NZ Energy Scenarios TIMES-NZ 2.0 Industrial Sector

2 July 2021

NZ Energy Scenarios TIMES-NZ 2.0

Our work at EECA included creating the data structure, data inputs, modelling, and analysis of the results.

NZ Energy Scenarios TIMES-NZ 2.0

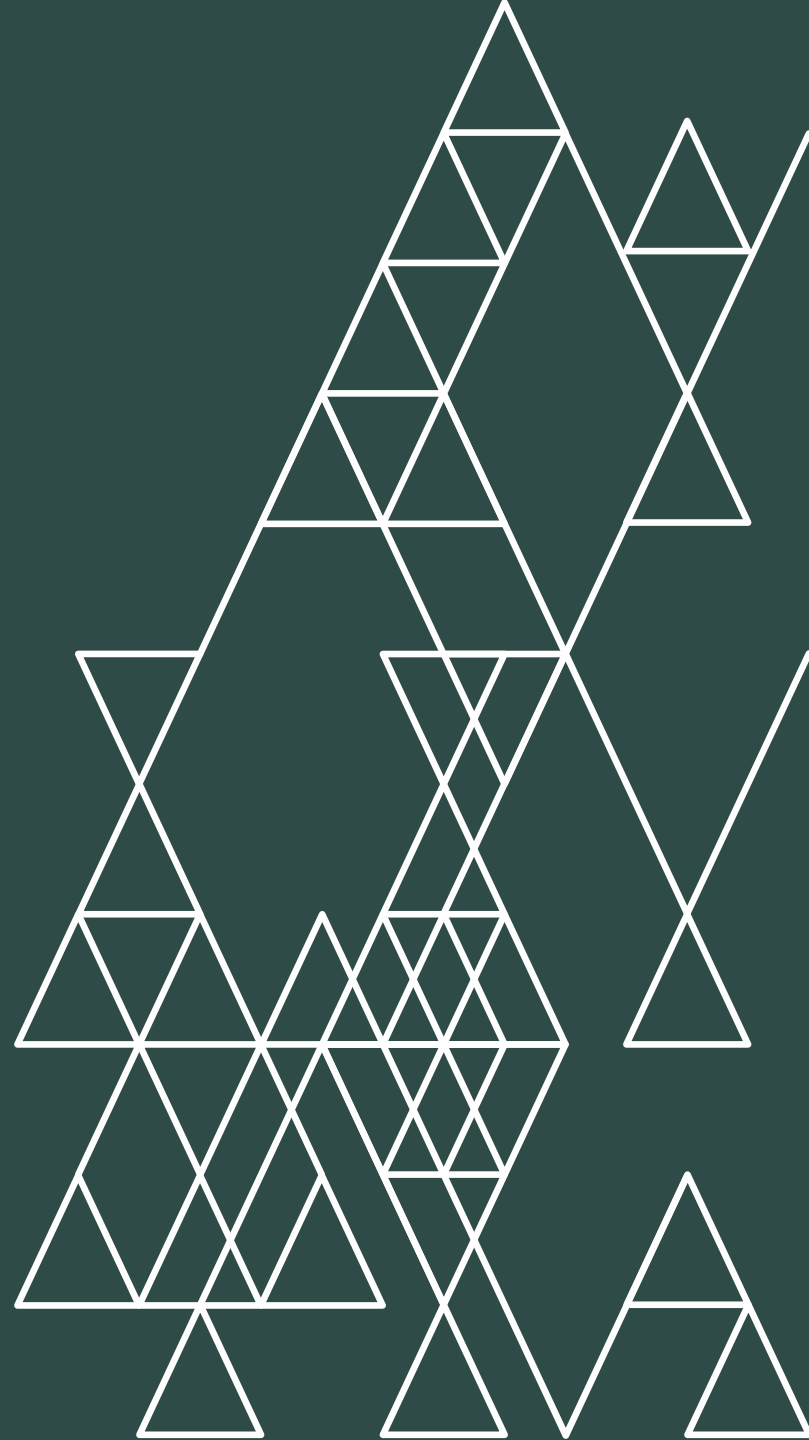
Kea

Kea represents a scenario where climate change is prioritised as the most pressing issue and New Zealand deliberately pursues cohesive ways to achieve a low-emissions economy.

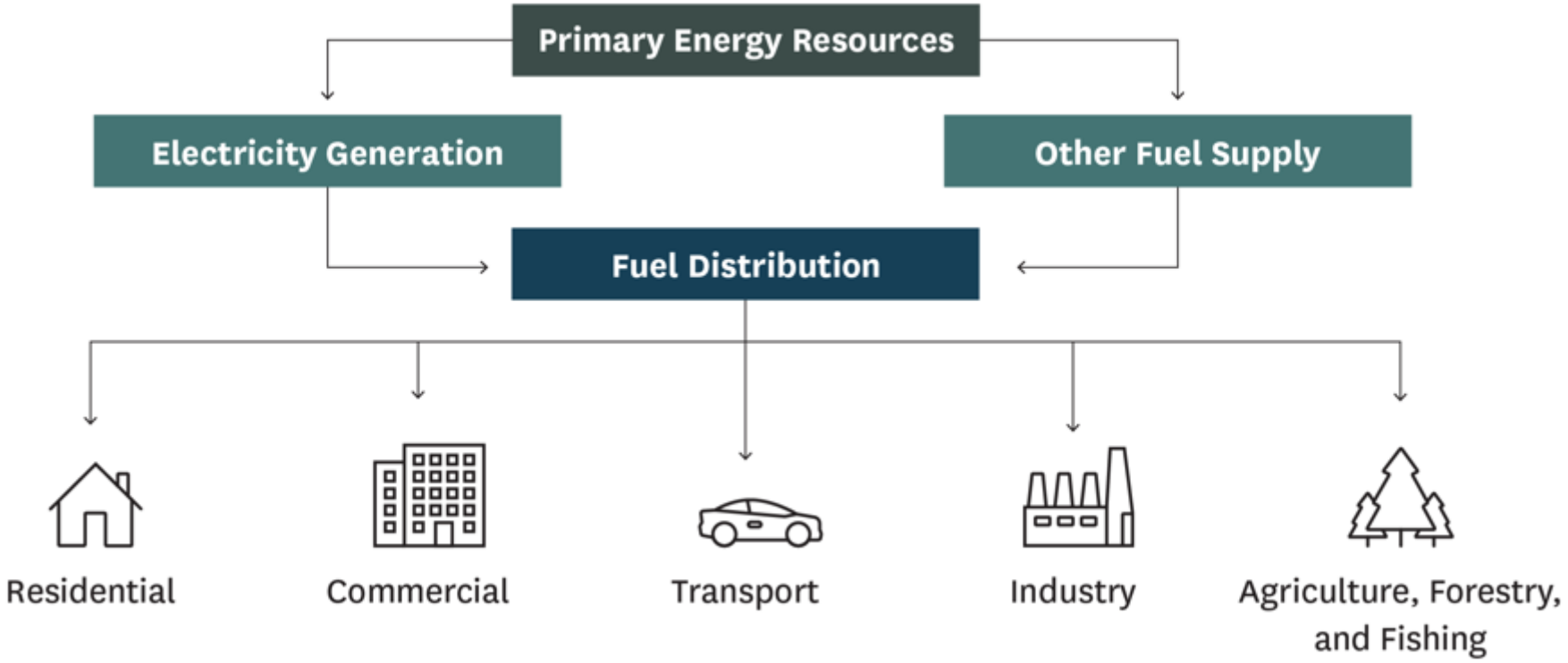
Tūī

Tūī represents a scenario where climate change is an important issue to be addressed as one of many priorities, with most decisions being left up to individuals and market mechanisms.

TIMES-NZ Overview



TIMES-NZ 2.0 Model Structure



TIMES-NZ 2.0 Model Structure

Residential

Detached Dwellings
Joined Dwellings

Commercial

Education
Healthcare
Office blocks
Warehouses Supermarkets and Retail (WSR)
Other

Transport

Light road
Heavy road
Aviation
Shipping
Rail

Industry

Aluminium
Construction
Dairy Product Manufacturing
Food Processing
Iron/Steel Manufacturing
Meat Processing
Metal Product Manufacturing
Methanol Production
Mineral Production
Mining
Petroleum/Chemicals
Refining of petroleum products
Urea Production
Wood Product Manufacturing
Wood Pulp and Paper Processing

