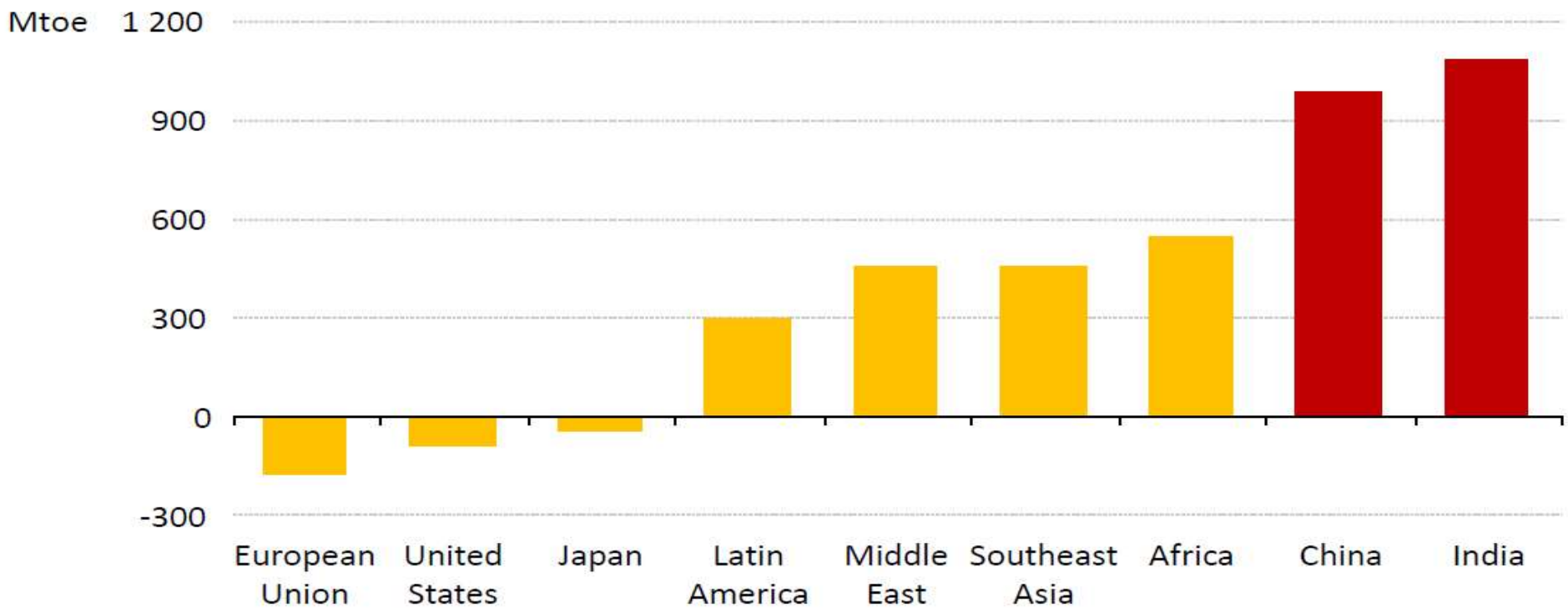


Source: BP Statistical Energy Review 2016

Demand growth in Asia – the sequel

World Energy Outlook 2015

Change in energy demand in selected regions, 2014-2040



By 2040, India's energy demand closes in on that of the United States, even though demand per capita remains 40% below the world average

Benefits of Biofuels in New Zealand

Macro-economic impact of NZ Bioenergy Strategy (30% transport biofuels)

	Gain in 2040 over BAU scenario	
National GDP	$6.1 B	+ 1.2%
Household consumption	$2.6 B	+ 0.9%
Export volumes	$2.2 B	+ 1.5%
Trade balance	$1.9 B	+ 0.2% of GDP
Employment	27,000	+ 1.1%
GHG reduction CO_2-e	11 M tonnes	

NZ$2.6/litre

33,800 litres/job

Source: Nana et al. Preliminary analysis of the economic impact of the New Zealand Bioenergy Strategy (2011) [http://www.bioenergy.org.nz/documents/Homepage/BERL-report-to-BANZ-Preliminary-EIA-of-NZBioenergy-Strategy.pdf]

