BEC2060 ENERGY SCENARIOS

Navigating our flight path

The energy future for New Zealand HOUSEHOLDS

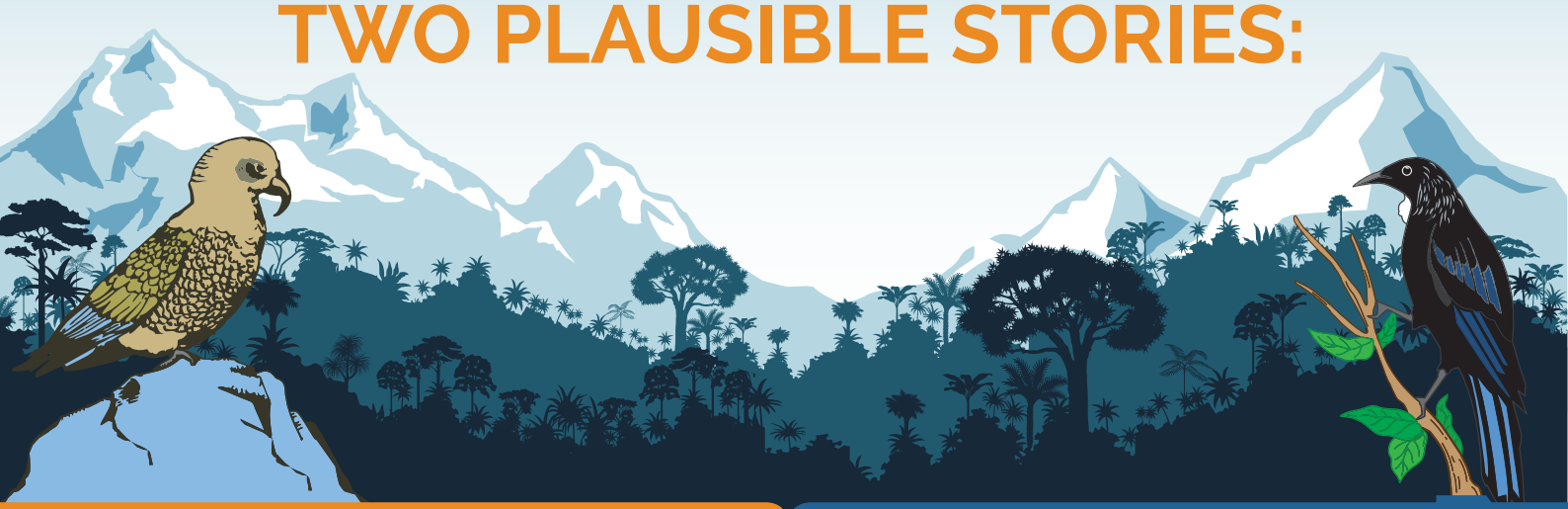
No consumer has ever before had such choice in participating in the energy market. With the increasing uptake of more sophisticated electricity market tools, batteries, electric vehicles, solar panels and home energy management, the role of the consumer is shifting from passive user to electricity storage provider, energy producer and energy aggregator. What will this mean for New Zealand households and what will be the key opportunities and challenges they face when decarbonising New Zealand?

The BusinessNZ 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 how New Zealand households may be impacted, and the range of choices and trade-offs that might emerge.

Go to **www.bec2060.org.nz** to find out more.

WORLD ENERGY COUNCIL | BusinessNZ Energy Council

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.

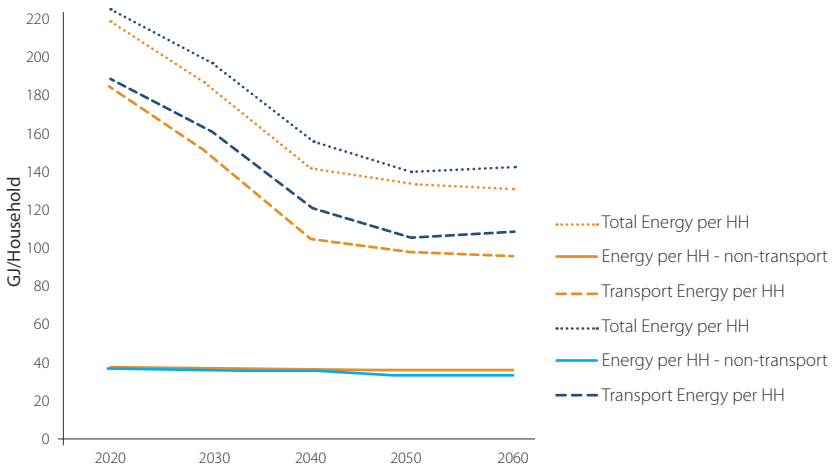
Tūī:

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.

Under **Kea**, households have a strong common purpose to transition quickly to a lower emission economy. Households act increasingly for the common good on environmental issues, change behaviours to reduce emissions, and accept other environmental solutions such as moving towards a circular economy, recycling and the reduction of wasteful disposable activities and products. Household travel increasingly switches to public transport, active modes and ride-sharing for mobility. In **Tūī,** there are polarised views and no mandate for Government to transition away from the historically light-handed approach to climate change and emission reduction. The emphasis is on the rights of individuals and households to make their own decisions, and the continued reliance on market signals to influence decisions. Deciding to leverage off our traditional competitive advantage and short-term prosperity that allows price signals to initiate a transition include behaviour and technology adoption, but the pace of changes is slow.

