

Research and Development Strategies

Michael Jack, Senior Scientist – 9th February 2010



Strategic approach to research in NZ

Principles for NZ funded research:

1. Pursue the opportunity that provides greatest overall benefits for NZ
1. Link to overseas research that could be adapted to New Zealand, rather than duplicating this work.

New Zealand's Energy Future

- Electricity ✓

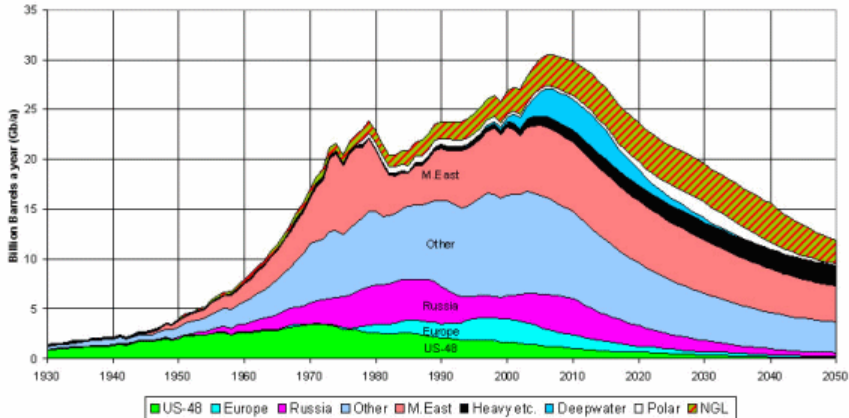


- Heat ?



- Transport ?

