

# BEC2060

# ENERGY SCENARIOS

## Navigating our flight path



## Exploring New Zealand's **TRANSPORT** future

The government aims to transition New Zealand's economy to net zero carbon by 2050. Today, the energy sector is the second largest carbon emitter with almost 20% of carbon emissions coming from domestic transportation. How the transport sector evolves will be critical to the future of the New Zealand energy sector and the quality of our lives.

The Business New Zealand Energy Council has partnered with the public and private sectors to develop two plausible and coherent stories about New Zealand's energy future. Having modelled these stories, the results will help you to better understand the challenges and opportunities faced by the transport sector as we grapple with important issues such as the end of oil and gas exploration, the uptake of new technologies and changing consumer preferences.

Go to [www.bec2060.org.nz](http://www.bec2060.org.nz) to find out more.

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# TWO PLAUSIBLE STORIES



## Kea:

a future where climate change is recognised by society as the most important priority. New Zealand aggressively transforms itself into a low-emissions economy, faster than its global trading partners, competitors and peers.

## Tūi:

a future where climate change is recognised as one of many competing priorities. New Zealand leverages off its traditional comparative advantage to generate wealth. A 'follower' approach is taken to climate policies and solutions made possible by the actions of trading partners and competitors.

## The key differences between the two stories

**Early adopter of technology** to reduce emissions

Domestic **carbon price is higher** than global price, New Zealand a world leader in carbon pricing.

**Mass public transport** increasingly a preferred method of travel in New Zealand cities

Consumers and businesses **favour non-fossil fuel sources**

Government encourages a **fast transition** to non-fossil fuel sources

**Higher road pricing** and environmental charges used to support carbon pricing



**Follow global technology** trends to reduce emissions

Domestic **carbon price is lower** than the global price

Passenger fleet is **dominated by private car ownership**

Consumers and businesses **favour lowest cost energy sources**

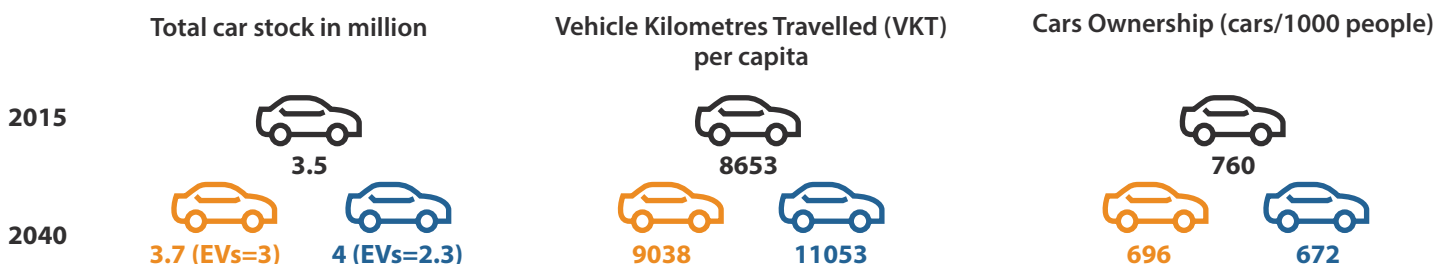
Government doesn't push a switch from fossil fuels instead relying on incremental **market-led change**

**Limited road pricing** is used to fund expansion of road infrastructure to ease congestion

## REDUCING EMISSIONS IN TRANSPORT

Under **Kea**, transport energy consumption and transport emissions drop significantly throughout the period to 2040 due to a higher carbon price and lower economic activity and population growth. This is underpinned by business and consumers early adoption of low emission technology in the transport sector.

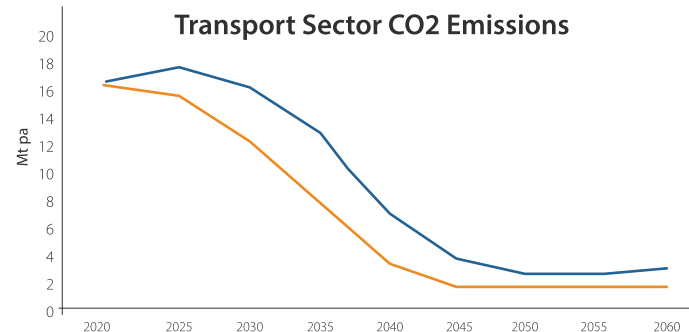
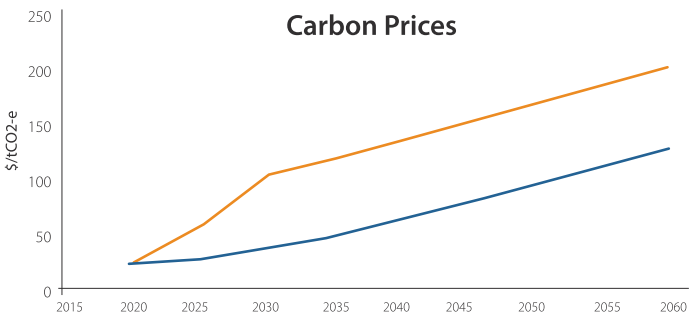
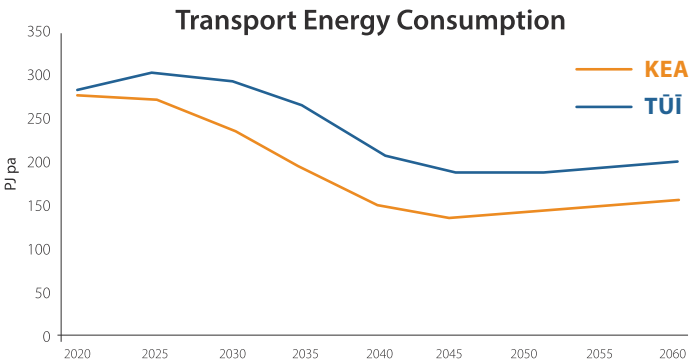
In **Tūi**, businesses and consumers are slow followers rather than early adopters of low emission technologies. As a result, energy consumption and emissions rise until 2025, indicating continuing reliance on fossil fuels. However, from this point on, clean energy and low emission fuels become more prevalent as markets respond to international trends.



