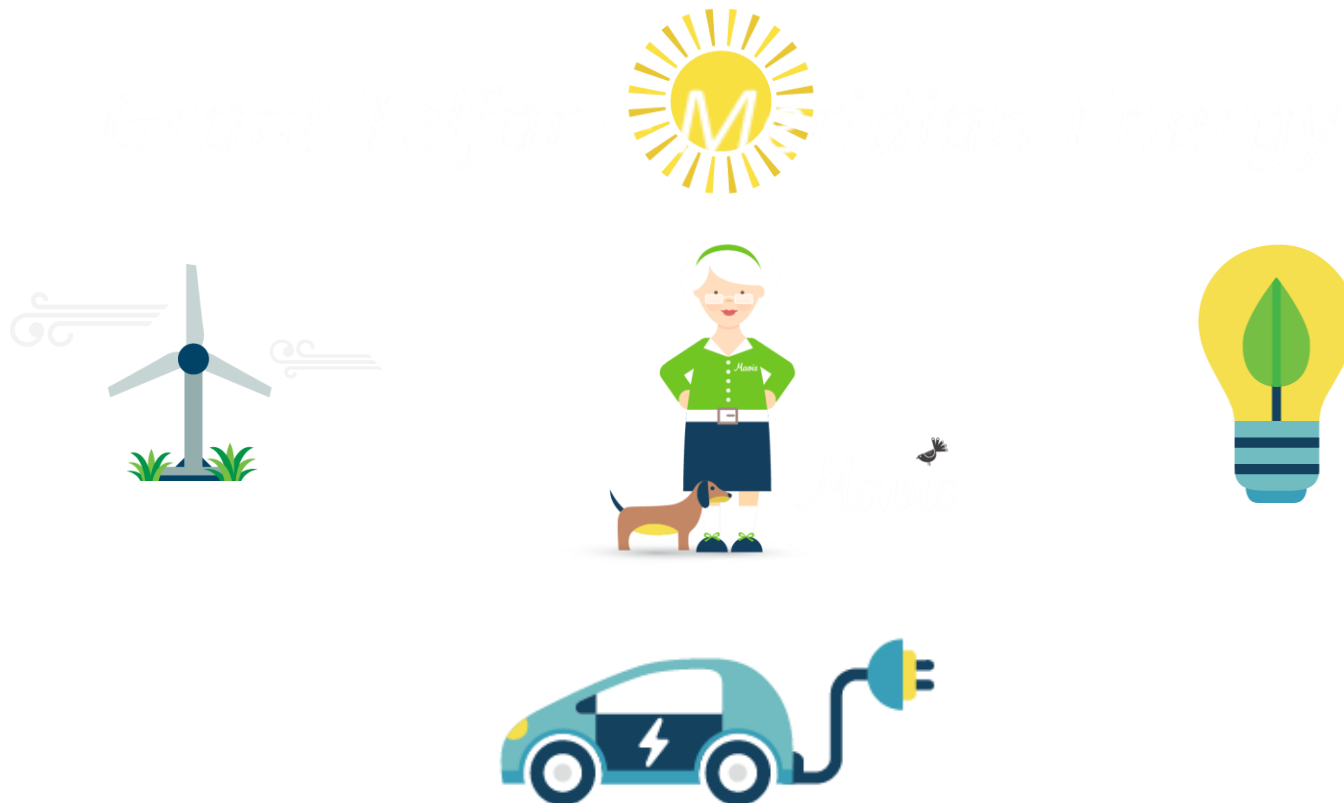


A Generator-Retailer View of the Future

2018 Wind Energy Conference

Grant Telfar – Meridian Energy



Disclaimer

This information in this presentation has been prepared by Meridian Energy Limited ("Meridian") to provide a general overview of Meridian and the New Zealand electricity industry. It has been prepared solely for informational purposes and does not purport to be complete or comprehensive and does not constitute financial produce, investment, tax or other advice. Past performance information provided in this presentation may not be a reliable indication of future performance.

This presentation contains certain forward-looking statements with respect to the financial condition, results of operations and business of Meridian. All such forward-looking statements involve known and unknown risks, significant uncertainties, assumptions, contingencies, and other factors, many of which are outside the control of Meridian, which may cause the actual results or performance of Meridian to be materially different from any future results or performance expressed or implied by such forward-looking statements. There can be no assurance that actual outcomes will not differ materially from the forward-looking statements.

This presentation is not and should not be construed as an offer to sell or a solicitation of an offer to buy Meridian securities and may not be relied upon in connection with any purchase of Meridian securities. In particular, this presentation does not constitute an offer to sell, or a solicitation of an offer to buy, any securities in the United States. Meridian's securities have not been, and will not be, registered under the U.S. Securities Act of 1933 (the "Securities Act") or the securities laws of any state or other jurisdiction of the United States and may not be offered or sold in the United States without registration except in a transaction exempt from, or not subject to, the registration requirements of the Securities Act and any other applicable U.S. state securities laws.