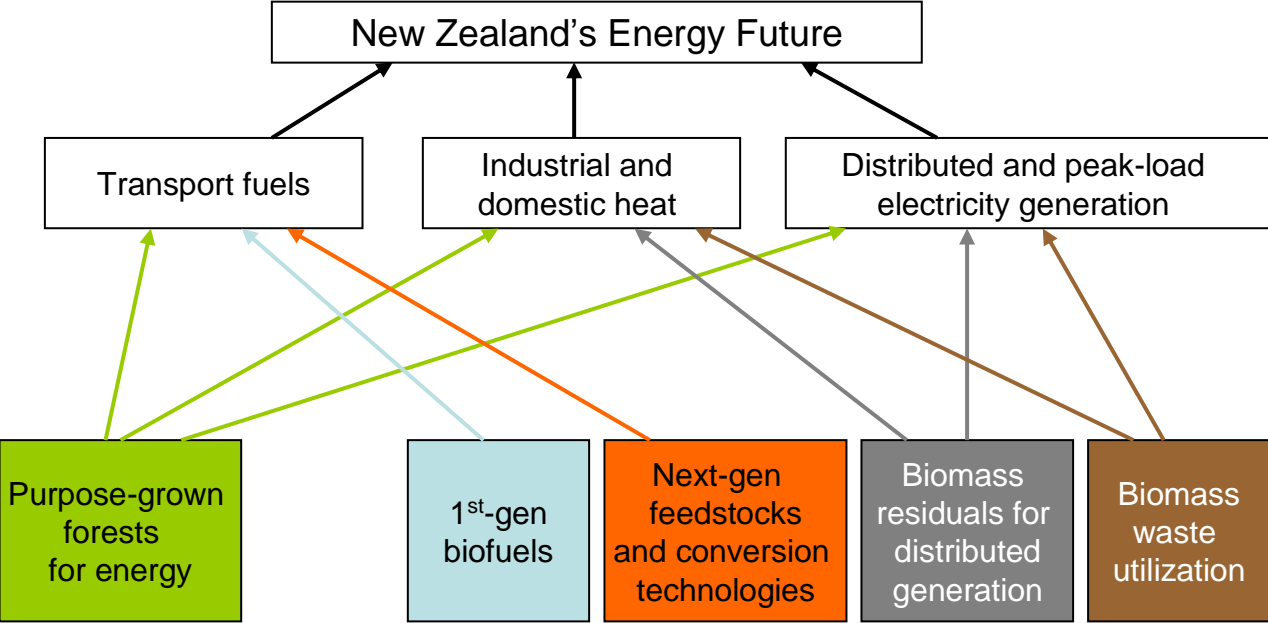
OIL AND GAS LIQUIDS
2004 Scenario



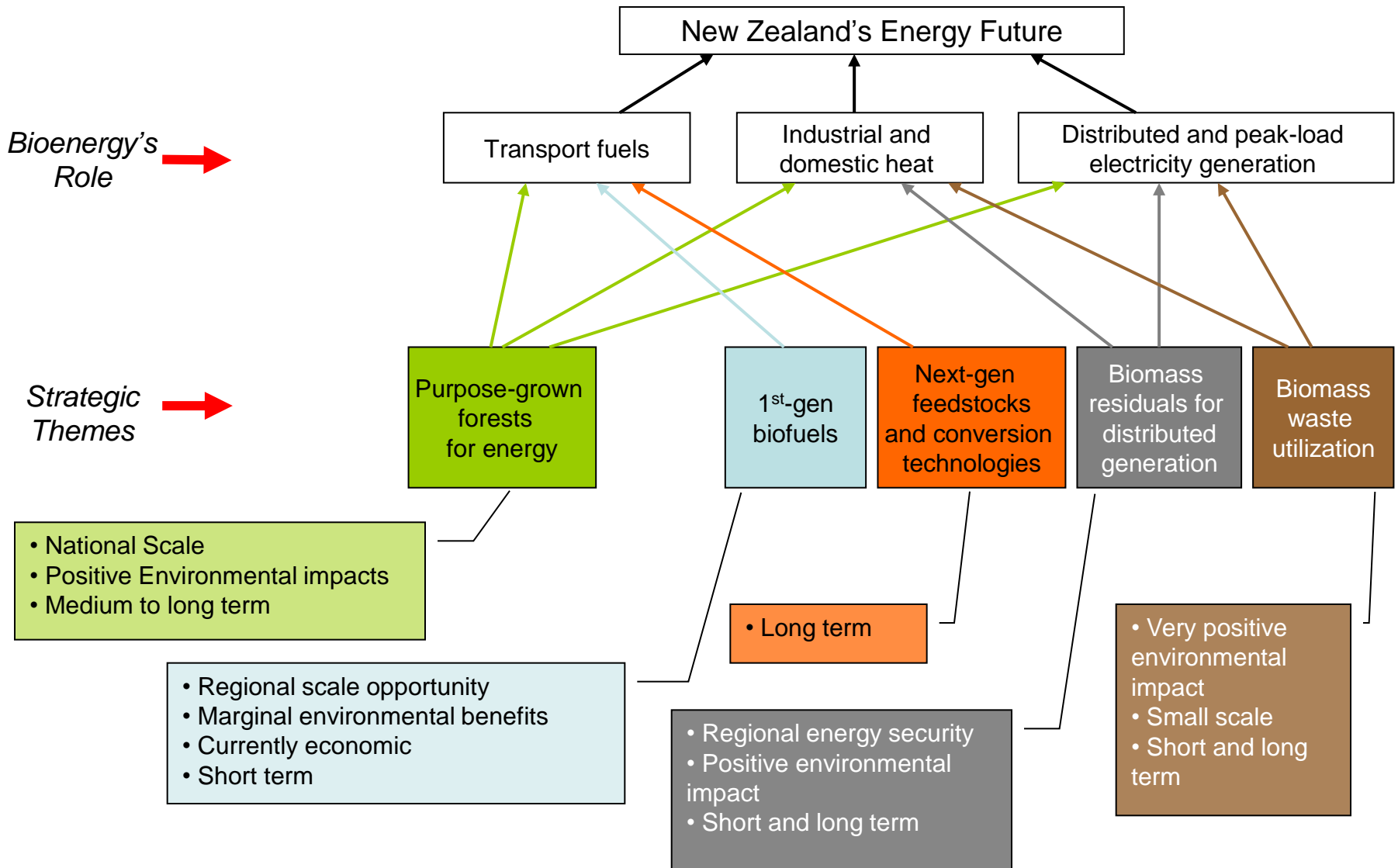
