



6 June 2023

Ministry of Business, Innovation and Employment
By email: energyinfo@mbie.govt.nz

Electricity Demand and Generation Scenarios (EDGS) 2023 consultation

Meridian is Aotearoa's largest generator of renewable energy and operates six large hydro stations and five large wind farms. We have a sixth wind farm and a grid scale battery currently under construction.

Meridian appreciates the opportunity to comment on the development of the 2023 EDGS. This is an important input for the Commerce Commission's investment test used to approve Transpower's investment proposals under the Capital Expenditure Input Methodology. Timely electricity network investment is critical to enable the transition to an electrified and net zero carbon economy. The EDGS should therefore encompass a broad range of scenarios that will enable increased transmission investment, including:

- relatively aggressive demand growth scenarios like the proposed innovation scenario; and
- scenarios that will highlight potential grid constraints.

We note at the outset that none of the proposed scenarios attempt to take into account the NZ Battery Project and that the generation expansion part of the model makes available eight generic 100-200MW gas peakers for construction between now and 2050. Meridian agrees with this approach given the considerable uncertainty regarding any potential Crown investment and the likely role of gas generation in future. We assume that the EDGS would be updated again if any final investment decisions are made on the NZ Battery Project.

The question of what the scenarios assume in respect of New Zealand's Aluminium Smelter is assessed via a sensitivity on the Reference scenario. The default assumption is that the smelter stays open throughout the forecast period. However, this assumption is also tested against a sensitivity in which the smelter closes in 2035. Given the current electricity

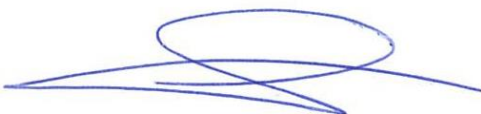
contract for the smelter ends after 2024 and no replacement contract has been agreed¹, it may be sensible to also test against a sensitivity in which the smelter closes after 2024. To be clear, Meridian does not know the likelihood of a 2024 smelter exit but it would seem prudent to test the impact of the contractual status quo and be prepared in the event it does play out. We would expect the EDGS scenarios to be further updated in early 2025 if in fact the smelter decided to exit.

According to the consultation document, outputs from the Government's interim Hydrogen Roadmap will be built into the 2023 EDGS. Given the interim Hydrogen Roadmap has not been released we cannot comment on the use of its outputs. In Meridian's opinion, a green hydrogen industry is likely to develop in New Zealand between now and 2050. Meridian has partnered with Woodside Energy, Ngāi Tahu, and Mitsui & Co in the development stage of the proposed Southern Green Hydrogen project. Commercial arrangements are being finalised on how Meridian, Woodside, and Mitsui will work together towards engineering design and a final investment decision. We believe a large-scale hydrogen and ammonia facility in Southland, focused on the export market, will accelerate the development of a domestic hydrogen economy and strengthen New Zealand's emissions reduction pathway. A key aspect of the project is the ability of a hydrogen production facility to easily flex its electricity consumption in sympathy with the needs of the New Zealand power system. We expect any facility will help to meet New Zealand's dry year energy and peak capacity needs and that the financial rewards for that demand response capability will help to deliver an electricity price that makes hydrogen production and export commercial. The EGDS should be updated if and when any final investment decisions are made.

Meridian's answers to the specific consultation questions are set out in the Appendix. Nothing in this submission is confidential.

Please contact me if you have any queries regarding this submission.

Nāku noa, nā



Sam Fleming
Manager, Regulatory and Government Relations

¹ Since July 2022 NZAS has been exploring potential pathways with electricity generators for a future beyond 2024 but no agreement has been reached to date:
https://www.nzas.co.nz/files/3875_20221030223741-1667122661.pdf

Appendix: Responses to consultation questions

Introduction	
1	a) Do you agree with the stated purpose of EDGS? (Please select one)
	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
	b) Why, or why not?
2	How do you use EDGS?
	Meridian does not use EDGS directly. However, it is a useful comparison for our own electricity market modelling and other modelling carried out by third parties. We also recognise the importance of EDGS as an independent input for the Commerce Commission's investment tests.
3	a) Do you agree with the frequency of the EDGS? (Please select one)
	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (please elaborate below) <input type="checkbox"/> Don't know
	b) If NO, how frequently do you think it should be?
	<input checked="" type="checkbox"/> Annually <input type="checkbox"/> Every two years <input type="checkbox"/> Every three years <input type="checkbox"/> Other (please specify)
	Or less often but with updates as required when there are significant changes to the power system and expected generation and demand mix.
Scenarios	
4	Does the set of four scenarios adequately explore the potential future states that you think will be important? (Please select one)
	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
5	a) Is each scenario's story internally consistent and coherent? (Please select one)
	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
	b) If NO, why not?
6	a) Are there other aspects that should be considered in our scenario planning? (Please select one)
	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Don't know
	b) If YES, please write here:

Key assumptions

7 Do these assumptions align with the four scenario definitions? (Please select one)

Yes No Don't know

8 a) Do you agree with these assumptions? (Please select one)

Yes No Don't know

b) If NO, please explain or add any specific changes to the table provided below.