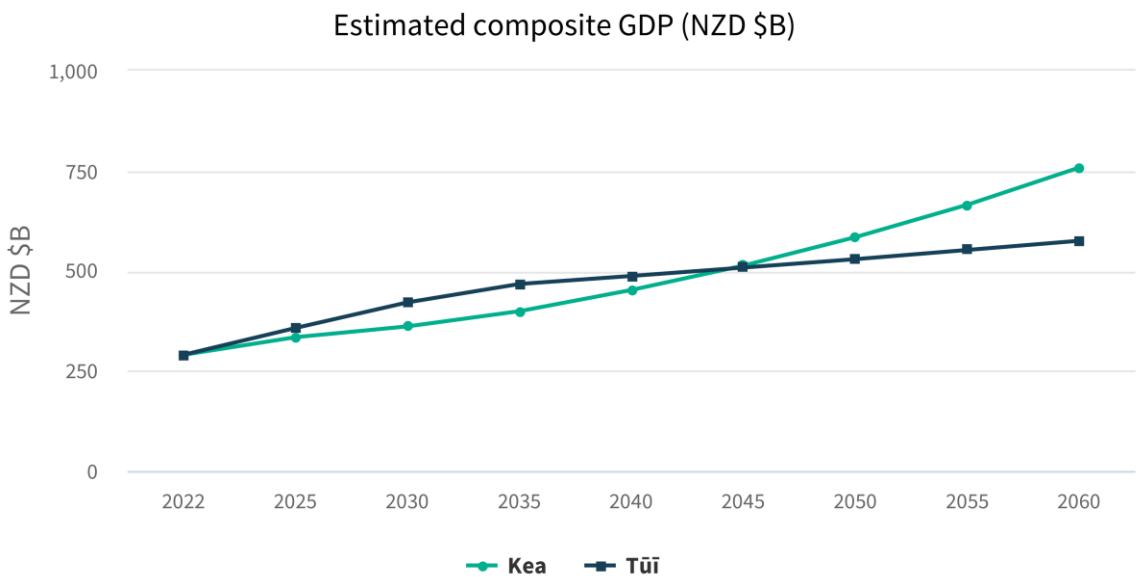
Agriculture, Forestry, and Fishing

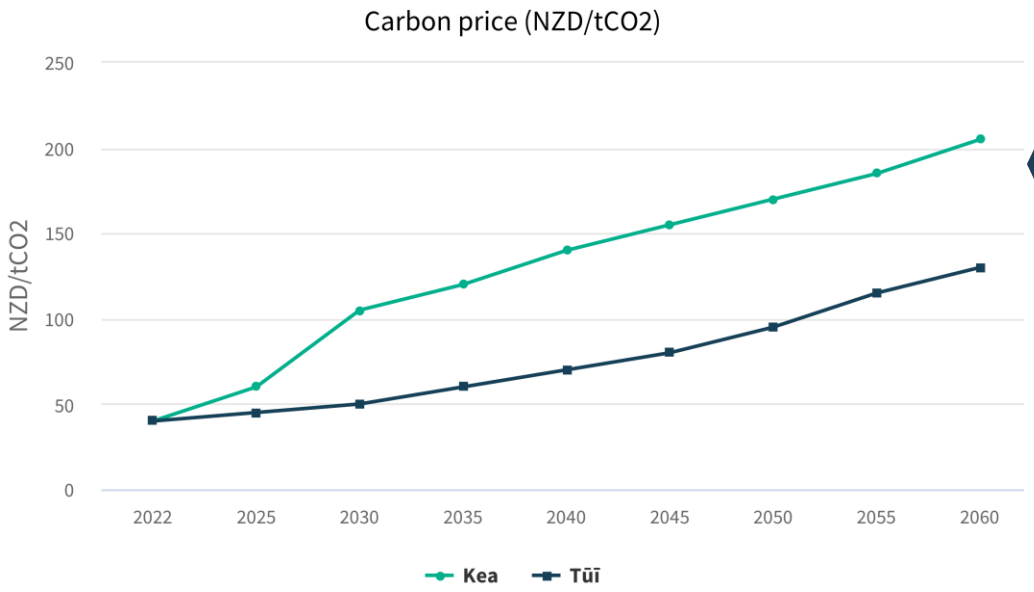
Dairy Farming
Livestock Farming
Outdoor Horticulture & Arable Farming
Indoor Cropping
Forestry
Fishing

EECA's Energy End Use Database (EEUD) provides a greatly improved input dataset for describing demand sectors.

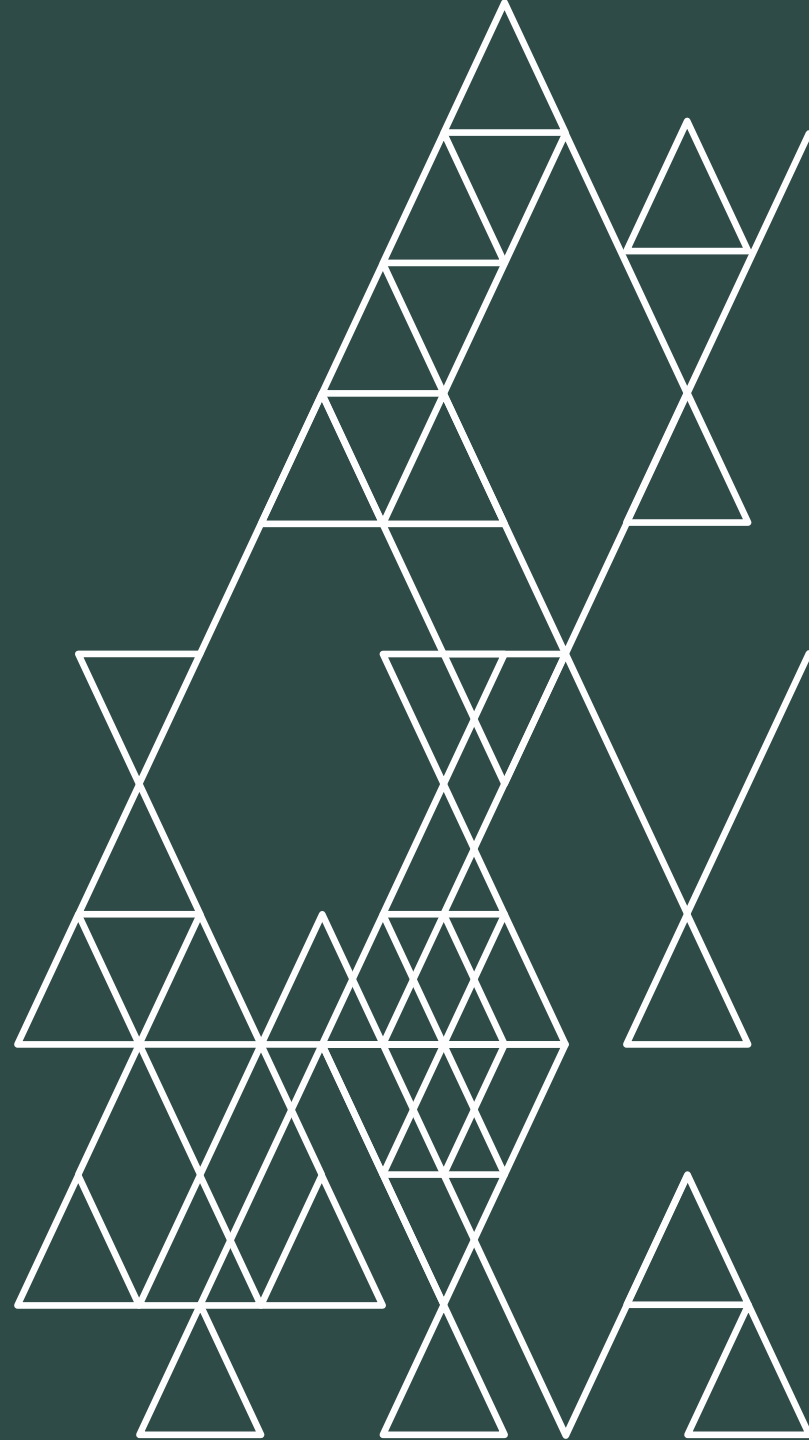
Scenario Parameters

The key model input differences between Kea and Tūī are:





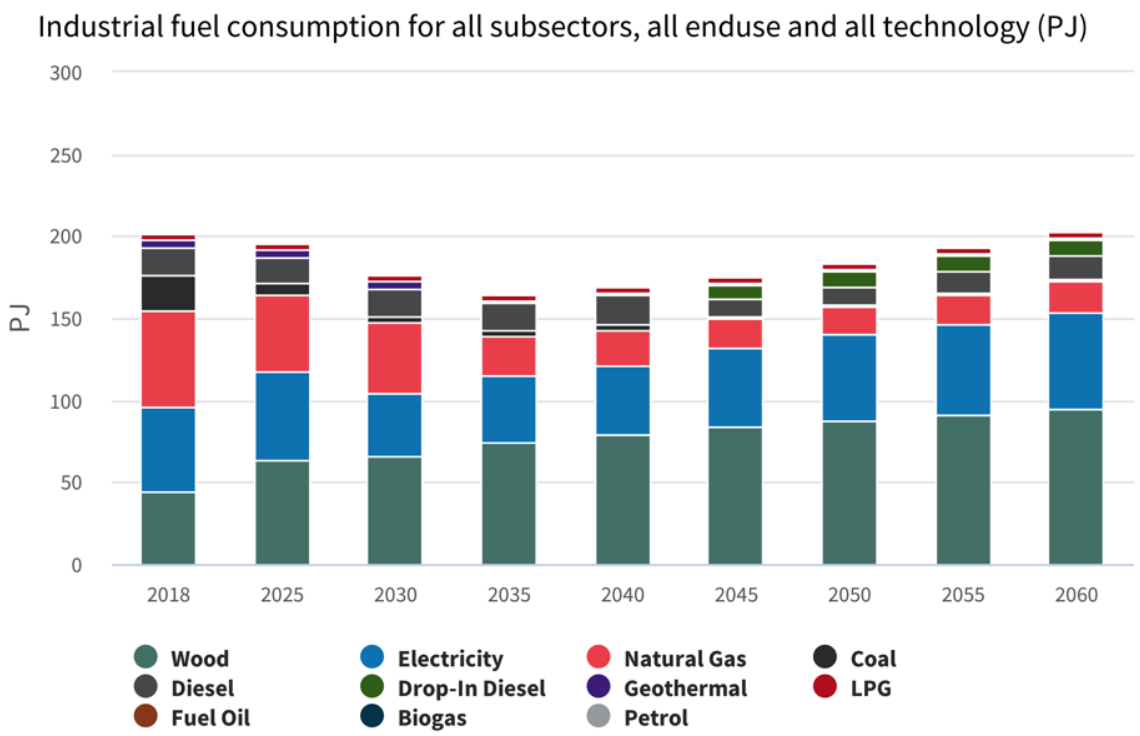
Industrial Sector Overview



Industry

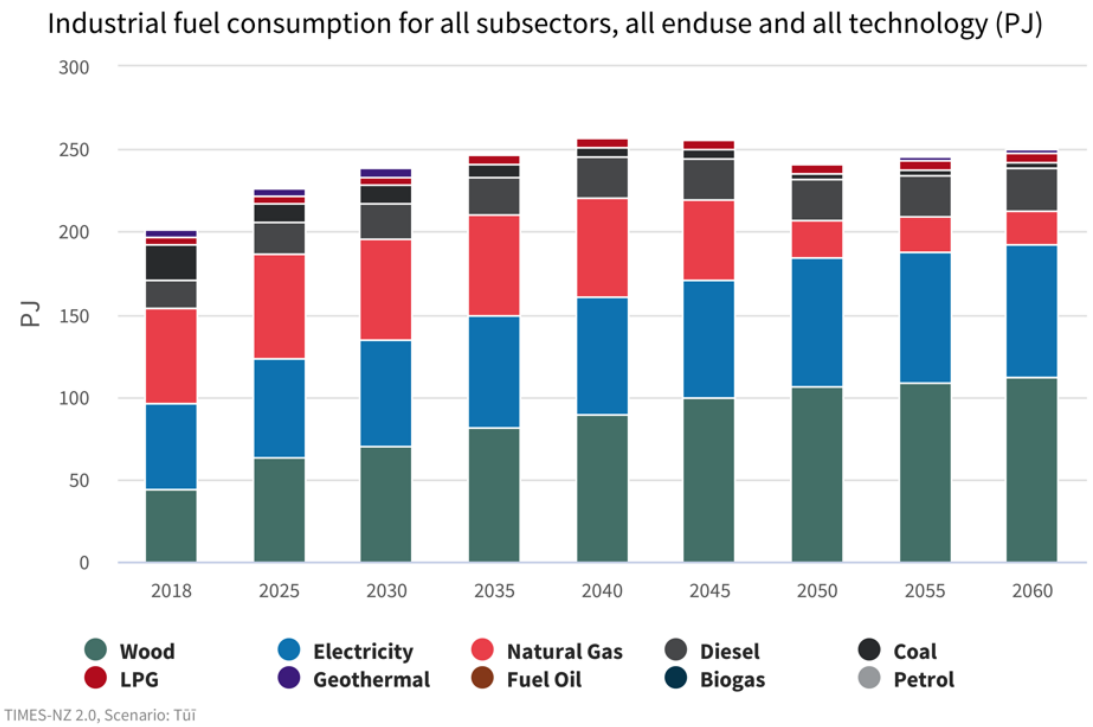
What fuels might industry use?