All amounts are disclosed in New Zealand dollars (NZ\$) unless otherwise indicated. Certain information in this presentation has been derived from a number of public sources including data released by the Government of New Zealand and the New Zealand Electricity Authority and public filings of other companies. None of Meridian (nor its officers, employees, agents or advisors) gives any warranty or representation (express or implied) of the accuracy, completeness or reliability of the information, and it takes no responsibility for it. The information has not been and will not be independently verified or audited.

Meridian views of the future

1988

A lot can happen in 30 years!

2018



Why does Meridian care?

- Planning for the future effectively
- Long-lived assets



So how does Meridian cope?

- Focussing on the fundamentals of supply and demand
- Scenario analysis



We tell stories of how we and the industry might evolve over the next few decades

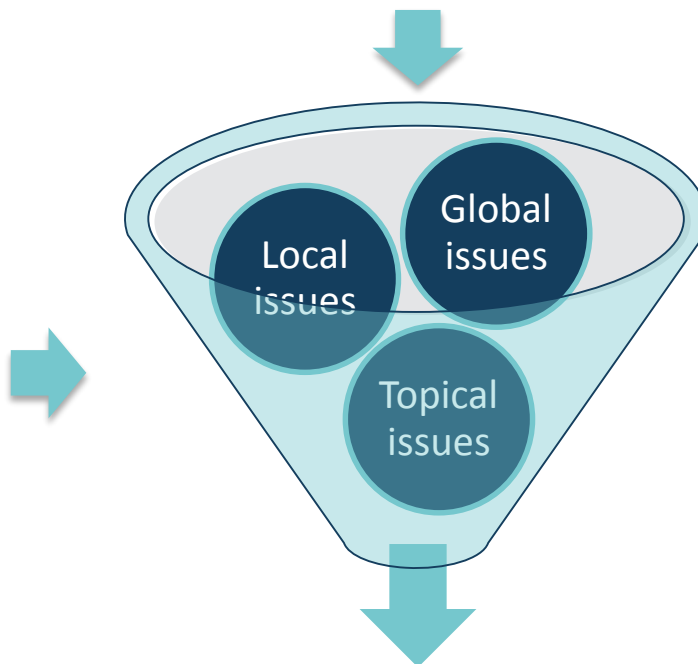


Key issues: so what really matters?

A huge range of potential areas to look at and stories to tell ...
but too many to cover in full detail

Focus on key issues that are
of immediate relevance to:

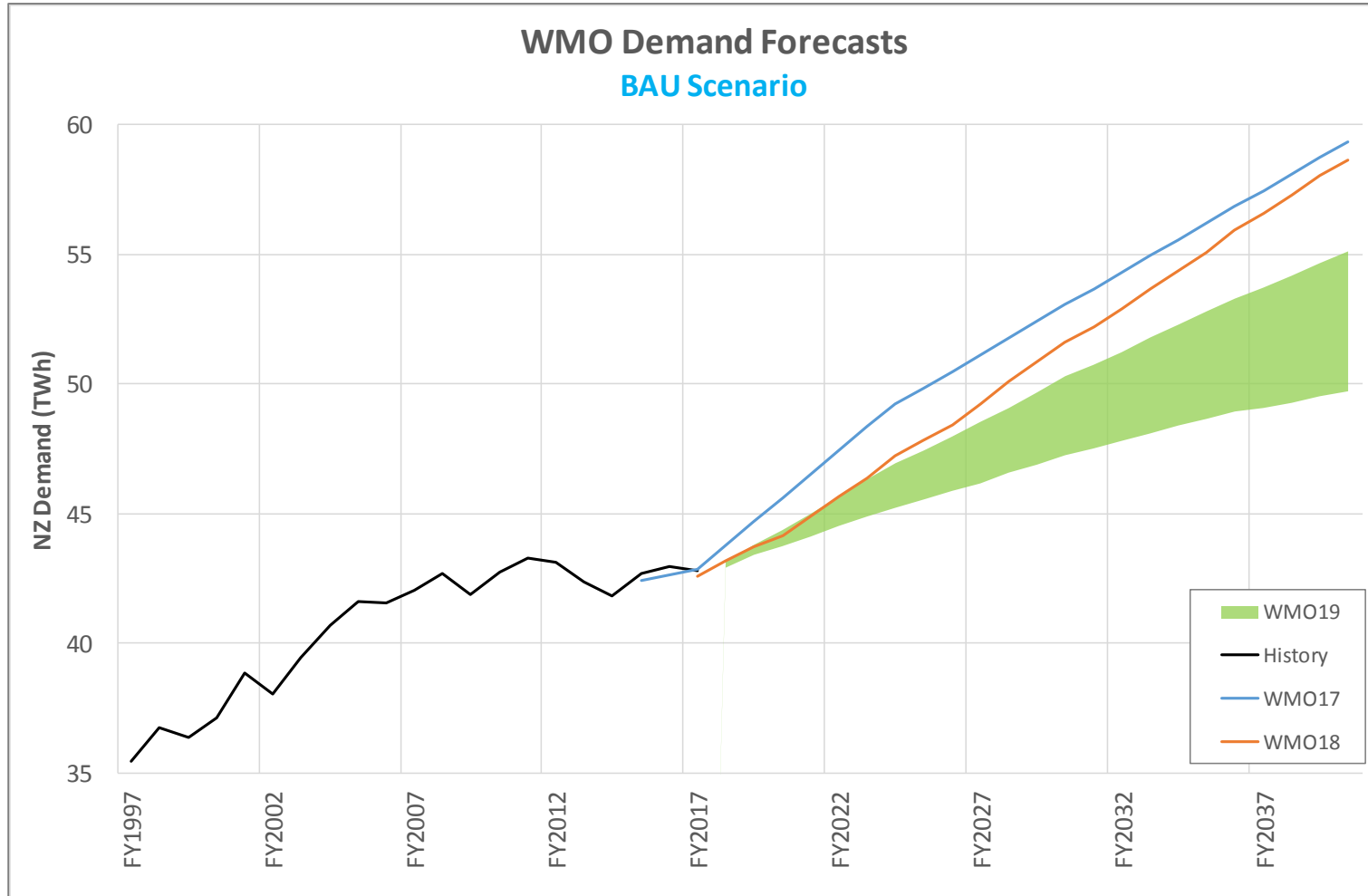
- consumers,
- the power sector,
- Meridian



