Waikato Affordable Energy Webinar Series

June-November 2026

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Research.
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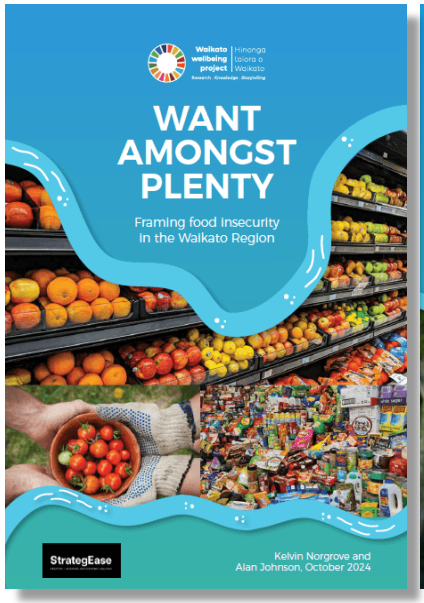
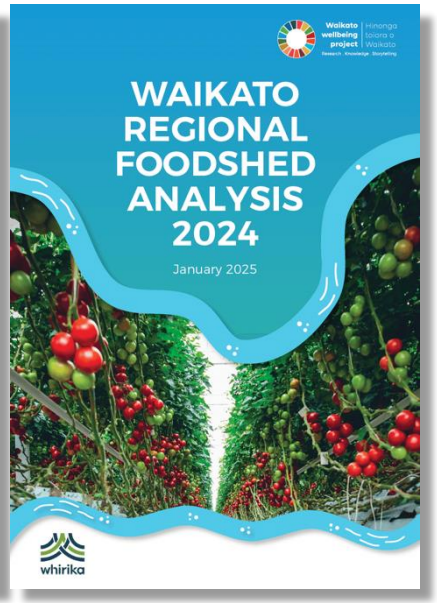
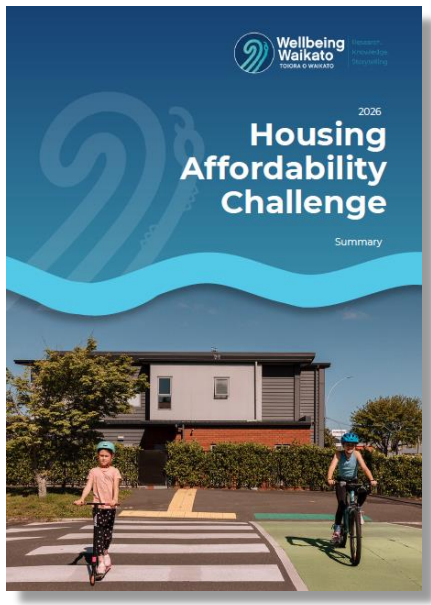
Independent Charitable Trust focused on:

- Regional intelligence about what's most important to households and whanau
- Identifying emerging opportunuities and risks early
- Surfacing underlying drivers, not just symptoms
- Convening government, iwi, councils, community organisations and the private sector around decision-useful insights.

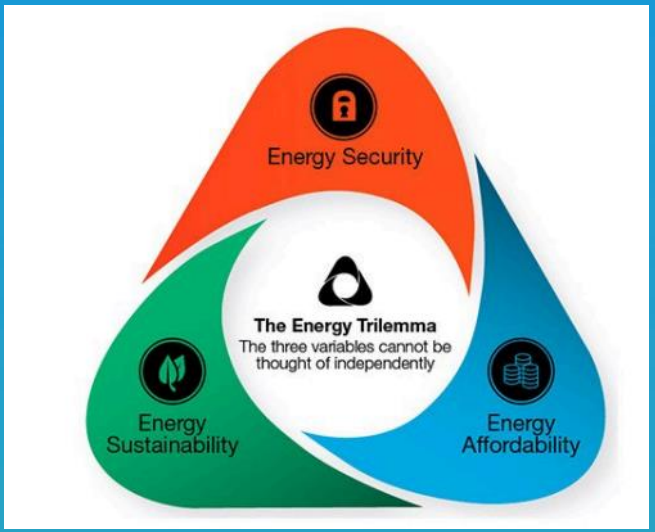






Energy systems need to be:

- Affordable
- Reliable
- Sustainable



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4 Big Questions

1. How does the electricity system actually work—and why is it designed this way?
2. What drives power prices, and how could they be made more affordable?
3. How does energy affordability affect household and community wellbeing?
4. What would a better system look like—and how do we get there?

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A Discussion on Energy Policy

David Wilson
MP, New Zealand First
28 October 11am

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A Discussion on Energy Policy