Kea



TIMES-NZ 2.0, Scenario: Kea

Tūī



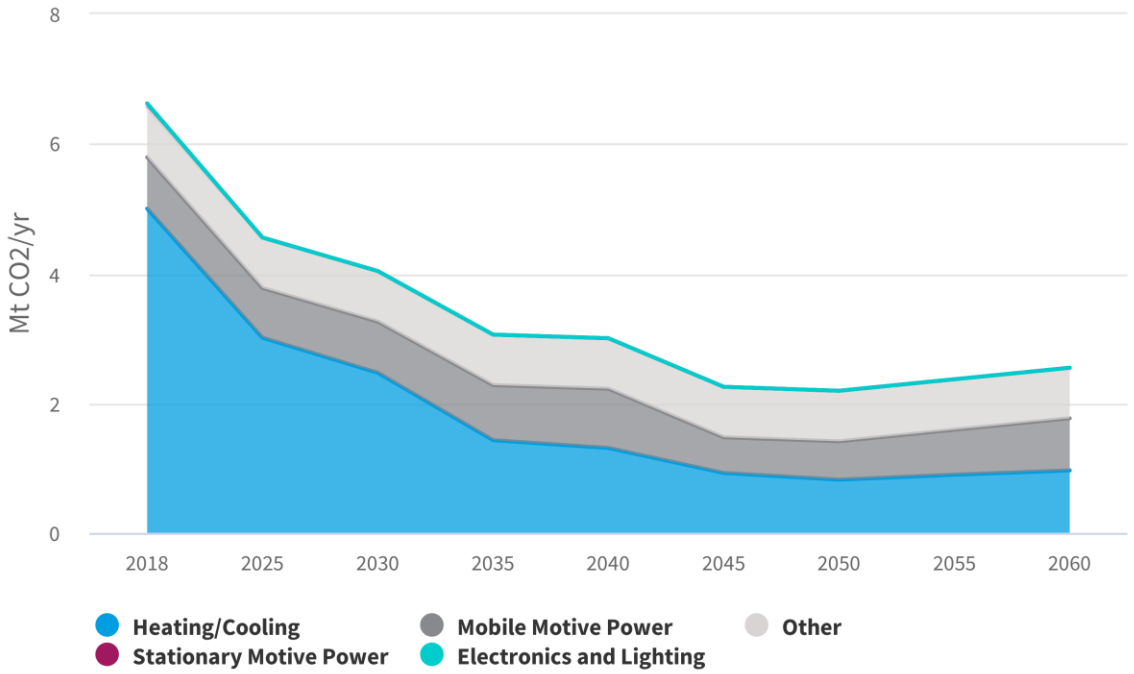
TIMES-NZ 2.0, Scenario: Tūī

Industry

What technologies decarbonise more readily?

Kea

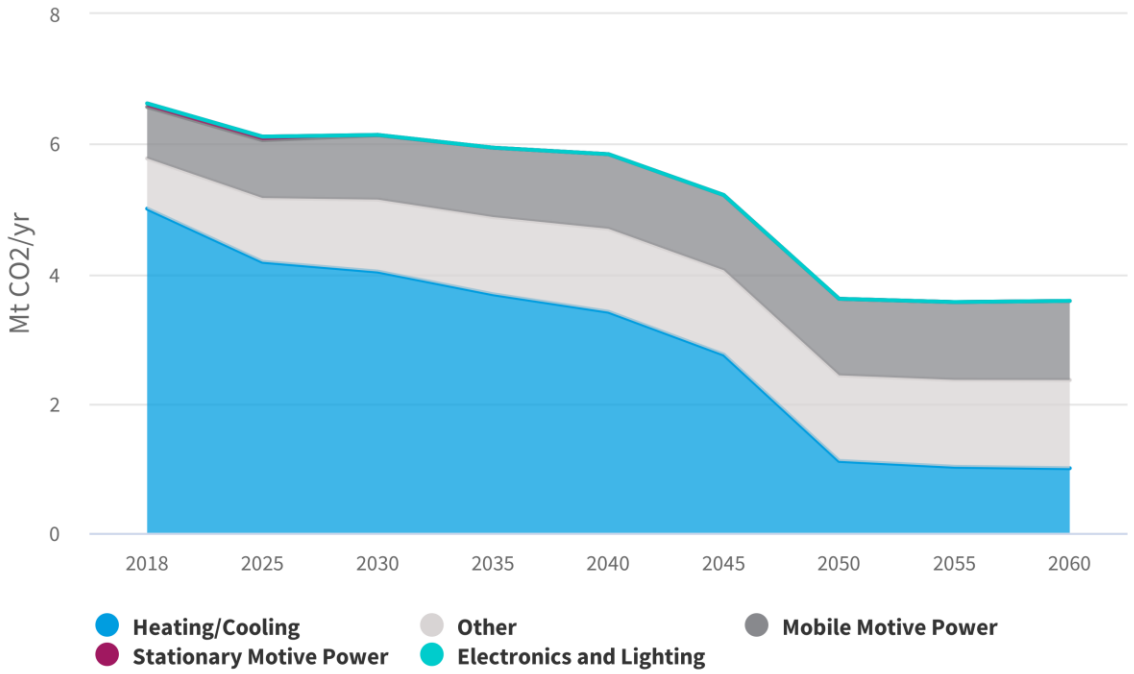
Industrial emissions for all subsectors, all end use and all technology (Mt CO2/yr)



TIMES-NZ 2.0, Scenario: Kea

Tūī

Industrial emissions for all subsectors, all end use and all technology (Mt CO2/yr)