Bioenergy's role in New Zealand

Bioenergy's Role →

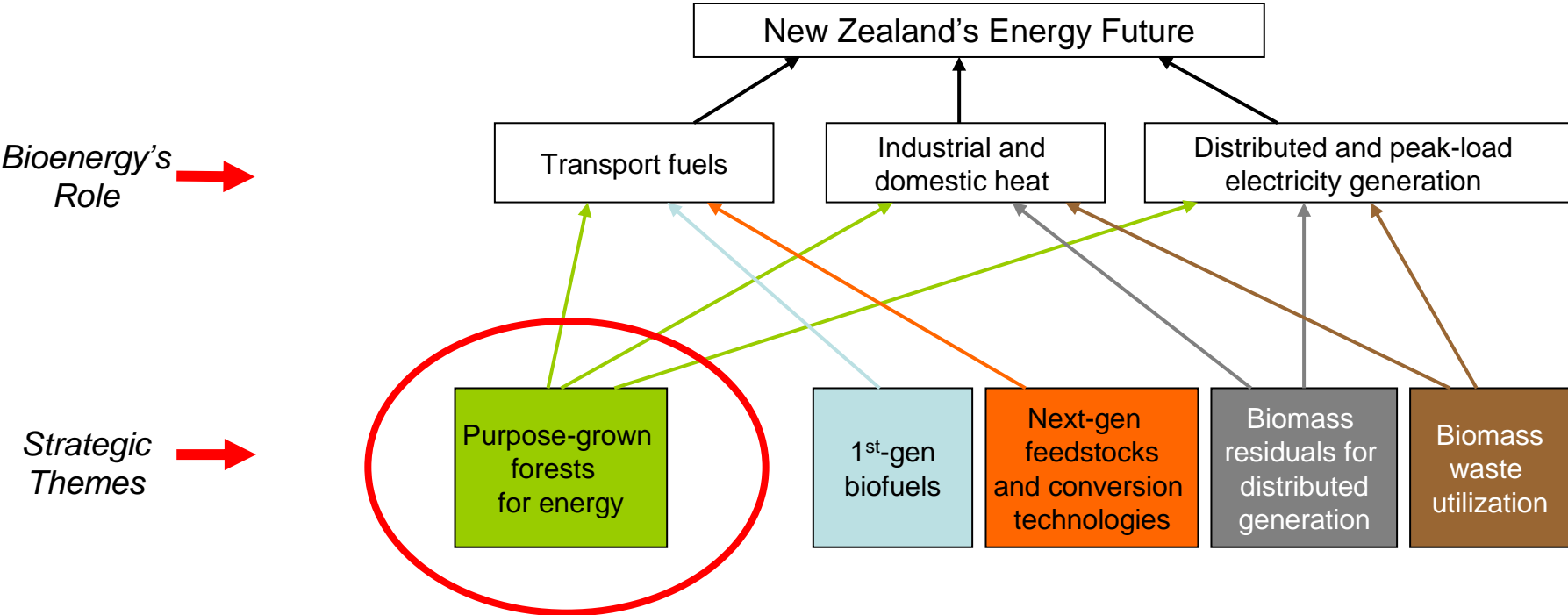
Strategic Themes →



Strategic directions