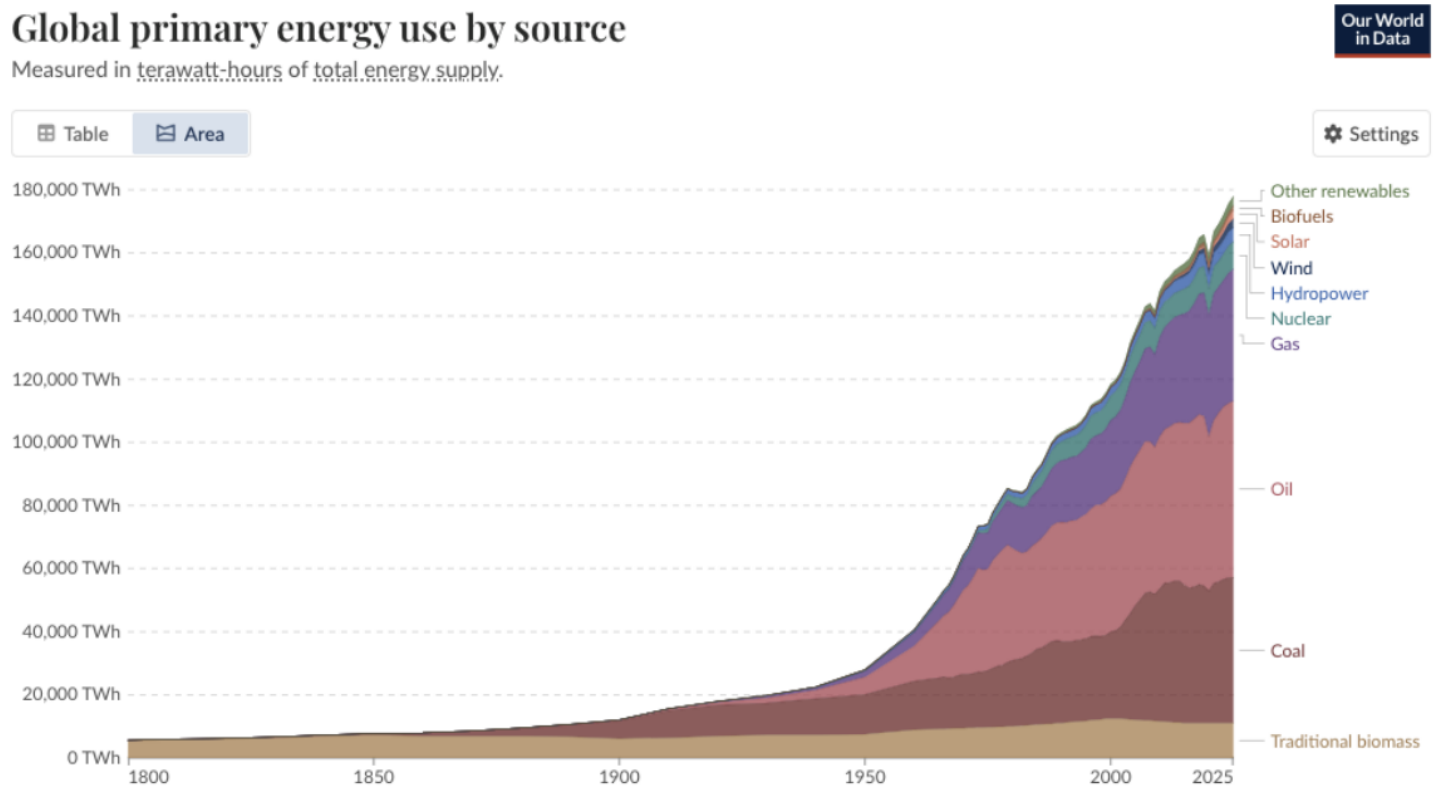
David Wilson

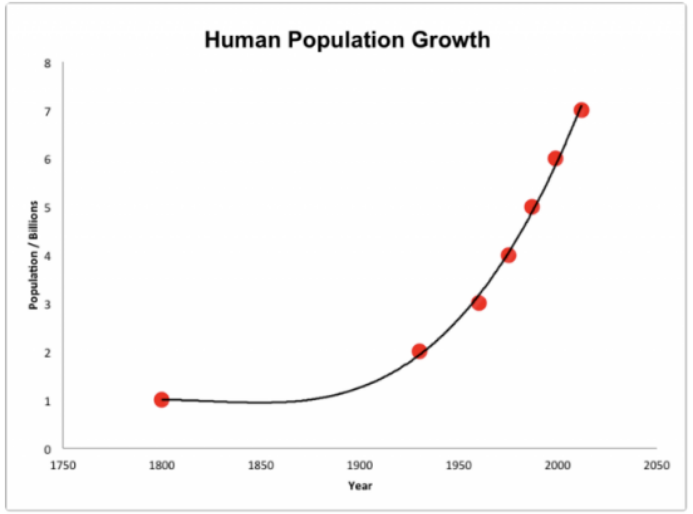
NZ First

Borrowing heavily from Larry Blair…
I’m impressed

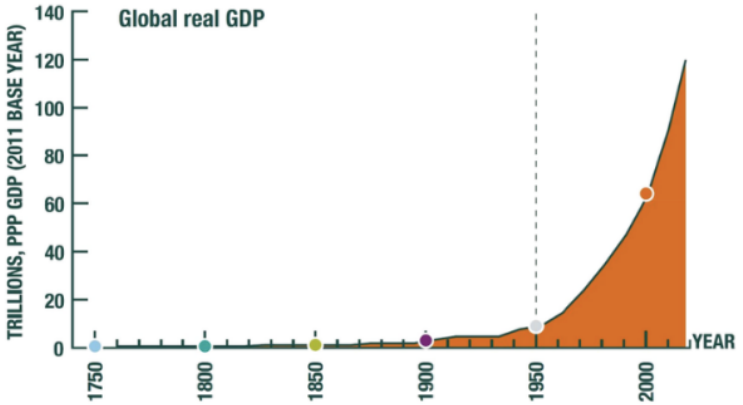
ENERGY VS GROWTH

- There has never been a transition, only addition.
- Global population and GDP have an almost 1:1 correlation, but lagging, the discovery and subsequent depletion of an energy gradient.
- First comes the energy then comes the growth.





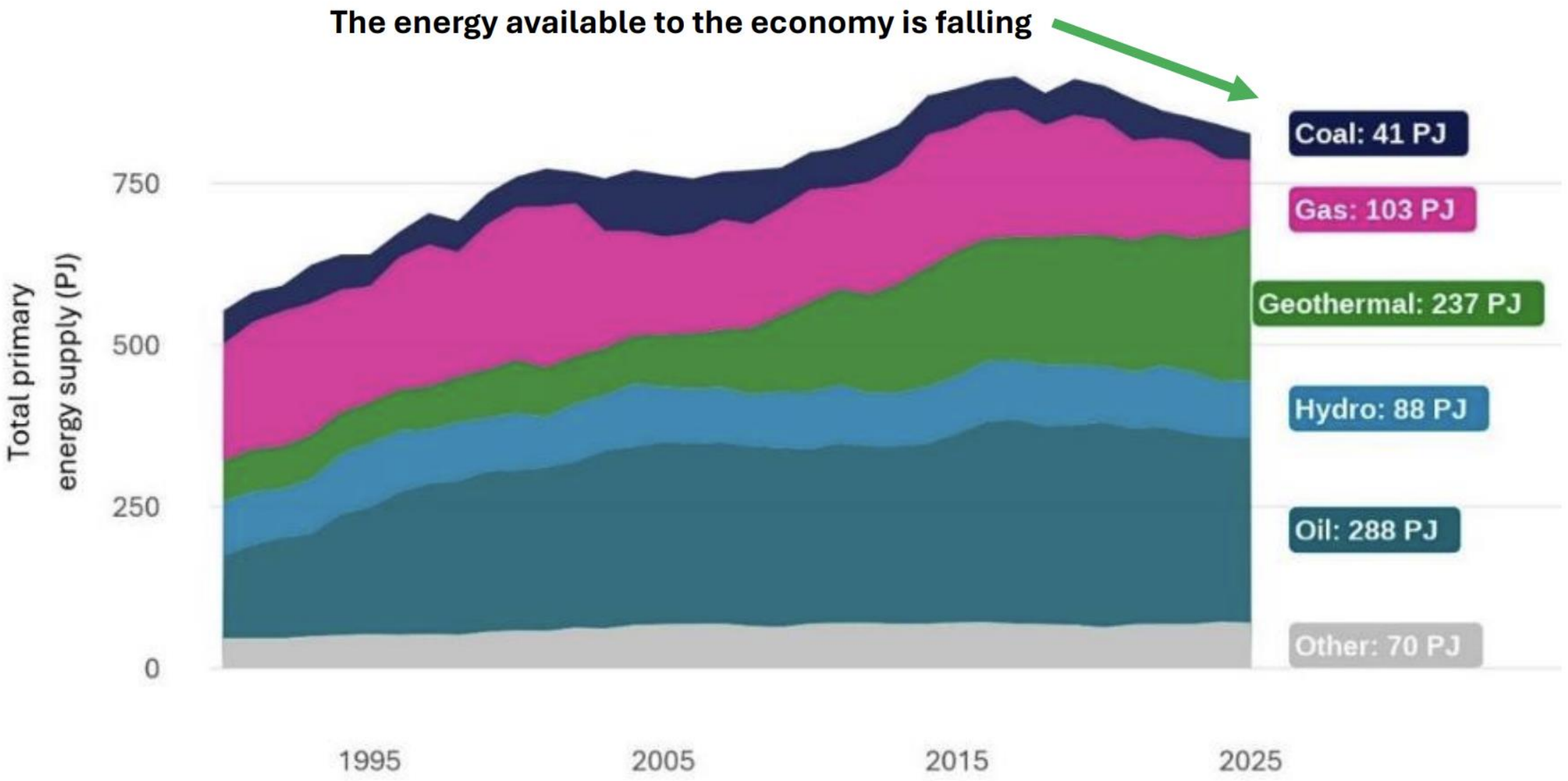
Human population growth from 1800 to 2000, via Wikimedia Commons.