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Electricity is critical for the economic transformation. Both scenarios move to predominantly electric vehicles (EVs) by 2040 although **Tūi** still has a significant portion of hybrid petrol cars. Intentional and clever urban design, coupled with other central and local government incentives to reduce private car transport (e.g., public and active transport investment) leads to a moderation in growth in VKT in **Kea**. A lack of these policies in **Tūi** result in single-person journeys in private cars remaining dominant, however, with VKT increasing 35% from 2020.



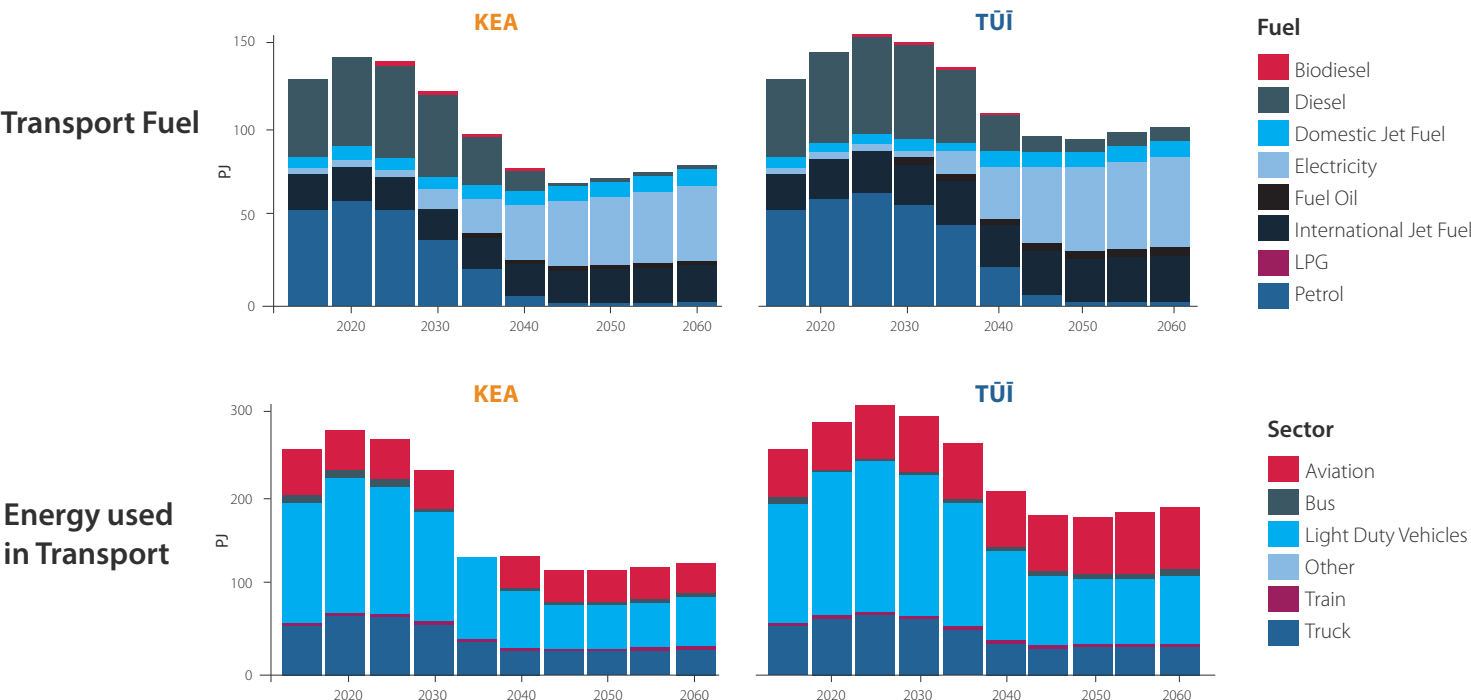
## ENERGY USE IN TRANSPORT

**Kea** and **Tūi** electrify transportation to over 50%. In **Kea** the use of fossil fuel declines significantly from 2025 as a result.

