

Submission on the *Interim Hydrogen Roadmap*

Name	
Organisation (if applicable)	
Contact details	

Release of information

Please let us know if you would like any part of your submission to be kept confidential.

I would like to be contacted before the release or use of my submission in the summary of submissions that will be published by MBIE after the consultation.

I would like my submission (or identified parts of my submission) to be kept confidential, and **have stated below** my reasons and grounds under the Official Information Act that I believe apply, for consideration by MBIE.

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Responses to questions

Section 1: Hydrogen is emerging as an important part of the future global energy system

Are there other issues we should be considering in our assessment of the strategic landscape for hydrogen in New Zealand?

- 1 Detailed life cycle cost comparison against the advancement in battery technologies for heavy transport.
A realistic assessment of the use of hydrogen for air transport. It will take another ten years before a passenger plane may be developed using liquid hydrogen. By that stage other alternative will be more feasible.
Ignore the use of hydrogen as a possible export commodity – there will be other countries that can do this at a cheaper price. Exporting ammonia to be burnt in Japan is just energy vandalism.
The environmental and social equity that has been ignored in providing GW of energy for hydrogen production for industries. The NZ taxpayer should not be subsidising this industry.

Section 2: The role for hydrogen in New Zealand's energy transition

Do you agree with our assessment of the most viable use cases of hydrogen in New Zealand's energy transition?

- 2 I support the use of green hydrogen to replace fossil hydrogen. I do not support the use of green hydrogen for heavy transport, aircraft or export.

Do you support some of these uses more than others?

- 3 The use of green hydrogen to replace fossil hydrogen

What other factors should we be considering when assessing the right roles for hydrogen in New Zealand's energy transition?

- 4 Environmental and social factors.
Other competing technologies.
How we would be better off using green electricity to displace fossil energy for low to medium heat applications.
Our price point of producing green hydrogen for export. It will never be competitive unless the taxpayer subsidises the hell out of it.

Do you agree with this assessment of the potential for hydrogen supply and demand in New Zealand?

5

	No
6	Do you agree with the key factors we have set out that are likely to determine how hydrogen deployment could play out?
	No Hydrogen is not a versatile energy carrier. It is expensive and problematic. If you are combusting it you are crazy.
7	What do you think needs to happen to address these factors?
	More robust technological, analytical and cost assessment. Assessments made by management companies that include may or could are just a waste of time. They need to clearly outline the risks and benefits based on current technologies and costs, not possible future.
8	Do you have any evidence to help us build a clearer picture?
	Hydrogen Science Coalition - https://h2sciencecoalition.com/ . You should use this group as a technical review rather than EY.
9	Do you agree with our findings on the potential for hydrogen to contribute to New Zealand's emissions reduction, energy security and resilience and economic outcomes?
	No
10	Do you have any insights we should consider on what is needed to make hydrogen commercially viable?
	No. It will never be cheaper than the electricity to use to make it. You need about 55kW to make 1 kg of hydrogen. Even at \$0.04/kW this is still \$2.20 for production alone. This does not include capex, opex, transport, conversion or delivery
11	Is there any further evidence you think we should be considering?
	Hydrogen Science Coalition - https://h2sciencecoalition.com/ . Read this website, someone, anyone. You should use this group as a technical review rather than EY.
Section 3: Government position and actions	
12	Do you agree with our policy objectives?
	Not really.

13

Do you agree with our positioning on hydrogen’s renewable electricity impacts and export sector?

No

14

Do you agree with the proposed actions and considerations we have made under each focus area?

No

15

Is there any evidence we should be considering to better target actions in the final Hydrogen Roadmap?

Hydrogen Science Coalition - <https://h2sciencecoalition.com/>.

You should use this group as a technical review rather than EY.

General comments

Comments on the August 2023 Hydrogen Road Map

Page 14 Bullet 3. Yes hydrogen is energy dense based on weight but it is not energy dense based on volume. This needs to be included in the challenges on page 15.

Page 15. Bullet 2. How are costs anticipated to fall over time? What does this mean? How will electrolyzers, which are complex, drop to a price point to equal fossil H2?

Page 15 Bullet 3. What rapid advances in H2 in NZ have happened? Please clarify.

Page 16. Simplified H2 value chain. Third column should be possible use. CCUS will not work. Gas blending or replacement is a waste of time for domestic. Where is the underground storage in NZ?

Page 17. Yes, there is significant international interest, mainly driven by fossil fuel entities. There is not much committed. This statement is leading and not accurate.

Page 17. First bullet. It will never be economical for us to export ammonia to Japan for conversion to hydrogen to burn. Japan will be better off laying a HVDC cable to China.

Page 17. Second bullet point. CCUS has failed to deliver.

Page 17. Third bullet. This statement lack evidence. There have been some instances of H2 being used domestically. Other examples like Cadent Gas in the UK have blatantly mislead people over domestic H2 use. It will never be cheaper or safer than electricity in NZ.

Page 18. First paragraph. NZ will not meet its current targets based on current activities. The use of electricity for the production of hydrogen will not provide an equitable and just transition for NZ communities.

Page 19. First sentence. It is not true that NZ meets much of its energy needs through domestic production. The previous page indicated that only 28% of came from renewables.

Page 19. Second paragraph. Stop focusing on GDP. Focus on an equitable and just transition. Change the lens you are looking through. Biff Deloitte’s out.

Page 19. Last sentence. Electrolysis normally like steady state operation.

Page 20. Second paragraph. MBIE needs to include a comparison against battery storage technology.