Global Real GDP since 1750 CE. Source: Our World in Data based on World Bank and Maddison Project Database, version 2018. Bolt et al. (2018), "Rebasing 'Maddison': new income comparisons and the shape of long-run economic development", Maddison Project Working paper 10

NZ ENERGY

TOTAL PRIMARY ENERGY – 2025 YEAR END



LOSING COMPLEXITY

Lost in transition: The businesses trapped by New Zealand's energy crisis

9:23 am on 11 December 2025 Share this

Kirsty Johnston, Investigative journalist
kirsty.johnston@rnz.co.nz

Heinz Wattie's proposes closure of three manufacturing facilities, impacting 350 jobs

5:03 pm on 11 March 2026 Share this

Report tips Methanex will close NZ operation next year, gas production plummets

Tom Pullar-Strecker | The Post

March 12, 2026 Share

BUSINESS

Kapuni fertiliser plant may temporarily shut due to gas supply concerns

9:14 pm on 7 August 2025 Share this

Susan Edmunds, Money Correspondent
susan.edmunds@rnz.co.nz

New Energy Minister Simon Watts warned of risk of outages, business closures in challenging sector

By Jamie Ensor
Political reporter · NZ Herald · 17 Mar, 2025 04:24 PM · 7 mins to read

NEW ZEALAND / BUSINESS

Hundreds of jobs lost as Winstone shuts mills

5:14 pm on 10 September 2024 Share this

What went wrong in the New Zealand electricity market and why it will get worse before it gets better

By Thomas Coughlan
Political Editor · NZ Herald · 2 Oct, 2024 05:00 AM · 11 mins to read

BUSINESS

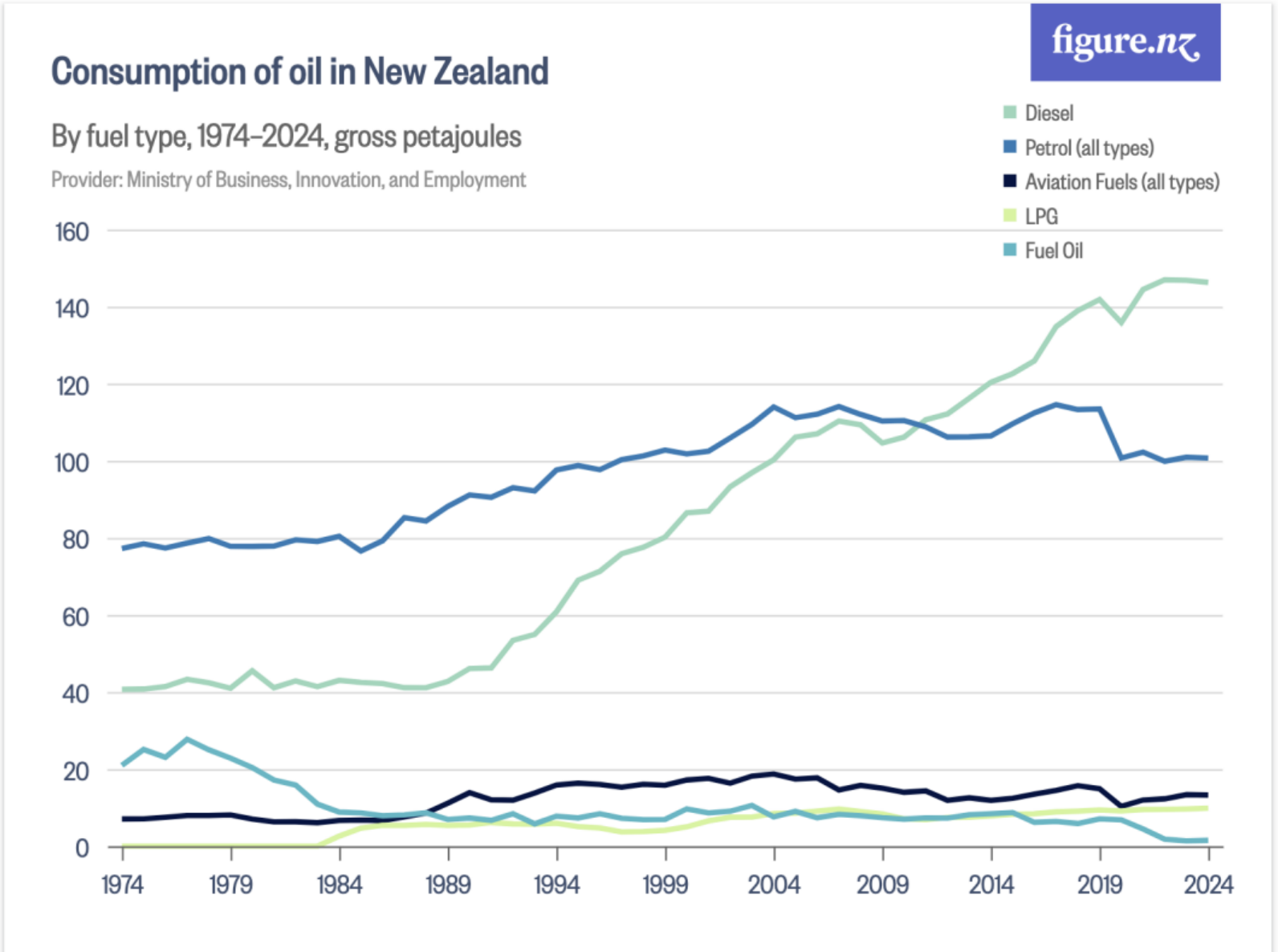
McCain to close Hastings vegetable processing plant by January 2027

4:17 pm on 24 March 2026 Share this

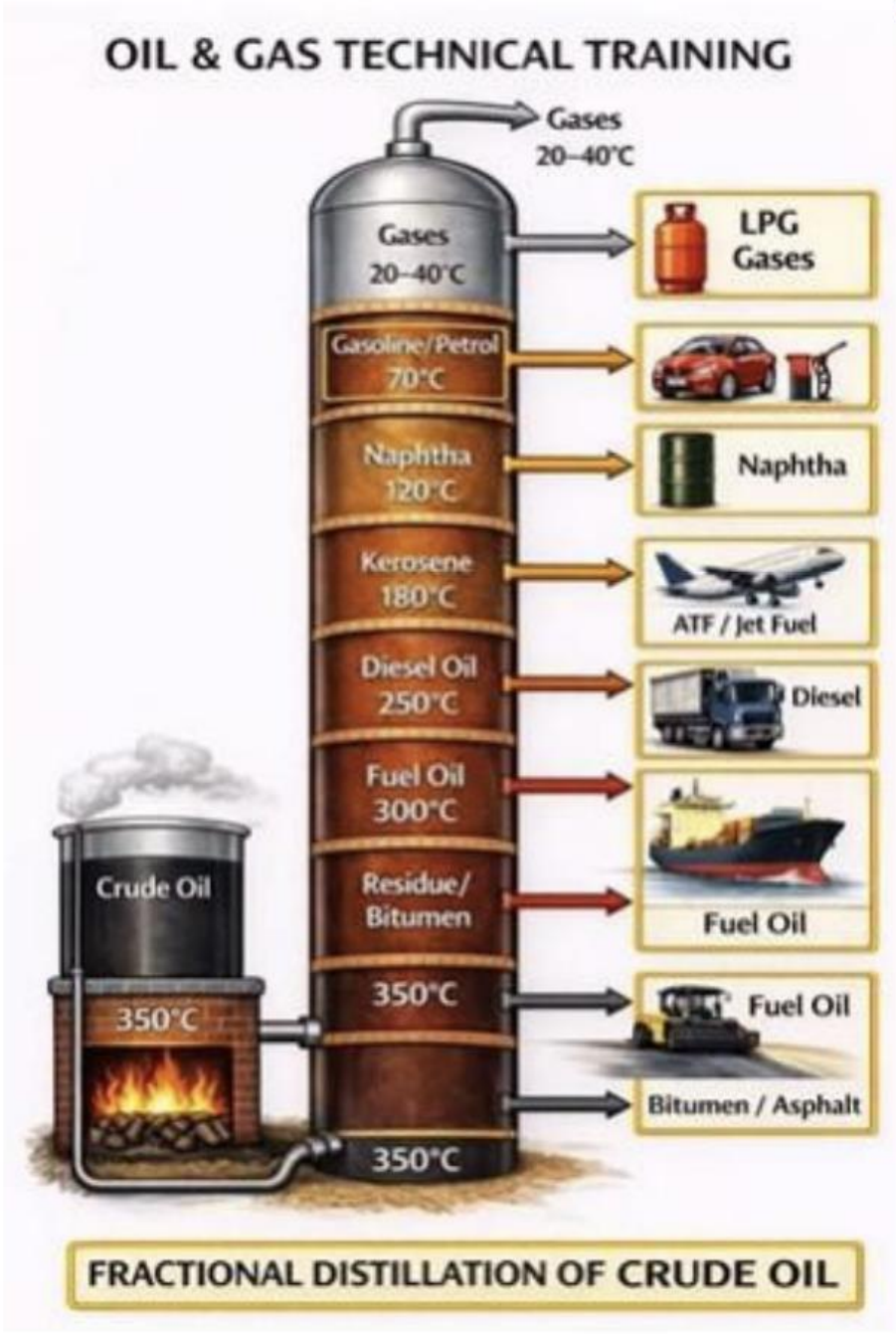
Watts warned about deindustralisation due to gas supply dwindling