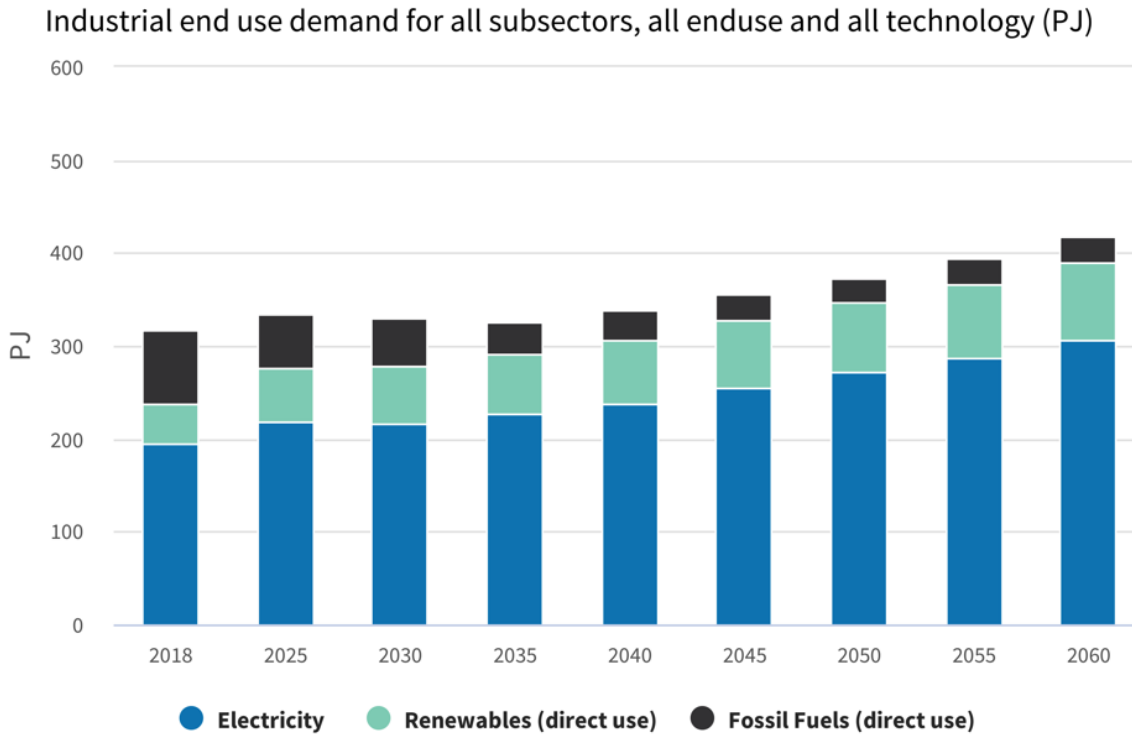


TIMES-NZ 2.0, Scenario: Tūī

Industry

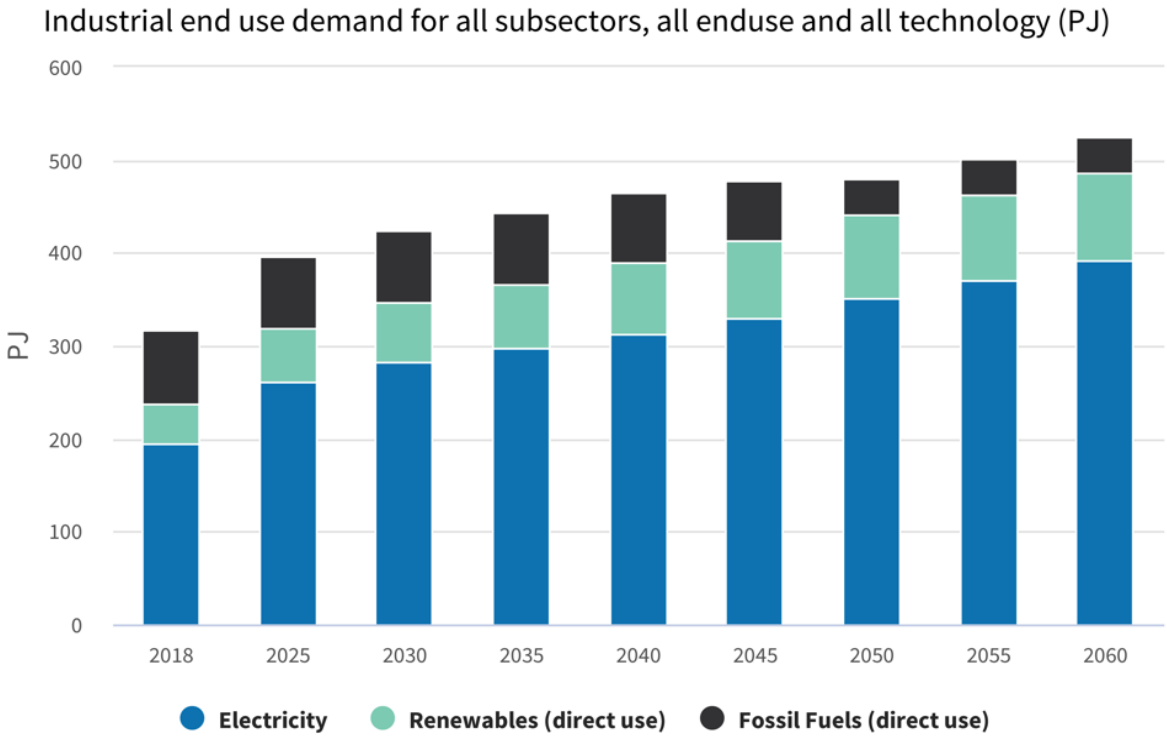
What might industrial demand look like?

Kea



TIMES-NZ 2.0, Scenario: Kea

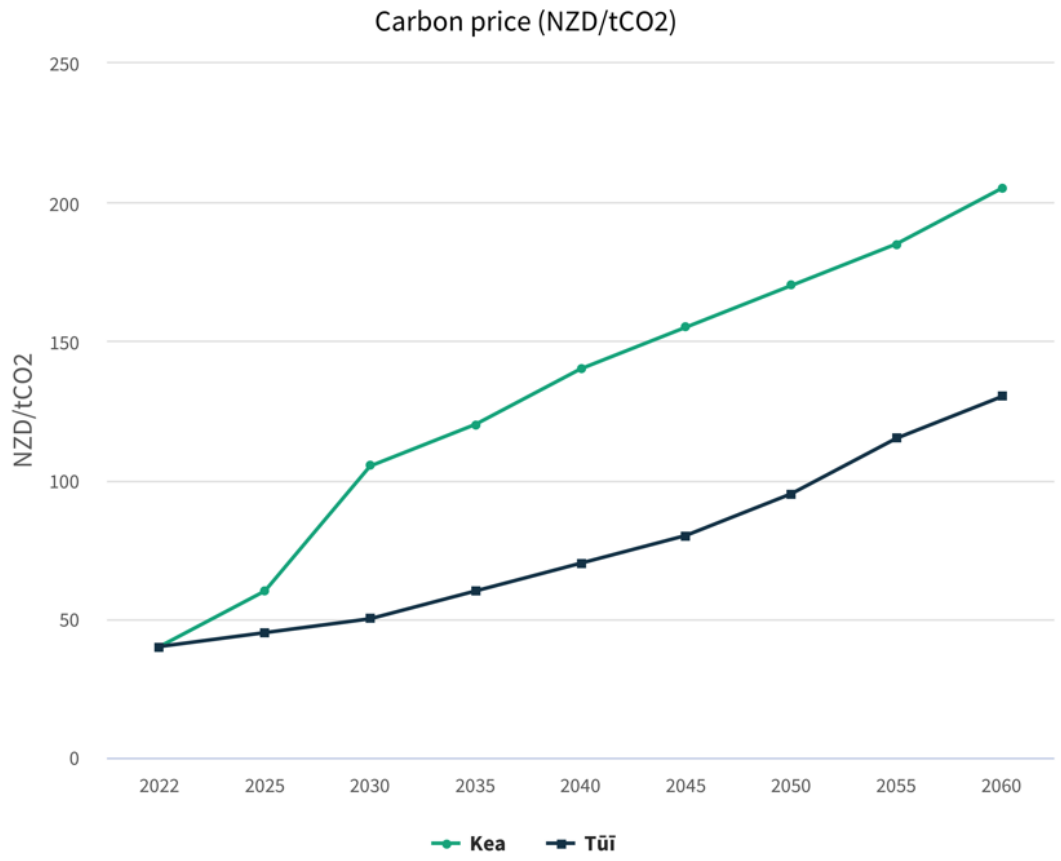
Tūī



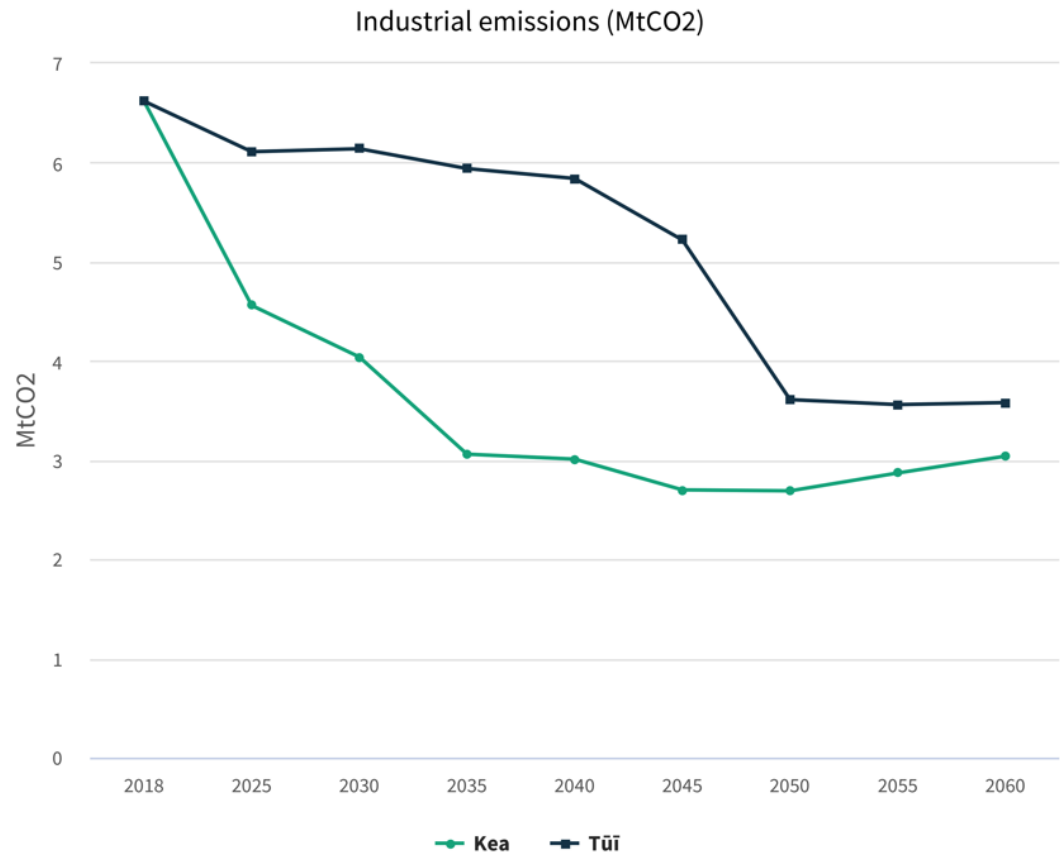
TIMES-NZ 2.0, Scenario: Tūī

Industry

What are the choices?



TIMES-NZ 2.0



TIMES-NZ 2.0

Industry Subsectors

TIMES-NZ 2.0 Model Structure

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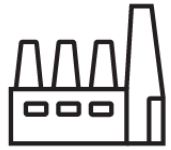

Industry

Aluminium
Construction
Dairy Product Manufacturing
Food Processing
Iron/Steel Manufacturing
Meat Processing
Metal Product Manufacturing
Methanol Production
Mineral Production
Mining
Petroleum/Chemicals
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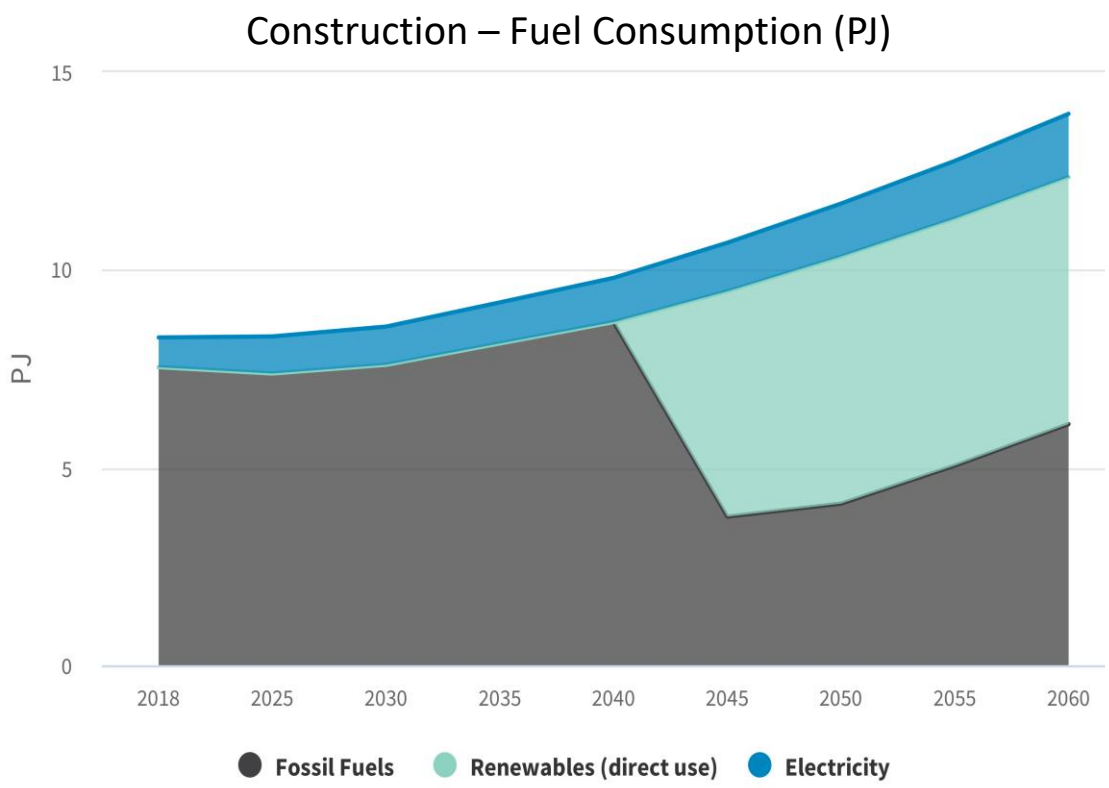
Forestry
Fishing

EECA's Energy End Use Database (EEUD) provides a greatly improved input dataset for describing demand sectors.

