



COVERSHEET

Minister	Hon Megan Woods	Portfolio	Energy and Resources
Title of briefing	New Zealand Battery Project: Progressing to the Next Phase	Date to be published	31 March 2023

List of documents that have been proactively released		
Date	Title	Author
February 2023	New Zealand Battery Project – progressing to the next phase	Office of the Minister of Energy and Resources
February 2023	NZ Battery Project Indicative Business Case v1.10	MBIE
February 2023	NZ Battery Project Indicative Business Case (Appendices) v1.10	MBIE
13 February 2023	New Zealand Battery Project: Progressing to the Next Phase CAB-23-MIN-0021 Minute	Cabinet Office

Information redacted

YES / NO [select one]

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Some information has been withheld for the reasons of commercial information, confidential advice entrusted to the Government, negotiations, and national security or defence.



Cabinet

Minute of Decision

This document contains information for the New Zealand Cabinet. It must be treated in confidence and handled in accordance with any security classification, or other endorsement. The information can only be released, including under the Official Information Act 1982, by persons with the appropriate authority.

New Zealand Battery Project: Progressing to the Next Phase

Portfolio **Energy and Resources**

On 13 February 2023, following reference from the Cabinet Business Committee (CBC), Cabinet:

Background

- 1 **noted** that in the absence of fossil fuelled-thermal plants, New Zealand needs an alternative form of large-scale dispatchable renewable energy to meet demand when the market is under stress from lower-than-average hydrological inflows;
- 2 **noted** that in December 2020, CBC agreed to establish the NZ Battery Project to assess renewable storage options to address the dry year problem, and that the Project should examine the viability of pumped hydro, particularly at Lake Onslow, and consider this solution against alternative technologies [CBC-20-MIN-0090];
- 3 **noted** that CBC also:
 - 3.1 agreed that the objective for the NZ Battery Project is to manage or mitigate dry year risk in the electricity system;
 - 3.2 agreed that the assessment criteria for the NZ Battery Project assess any proposal or group of proposals against its ability to:
 - 3.2.1 provide at least [5,000 GWh] of energy storage or equivalent energy supply flexibility;
 - 3.2.2 provide significant levels of employment for post COVID-19 recovery;
 - 3.2.3 reduce emissions either directly or indirectly through facilitating decarbonisation;
 - 3.2.4 maximise renewable electricity in order to provide a pathway to achieve the goal of 100 percent renewable electricity;
 - 3.2.5 lower wholesale electricity prices;
 - 3.2.6 be practical and feasible;
 - 3.3 noted that the assessment of any option will take into account wider social, cultural, and environmental factors, as well as those identified in the criteria above;

- 4 **noted** that the NZ Battery Project team has run a feasibility assessment for the Lake Onslow option, and an early assessment of 28 alternative options, including other hydro storage options, and alternative renewable energy storage options;
- 5 **noted** that an Indicative Business Case (IBC) has been developed for the NZ Battery Project, has been through a Treasury Gateway review and received an Amber rating;
- 6 **noted** that the IBC, attached under CAB-23-SUB-0021, identified two preferred options for solving the dry year problem: the Lake Onslow option and the Portfolio option of alternative technologies;
- 7 **noted** that further minor edits may be made to the IBC before publishing;
- 8 **noted** that the IBC observes that a more stable future electricity market will further encourage widespread electrification and support a pathway to achieving our climate goals;