Key focus areas:

- | | |
|---|--|
| <ul style="list-style-type: none">• Demand growth• Thermal closures• Cost of new generation | <ul style="list-style-type: none">• New technologies• Security• Profitability• Climate Change |
|---|--|

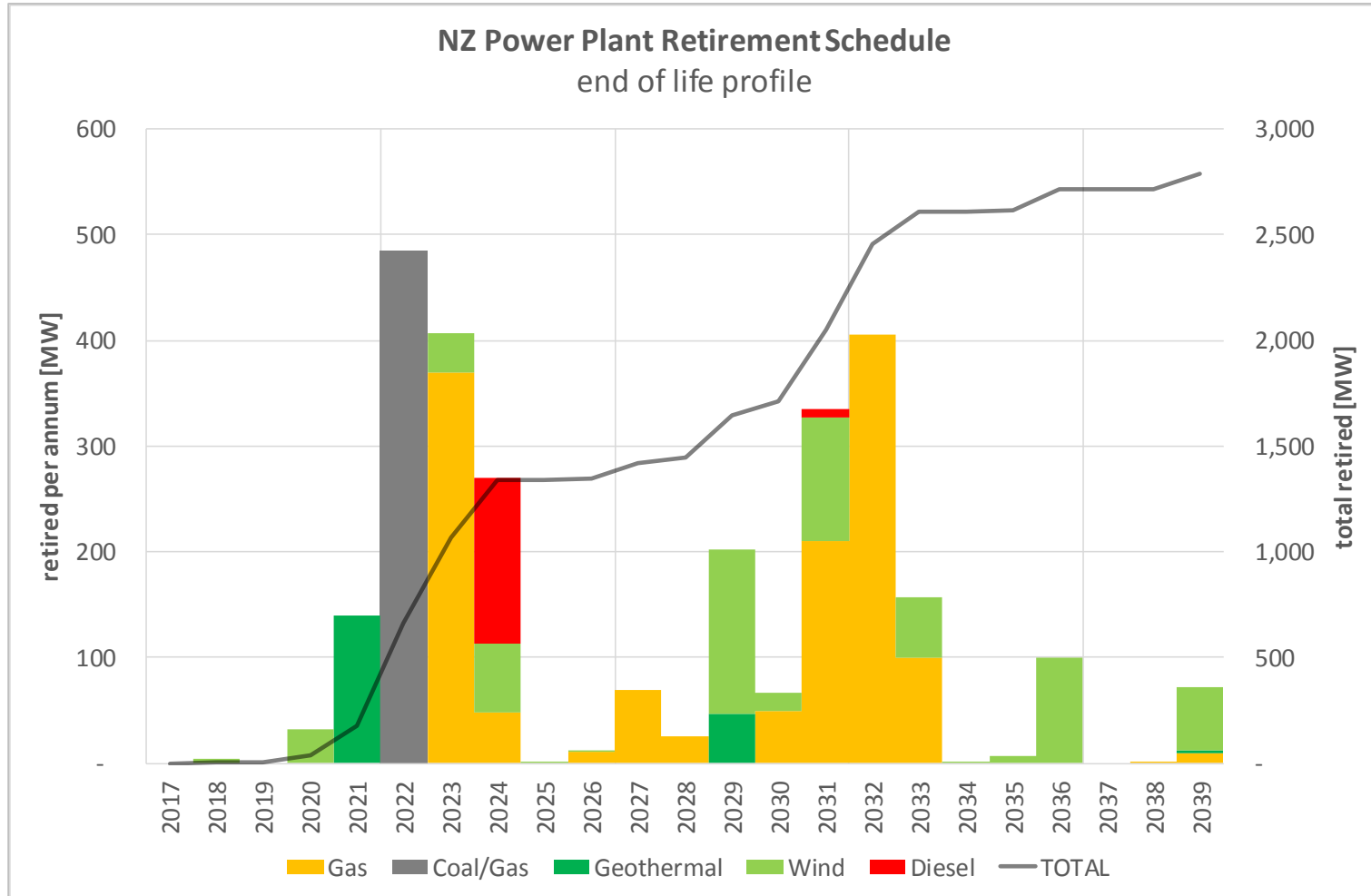