ENERGY IN HOUSEHOLDS

Household Energy Consumption



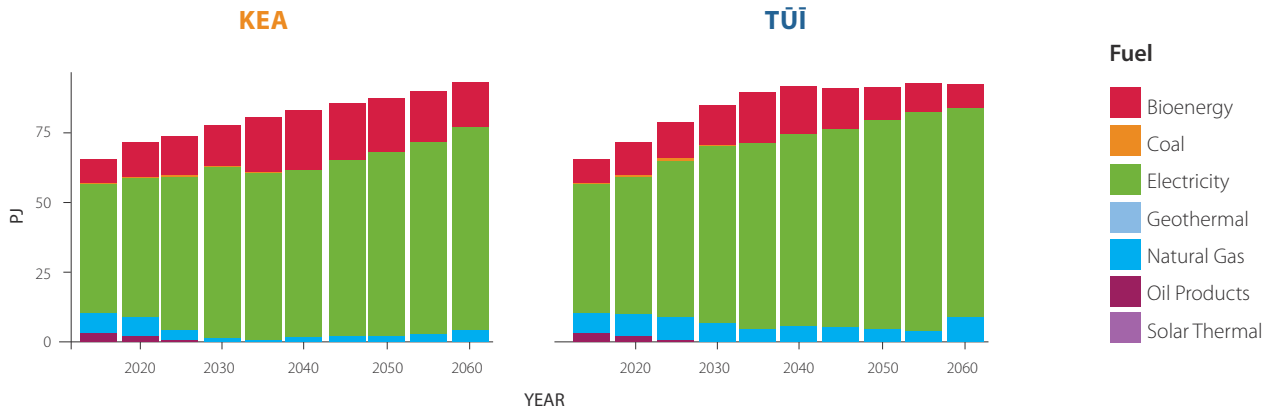
Household energy consumption declines significantly in both scenarios from 2020 on.

Kea's non-transport energy consumption per household is slightly higher, however, this is offset by lower transport energy consumption. Electrification of transport and greater use of public transport lowers consumption.

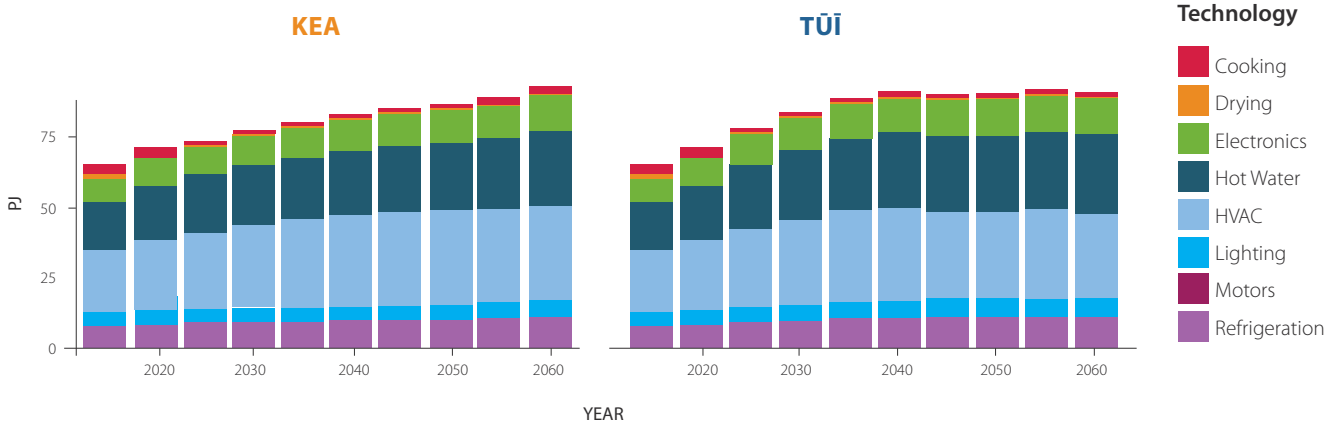
Tūī shows a lower non-transport energy consumption per household from 2040 due to appliance efficiencies.

