



COVERSHEET

Minister	Hon Dr Megan Woods	Portfolio	Energy and Resources
Title of briefing	NZ Battery Project – Proposal to Advance Two Options to a Detailed Business Case	Date to be published	20 September 2023

List of documents to be proactively released

Date	Title	Author
July 2023	NZ Battery Project – Proposal to Advance Two Options to a Detailed Business Case	Office of the Minister Energy and Resources
26 July 2023	NZ Battery Project – Proposal to Advance Two Options to a Detailed Business Case DEV-23-MIN-0150 Minute	Cabinet Office

Information redacted

YES / NO [select one]

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Cabinet Economic Development Committee

Minute of Decision

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NZ Battery Project: Proposal to Advance Two Options to a Detailed Business Case

Portfolio **Energy and Resources**

On 26 July 2023, the Cabinet Economic Development Committee:

Background

- 1 **noted** that on 13 February 2023, Cabinet:
 - 1.1 noted the Indicative Business Case (IBC) for the NZ Battery Project, which identified two preferred options for solving the dry year problem: the Lake Onslow option and the Portfolio option of alternative technologies;
 - 1.2 invited the Minister of Energy and Resources to report back in July 2023 with more information on the merits, risks and trade-offs of the Portfolio option and the potential Upper Moawhango pumped hydro scheme;

[CAB-23-MIN-0021]

- 2 **noted** that the Portfolio option assessed through the IBC consisted of the following components:
 - 2.1 geothermal plant operated flexibly;
 - 2.2 combustion of processed woody biomass;
 - 2.3 interruptible hydrogen electrolysis and storage as green ammonia;
- 3 **noted** that officials have provided further advice on the technical feasibility of the Portfolio option, as well as potential portfolio procurement and delivery options;

Technical feasibility of the Portfolio option

- 4 **noted** that advice on the technical feasibility of the Portfolio option is largely based on concept designs contained in a feasibility assessment report by WSP Global Inc, which was used as a key input into the assessment of the Portfolio option in the IBC;
- 5 **noted** that geothermal plant operated flexibly may provide a viable component of a portfolio battery solution, noting that technical and environmental concerns remain, especially around the long-term operation of the wellfield in a schedulable manner and the reinjection of CO₂ into geothermal reservoirs;

- 6 **noted** that combustion of processed woody biomass remains a viable component of a portfolio solution, noting that some concerns remain around its ability to cover concurrent dry years due to potential (biomass) supply constraints;
- 7 **noted** that based on the following risks and uncertainties, interruptible hydrogen electrolysis, as per WSP Global Inc's concept design, is not considered a viable component of a Crown-owned and operated portfolio solution to the dry year problem:
- 7.1 the concept relies on a suitable green ammonia market that does not exist at scale either in New Zealand or internationally, and its development prospects and timing are uncertain;
 - 7.2 the concept relies on emerging technologies that are unproven at the proposed scale, and questions remain around whether equipment could be delivered on time;
 - 7.3 there are health and safety risks associated with this concept, and very large-scale ammonia storage, which may prove hard to resolve;
- 8 **noted** that hydrogen could still play an important role in New Zealand in the future for covering short term variability in energy supply from renewable sources and to decarbonise hard to abate industries (such as steel production);

Portfolio procurement and delivery models

- 9 **noted** that the potential portfolio delivery models outlined in the IBC comprised:
- 9.1 Option 1 – the Crown owns reserve energy (portfolio);
 - 9.2 Option 2 – the Crown procures reserve energy services;
 - 9.3 Option 3 – development of a reserve energy / capacity market;
- 10 **noted** that while each portfolio delivery model has distinct advantages, disadvantages and uncertainties relating to procurement and operation, there are insufficient grounds to remove any from further consideration in the detailed business case (DBC) at this stage;

Updated economic modelling of the Portfolio option

- 11 **noted** that modelling suggests a smaller Portfolio option without hydrogen can still provide an effective dry year solution;

Further DBC consideration of the Portfolio option is justified

- 12 **agreed** that the Portfolio option should be taken through to the DBC stage for further analysis because it remains technically viable, procurement and operating models are likely to exist, and updated modelling suggests that its performance through a multi-criteria analysis may improve;

Update on pumped hydro scheme at Upper Moawhango

- 13 **noted** that there are issues with a pumped hydro scheme at Upper Moawhango, relating to the following:
- 13.1 lack of iwi consensus on whether to proceed with further investigations;
 - 13.2 New Zealand Defence Force concerns around losing a substantial part of their Waiouru Military Training Area;

13.3 the existence of unexploded ordnance in the area;

14 **agreed** that the Upper Moawhango option be excluded from further analysis based on these issues;

Developing understanding of the dry year problem

15 **noted** that a large and sustained increase in renewable generation is necessary to meet demand from rapid electrification of the economy, and to replace the approximately 7 TWh per annum of fossil fuel generation;

16 **noted** that the required increase in generation is expected to primarily come from private investment in wind, solar and geothermal generation plant;

17 **noted** that wind and solar generation are intermittent in nature, and are susceptible to prolonged periods of calm or cloudy weather conditions;

18 **noted** that the dry year problem may thus increasingly transform into a low rainfall, wind and solar problem;

There is a need to reconsider the base case in the DBC

19 **noted** that in the NZ Battery IBC, the different investment options were compared against a counterfactual that assumed a 100 percent renewable electricity scenario;

20 **noted** that to support robust decision making around a potential NZ Battery investment through the DBC, it is critical to develop a detailed understanding of what is most likely to happen without a NZ Battery investment;

21 **noted** that final investment decisions on the project should not be made until the options are compared to a counterfactual that reflects what would happen if a Battery investment is not made, and that this will be a focus for the project team to inform the case for a NZ Battery investment;

22 **noted** that officials consider the continued use of gas for electricity generation represents the most likely base case scenario, but that understanding the reality and feasibility of that scenario requires further detailed consideration;

23 **noted** that the base case will be developed in close coordination with Ministry of Business, Innovation and Employment officials working on the Energy Strategy, Gas Transition Plan, and the Electricity Market Measures projects;

Detailed business case to commence

24 **noted** that the DBC provides the right framework to identify a preferred option and solidify the government's understanding of the strategic case for investment and the base case;

25 **agreed** to advance the NZ Battery Project to a DBC;

26 **noted** that initial work in the DBC will focus on narrowing the uncertainties across all options to get them to an equal footing for economic assessment;

Next steps

27 **noted** that:

- 27.1 officials will commence work towards a DBC and will integrate this work with wider energy transition projects in support of the commitment to reduce greenhouse gas emissions, culminating in an Energy Strategy targeted for delivery by the end of 2024;
- 27.2 following the completion of the economic case in the DBC, officials will report to the Minister of Energy and Resources in mid-2024 on a preferred NZ Battery option to go forward to the development of detailed procurement, funding and financing, and delivery arrangements;
- 27.3 following the officials' report, the Minister of Energy and Resources will report back to Cabinet on the preferred option;
- 27.4 the preferred option would then proceed through the remaining DBC stages;
- 27.5 the completed DBC will proceed through assurance processes, including a 'Gateway' review by an independent panel of experts, before it is reported back to Cabinet.

Janine Harvey
Committee Secretary

Present:

Hon Grant Robertson (Chair)
Hon Dr Megan Woods
Hon Dr Ayesha Verrall
Hon Damien O'Connor
Hon Andrew Little
Hon Kieran McAnulty
Hon Ginny Andersen
Hon Dr Duncan Webb
Hon Dr Deborah Russell
Hon Rachel Brooking

Officials present from:

Office of the Prime Minister
Officials Committee for DEV