Demand forecasting: load101



Key takeout:

- Population, economy will continue to grow -> positive growth forecast
- While energy efficiency will continue to improve -> less certainty of scale

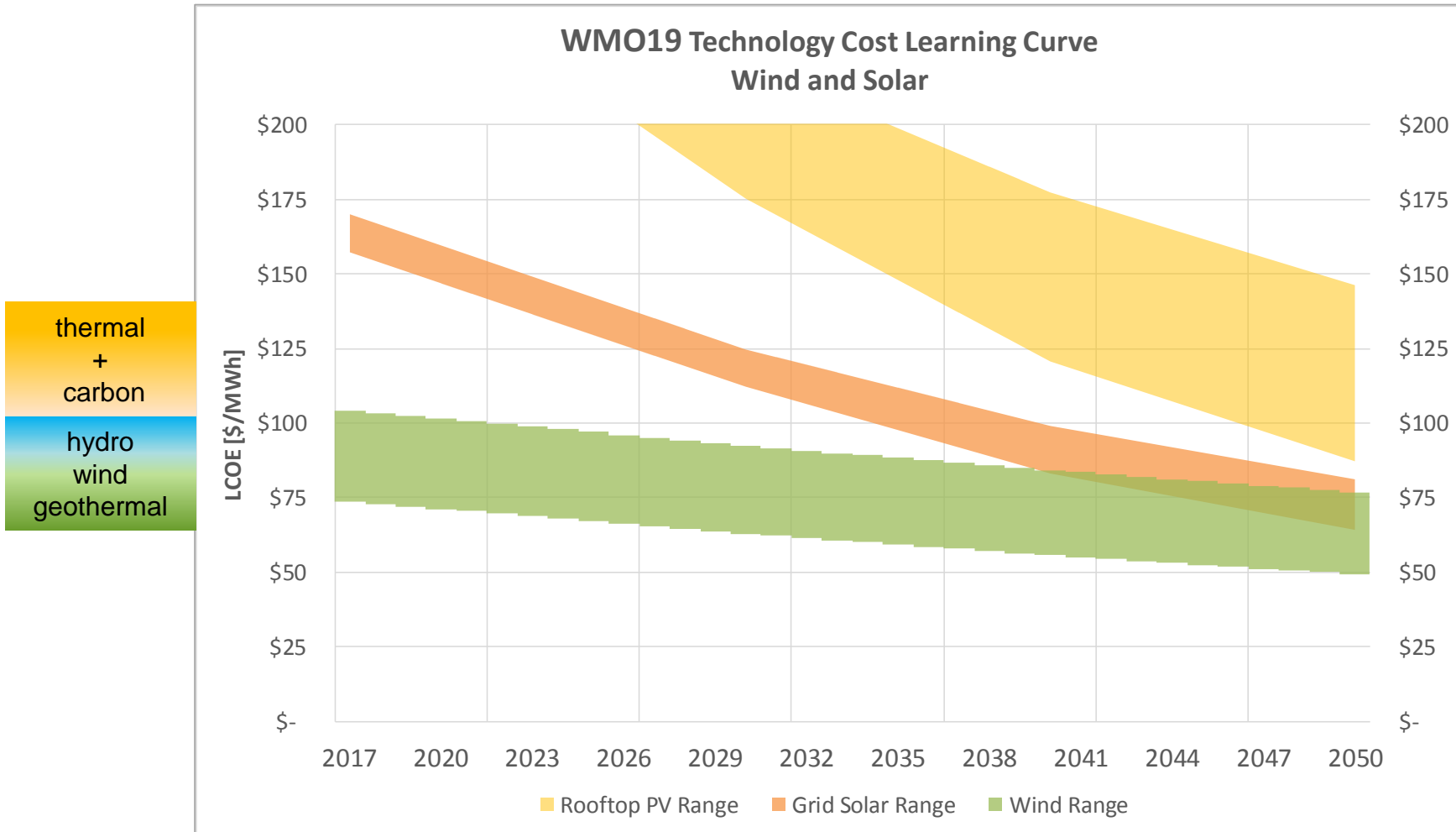
Generating plant retirement: nothing lasts forever



