Submission on "A Proposed Reliability Obligation to Manage Dry-Year Risk"

Submitted to: MBIE Consultation
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Executive Summary

I support MBIE's objective of reducing dry-year risk and improving the reliability of New Zealand's electricity system. However, I am concerned that the current discussion is overly focused on fuel security and firm thermal generation, while insufficient attention is being given to distributed energy resources (DER), vehicle-to-grid (V2G), flexible demand, distributed batteries, flexible exports, and network-level flexibility.

The consultation document proposes a Winter Energy Reliability Obligation that is intended to work alongside a proposed LNG import terminal and encourage investment in firm capacity and fuel. My submission argues that:

1. V2G and distributed flexibility should be explicitly assessed as dry-year mitigation resources.
2. The opportunity cost of delaying V2G adoption is significant and growing.
3. Hydro should be treated as *seasonal storage* and EVs as *daily storage*.
4. Network deferral benefits have been largely overlooked.
5. LNG should be assessed against the full value stack available from distributed flexibility.
6. New Zealand can reduce both transport costs and electricity costs simultaneously through accelerated electrification and V2G.

The key policy question should not be "How much LNG does New Zealand need?" but rather "What is the least-cost combination of hydro, renewables, distributed flexibility, V2G, batteries and firm fuel that minimises long-term costs to New Zealand?"

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1. Dry-Year Risk Is Primarily an Energy Storage Problem

A dry year is fundamentally a shortage of stored energy. Historically New Zealand has relied upon:

- Hydro storage.
- Gas-fired generation.
- Coal-fired generation.

The proposed LNG solution continues this paradigm by importing fuel when domestic energy reserves become constrained. MBIE's consultation explicitly positions the reliability obligation alongside an LNG import terminal.

However, technology developments over the last decade have created a new category of storage resource:

- EV batteries.
- Residential batteries.
- Commercial batteries.
- Flexible demand.

These resources should be evaluated on an equal footing with fuel-based solutions.

2. Hydro and V2G Are Complementary

The debate is often framed incorrectly as Hydro versus batteries, LNG versus batteries.

The more useful framework is:

Resource	Function
Hydro lakes	Seasonal storage
EV batteries	Daily storage
Stationary batteries	Daily to weekly storage
Flexible demand	Peak reduction
Wind and solar	Energy production
LNG	Emergency reserve fuel

Under this model:

- EVs manage daily peaks.
- Hydro manages seasonal shortages.
- LNG becomes a last-resort insurance product.

This hierarchy minimises the quantity of LNG required.

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3. The Opportunity Cost of Delay

A major omission from current policy discussions is opportunity cost. Every year New Zealand delays V2G adoption:

- Additional EVs enter the fleet without bidirectional capability.
- Additional network upgrades proceed under traditional assumptions.
- Additional flexibility remains inaccessible.

The cost of delay is not simply lost V2G revenue. The cost is:

- Higher network expenditure.
- Higher wholesale prices.
- Higher fuel imports.
- Reduced hydro preservation.

Opportunity costs should be explicitly included in MBIE's modelling.

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4. Network Benefits Have Been Underestimated

The consultation focuses largely on system reliability. However, V2G offers significant transmission and distribution benefits. Examples include:

- Deferring transformer upgrades.
- Deferring feeder upgrades.
- Reducing local peak demand.
- Improving utilisation of existing assets.

Consumers benefit twice:

1. As EV owners receiving flexibility payments.
2. As electricity customers facing lower future line charges.

This value stream is largely absent from current dry-year discussions.

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5. The National Battery Already Exists

Consider a future fleet of 1 million EVs (Average battery size 60 kWh). This equates to 60 GWh of battery capacity. Not all capacity will be available. Not all vehicles will participate.

However, even partial participation creates a storage resource that is material at national scale. Unlike utility batteries, these batteries are largely *funded through transport purchases* rather than electricity charges. The electricity system gains access to storage capacity *without funding the battery* itself.

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6. Overnight Geothermal and Wind Create a Natural Charging Opportunity

New Zealand has a generation mix that is particularly well suited to V2G. Characteristics include:

- Continuous geothermal generation.
- Significant overnight wind production.
- Growing solar production.