Page 20. First bullet point. I do not agree with the Southern Green H2 project. I do not see how Meridian working with Woodside results in a equitable and just transition. Woodside will not give a stuff about the community (although will greenwash with the appropriate PR). Any excess energy from Manapouri should be diverted to decarbonise local industry where possible e.g. Meatworks, diary etc.

Page 20. Second bullet. H2 heavy transport using fuel cells will not be able to compete with advances in battery technology and opex. This is a short sighted option that has been selected by MBIE. Dual fuel H2 combusting with diesel is just madness. What are you thinking allowing this to happen? Toyota are flogging a dead horse with the Mirai. Just look at what is happening in California with H2 cars - <https://www.hydrogeninsight.com/transport/exclusive-fresh-blow-for-hydrogen-vehicles-as-average-pump-prices-in-california-rise-by-a-third-to-all-time-high/2-1-1351675>

Page 21. First bullet. Hydrogen for aircraft is a dead end. It is too complex. Liquid H2 will need to be used and even then, the volume is such that it will impact on passenger numbers and freight volumes. Has anyone ever provided a price for a ticket on a H2 plane? Dreaming.

Page 22, Diagram 3. Using hydrogen in existing pipelines does not provide enough justifiable cost or environmental benefits. Just First Gas trying to keep its business alive.

Page 23. Last sentence. Lol. Of course you are receiving strong support when you are giving out millions.

Page 24. Second bullet. More analysis is needed to prove that H2 has an advantage, rather than just appears to have. We need hard facts here before we invest millions more.

Page 27. Heavy land transport. What about the implications of a better rail system and freight moving to rail? Most of those perceived benefits of hydrogen have largely been nullified by operation of recent battery operated heavy vehicles. Blending and burning of H2 is just nuts. What is the cost for the for HW Richardson? I doubt that it is economically viable. Please provide a cost estimate to operate a H2 blended HV.

Page 28. Third paragraph. Probably the best statement in this road map about the uncertainty of how much HV will use H2.

Page 28. Case Study Globa Bus. I thought Ports of Auckland returned the H2 bus?

Page 30. Marine Use and Freight. There is a lot of conjecture in this section. Use of the words could and signal do not translate to are or have. Ammonia as a bunkering fuel is so dangerous. An efficient chemical but deadly.

Page 30/31 Aviation. Recent estimations for requirements of hydrogen by Air NZ suggested that "only" 16 % of our electricity would be required to meet their H2 requirements. As far as I am concerned, they can only have this amount if the build the renewable electricity to meet this demand. I do not expect an aircraft to be built until about 2040. I agree that SAFs will be a more

viable alternative. Also we just need to fly less. Air NZ needs to think about degrowth. H2 combustion will be too expensive.

Page 32 Rail. Please do not burn H2 with diesel. Electricity the rail as much as possible. Look at installing batteries on trains to counter areas where no electrification is used.

Page 33. Electricity system services. I think this section needs to include the nuances of battery storage for home and business purposes as a comparison and how batteries could feed back into the grid (Transpower needs to get moving on this). Having an onsite electrolyser and H2 storage is complex and requires high safety protocols. Batteries and solar panels on the other are pretty straight forward and have dropped remarkably in price over the last 10 years.

Page 34. Export. There is no way that we can be cost effective given the transport distances and conversion losses, boil off etc. Just write this off and leave in the too hard basket.

Page 34. H2 in the Gas Network. Hydrogen is not compatible with the existing gas network – this is known. You will need conversion of seals, new valves, larger pumps due to volume inefficiencies, changes in control and instrumentation. H2 will not be cheaper than fossil gas and it will be better for everyone to convert to electrical appliances where possible. Also use high temperature heat pumps for industrial rather than fossil gas.

Page 35. Pathway to 2050. Why did MBIE use EY for this? Why have we based a road map on modelling that has a high degree of uncertainty?

Page 36. Fourth bullet point. Did not know we had Transformers in the mix (the maximal scenario)

Page 36. Second paragraph. I think that the base case is what we should be focusing on and assisting if needed. The other cases are too far off with too many factors to have a high degree of confidence that the predictions will turn out as expected. Even then the electricity required is enormous and needs to be balanced against environmental, social and just transition requirements.

Page 39. H2 and our objectives. Possible emissions reductions need to be compared to other alternative that could use the electricity rather be gobbled up by H2. E.g. decarbonations of industrial heat using electricity, reduction in fossil fuel use, electrification of heavy transport and the rial network. Need to show what bang for our buck we are getting for emission reductions.

Page 40. Energy resilience and security. This needs to include the amount of electricity used to produce H2 versus the fossil energy displaced.

Page 43. Export. Just forget this, stop thinking about GDP, think about equitable energy for all NZers instead. What does that look like?

Page 48. Action for HV vehicles. I think that advances in battery technology e.g. CATL <https://www.catl.com/en/news/6107.html>

Page 48. Batteries will win out for emergency storage where needed.

Page 49. Workforce skills and training. MBIE needs to set up skill training initiatives now to have enough expertise available when H2 is rolled out for hard to abate sectors. There is not enough of a skill set worldwide to provide enough resource to go around.

Page 57. Table 1. TR Group Trial. I thought that Hyzon has gone out of business or is in financial trouble over false claims.

Page 57. HW Richarson Trial. Yes, this can be done but it is nuts to do this. The reporting will say that it is not cost effective to do this. Cost for this answer - \$0.

Page 57. Hyundai Trial. Will this information be publicly released?