9 a) Do you agree with these process heat assumptions? (Please select one)

Yes No Don't know

b) If NO, why not?

10 What mix of electricity and biomass should we be assuming for process heat fuel-switching in each of our scenarios? Please fill out the table supplied below.

See EECAs work on biomass potential for process heat conversions in Southland <https://www.eeca.govt.nz/assets/EECA-Southland-RETA-Report.pdf>. That work identified optimal pathways for industrial fuel switching decisions that result in 45% of the energy needs supplied by biomass, and 55% of energy needs supplied by electricity. In Meridian's opinion this would be an upper end estimate of the potential for biomass. It is worth further assessing the emissions impact of biomass as it may change the timing of the emissions release (relative to other wood products) by a significant period. The same study also estimated that by 2024, all unutilised harvesting and processor residues will be exhausted, and meeting the remaining demand from fuel switching projects will require diversion of export chip and export low-grade logs to domestic bioenergy at a higher cost.

This was a Southland study only and the energy mix for industrial fuel switching projects will vary by location depending on the availability and cost of nearby biomass resources. It will be difficult to make broad assumptions for EDGS and whatever assumptions are made should be transparent.

11 What do you think we should be assuming for the **future activity** of large energy users involved in specific industry process heat applications in each of our scenarios?

Following the NZ Steel GIDI funding announcement, some reasonable assumptions should be possible with a degree of confidence for steel production. Meridian is not privy to any information or modelling that might help to inform methanol or fertiliser process heat applications.

12 What do you think we should be assuming for the **closure** of large energy users involved in specific industry process heat applications in each of our scenarios?

Given it is in the national interest to retain industry in New Zealand (rather than export emissions) the EDGS scenarios should not make closure assumptions unless there is a valid basis for those assumptions.

13 a) Do you agree with our approach to the possible closure of Tiwai Point? (Please select one)

Yes No Don't know

b) If NO, why not?

While the approach to sensitivity testing seems reasonable, an additional sensitivity on closure at the end of 2024 should also be included to reflect the current contractual arrangements.

Generation stack

14 What timeline do you believe we should use for the **refurbishment** of existing plants?

Meridian does not have strong views. Statements by the owners of existing plant should be the first consideration.

15 What timeline do you believe we should use for the **retirement** of existing plants?

As, above.

16 a) Do you feel your views on the refurbishment or retirement of plants would be affected by scenario? (Please select one)

Yes No Don't know

b) If YES, please provide details.

17 If you know of any additional plants that need to be considered, please provide information below.

The table of proposed plants on page 16 seems to include an error in respect of fully consented solar. The table says 12 projects with total capacity of 4610MW. However, the detail in the appendix of the consultation document confirms it is actually 12 projects with total capacity of just over 1000MW.

18 a) Do you agree with our definition of potential plants? (Please select one)

Yes No Don't know

b) If NO, why not?

Developers will have a longer list of potential plants under investigation. These are likely to be commercially sensitive and could only be shared in confidence. Regularly surveying developers would also be an onerous exercise. Therefore, relying on announced potential plants may be reasonable.

19 a) Do you agree with what we have presented in Table 4 in Appendix A of the Consultation document around generic plants? (Please select one)

Yes No Don't know

b) If you have amendments or additional information, please provide details below.

Information about the assumed cost stack for generic plant would enable more informed feedback.

20 a) Given the information presented in the Generation stack section and Appendix A of the Consultation document, are there any other generation types that we are missing from our generation stack? (Please select one)

Yes No Don't know

b) If YES, please specify.

The consultation paper states that grid-scale BESS are separately modelled. It is not clear how this is proposed to be done.

Views on new and emerging technologies

21 How do you envision the cost for new technologies changing in coming years?

In addition to projected technology costs, the 2023 EDGS may also need to consider inflation, financing, shipping, labour, and commodity costs as well as global supply chain constraints. Technology costs are not the only costs associated with generation development projects. It would be helpful if any assumptions were explicit, e.g. are recent cost increases assumed to remain or are they assumed to be temporary with broader expectations of cost decreases.

22 What do you think the uptake will be like for these new technologies?

We agree that uptake of electric vehicles and rooftop solar photovoltaics is unpredictable and highly dependent on economic factors and (we would add) government policy settings. Electric vehicle uptake numbers could be borrowed from the Climate Change Commission's preferred pathway, i.e. the update required to achieve emissions reduction targets.

23 How do you believe New Zealand's green hydrogen industry will develop between now and 2050? What role will hydrogen taken in our electricity system in this time?

See the comments at the start of this submission. Meridian believes hydrogen production and the associated demand flexibility will have a significant role to play in the New Zealand power system between now and 2050.

Next steps

24 Which of the below products would you find MOST beneficial? Please rank them from 1 (most beneficial) to 4 (least beneficial).

- 2 Electricity Generation Investment Opportunities Report
- 3 Energy Outlook
- 4 Generation Stack Report
- 1 Levelised Cost of Electricity Generation (LCOE)

Additional feedback

25 Do you have any additional feedback that you would like to provide on the EDGS or the options we have proposed? If yes, please provide below.

Once the 2023 EDGS are further developed, it would be helpful to see more information about the assumptions made and proposed outputs.