Residential Carbon Emissions: 2015 vs 2040

Household Energy use by Fuel Type

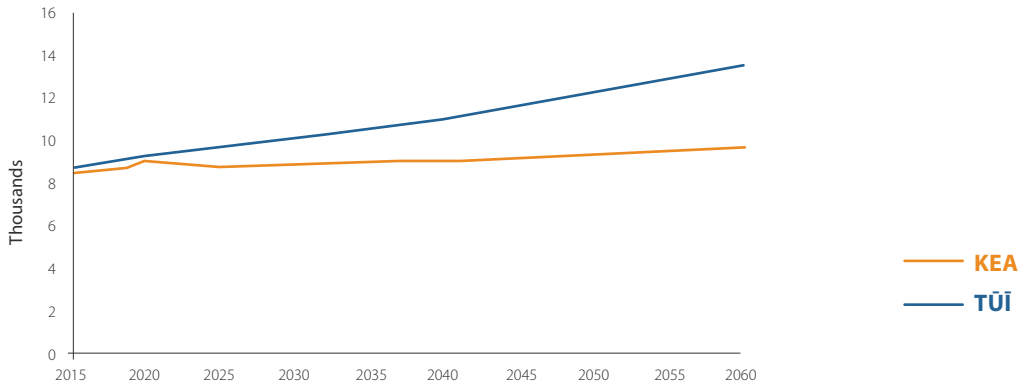


Household (non-transport) Energy Use by Technology



DOMESTIC TRAVEL

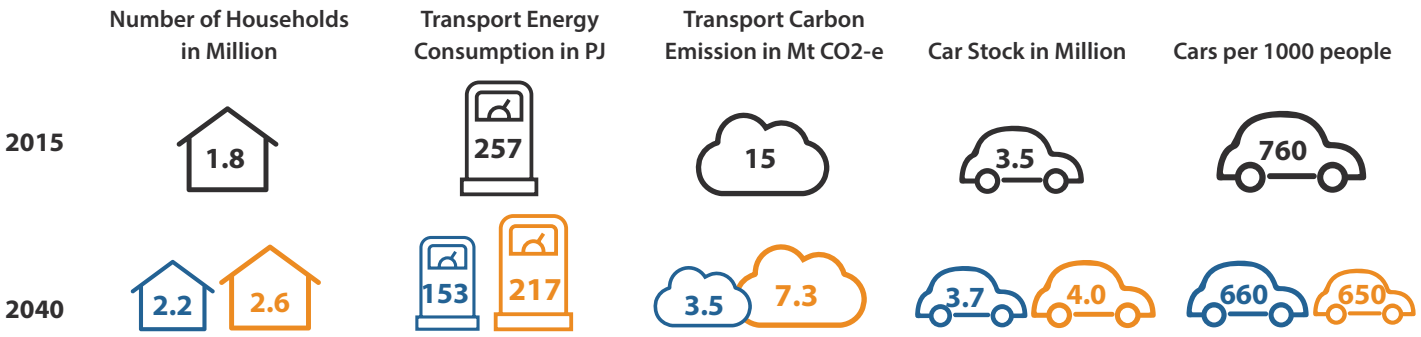
VKT per Capita



Commuting remains a key driver for vehicle kilometres travelled in both scenarios (VKT).

Under **Kea**, VKT remains stable over the time period. New Zealand households have a faster uptake of EVs and changing consumer preferences leaning toward more higher frequency mass public transport making it an increasingly preferred method of travel within New Zealand's cities. Ride-sharing, active modes and autonomous public transport reduce single occupant vehicle travel and private vehicle ownership. CO_2-e reduces by 80% by 2040.

Under **Tūī**, in the longer term, autonomous vehicles make the longer commutes more tolerable, ensuring VKT per capita increases. The passenger fleet continues to be dominated by private car ownership, with only limited uptake of shared vehicles, public transport and active transport modes. CO_2-e halves by 2040.



Space of living

Insightful urban design in **Kea** leads to a concentration of population and household growth in urban areas, moving residents closer to where they work, shop and play and encourages a shift to public transport and more active modes of transport. In **Tūī**, the boundaries of towns and cities continue to expand driven by the focus on increasing the supply of land in response to market demand, rather than urban intensification. More people live in sprawling suburban areas, and rely more on private travel to work, shops and leisure.

Speed of technology change

Under **Kea**, households switch to low carbon fuels and technology, including electricity for transport and heat. Households are willing to try out emerging technologies as early adopters. Households support decarbonisation and recognise the dual role of electricity to both reduce its own emissions and support other heat and transport sectors to electrify. For **Tūī**, households switch to emerging technologies where they are the least cost solutions to their needs. Consumers are followers of technology, dependent on the price point and quick payback.

KEY INSIGHTS

- Decarbonising New Zealand economy requires work on both sides of the energy value chain, supply and demand.
- Pricing is a significant lever to reduce household energy consumption, especially for appliances.
- Transport forms a significant part of household energy use. The electrification of transport remains one of the key ways to reduce household emissions.

Project Investors

bp, contact, EECA Te Tari Tiaki Pūngao Energy Efficiency & Conservation Authority, Firstgas, Fonterra, genesis, Mercury, Ministry of Transport Te Manatū Waka, Ministry of Business, Innovation & Employment Hīkina Whakatutuki, Ministry for the Environment Manatū Mō Te Taiao, New Zealand Steel, PEPANZ Petroleum Exploration & Production Association of New Zealand, POWERCO, Refining NZ Your Energy Hive, Todd Energy, Toyota, Transpower, vector, Z Energy

Project Partners

sapere research group, Deloitte., Paul Scherrer Institut PSI, ARUP, The University of Auckland Te Whare Wānanga o Tāmaki Makaurau New Zealand