

# Hon Dr Megan Woods

MP for Wigram

Minister of Housing

Minister of Energy and Resources

Minister of Research, Science and Innovation

Associate Minister of Finance



Ref: OIA21-160

Micky Turner

[fyi-request-15881-c95a5c02@requests.fyi.org.nz](mailto:fyi-request-15881-c95a5c02@requests.fyi.org.nz)

Dear Mr Turner

I refer to your email of 23 June 2021 to the Hon James Shaw, requesting information on electric vehicles (EVs) under the Official Information Act 1982 (the Act). Your request has been partially transferred to me as it more closely relates to my responsibilities as Minister of Energy and Resources.

As previously advised to you, the following questions fall under my Energy and Resources portfolio:

- 1. Details of the energy infrastructure the Government has put in place to provide energy for electric vehicles since October 2017?*
- 2. Details of any work underway on massive energy projects for the purpose of ensuring enough energy is available for electric vehicles.*
- 3. Detailed analysis of what the benefits of EV's are over H2 Hydrogen vehicles and petrol/diesel vehicles - including - environmental advantages/disadvantages (lithium mining, concrete & steel in windmills etc) - and what would happen to the country in the event of a large scale, long duration power blackout or natural disaster if personal vehicles and commercial trucks are electric only (i.e. difficulty moving supplies etc).*
- 4. Information on any plans to roll out a Hydrogen powered economy including proposed infrastructure.*

I have responded to each question in turn below:

- 1. Details of the energy infrastructure the Government has put in place to provide energy for electric vehicles since October 2017.*

New Zealand's public EV charging network has grown to the point that we now have rapid direct current (DC) charging stations<sup>1</sup> at least every 75 kilometres across over 96 percent of our state highway network. The Government has supported this by co-funding the installation of over 600 public and over 500 private EV chargers through the Energy Efficiency & Conservation Authority's (EECA's) Low Emissions Vehicle Contestable Fund (LEVCF).

Since the Contestable Fund began, EECA has committed \$29.4m in government funding to 180 projects, matched by \$62m in applicant funding.

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<sup>1</sup> Rapid charging typically describes direct current charging systems and is the fastest charging option currently available in New Zealand, delivering up to 50 kilowatts. This charge capability implies that within 30 minutes the EV battery will have sufficient charge to cover approximately 100 kilometres.

2. *Details of any work underway on massive energy projects for the purpose of ensuring enough energy is available for electric vehicles.*

Energy companies will respond to the increased demand for electricity by building more renewable electricity generation.

Currently there are several new renewable generation projects that are in the later stages of development, as detailed in the below table:

<b>Project</b>	<b>Developer / owner</b>	<b>Capacity</b>	<b>Completion date</b>
Mt Cass wind farm	Mainpower	93 MW	2021
Waipipi wind farm	Genesis/Tilt	133 MW	2021
Turitea Stage 1 wind farm	Mercury	119 MW	2021
Harapaki (Hawkes Bay) wind farm	Meridian	176 MW	2024
Tauhara geothermal	Contact	152 MW	2023
Ngāwhā geothermal	Top Energy	32 MW	Completed in 2020
Kapuni solar farm	Todd - Sunergise	2.1MW	Operational since 10 May 2021
Pukenui Solar Farm --	Far North Solar Farm Ltd	16MW	Sod-turning by PM 1 July 2021
Lodestone Energy (multiple solar farm sites Upper North Island)	Lodestone Energy	229MW	construction expected to begin late 2021

As demand increases we can expect to see more renewable electricity projects announced.

3. *Detailed analysis of what the benefits of EVs are over H2 Hydrogen vehicles and petrol/diesel vehicles - including - environmental advantages/disadvantages (lithium mining, concrete & steel in windmills etc) - and what would happen to the country in the event of a large scale, long duration power blackout or natural disaster if personal vehicles and commercial trucks are electric only (i.e. difficulty moving supplies etc).*

ECCA published a report on the “Life Cycle Assessment of Electric Vehicles”. In this report, ARUP and Verdant Vision's life cycle assessment compares the environmental impact of EVs with internal combustion engine vehicles (petrol and diesel). The report confirms that EVs are better for the New Zealand environment than petrol or diesel powered vehicles, across the life cycle of the vehicle as well as in use. The report can be read here: <https://www.eeca.govt.nz/assets/EECA-Resources/Research-papers-guides/ev-lca-final-report-nov-2015.pdf>.