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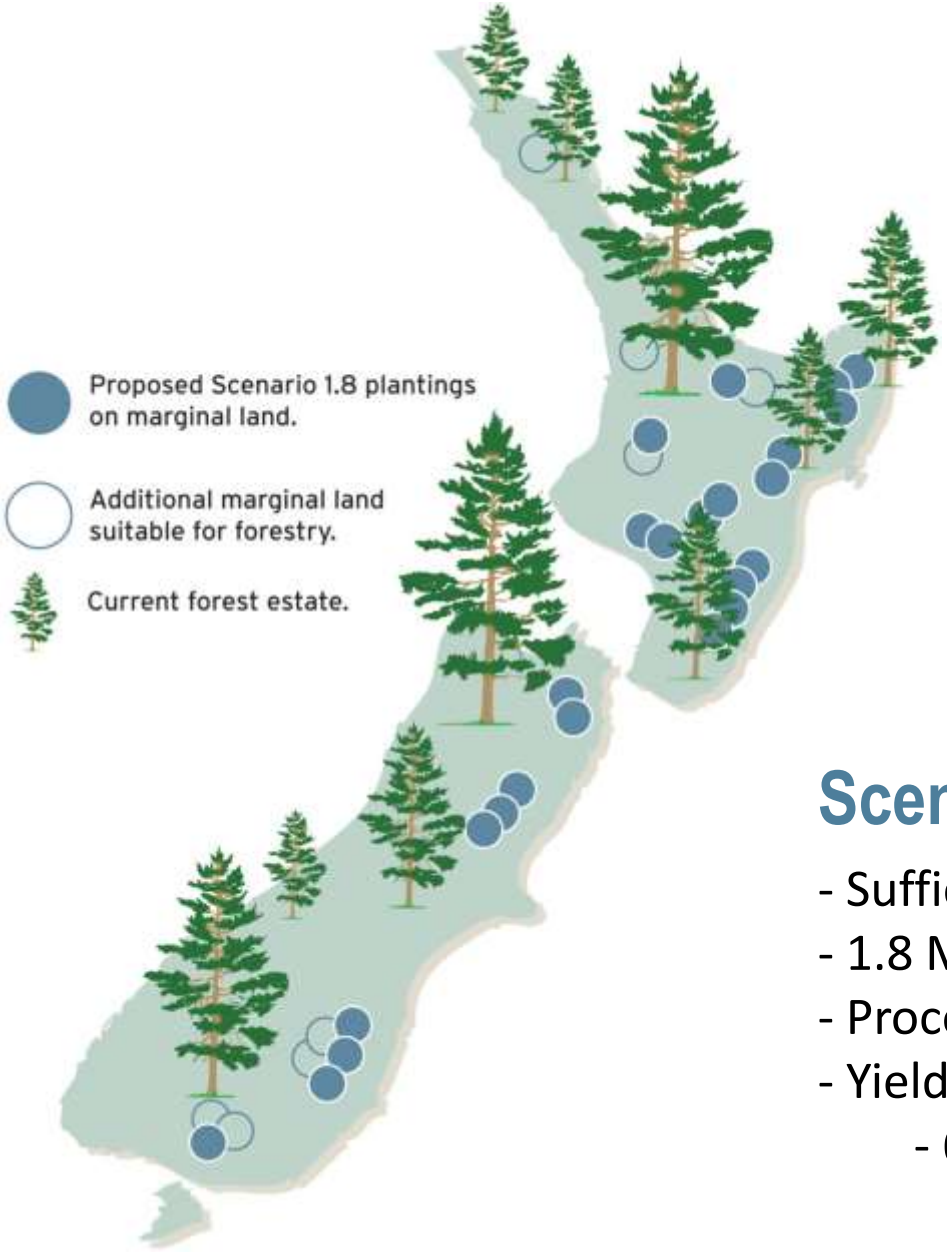
New Zealand's large-scale biofuel opportunity



Scenario 1.8

- Sufficient residues for 6.6% now.
- 1.8 M ha of new forest by 2035
- Process 86,000 odt/day wood
- Yields 6 B litres/y of transport fuel
    - 60% of est. transport fuel needs

Where do we need to go? How do we get there? Roadmap?

Views on Biofuels in NZ

Qualitative Assessment – 26 Stakeholder interviews

Biofuels cannot be automatically assumed to be a positive for social acceptance.

Diverse views follow whether liq. biofuels will substitute jet, diesel or marine industries.

No clear main enablers are standing out at the moment.

Economics is agreed to be the main hurdle followed by technology.

Government is seen as a follower - Industry needs to drive initiatives and prove their feasibility.

Stakeholders were quite keen to work systematically through a plausible scenario.

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The Risks for not acting

Carbon Footprint/Intensity of key export products (and Tourism) makes New Zealand products unattractive to Global Community

Management of GHG emissions from International transport cannot be serviced locally, resulting in a New Zealand being sidelined.

Unable to meet International commitments (eg COP21) on GHG emissions results in severe disruptions in key sectors eg transport

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