V2G allows:

- Overnight charging from geothermal and wind.
- Midday charging from solar.
- Morning and evening discharge.

This increases utilisation of existing renewable generation and reduces curtailment.

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7. V2G Improves Hydro Conservation

Dry-year risk is largely driven by concern over hydro storage depletion.

V2G can assist by:

- Reducing peak hydro dispatch.
- Flattening demand curves.
- Reducing reliance on thermal generation during normal conditions.

The result is greater hydro preservation for periods when it is genuinely needed. This benefit should be explicitly modelled.

Investigate the role of large-scale flexible industrial demand as a reliability resource capable of both absorbing surplus renewable generation and reducing demand during dry-year and scarcity events.

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8. Economic Benefits Extend Beyond the Electricity Sector

The Government's own analysis highlights the economic consequences of dry-year risk, including higher electricity prices and broader economic impacts. MBIE notes that dry-year risk contributes to a $30-$50/MWh premium in forward electricity prices and has wider effects on GDP, wages, household spending and the trade balance. V2G provides benefits beyond electricity:

- **Reduced Fuel Imports.** EVs replace imported transport fuels with *domestically generated* electricity.
- **Improved Trade Balance.** Less money leaves New Zealand to purchase fossil fuels.
- **Increased Economic Productivity.** Lower transport and electricity costs improve business competitiveness.
- **Greater Energy Sovereignty.** New Zealand becomes less exposed to international fuel markets and geopolitical disruptions.

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9. V2G Should Be Explicitly Included Within the Reliability Obligation Framework

The proposed reliability obligation appears focused on:

- Firm fuel.
- Firm generation.
- Procurement obligations.

I recommend that MBIE also recognise:

- Aggregated EV fleets.
- Distributed batteries.
- Flexible exports.
- Flexible demand response.

as eligible reliability resources.

The reliability obligation should reward outcomes rather than technologies. If distributed flexibility can provide reliability more cheaply than imported fuel, it should compete on equal terms. Beyond residential flexibility, MBIE should also investigate the role of emerging flexible industrial loads as reliability resources. New Zealand already has experience with large-scale industrial demand response through arrangements involving major electricity users such as NZAS and NZ Steel. Future flexible loads, including data centres, hydrogen production, water and wastewater pumping, desalination and other controllable industrial processes, could provide additional dry-year resilience by increasing consumption during periods of renewable surplus and reducing consumption during periods of scarcity. These resources should be evaluated alongside V2G, distributed batteries and other forms of demand flexibility within a common economic framework.

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10. Recommendations

I recommend that MBIE:

1. Undertake explicit modelling of V2G as a dry-year mitigation resource.
2. Quantify the opportunity cost of delaying V2G deployment.
3. Model *hydro preservation benefits* arising from V2G.
4. Quantify transmission and distribution deferral benefits.
5. Require future reliability assessments to compare:

    - LNG
    - V2G
    - distributed batteries
    - flexible demand
    - flexible exports

using a common economic framework.

6. Accelerate regulatory settings that support:

    - *bidirectional* charging
    - flexible exports
    - dynamic pricing
    - local flexibility markets
    - aggregation of residential DER.

Conclusion

The consultation correctly identifies dry-year risk as a significant challenge for New Zealand's electricity system. However, the solution set should be broadened beyond fuel security and thermal firming.

New Zealand now has access to technologies that did not exist when previous dry-year frameworks were developed. Vehicle-to-grid, distributed batteries, flexible demand and flexible exports can *collectively reduce dry-year risk*, lower network costs, *preserve hydro storage*, reduce fuel imports and improve economic resilience.

Before New Zealand commits to long-term LNG dependence, the Government should fully quantify the contribution that distributed flexibility can make to reliability, affordability and energy security. The least-cost dry-year solution may not be a choice between LNG and renewables. It may be *a coordinated system* that combines hydro, renewables, V2G, batteries and demand flexibility, with LNG acting only as a *last-resort* insurance mechanism.

Appendix 1

An illustrative alternative scenario that MBIE should model alongside LNG-based options.