Key takeout:

- Existing thermal and renewables closures are inevitable in the future
- New build will be required, if only to replace plant as they close

Costs of new build: now and in the future



Key takeout:

- Baseload thermal opportunities limited
- Renewables costs likely to continue falling -> door is open but cost is just one element to consider

New technologies: living in interesting times

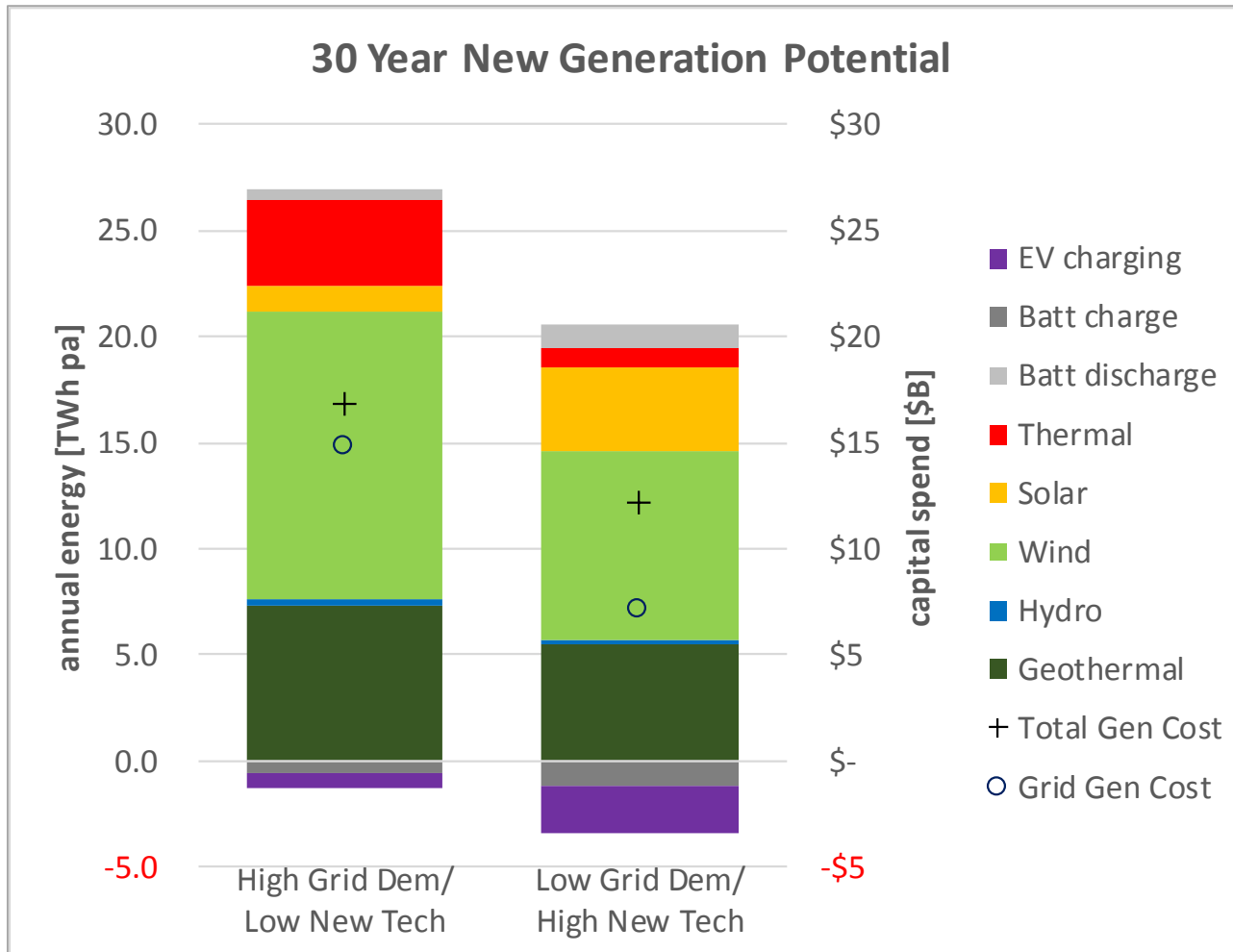
Potential new technology scenarios

	Low steady but modest increase from today	High persistent & strong increase from today	Steady cost decline Expected
Solar (residential)	300,000 (900MW, 1.2TWh)	1,000,000 (3GW, 4TWh)	falling from: 30c/kWh to 9-14c/kWh
EV (passenger)	500,000 (725GWh)	1,500,000 (2.3TWh)	falling from: \$60K to \$18-25K
Batteries (domestic)	100,000 (700MW, 1.2GWh)	350,000 (2.5GW, 4.5GWh)	falling from: \$160/MWh to \$40-50

Key takeout:

- New consumer-led technologies will continue to develop and be deployed
- But largely out of our hands, with outcomes uncertain, so instead focus on how much it matters

Insights: how much stuff?