NZ ENERGY

LIQUID FUEL USE



- All fuels are 100% imported. Primarily from Asia.
- Diesel fuels New Zealand's economy.
- Demand has flattened over the past few years which is indicative of the absence of economic growth in real terms.



DISTILLATION

Crude oil is not a single substance. It is a complex mixture of:

- light gases
- gasoline-range hydrocarbons
- diesel-range molecules
- heavy oils
- waxes
- asphaltic compounds
- The refinery separates these into “fractions”.

Different hydrocarbons boil at different temperatures.

Smaller molecules:

- boil first
- are lighter
- more volatile

Larger molecules:

- boil at higher temperatures
- are heavier
- more viscous

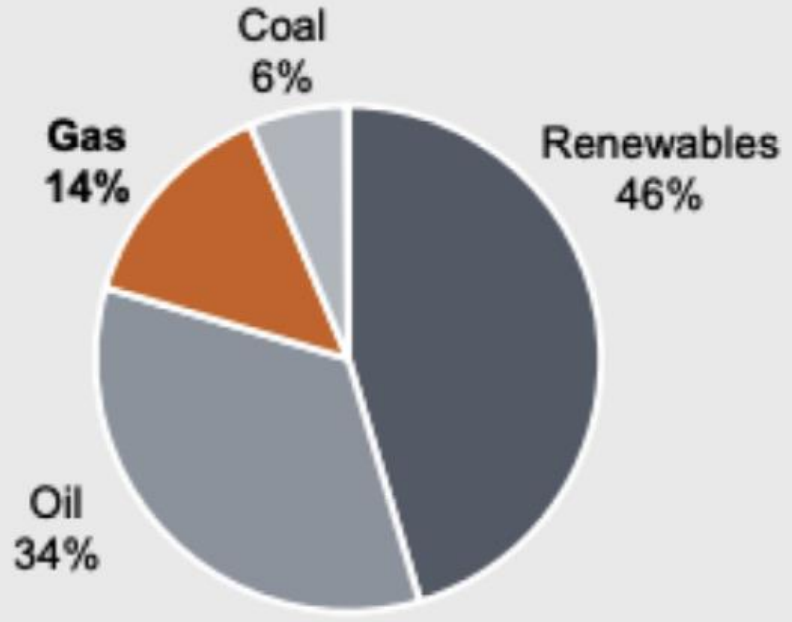
NZ ENERGY

The largest cost in the oil value chain is refining

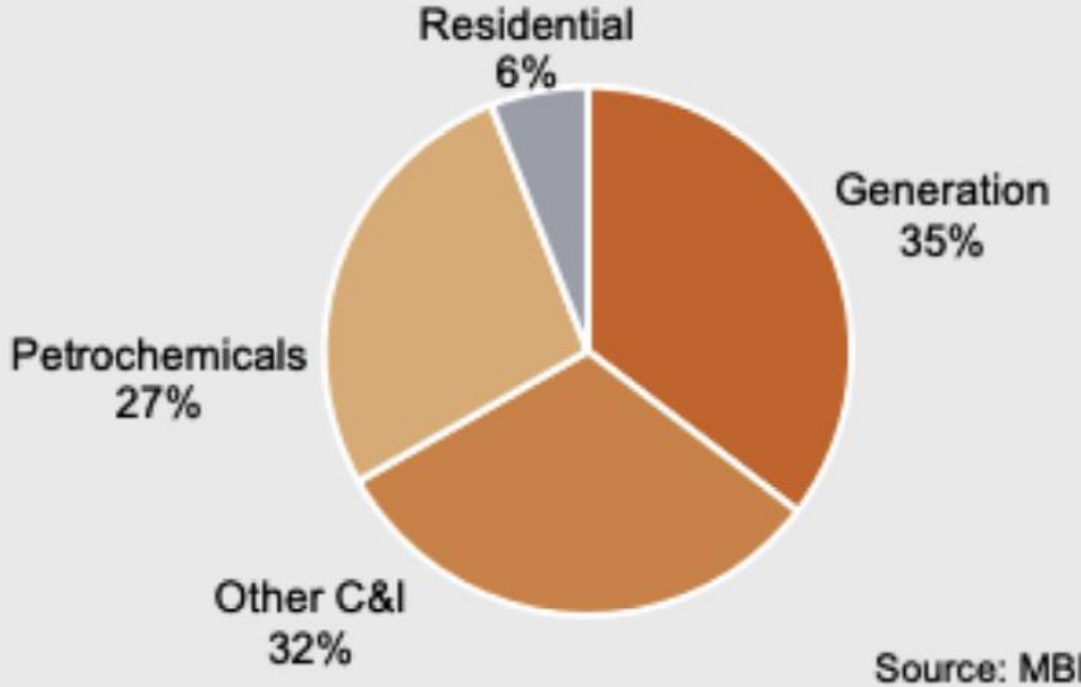
NATURAL GAS SUPPLY

Gas is New Zealand's third largest source of primary energy and is vital for industry and electricity generation

New Zealand Sources of Energy (2024)



Gas Use by Consumer Segment (2024)