EECA has published another report, *Review and analysis of electric vehicle supply and demand constraints*, which also outlines the advantages of EVs over internal combustion engine vehicles (petrol and diesel). The report can be found here: <https://www.eeca.govt.nz/assets/EECA-Resources/Research-papers-guides/REL-EECA-EV-Supply-constraints-report.pdf>.

Analysis on “what would happen to the country in the event of a large scale, long duration power blackout or natural disaster if personal vehicles and commercial trucks are electric only” has not been undertaken. As such, this part of your request has been refused under section 18(e) of the Act; that the document alleged to contain the information requested does not exist.

However, an emergency plan for the energy system exists in the event of large scale, long duration power blackout or natural disaster.

4. *Information on any plans to roll out a Hydrogen powered economy including proposed infrastructure.*

Hydrogen is recognised internationally, along with biofuels, as a versatile low carbon fuel to support decarbonisation particularly for industrial processes, process heat and transport. In New Zealand, with our high renewable electricity capability the direct use of electricity supplemented by biofuels is more likely than hydrogen for process heat. For transport, hydrogen is a strong contender in the near term for heavy transport, and in the medium term for shipping and in the longer term for aviation. Bio fuels can perform similar roles. Hydrogen can also be used to reduce emissions in industrial processes, being a key input in fertiliser development, petroleum cracking and an alternative for steel production.

The Government has a number of initiatives to advance a hydrogen powered economy, including:

Vision: The Hydrogen Vision Paper, *A Vision for Hydrogen in New Zealand*, was completed in 2019. The hydrogen vision outlined the potential uses of hydrogen in New Zealand and explored in a non-quantitative manner some of the issues around its use.

Regulatory: Ministry of Business, Innovation and Employment (MBIE) continues to work with industry and other agencies to ensure that our regulatory and policy settings are fit-for-purpose and consistent with international standards, in order to make the most of the opportunities presented with hydrogen.

International: A Memorandum of Cooperation was signed between New Zealand and Japan in 2018. It was instrumental in the Obayashi Board committing to the hydrogen pilot with the Tuaropaki Trust development at Mokai.

An Arrangement of Cooperation was also signed between New Zealand and Singapore in 2021. This Arrangement of Cooperation aims to provide significant benefits from sharing knowledge about hydrogen, both from its use and deployment through small demonstration projects up to large scale construction, but also from cooperation around the research and development of new hydrogen technologies.

The Government is involved in a number of collective international hydrogen initiatives:

Japan Hydrogen Ministerial The Minister of Energy and Resources and/or MBIE senior management has represented New Zealand at this hydrogen event since it began three years ago.

Clean Energy Ministerial New Zealand recently joined the new hydrogen initiative under this ministerial. The initiative has got off to a slow start due to COVID and to date we have identified the 'Hydrogen in Ports' task as being of interest to the Ports of Auckland as a participant.

ASEAN MBIE was representing New Zealand in this forum funded by ASEAN (Working group on hydrogen Supply and Demand in Asia)

MBIE is undertaking a hydrogen project for a hydrogen standard for APEC 2021.

### Projects

The Government has funded a number of small and large scale hydrogen projects:

- First Gas has undertaken a hydrogen feasibility study. This project received \$250,000. [https://firstgas.co.nz/wp-content/uploads/Firstgas-Group\\_Hydrogen-Feasibility-Study\\_web\\_pages.pdf](https://firstgas.co.nz/wp-content/uploads/Firstgas-Group_Hydrogen-Feasibility-Study_web_pages.pdf)  
<https://firstgas.co.nz/news/hydrogen-pipeline-project-gets-government-funding/>
- Hiringa Energy and Ballance Agri-Nutrients have committed to a \$50 million Green Hydrogen project at Kapuni. The green hydrogen will be used as both feedstock into the ammonia-urea plant to reduce the plant's environmental footprint, and as a zero-emission transport fuel. This project has received \$19.9 million from the Government's Provincial Development Fund. <https://ballance.co.nz/Ballance-Hiringa-media-release-06March2020>
- Hiringa Energy has committed to establishing New Zealand's first nationwide network of hydrogen fuelling stations. The initiative will involve the installation of eight hydrogen refuelling stations. These stations will provide refuelling for zero emissions heavy hydrogen-powered fuel cell electric vehicles such as trucks and buses. The Infrastructure Reference Group has provisionally approved \$20 million for this project. <https://www.hiringa.co.nz/post/government-backs-hiringa-s-nationwide-hydrogen-fuelling-network>  
<https://www.beehive.govt.nz/release/low-emissions-options-heavy-transport-step-closer>
- Ports of Auckland has committed to building a hydrogen production and refuelling facility at its Waitematā port. The company, and project partners Auckland Council, Auckland Transport and KiwiRail will invest in hydrogen fuel cell vehicles including port equipment, buses and cars as part of the project. Ports of Auckland has deployed a small hydrogen refuelling station which will be used to trial and gain experience with hydrogen use at the port. The long term objective is hydrogen powered straddle carriers (lift container ports). This project received \$250,000 for this hydrogen demonstration project through the Low Emissions Vehicle Contestable Fund. <https://www.beehive.govt.nz/release/record-investment-low-emissions-vehicles-announced>

### Roadmap

- The next stage of the hydrogen strategy is a roadmap that will explore the issues that need to be resolved for hydrogens use in the wider economy, and what steps need to be undertaken to resolve these and when.

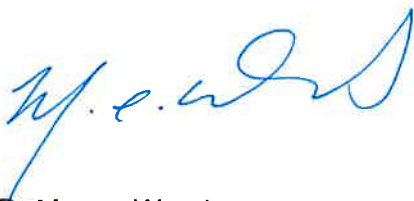
- The first stage in the development of the hydrogen roadmap is an initial view of hydrogen supply and demand in New Zealand. Castalia were commissioned to undertake this preliminary work. This work was completed in 2020. The model and further information, including the results can be found on MBIE's website: <https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/a-vision-for-hydrogen-in-new-zealand/roadmap-for-hydrogen-in-new-zealand/>.
- The model identifies plausible scenarios for a future New Zealand hydrogen economy, and identifies the key variables that determine how those scenarios might play out. It is not possible to precisely forecast the role of hydrogen in the New Zealand economy. However, the model can show how scenarios might develop, and which assumptions and variables are determinative. The New Zealand Hydrogen Roadmap will incorporate model outputs to understand how a wide range of future scenarios might develop.
- The primary objective of a roadmap is to provide a blueprint for the development of a hydrogen industry in a country. It is designed to help inform the next series of investment amongst various stakeholder groups (e.g. industry, government and research) so that development can scale in a coordinated manner. Another purpose of a roadmap is to ensure coordination which is critically important in a developing industry with limited funding and resources.

#### Research and Development

- GNS scientists won funding in Smart Ideas project “Nano-catalytic surfaces for efficient, stable fuel cells and eco-friendly hydrogen production” (2019) and an Endeavour bid entitled “Powering NZ's Green-Hydrogen economy: Next-generation electrocatalytic systems for energy production and storage” (2020). Both bids include collaborators from across the MacDiarmid network.
- MBIE and the German Federal Ministry of Education and Research (BMBF) have agreed to jointly support up to three Green Hydrogen research projects through the February 2021 Catalyst funding round. Up to \$2,000,000 (excluding GST) over three years is available per successful project. Projects are expected to commence in early 2022.

I trust that you will find this information helpful; however, you have the right to seek an investigation and review by the Ombudsman of my decision on this request, in accordance with section 28(3) of the Act. The relevant details can be found at: [www.ombudsman.parliament.nz](http://www.ombudsman.parliament.nz).

Yours sincerely



Hon Dr Megan Woods  
**Minister of Energy and Resources**