In 2040, overall transport fuel consumption has dropped by 40% under **Kea** whilst in **Tūi** transport fuel consumption decreases by only 10%. Consumption reductions are driven by electric efficiency.



From 2045 onwards, aviation is the larger share of transport fuel consumption and contributor of carbon emissions with around 40% of transport fuel being domestic and international jet fuel.

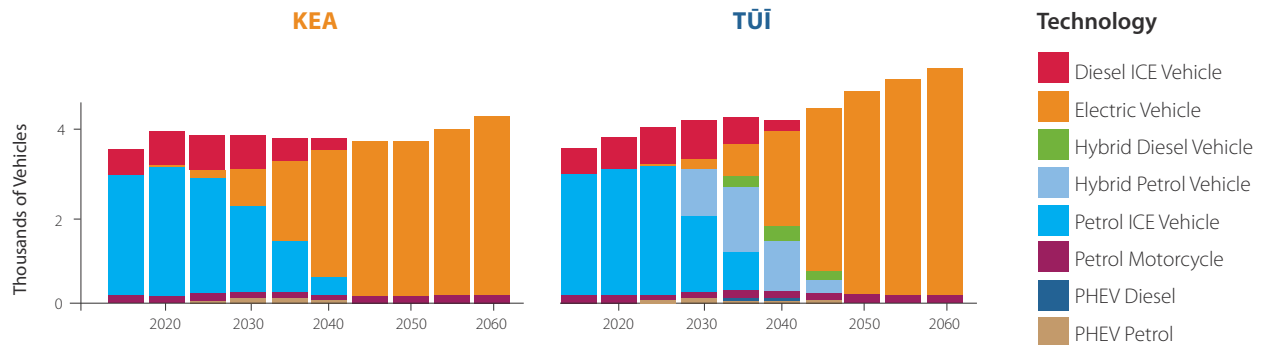


In both scenarios, consumers and businesses switch to low carbon fuels and technologies, seen in the fast uptake of electric and hybrid petrol vehicles for private travel and the switch to electric and hydrogen vehicles in heavy haulage.

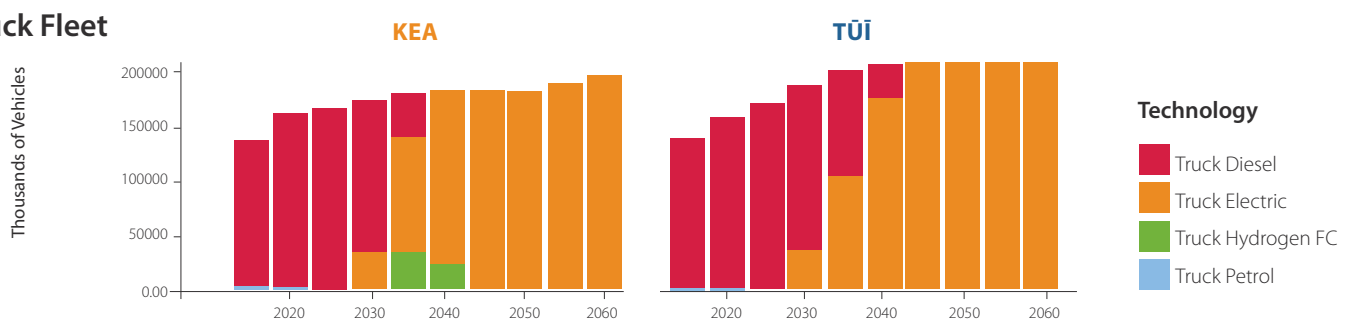
**Kea** and **Tūi** have a fully electrified car fleet by 2050. A higher carbon price under **Kea** makes fuel substitution more desirable and we see

a faster pace of switch to electric vehicles. Under **Kea**, around 30,000 hydrogen trucks appear by 2035 and stay for around a decade, then get superseded by electric trucks by 2045. Over 90% of the bus and truck fleet will be electrified by 2040. In **Tūi**, there is more of a mix of diesel and electric outside the light-duty vehicle fleet.

## Car Fleet



## Truck Fleet



## KEY INSIGHTS



The degree to what New Zealand can electrify in its transport system (and maintain a growing and largely decarbonised electricity system) is critical to determining the future of the energy system.



The scenarios illustrate that the race for technology is finely balanced and mitigation policy should be technology agnostic as much as possible.



We widely decarbonise transportation, except aviation, which gives guidance as to where to focus effort.



Questions remain on what infrastructure is required by the changes in transport energy. What are the implications for cities, businesses and consumers? What is the overall contribution of transport to changing New Zealand's total energy system?

## Project Investors



## Project Partners