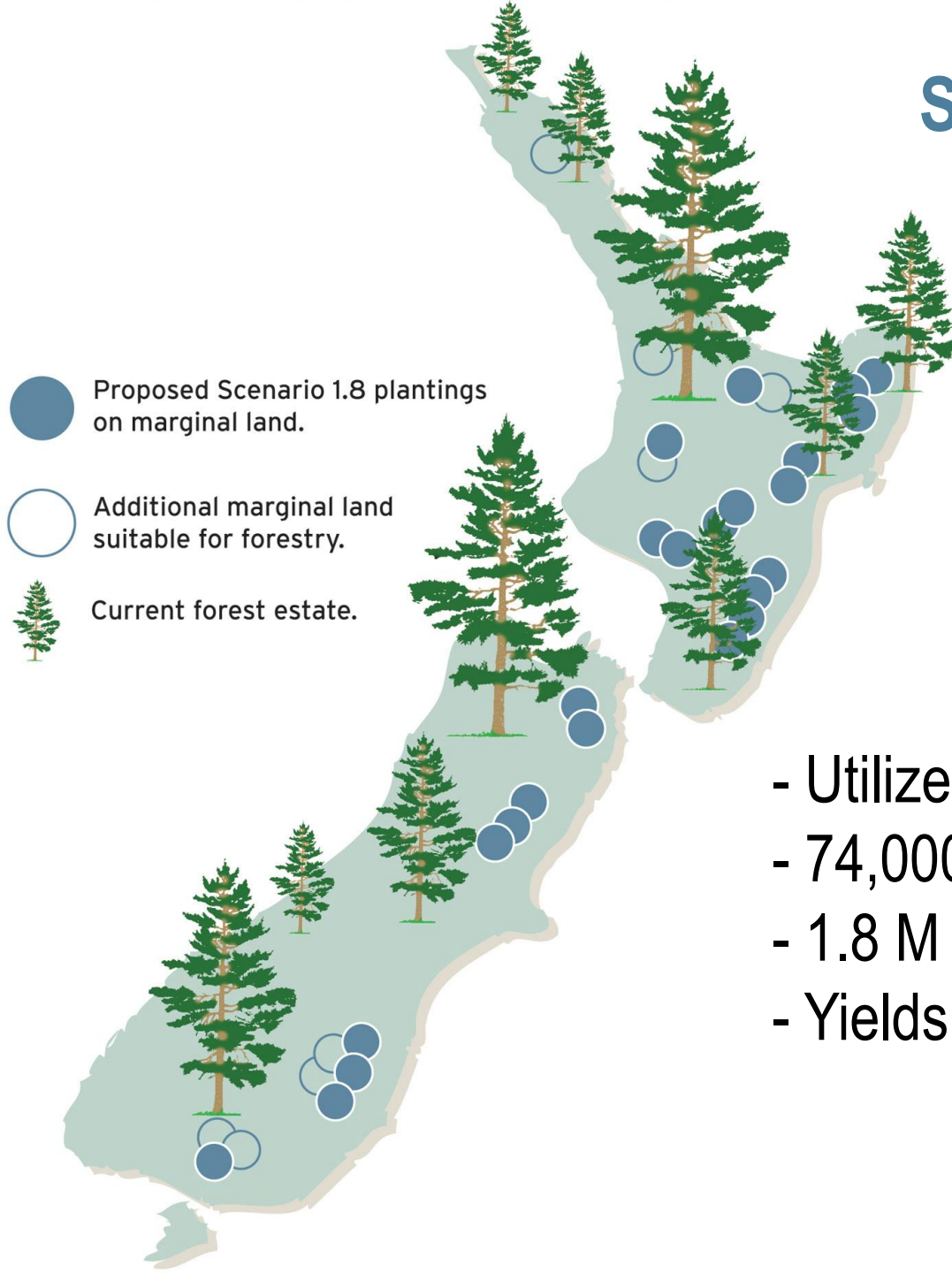


Focus on purpose-grown forests



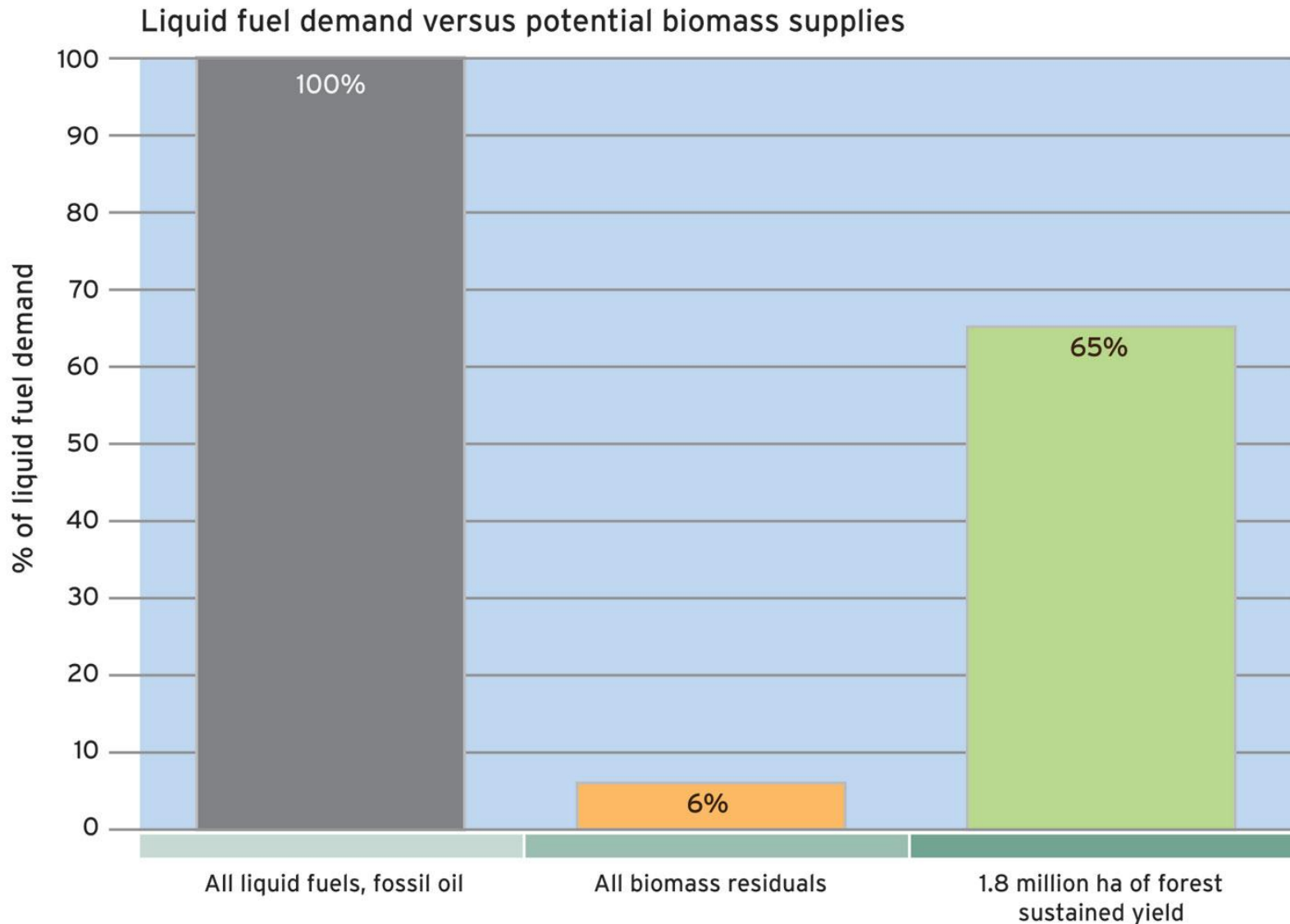
Focus area. Why?