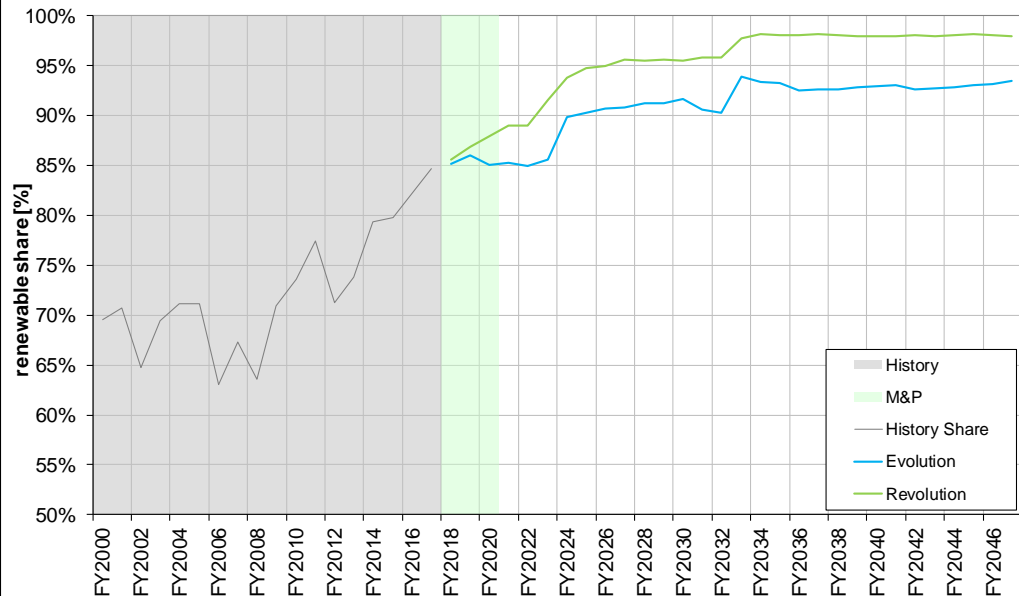
Key takeout:

- New grid-scale generation build inevitable -> dominated by renewables but supported by gas
- New technologies accommodated by the grid-level power system but remain expensive

Insights: ... and the carbon thing?

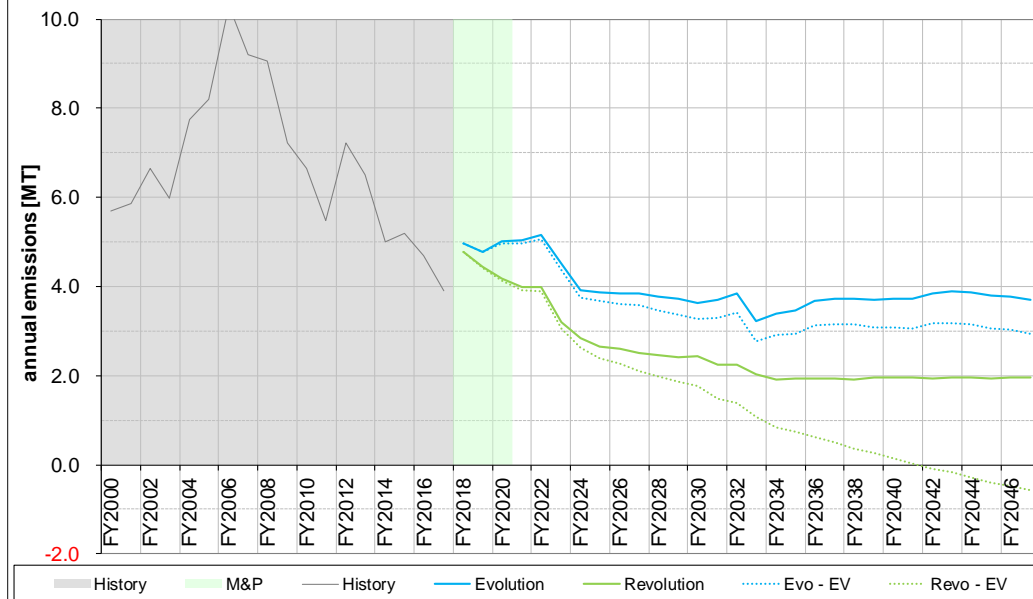
NZ Renewable Generation Share

Wholesale Market Outlook #19



Annual Thermal Generation Carbon Emissions

Wholesale Market Outlook #19



Key takeout:

- Renewable % improves as thermals retire, and are replaced by renewables & new, cleaner GTs
- A struggle to get to 100% without an altered market structure or new, undeveloped technologies

A 101 view of the future

This is a very good news story – the future grid-level NZ power system is resilient and can accommodate:

- Significant demand growth,
- Plant closures,
- New demand-side technologies – including large-scale roll out of EV charging,
- An increasingly renewable power system – with good levels of security-of-supply,
- Delivered by efficient, commercial investments made within the current market design,
- AND without wholesale prices spiralling out of control.

But plenty of challenges:

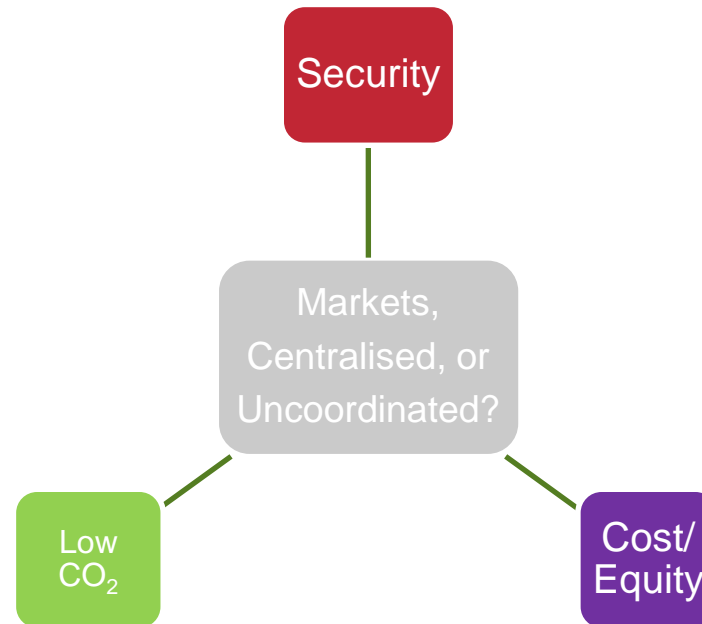
- The industry needs to demonstrate that it can embrace and accommodate change.
- The industry needs to show a collective willingness and the ability to manage the transition to a lower carbon future.
- Uncertainty in future outcomes is larger than ever.
- Optionality in decision-making in the face of future uncertainty will become crucial.

There is a lot to like in this story.

Pushing towards 100% renewable

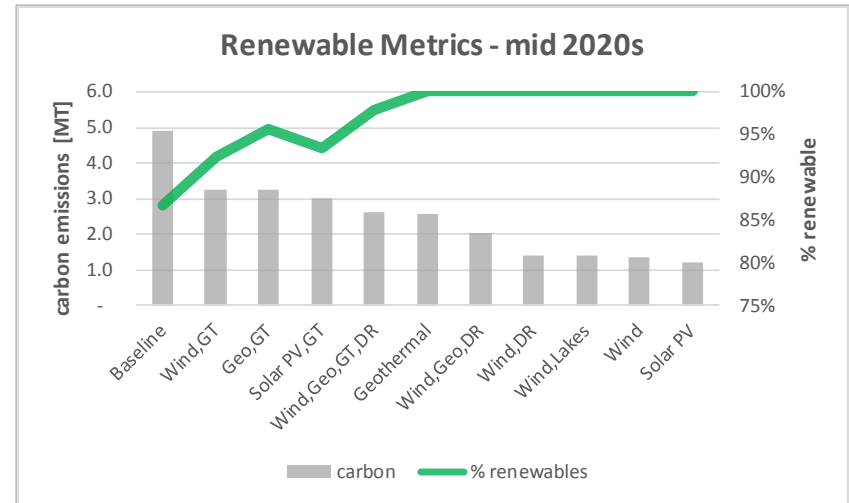
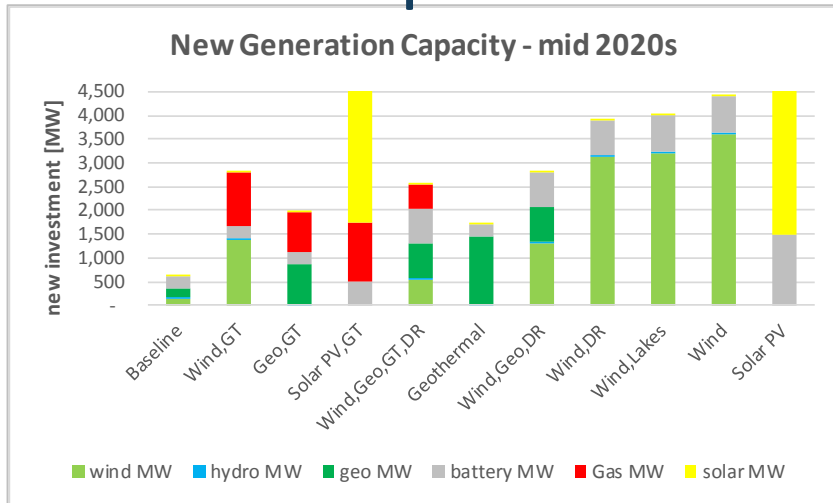
Can we do better than this?