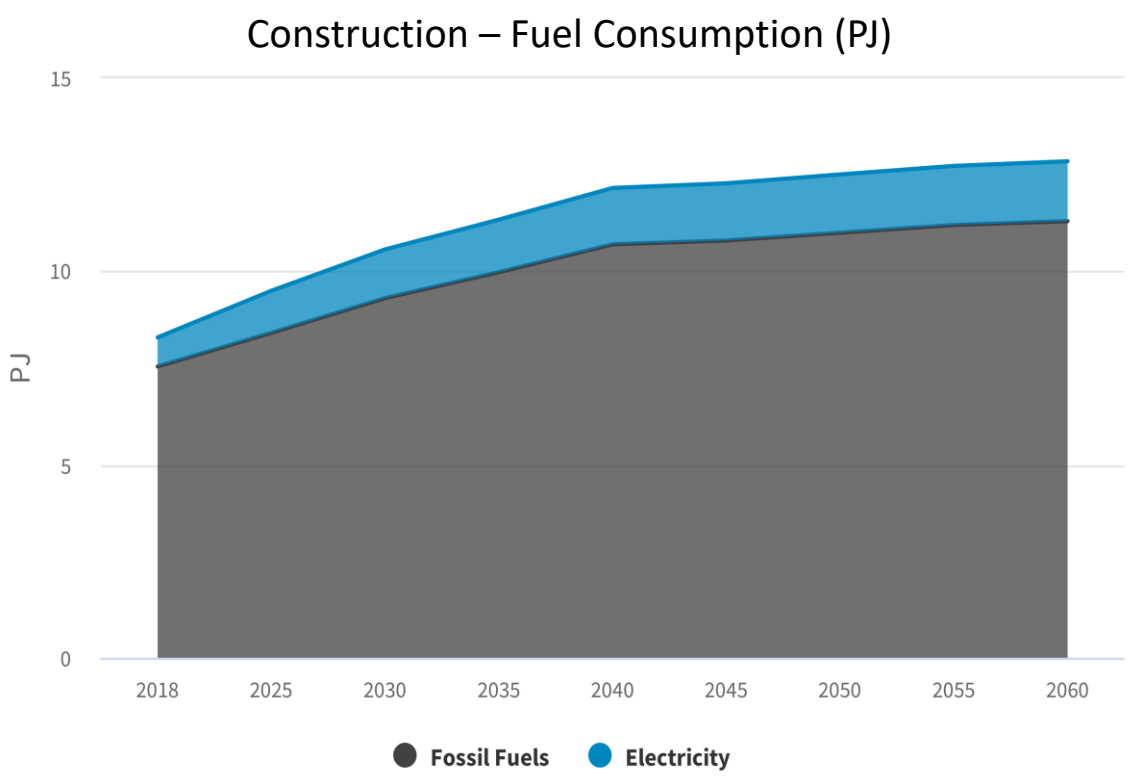
Construction – Drop-In Diesel emerges

Kea



TIMES-NZ 2.0, Scenario: Kea

Tūī

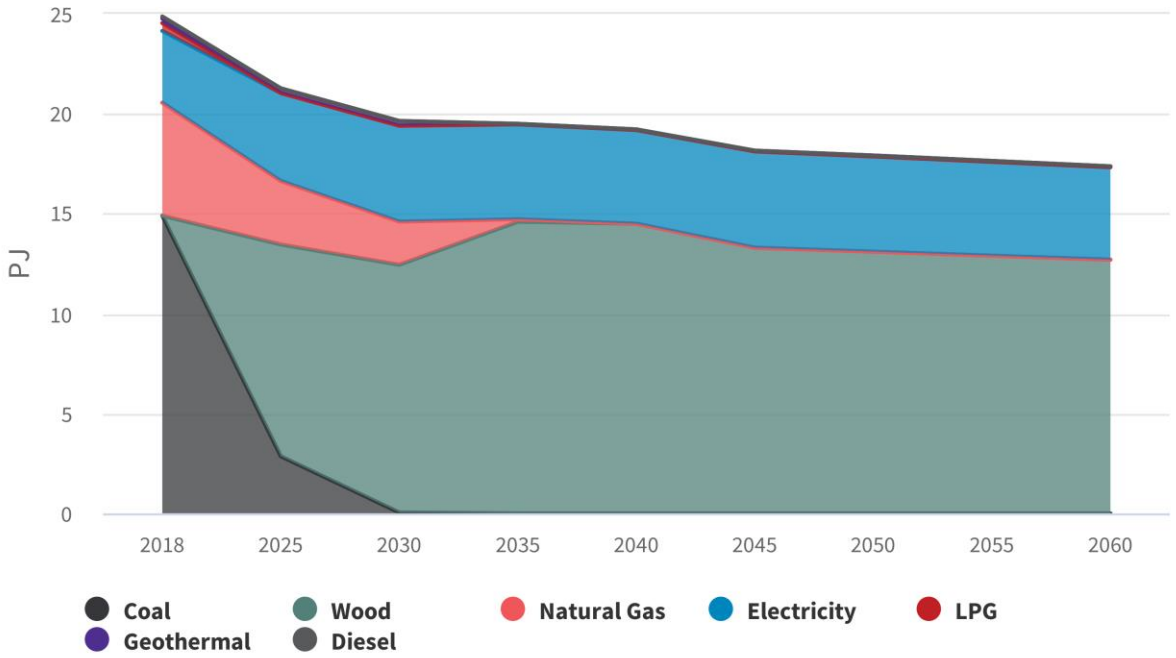


TIMES-NZ 2.0, Scenario: Tūī

Dairy Product Manufacturing – Biomass Grows

Kea

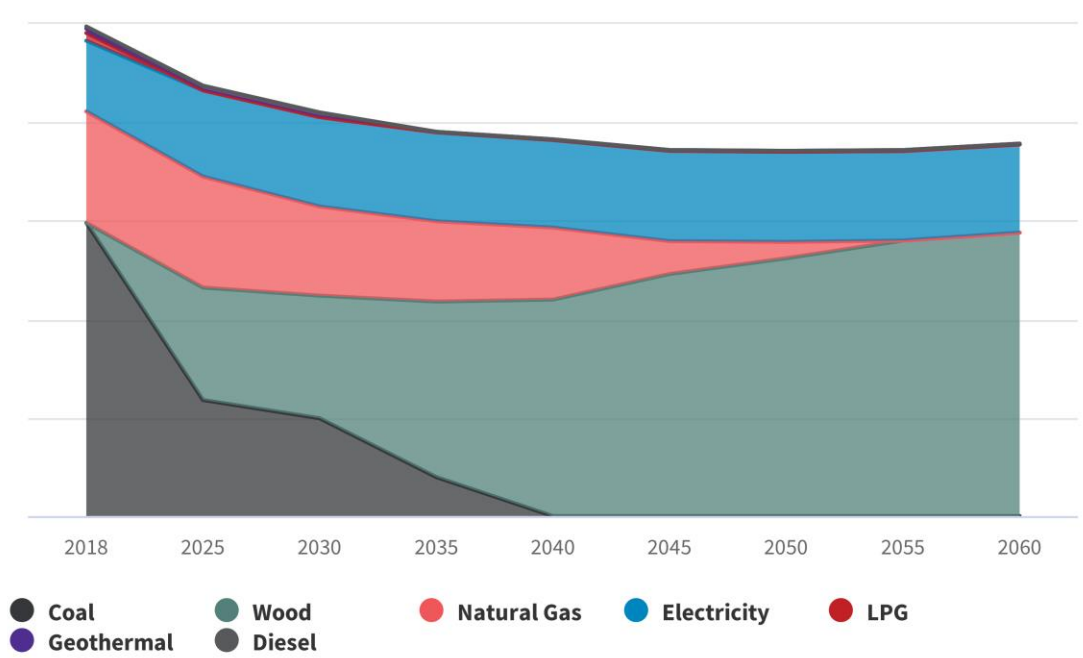
Dairy Product Manufacturing – Fuel Consumption (PJ)



TIMES-NZ 2.0, Scenario: Kea

Tūī

Dairy Product Manufacturing – Fuel Consumption (PJ)