Scenario 1.8

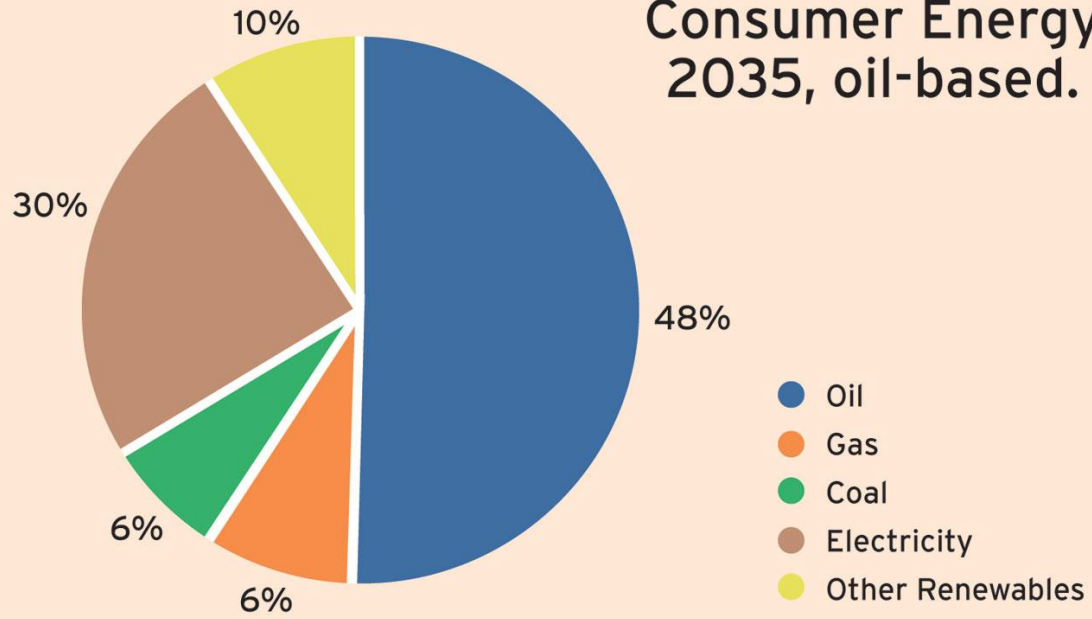


- Utilize marginal land
- 74,000 ha/y new forest
- 1.8 M ha of new forest by 2035
- Yields 6 M litres/y of transport fuel

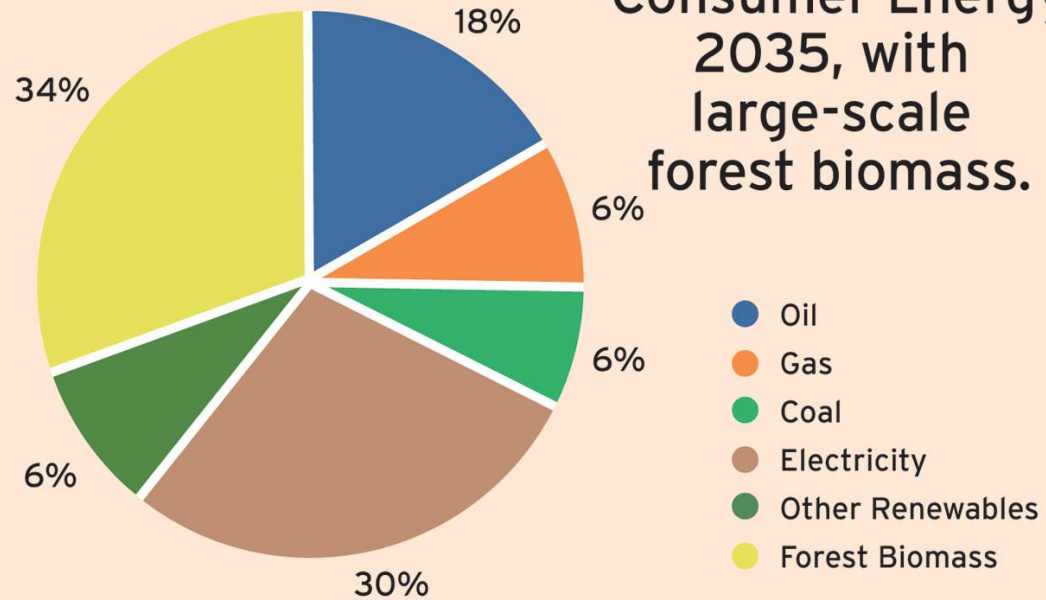
Scenario 1.8 is a large-scale transport-fuel opportunity