Source: MBIE

ELECTRICITY USE

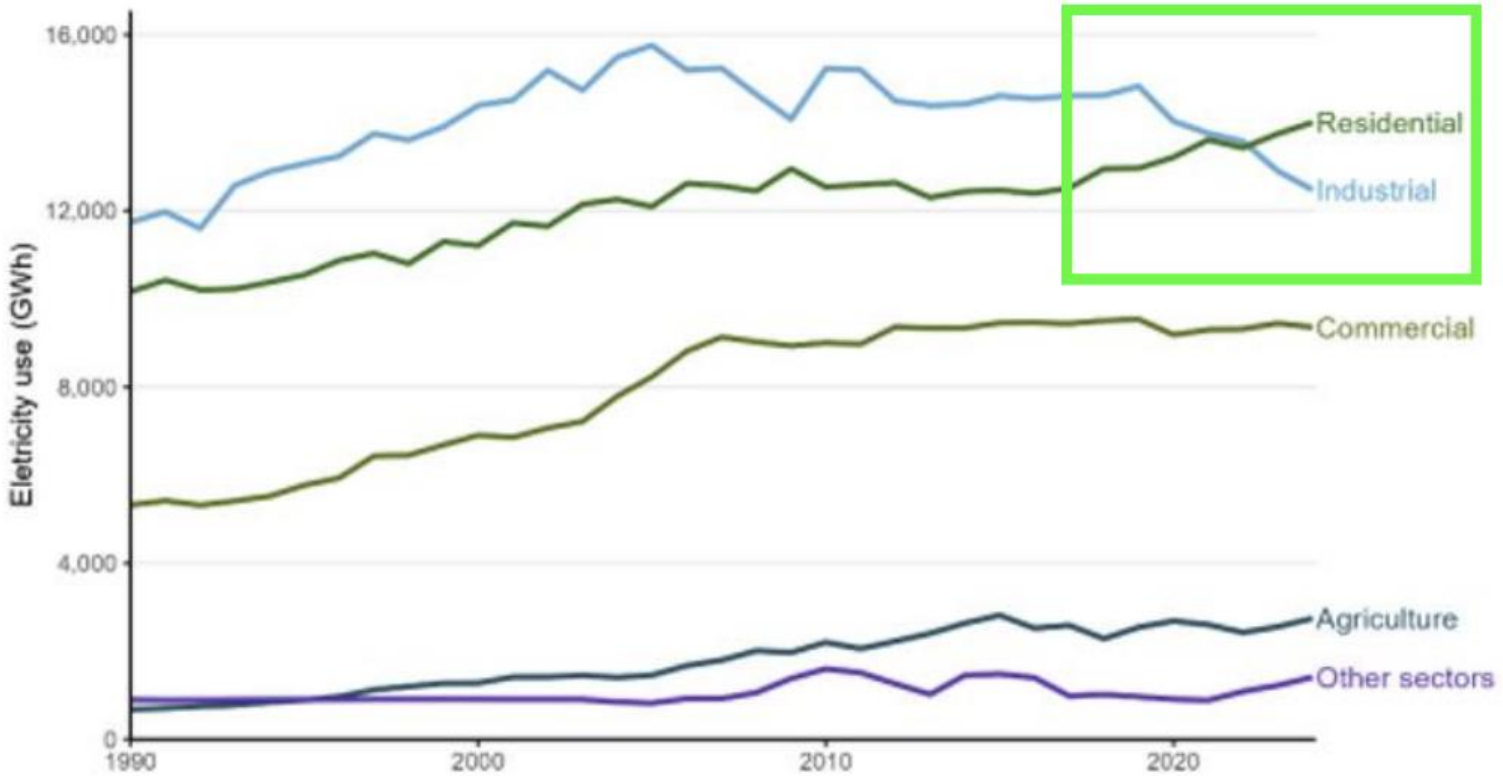
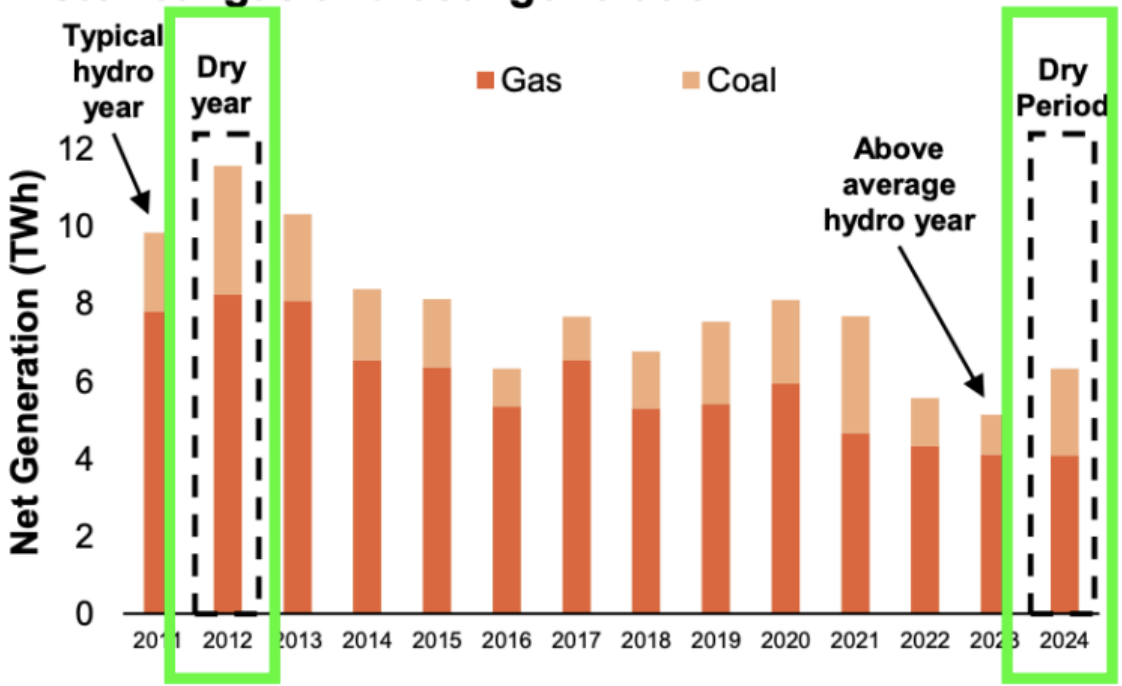


Figure 9. Electricity consumption by sector, by year. "Other sectors" includes transport, unallocated onsite generation, and unallocated demand.

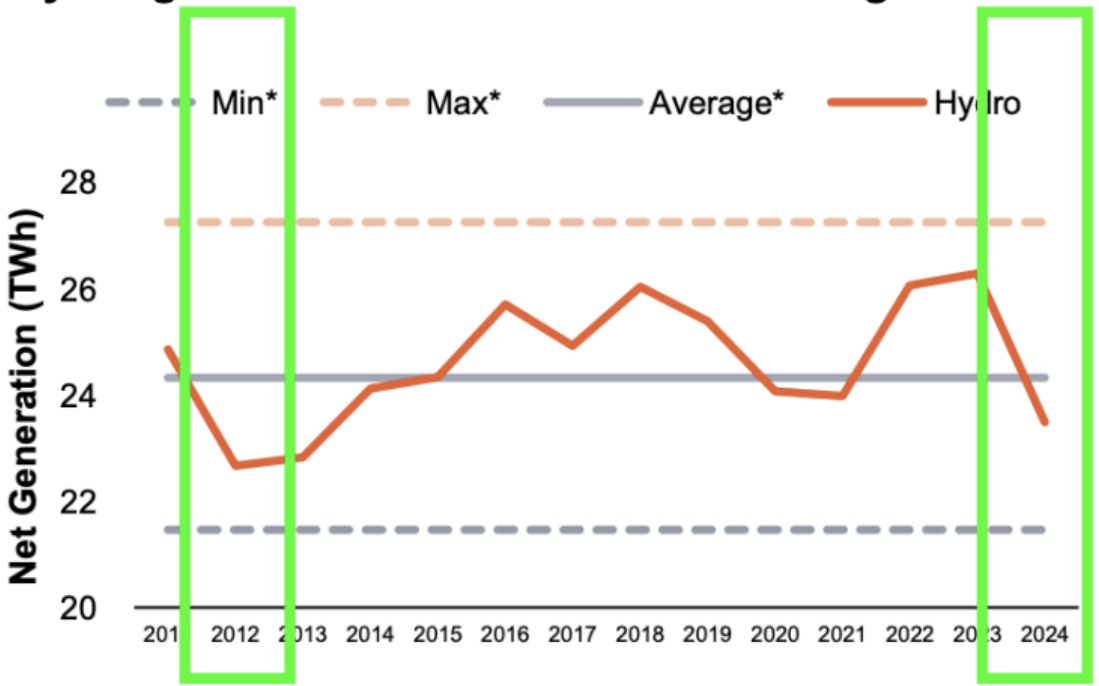
- For the first time since records began residential electricity use exceeds industrial.
- Industrial electricity usage is not dropping due to efficiency it is driven by curtailment and business closures.