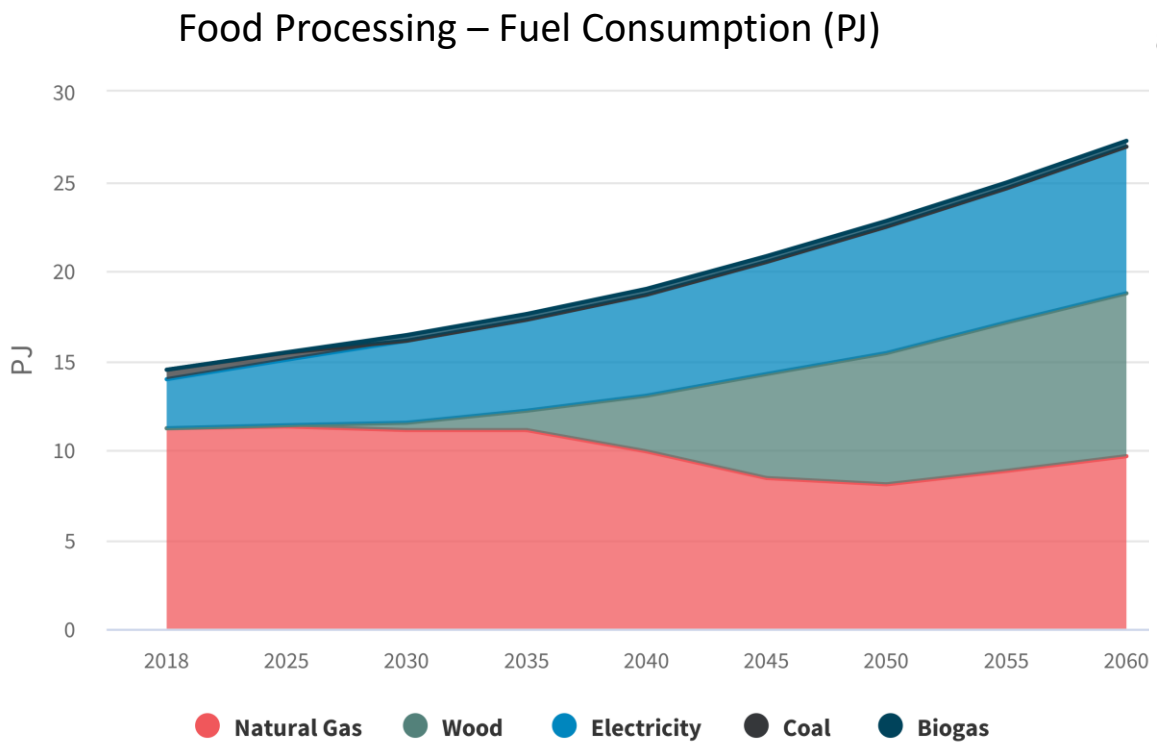


0, Scenario: Tūī

EECA TE TARI TIAKI PŪNGAO

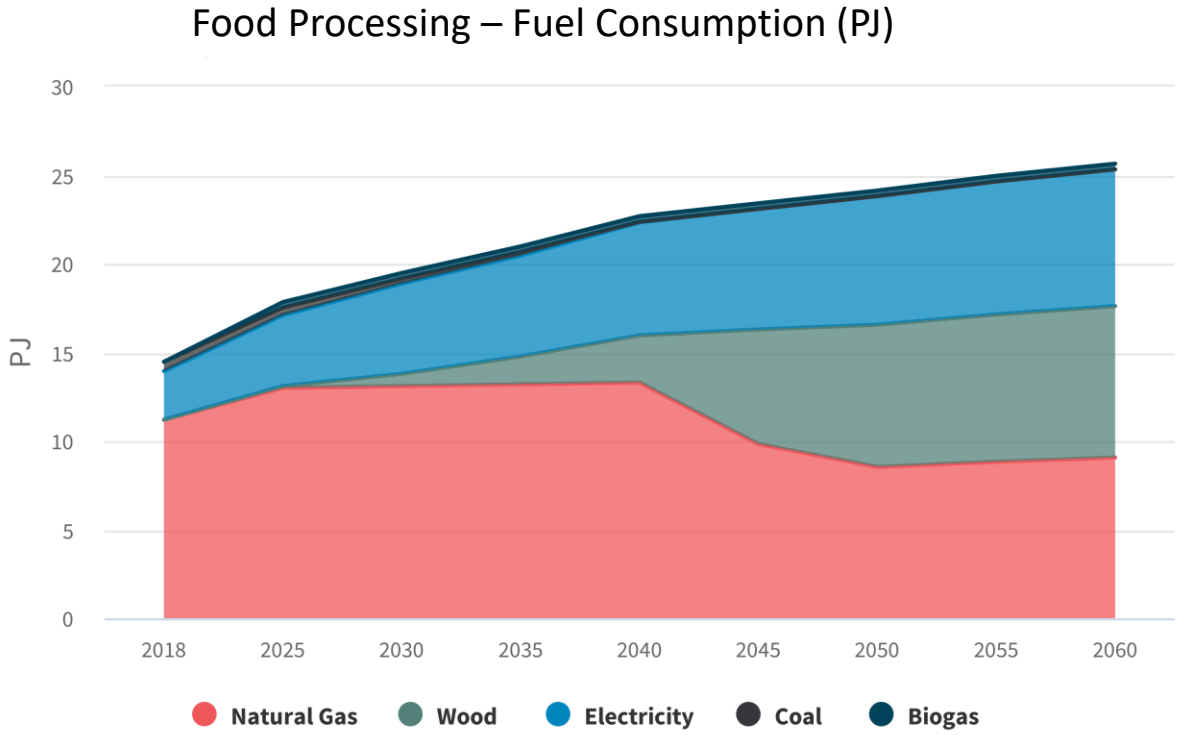
Food Processing

Kea



TIMES-NZ 2.0, Scenario: Kea

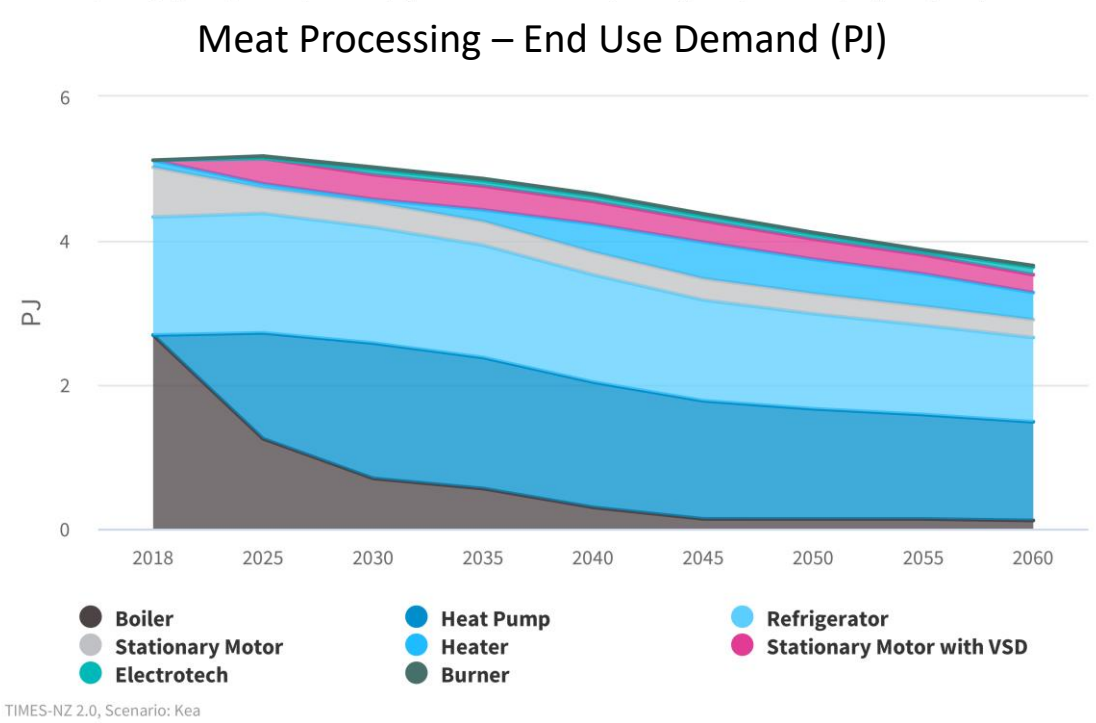
Tūī



TIMES-NZ 2.0, Scenario: Tūī

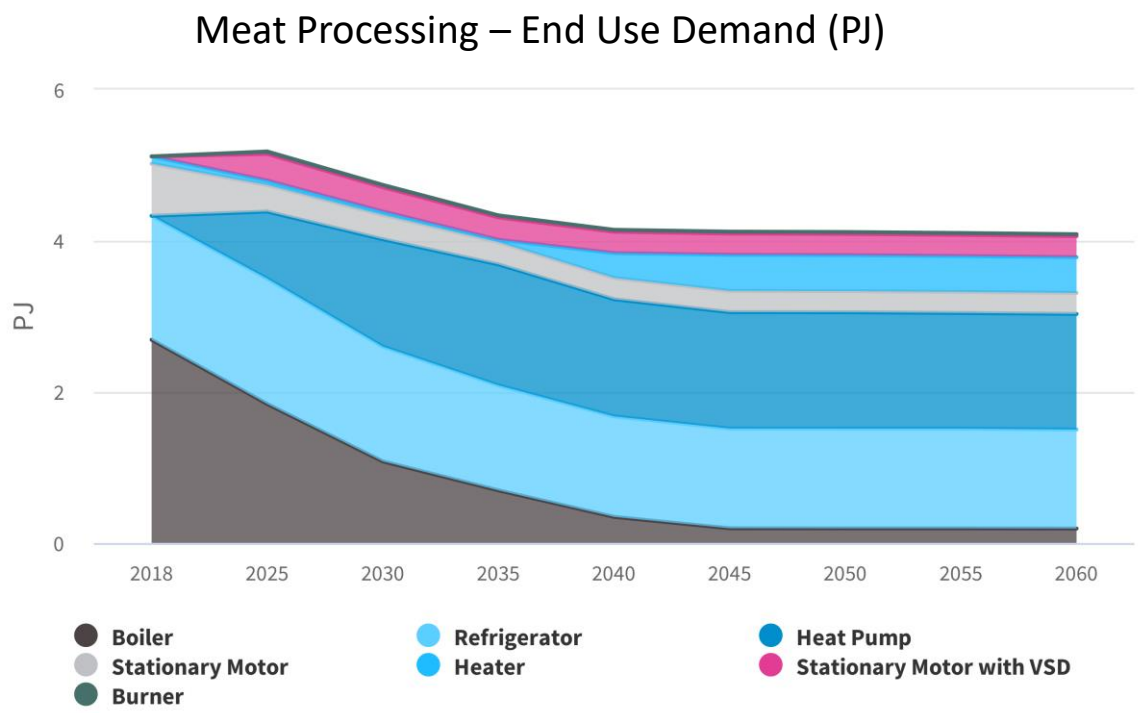
Meat Processing

Kea