**Consumer Energy
2035, oil-based.**



**Consumer Energy
2035, with
large-scale
forest biomass.**

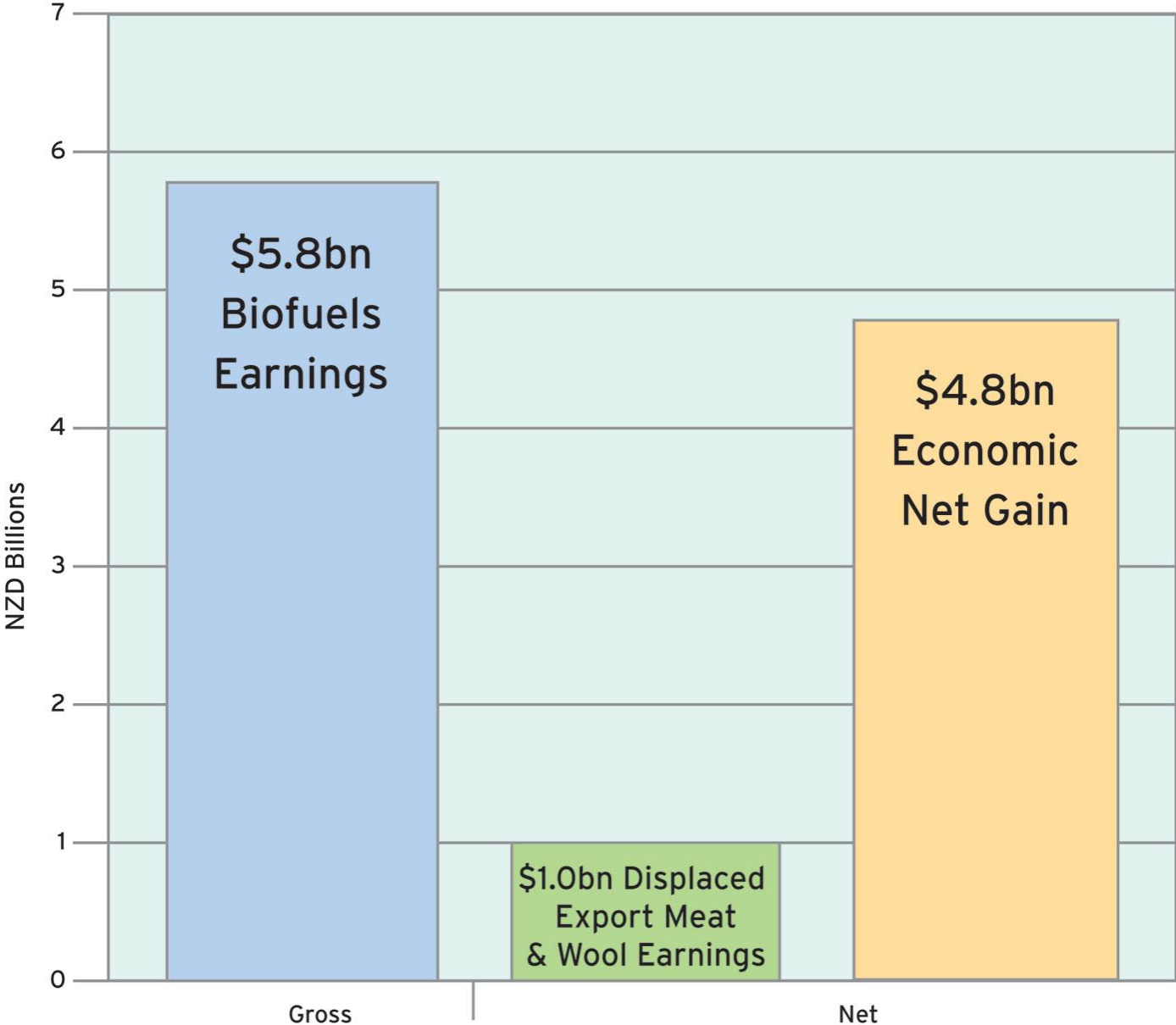


Scenario 1.8 utilizes marginal land

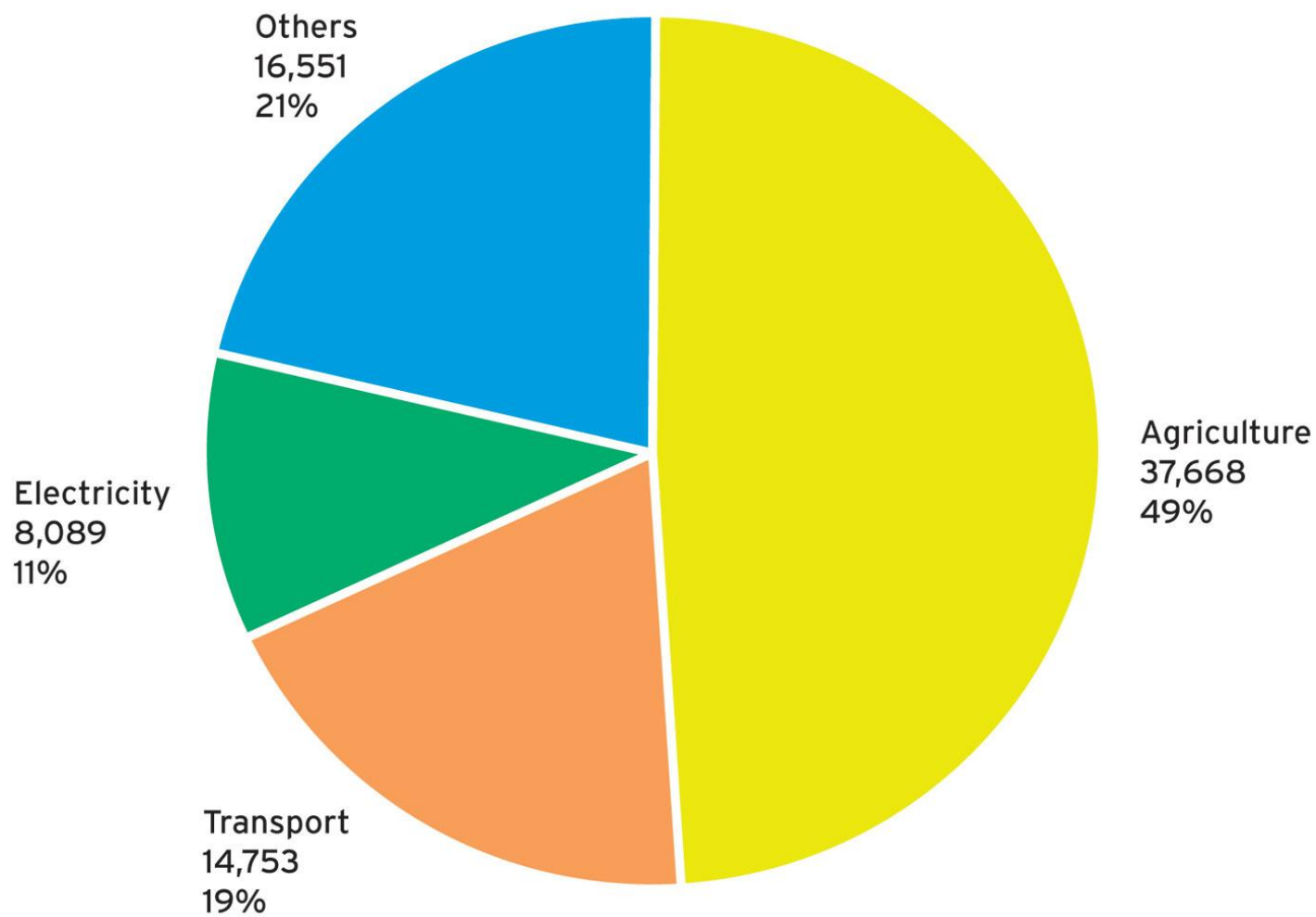


72% of marginal land yielding less than \$100/ha can produce 65% of New Zealand's projected fuel demand

Biofuel production improves terms of trade.