GAS & COAL DRY YEAR GENERATION SUPPORT

Historical gas and coal generation



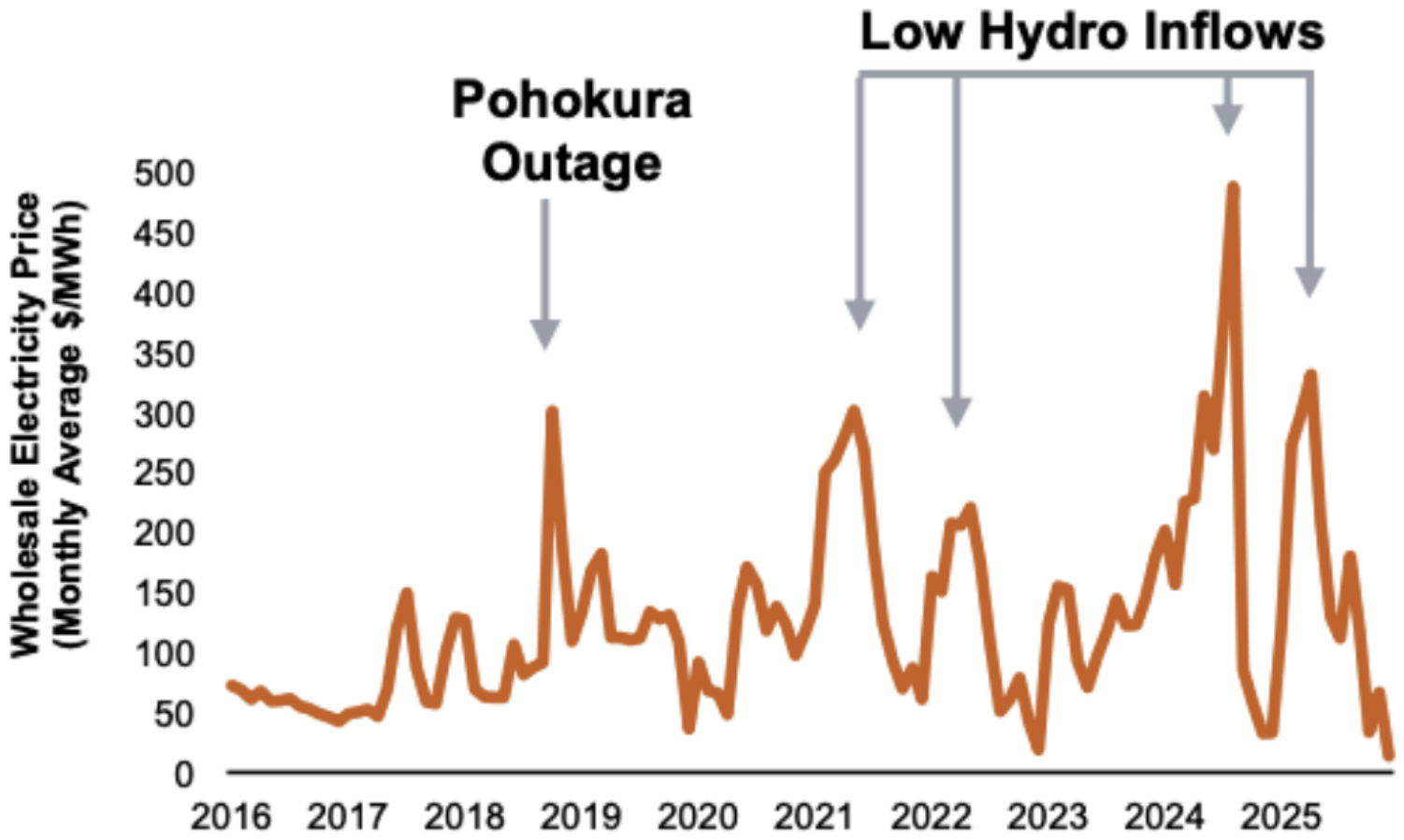
Hydro generation versus historical average



- Gas and coal use tracks hydro inflows almost perfectly.
- Increasing hydro storage is possible but lowers the utilisation of Huntly even further.