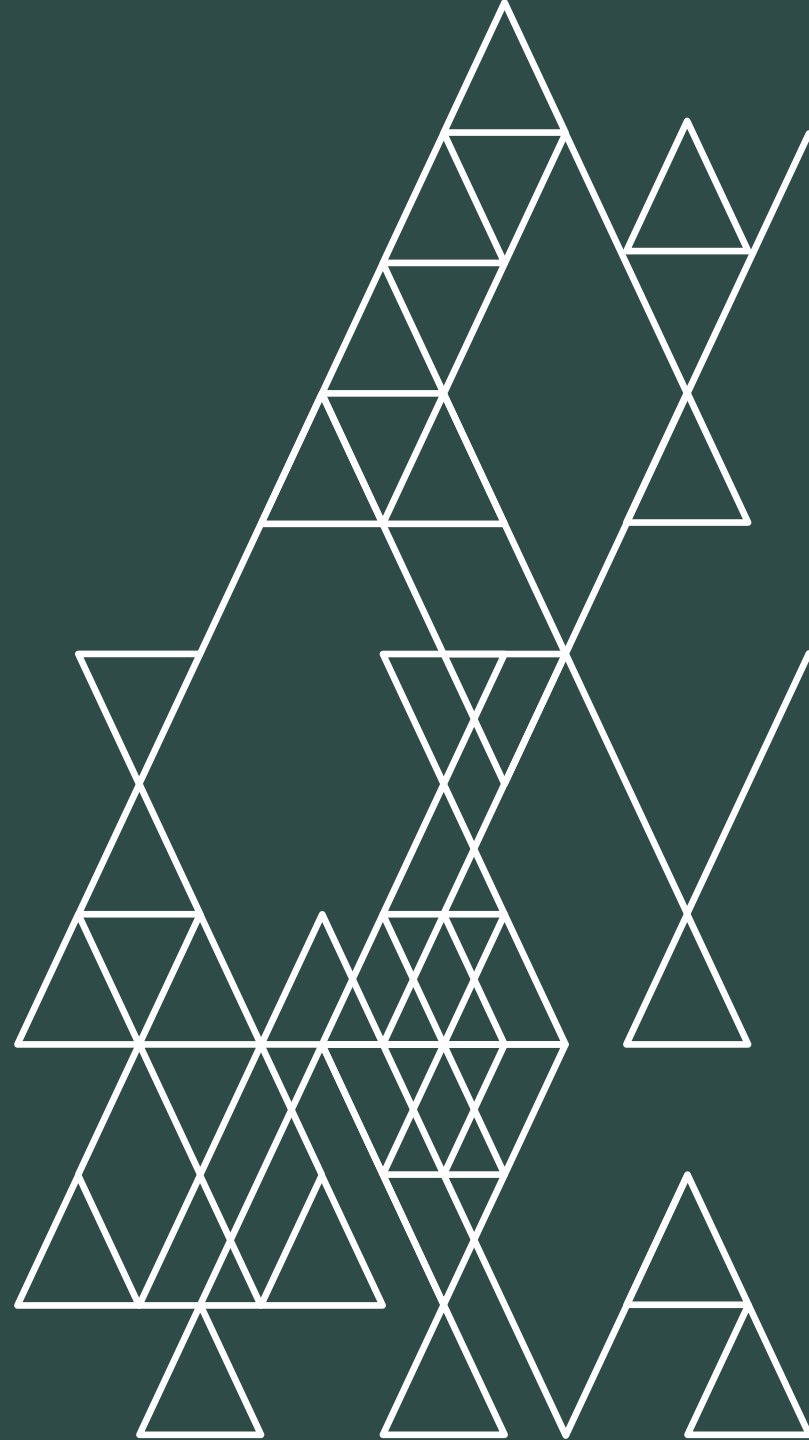
TIMES-NZ 2.0, Scenario: Kea

Tūī



TIMES-NZ 2.0, Scenario: Tūī

Industrial specific assumptions

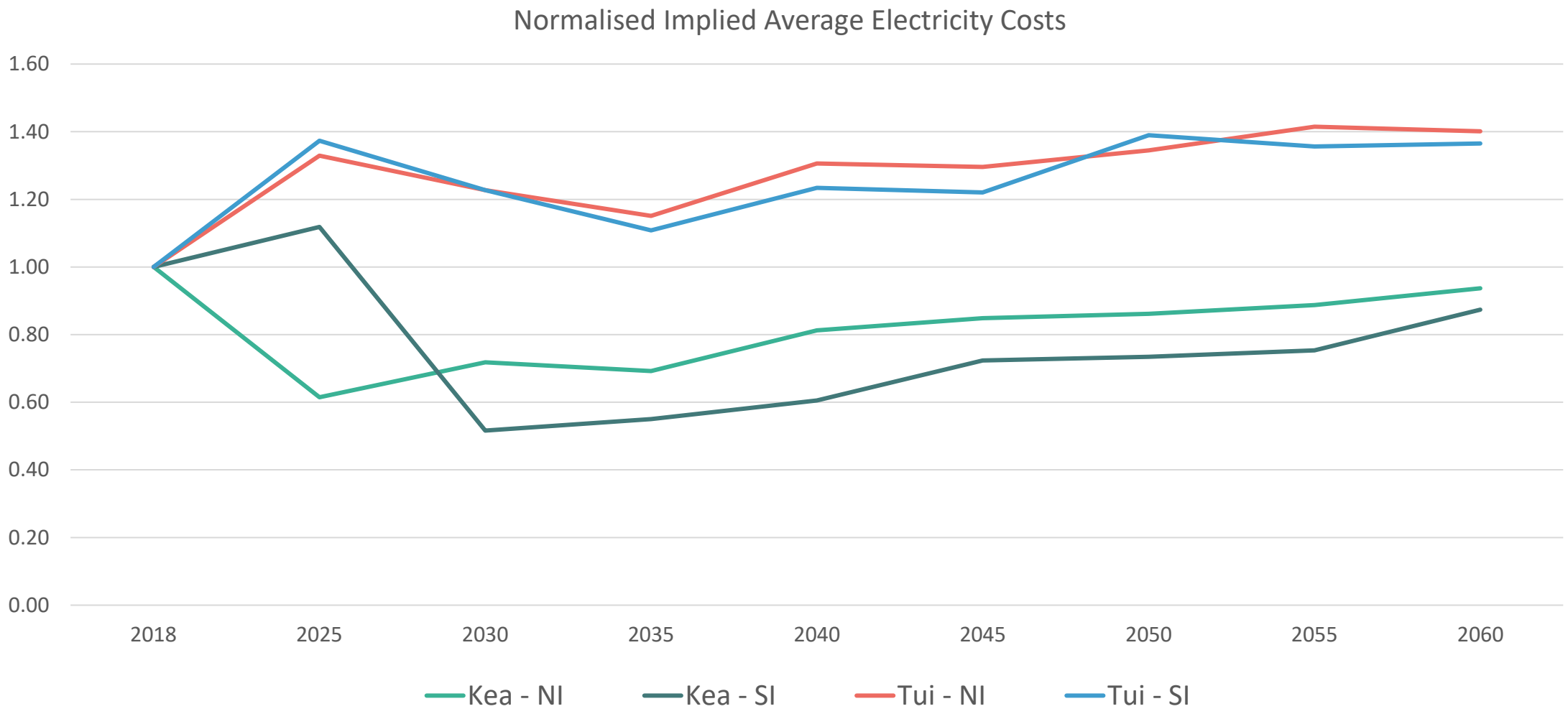


Industry Specific Assumptions

- Tiwai Point Aluminium Smelter
  - Exit in 2027 in Kea
  - Demand remains in Tui (either assuming smelter stays or is replaced by identical demand)