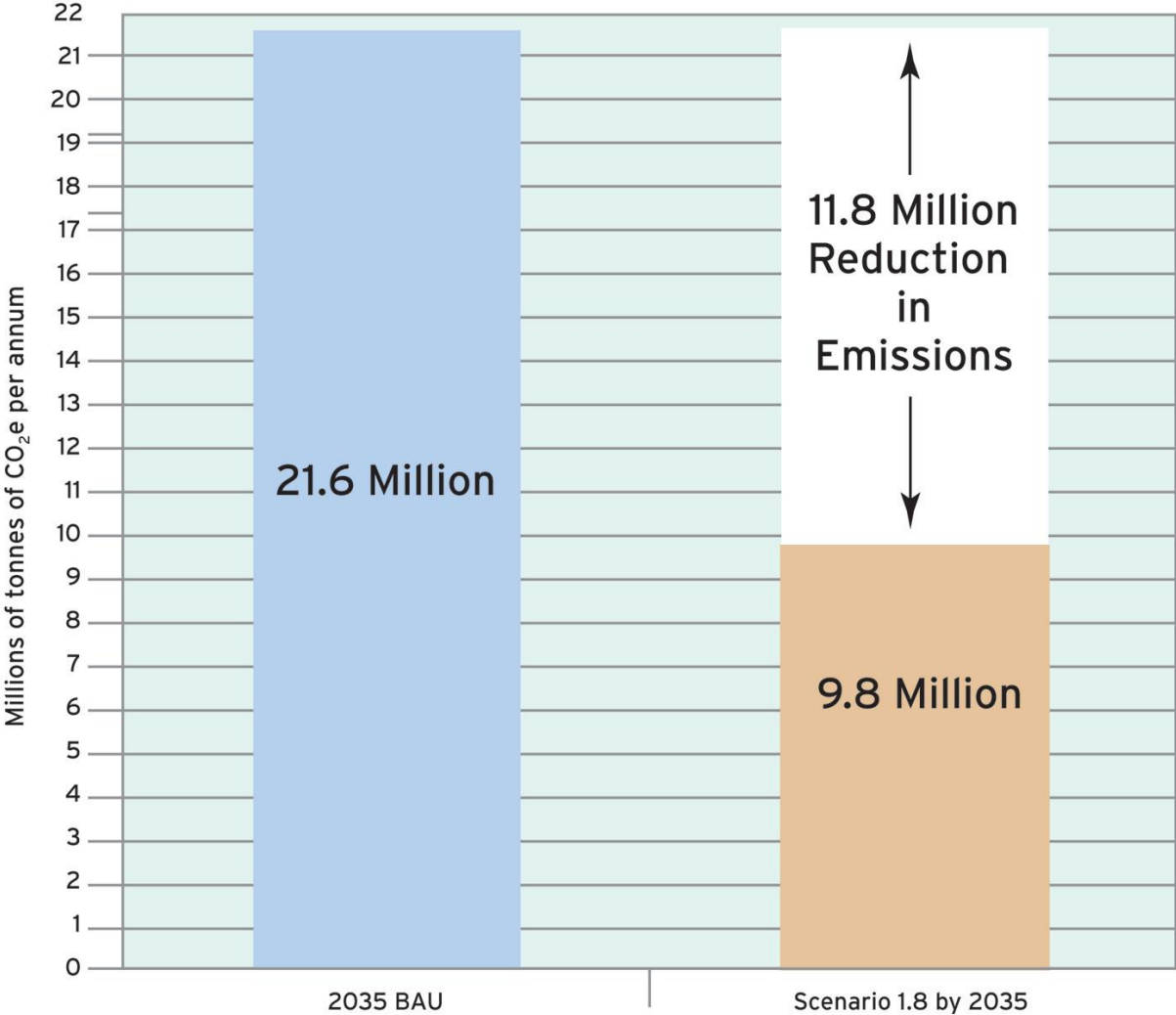


Green house gas emissions, kt CO₂e, 2006



Scenario 1.8 reduces transport emissions by 45%

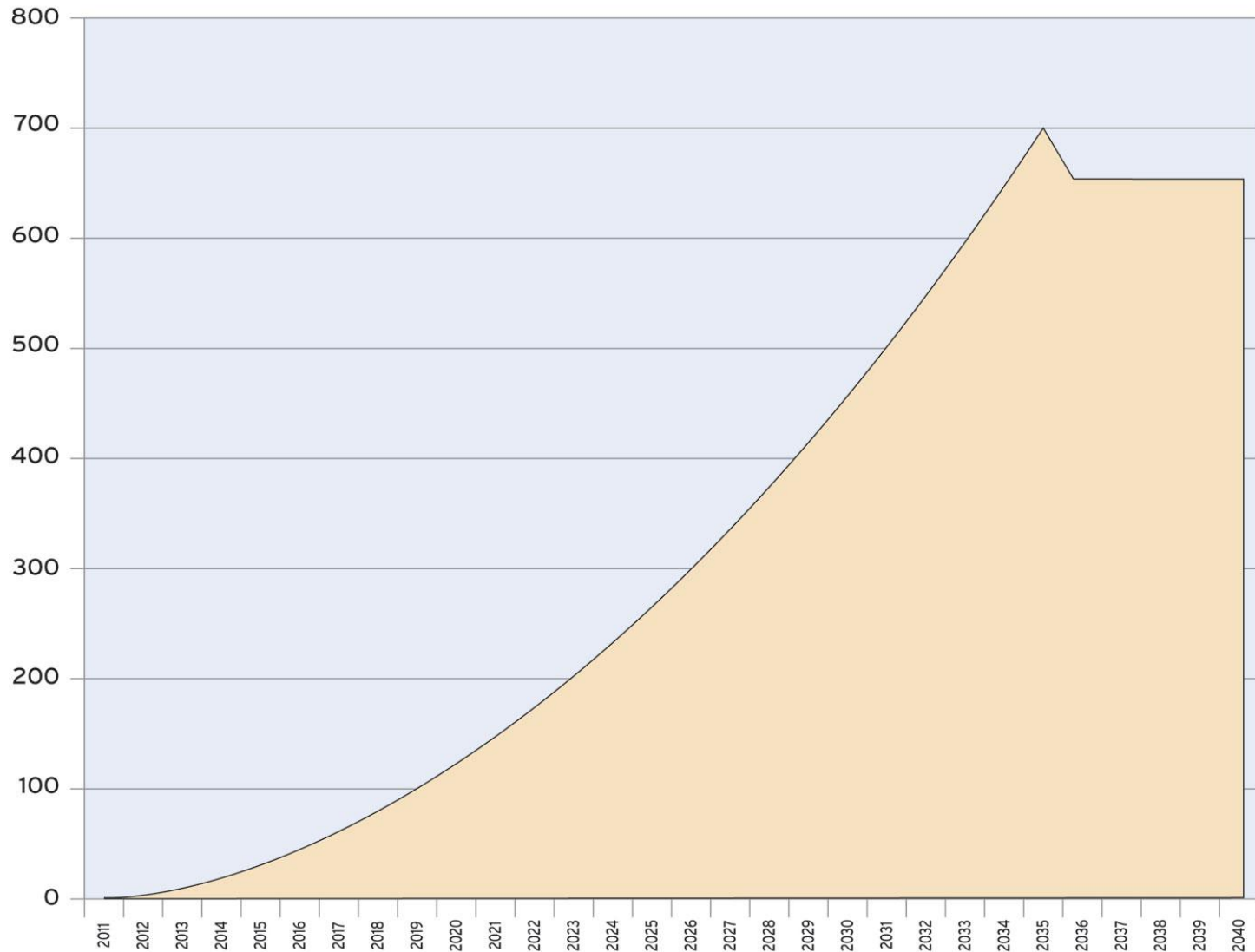
Transport GHG Emissions Profile.



Reference - Ministry of Economic Development, New Zealand's Energy Outlook 2009.