- Of course we can!
- Making green electrons is not hard.
- But there are many issues to work through and trade-offs to be made.



Power supply has to satisfy and balance a range of often conflicting requirements.

For example ... some mid-2020s alternatives

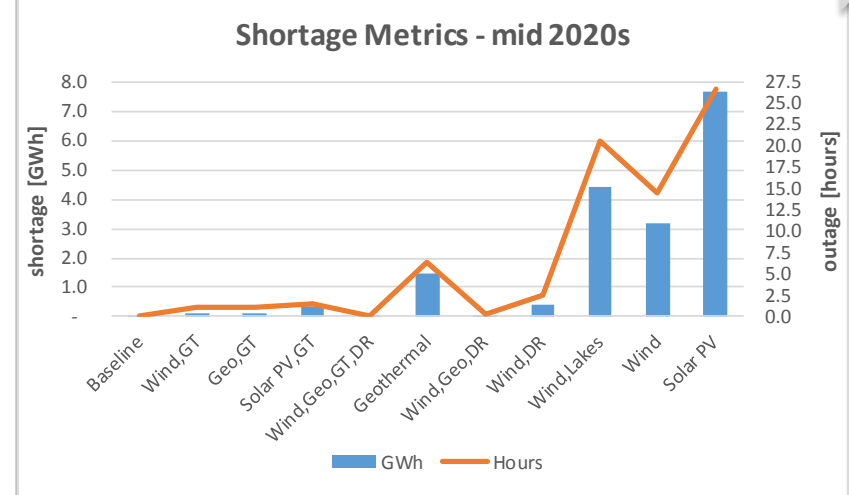
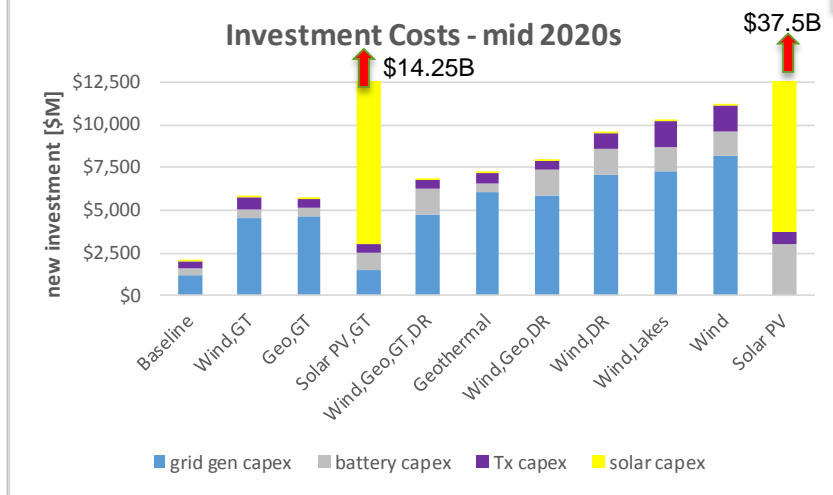


The market will tend towards delivering minimum cost outcomes and avoiding security of supply concerns.

Given geothermal, a zero carbon power system in NZ is not realistically possible.

decreasing carbon emissions >>

decreasing carbon emissions >>



Building GTs lowers both the build requirements (MW) and the cost of lower emission scenarios

System security is critical for market confidence. Demand response and gas turbines improve system security.

Final thoughts on 100% renewable

100% renewables is probably achievable:

- But, deciding to take the first step is critical.
- Otherwise getting to 100% will be harder, and potentially further off.

Some other flies in the ointment that we might want to discuss:

- A wider emissions goal might be more effective.
- Consented options are critical, and there is a cliff coming.

The market will tend towards delivering least-cost investment outcomes and will avoid security of supply concerns:

- It is unlikely to deliver low emission outcomes as quickly as large scale subsidies could.
- Low emission outcomes are possible by 2035, without additional government intervention.
- Earlier low emission futures and/or solutions without gas plant will likely require mechanisms outside the current market arrangements.