PRICE VOLATILITY

Electricity prices during supply constraints

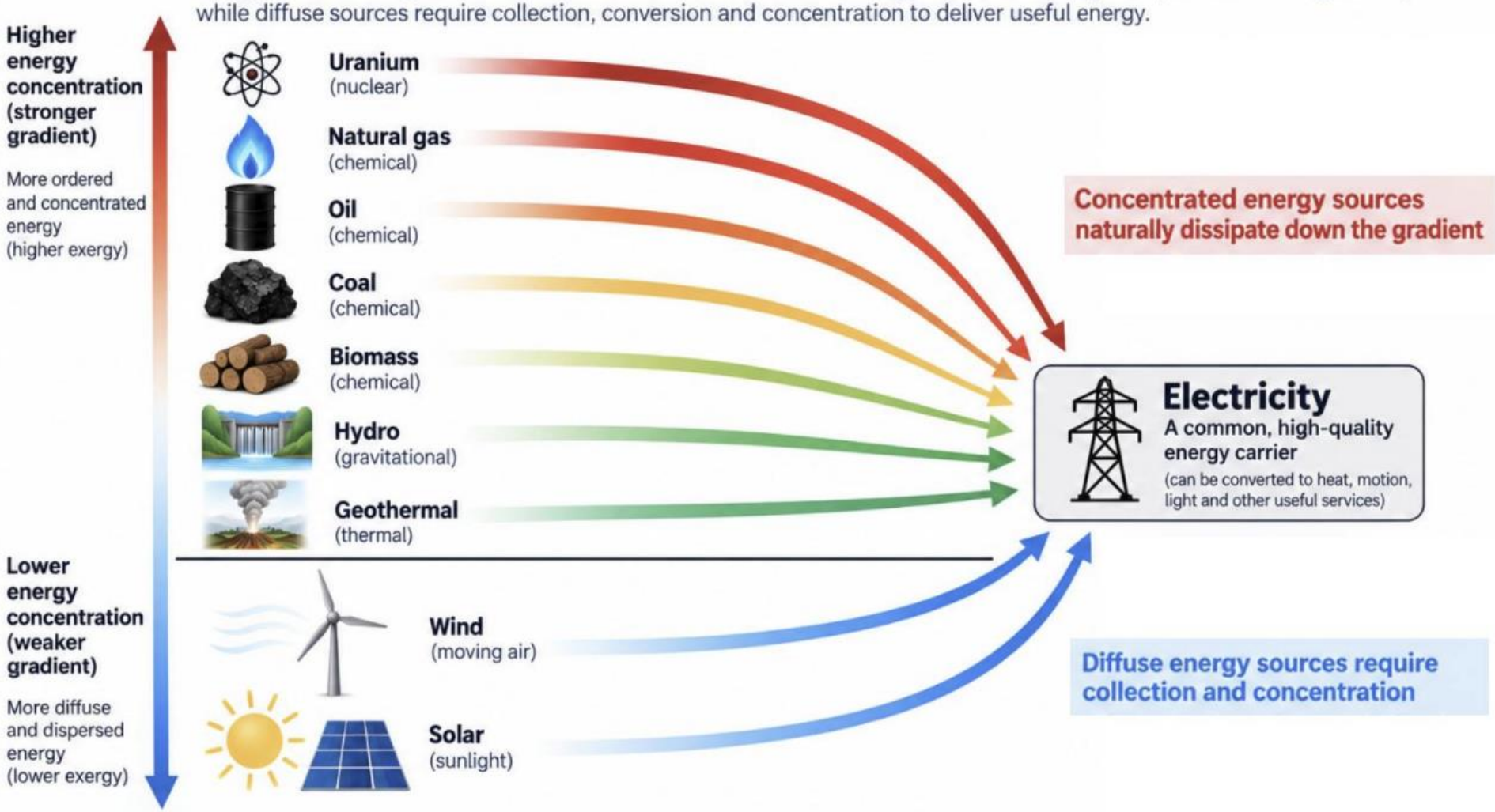


- In the absence of cheap gas firming the NZ electricity market is becoming increasingly weather dependent and as a result increasingly volatile.
- This is very difficult for businesses to manage when selecting power purchase agreements on a fixed or floating basis.
- Larger users that select fixed options very often have to accept demand management provisions.

NZ ENERGY

Different Energy Sources, Same Electricity Output

Energy flows from higher to lower concentration. Concentrated energy sources naturally dissipate down the gradient, while diffuse sources require collection, conversion and concentration to deliver useful energy.



LOW ENERGY DENSITY

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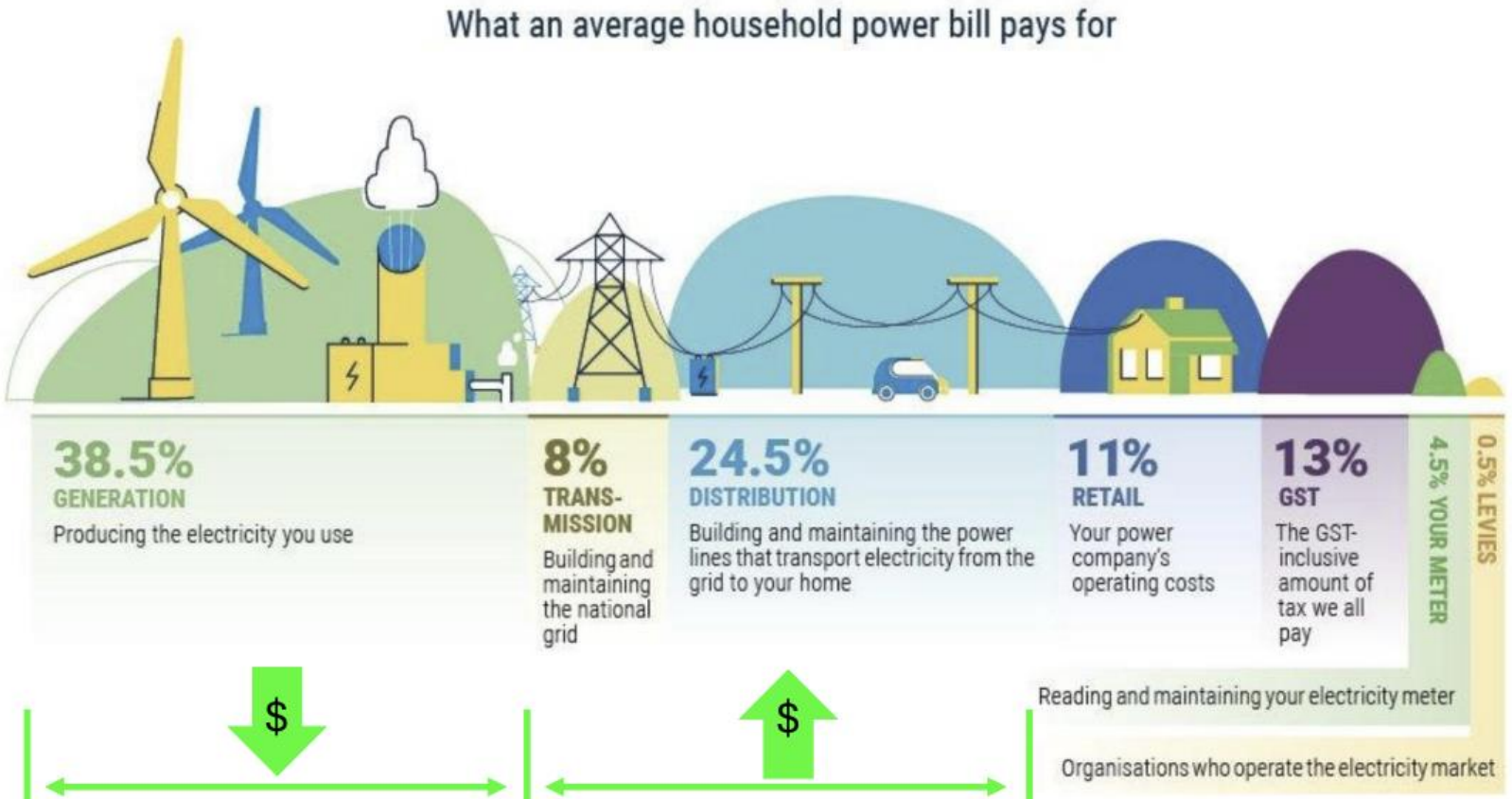
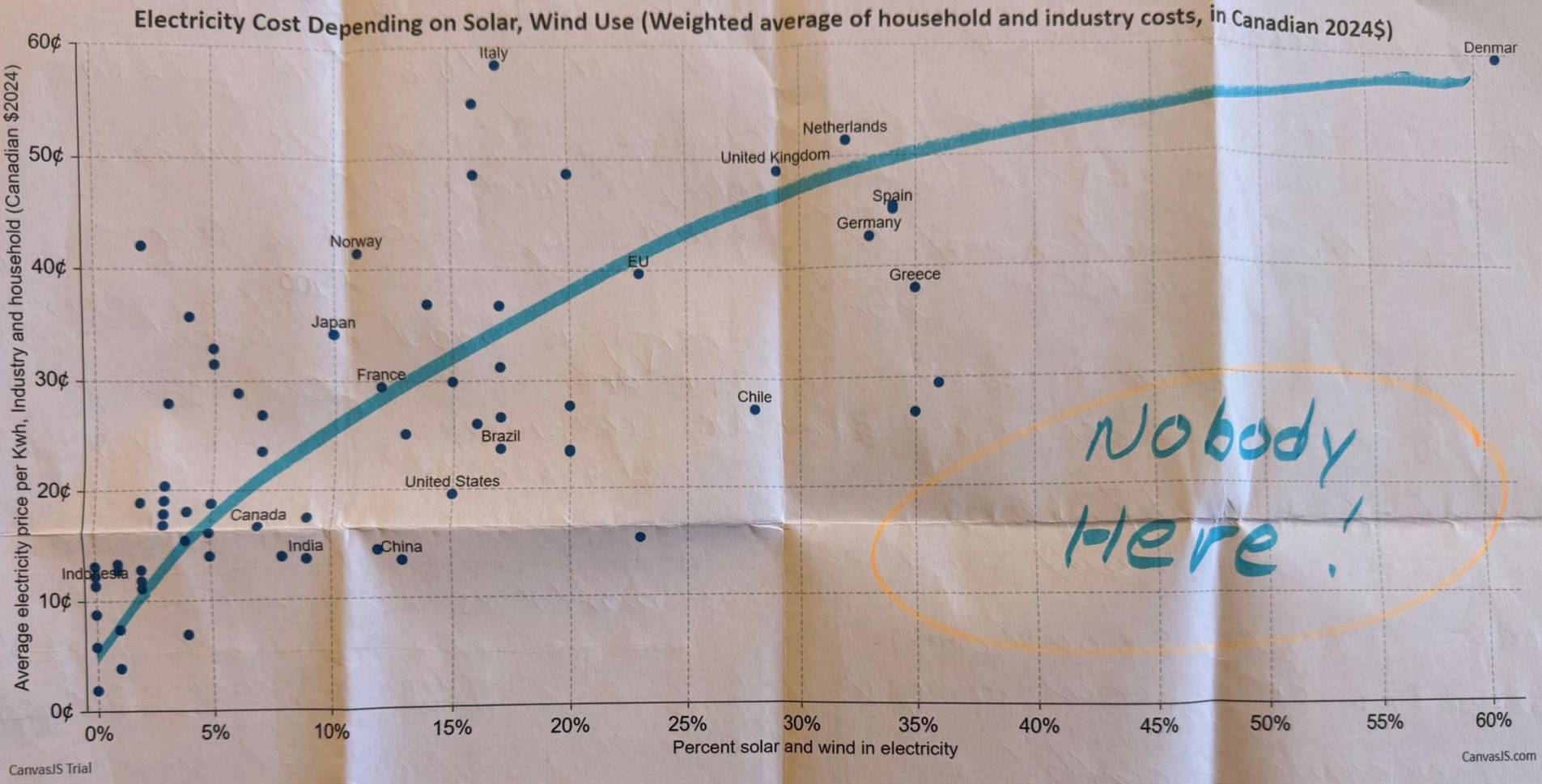
HIGH RESOURCE INTENSITY