The Lake Onslow option

- 9 **noted** that the cost of the Lake Onslow option is currently estimated to be \$15.684 billion (P50, escalated), excluding transmission;
- 10 **noted** that, following a final investment decision, the estimated build time for the Lake Onslow option is approximately 9 years (P50), before it can start pumping;
- 11 **noted** that developing the Lake Onslow option comes with environmental, cultural, and social impacts which will need managing;
- 12 **agreed** to progress work on the Lake Onslow option to Phase 2a, which will include work and advice on:
- 12.1 the configuration of the Lake Onslow option, including the size of the storage reservoir, the pumping/generation capacity, the lower intake location, and the size of any lower reservoir;
 - 12.2 scope a detailed business case, pending approval to start drafting;
 - 12.3 further environmental field studies, including water quality, species distributions, translocation trials, archaeological survey and more detailed mitigation, offsetting and compensation work;
 - 12.4 further community, mana whenua, stakeholder, and market engagement;
 - 12.5 a preferred entity to deliver the project and confirm the associated governance, roles and responsibilities, and accountabilities;
 - 12.6 the preferred funding and finance arrangement for the delivery of the project;
 - 12.7 procurement and land acquisition strategies;
 - 12.8 detailed geotechnical investigations;
 - 12.9 other required activities, which may include early works;
- 13 **noted** that officials have advised that a Detailed Business Case (DBC) could be delivered within 18-24 months, with a final investment decision approximately three years later;

- 14 **noted** that officials advise that following the detailed planning phase, there will be a procurement and implementation phase, before a final investment decision, subject to a Cabinet decision to proceed;
- 15 **noted** that progressing the Lake Onslow option may justify enabling legislation;
- 16 **noted** that given the nature and complexity of Phase 2a, it is not likely that any material updates on the Lake Onslow option will be ready before the DBC is completed in 2024;

The Portfolio option

- 17 **noted** that the NZ Battery Project has considered alternative technologies as a comparison to the Lake Onslow option;
- 18 **noted** that the NZ Battery Project did not find any alternative technologies that on their own could realistically provide enough energy and capacity to the electricity market to solve the dry year problem;
- 19 **noted** that combining those alternative technologies into a portfolio, consisting of interruptible hydrogen electrolysis, biomass storage and combustion, and new geothermal plant used in reserve, appears to provide a potential alternative solution to the dry year problem;
- 20 **noted** that there are known limitations with each of the components of the Portfolio option and uncertainties that need to be investigated further;
- 21 **agreed** to continue work on the Portfolio option in order to better understand its full costs, benefits and impacts and investigate how it would be delivered;

Pumped hydro at Upper Moawhango

- 22 **noted** that, following a geographic information system scan of New Zealand's waterways, the NZ Battery Project team identified another possible site for a pumped hydro scheme at Upper Moawhango, at the southern end of the Kaimanawa ranges;
- 23 **noted** that early and emerging findings suggest that a pumped hydro scheme at Upper Moawhango could provide a large amount of energy storage and generation capacity;
- 24 **noted** that Upper Moawhango's location in the North Island, close to demand centres and north of the High Voltage Direct Current link, could make it very effective despite its limited size relative to the Lake Onslow option;
- 25 **noted** that pumped hydro at Upper Moawhango would face some practical limitations, such as interacting with existing hydro assets, that could reduce its ability to solve the dry year problem;
- 26 **noted** that the Minister of Energy and Resources and Adrian Rurawhe MP met with iwi representatives local to Upper Moawhango in September 2022, presented the idea of a pumped hydro scheme at Upper Moawhango, spoke to the findings in the Stantec report, and agreed to only proceed with further work in partnership;
- 27 **noted** that the NZ Battery Project team has not been able to fully assess the economic merits of a pumped hydro scheme at Upper Moawhango, having agreed to pause further work until mana whenua agree to such work occurring;

- 28 **agreed** to continue further investigative work on the potential merits of pumped hydro at Upper Moawhango, including further consideration of potential impacts on New Zealand Defence Force operations, subject to partnership with, and agreement from local iwi leaders;

Next steps

- 29 **invited** the Minister of Energy and Resources to report back to the Cabinet Economic Development Committee 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;
- 30 **noted** that the report back will help align the levels of information and understanding of the different options for solving the dry year problem relative to the Lake Onslow option, which will help inform Ministers' decisions on which option(s) to progress to a detailed business case.

Rachel Hayward
Secretary of the Cabinet