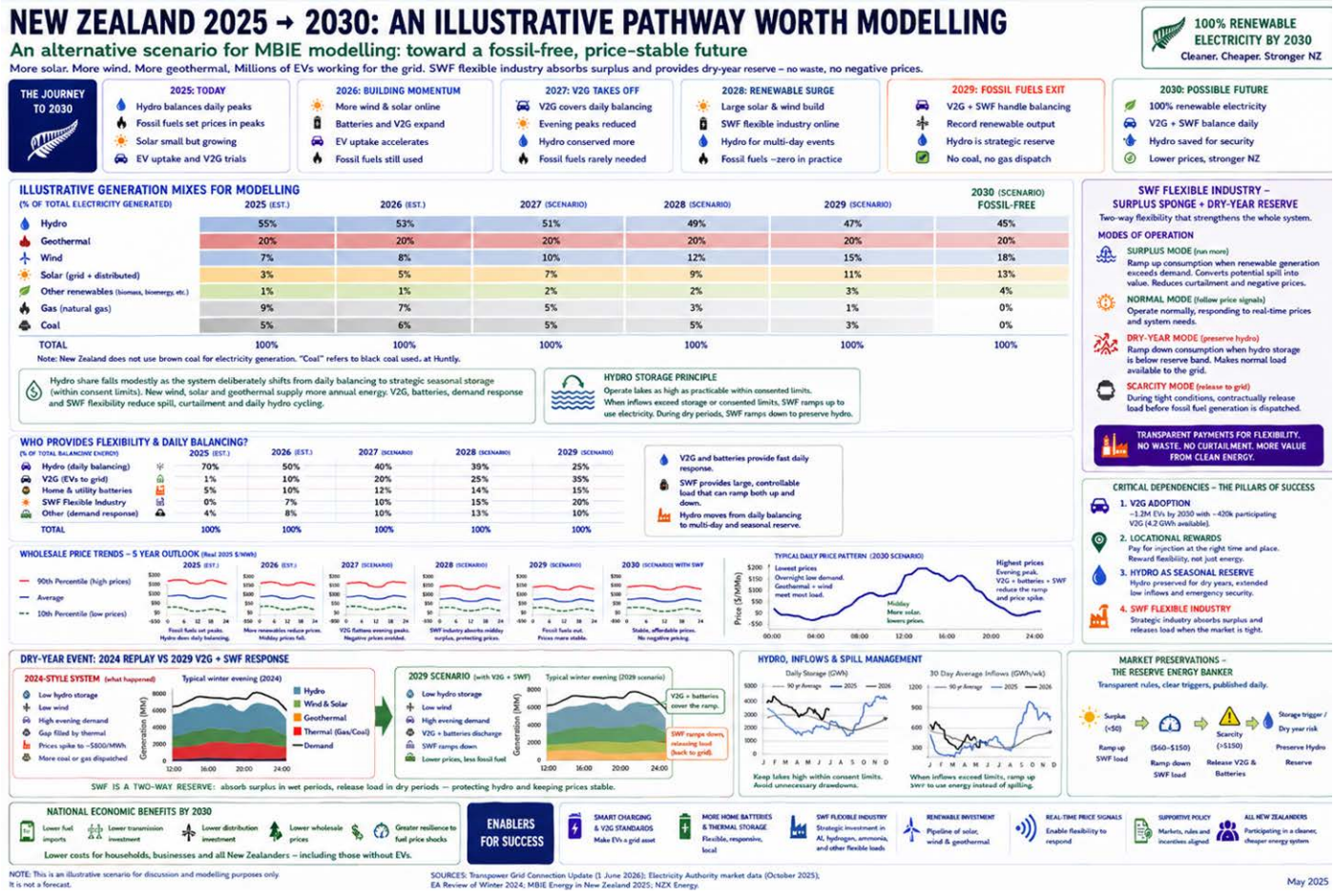


Fig.1 Hydro becomes strategic seasonal storage, while V2G, batteries, flexible demand and SWF handle daily balancing.

Hydro share is shown falling modestly because the scenario treats hydro as strategic seasonal storage. New wind, solar and geothermal generation supply more annual energy, while V2G, batteries, demand response and SWF flexible industry reduce spill, curtailment and daily hydro cycling.