NZ ENERGY

FULL SYSTEM COSTS



- As intermittency and variability increase as a % of the grid system costs rise as system complexity increases.
- This pattern is not unique to New Zealand and is one of the key challenges for the energy transition
- Key take away – system costs can quickly erode the net energy surplus the system provides



Source: IEA.org energy prices data set

Solar and Wind Power Are Expensive | Fraser Institute (2025)

70 nations

IN SUMMARY

- We have accumulated enormous societal complexity – complex systems are typically only stable when they are growing.
- Our energy metabolism is a function of needing both the energy to maintain accumulated complexity and a small surplus with which to grow.
- Oil and gas are key components of NZ's energy system both systems are providing us with much less net energy to society – this manifests as a loss of capacity to perform work – jobs go and things get more expensive.
- Electrification is our key response to this situation – this however comes with fundamental challenges:
  - Low energy density.
  - High resource intensity.
  - High system complexity.
  - The ability to provide sufficient net energy surplus to maintain societal complexity remains an open question?

NZ ENERGY

POTENTIAL SOLUTIONS

Short Term

- Conventional geothermal expansion.
- Increased run of the river hydro expansion.
- Small pumped hydro storage schemes to supplement solar generation.
- Domestic solar and battery systems.
- On farm and on warehouse solar.
- Market reform - single buyer market.
- LNG to give a transition lifeline to 18,000 C&I gas users.
- Transport electrification.

Long Term

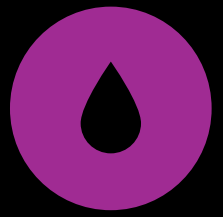
- Nuclear baseload generation.

NZ First Policies

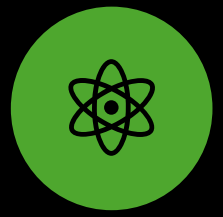
SEPARATE THE GENTAILERS

CREATE A LONG-TERM ENERGY STRATEGY

GEOTHERMAL AND SUPERCRITICAL GEOTHERMAL



HYDRO-ELECTRICITY



HYDROGEN

NUCLEAR FISSION TO FUSION

OIL AND GAS EXPLORATION

The Affordable Energy Webinar Series June-November 2026

Blair Dickie
Waikato Regional Council
4 November

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Upcoming Speakers:

Martin Atkins, UoW Ahuora Centre for Smart Energy Systems 11 November

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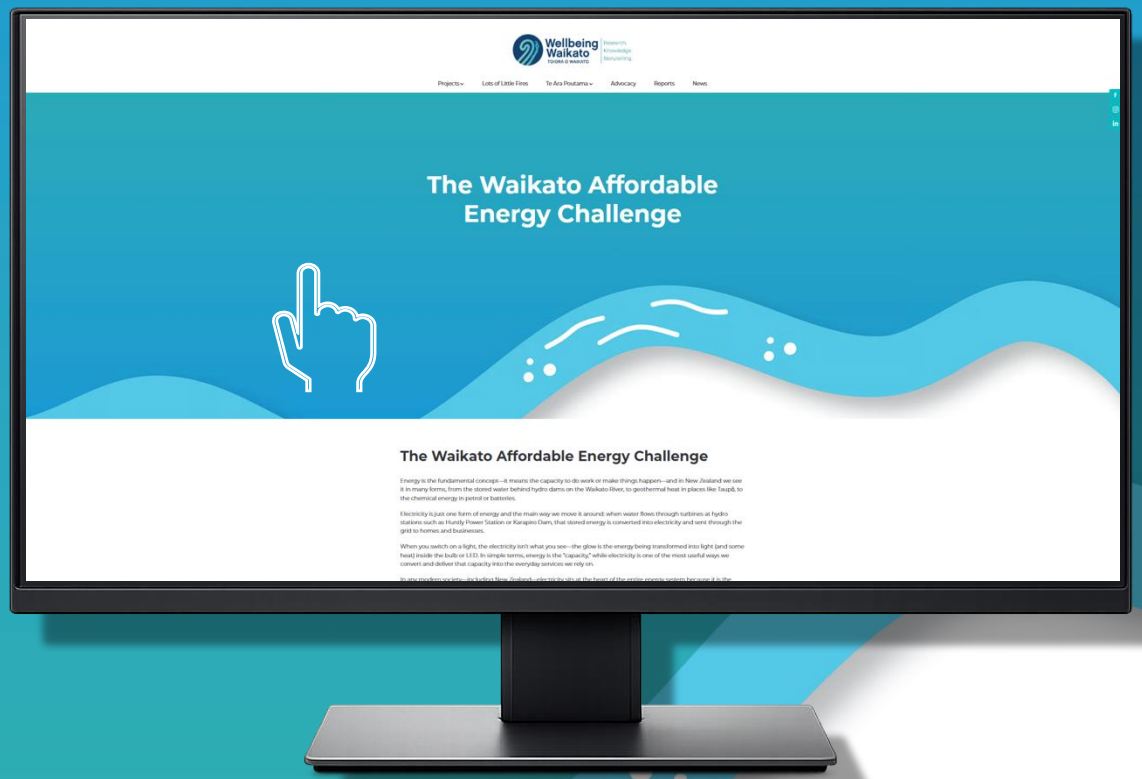
Go to our Website to See all Presentations and Slides from the Series:



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Thank you!

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