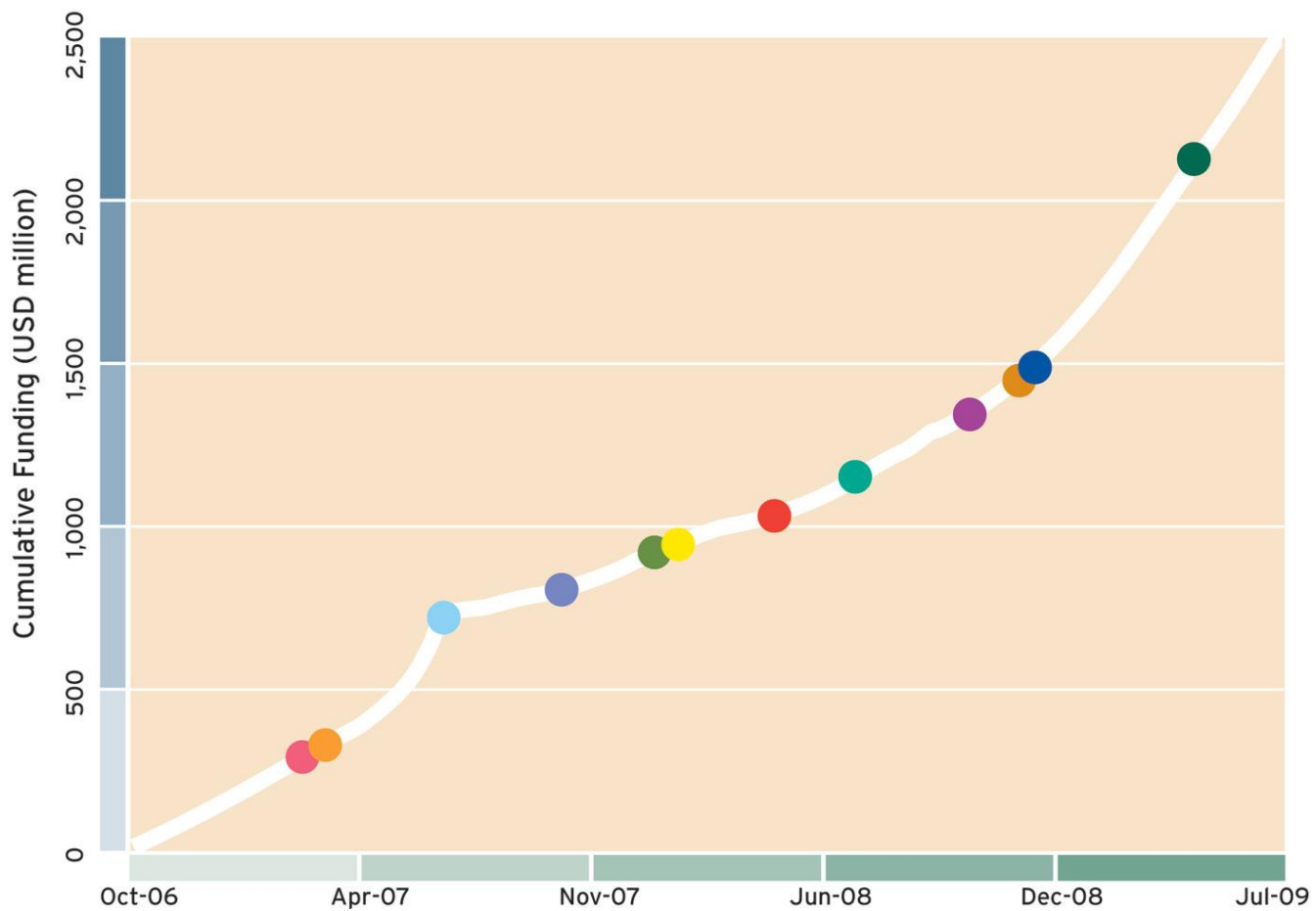
Scenario 1.8 Increases Carbon Stocks

CO₂e Millions of tonnes, per annum.

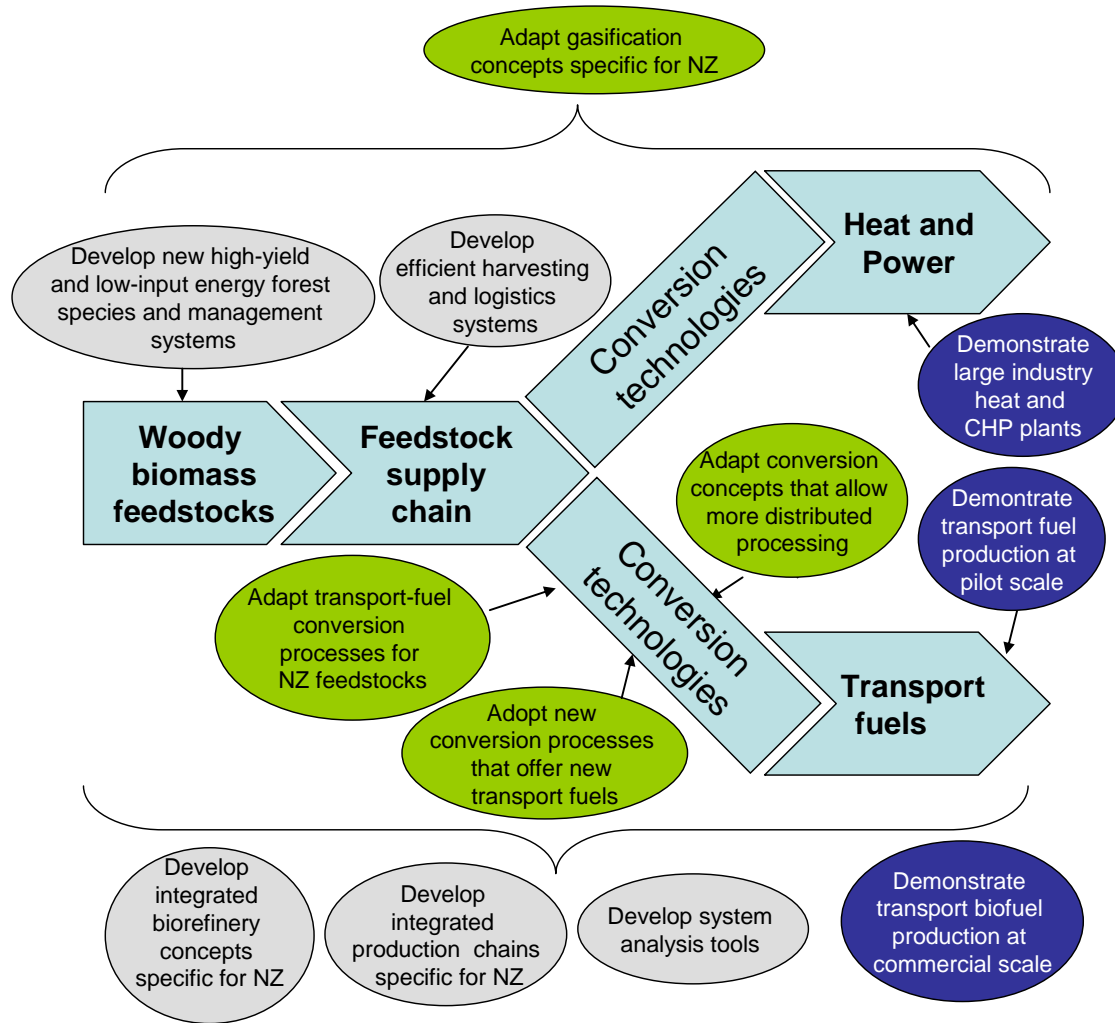


Scenario 1.8 leverages international R&D

US Department of Energy and US Department of Agriculture funding for lignocellulosic biofuels.



Adapt conversion technologies



○ New Zealand Lead

● Fast Adapter

● Demonstration/Implementation

Summary of Scenario 1.8

- Net economic gain of \$4.8 billion
- Reduction in imported oil by 60%
- Reduction in transport emissions by 45% and a gain in carbon stocks of 651 M tonnes of CO₂-e
- Other environmental benefits (erosion, water quality)
- Opportunity to leverage international R&D for NZ benefit

Next steps

- What will the industry look like that takes up this opportunity?
- What is the government's role?