- Methanex
  - 2032 exit in Kea
  - 2047 exit in Tui

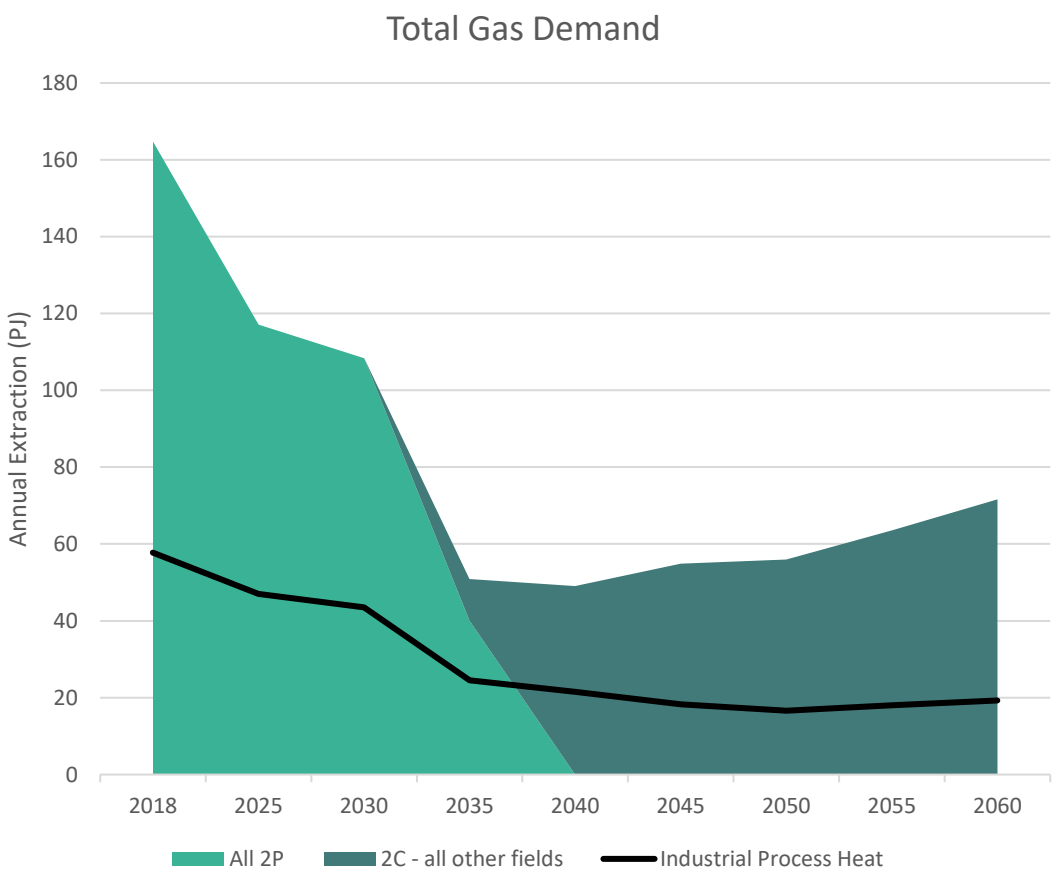
Effect of Tiwai Exit



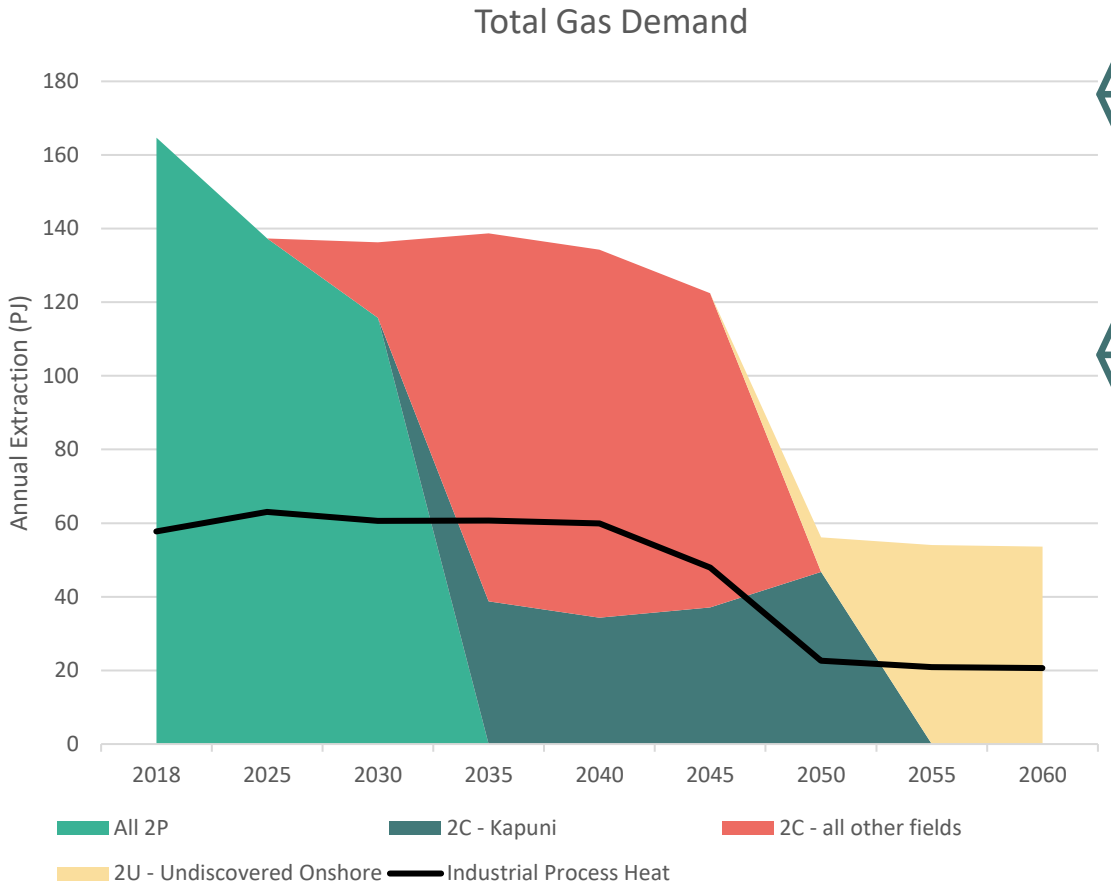
Industrial Supply Side Results

Modelled Gas Demand

Kea

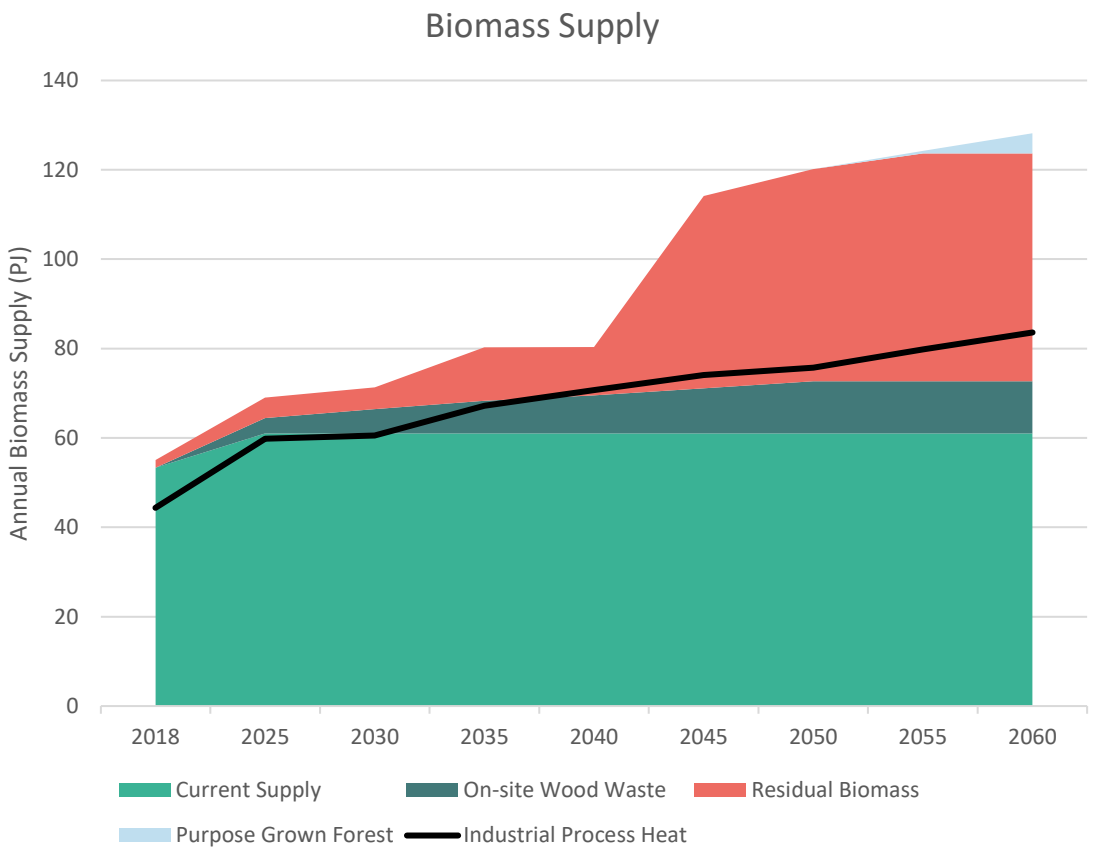


Tūī

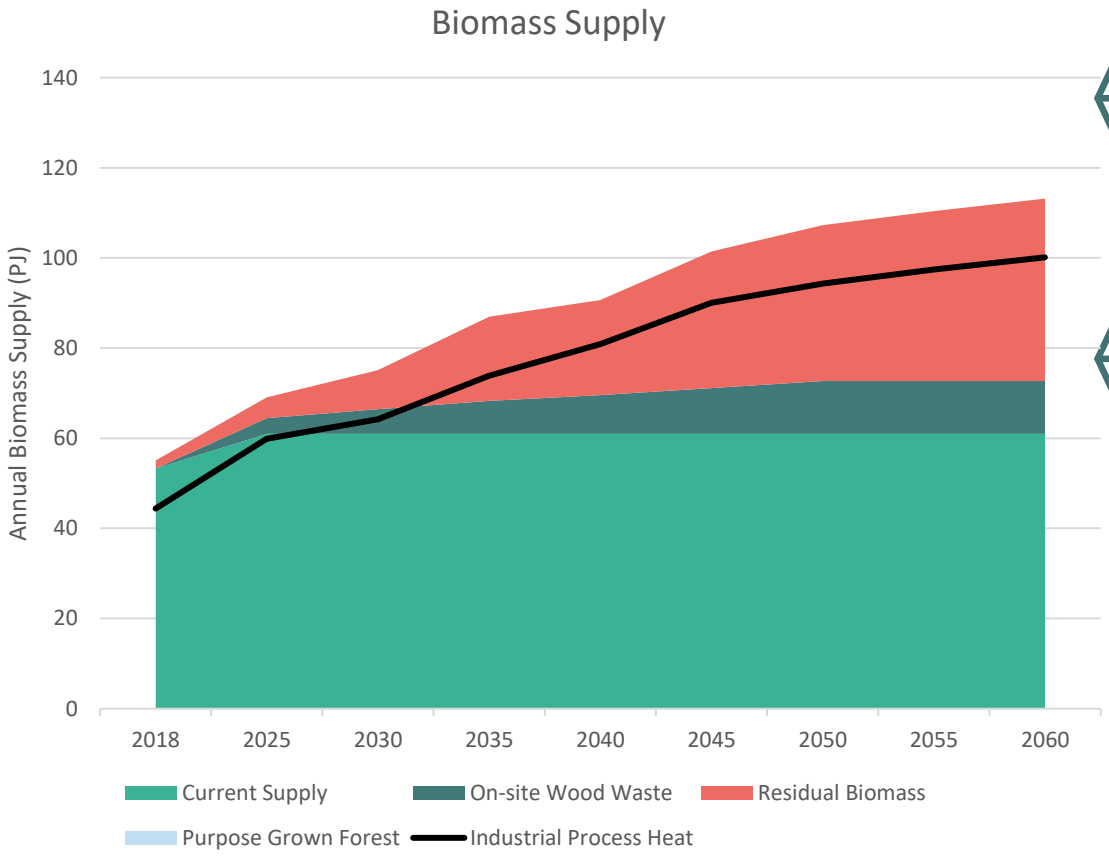


Modelled Biomass Demand

Kea



Tūī



NZ Energy System Scenarios TIMES-NZ 2.0

Innovative communication

To ensure results are accessible to the community, and clearly communicated, TIMES-NZ 2.0 data have been released as an interactive visualisation app: http://www.eeca.govt.nz/times-nz