Submission by

Z Energy

to the

Ministry of Business, Innovation and Employment

on the

Interim Hydrogen Roadmap

2 November 2023

Summary

Z Energy (Z) welcomes the opportunity to submit to the Ministry of Business, Innovation and Employment (MBIE) on the Interim Hydrogen Roadmap. Z is an integrated transport energy company focused on meeting the needs of our customers now and into the future. This means as we continue to deliver the fuel Aotearoa New Zealand needs today, we are committed to contributing to the decarbonisation of New Zealand's transport network.

While the Interim Hydrogen Roadmap focuses on a number of ways hydrogen could be applied domestically to support New Zealand's decarbonisation, Z's submission is focused on the role it could play in the road transport sector as a low carbon fuel. We note that it's too early in the development of technology to form a view on whether hydrogen is a suitable low carbon fuel alternative in the aviation and maritime sectors.

In 2019, Z published a House View on Hydrogen as a way to share our knowledge and the things that we had learnt through our business and strategy development. Consistent with our view at the time, hydrogen is technically ready as a low carbon fuel alternative, and manufacturing scale-up can occur if market conditions are right. However, it currently has significant economic and affordability challenges.

Z believes the majority of New Zealand's transport fleet, particularly the light vehicle fleet, will likely be electrified in the transition, as EVs present a far more feasible low carbon alternative.

Analysis undertaken by Z on New Zealand's heavy fleet task for this submission shows total annual kilometer's travelled are largely made up of urban and short haul travel. For these heavy vehicles, Z's view is that businesses will look to electrify these fleets as they transition to low carbon solutions. Due to their short daily range and large amount of downtime, Z believes electrification presents a more readily available and cost-efficient solution than hydrogen at this point in time.

While this means the role of hydrogen is less certain, we acknowledge there may be use cases for the fuel to decarbonise heavy fleet vehicles that don't transition to Battery Electric Vehicles (BEV) in the medium to long term.

For the heavy vehicle fleet required for long-haul travel, Z agrees that hydrogen presents a viable low carbon transport solution, as it offers a less frequent and faster re-fueling option than BEVs. It's important to note that only about 3-5 percent of kilometers travelled by heavy vehicles in New Zealand are for the purpose of long-haul travel[1]. This is different to overseas examples we traditionally look to including Australia, Europe, and America, given a greater proportion of kilometers travelled by heavy vehicles in these countries is for long-haul travel.

Importantly, as New Zealand is and will continue to be a taker of transport technology, we rely on sufficient demand in Europe, America, and East Asia to drive original equipment manufacturers (OEM's) to continue with hydrogen development.

While industry players will ultimately find the most cost-effective solutions to decarbonisation in the energy transition, government has a critical role to play in ensuring the frameworks and incentives are targeted at the end objective - which is to decarbonise New Zealand in the most efficient and orderly manner.

We look forward to continuing to work constructively with the Government and welcome the opportunity to hold a briefing session to go through our submission in more detail.

If there is any further information that would be of use to the Ministry, please do not hesitate to contact us.

[1] Z has defined 'long haul' as travel over 1000 kilometres per day, in a highly utilised vehicle.

Consultation 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?

Z considers that the Interim Hydrogen Roadmap provides a fair view of the current hydrogen landscape in Aotearoa New Zealand.

While the Government to date has rightly been focused on green hydrogen as the best option to reduce emissions, it comes at a price. In other jurisdictions like the United States where different 'colours' of hydrogen are available for transport applications, there is evidence of hydrogen being developed as an enabling technology at a lower cost. In the development of the final Hydrogen Roadmap, we encourage officials to be mindful of the risks and opportunities associated with a continued focus on only green hydrogen.

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?

Z largely agrees with the assessment undertaken within the Interim Hydrogen Roadmap of the most viable use cases of hydrogen in New Zealand's energy transition.

Focusing specifically on transport use cases of hydrogen, we have reviewed Waka Kotahi Road User Charges (RUC) data to understand the current travel purposes of heavy vehicles, on an annual basis. This data indicates most of the travel undertaken by heavy vehicles is relatively short distances and therefore would largely be best converting to BEV.

Given only 3-5 percent of heavy vehicles are undertaking long-haul travel, it is only this small group that would likely look to shift to hydrogen alternatives moving forward.

Do you support some of these uses more than others?

Z believes that all use cases of hydrogen must be considered. This will help ensure the private sector is encouraged to look at a broad range of hydrogen solutions that can be brought to market, driving innovation and growth.

With demand being one of the greatest barriers to hydrogen uptake, Z encourages the government to look at a policy framework designed to encourage established users of hydrogen (i.e., those who already have established customer demand) to convert to green hydrogen. This would present the opportunity to grow a green hydrogen market in New Zealand at a faster pace.

At the same time, we strongly encourage the final Hydrogen Roadmap to take a longer-term view by ensuring use cases that 'burn' hydrogen be monitored closely where possible, given these currently emit particulates.

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

When considering the role of hydrogen in New Zealand, officials must look at how the different use cases of hydrogen would interact with each other and therefore which outcome is most important. This is vital to understanding the applicability of the fuel as it's unlikely that the best of all outcomes can be achieved unless there is duplication. For example, using hydrogen production to balance the power grid will impact the utilisation of the equipment and has the potential to drive up prices or reduce supply.

Additionally, there is still work to be done to ensure New Zealand has a strong and resilient national grid to support the country's energy transition as our energy needs adapt. We strongly encourage officials to consider the additional pressure hydrogen production would add to the grid, as this is likely to be significant.

It may be beneficial to consider whether importation of hydrogen has benefits. This will be particularly important if Australia, or other nearby countries become major hydrogen producers and would be valuable to ensure all options for growing a domestic hydrogen market in New Zealand are explored.

A final consideration for officials is to determine if New Zealand could credibly compete to trade hydrogen as an international commodity in a global market. This would determine whether domestic production is competitive and the commercial viability of New Zealand hydrogen exports.

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

Z acknowledges the scenario modelling provided in the Interim Hydrogen Roadmap which looks to understand how different levels and types of uses for hydrogen might affect core objectives of reducing emissions, supporting economic development, and ensuring energy system security and resilience.

Based on our analysis of the RUC data for heavy vehicles, we believe the estimates used in the scenario modelling undertaken by Ernst and Young NZ Ltd that 40 percent of new trucks and buses being fuel cell electric vehicles (FCEVs), or dual fuel, is too high. RUC data indicates most of the travel undertaken by the heavy vehicle fleet is relatively short distances per year and therefore in most cases would be best converting to BEV.

Additionally, it is unclear if the assumption made in the scenario modelling undertaken around the high percentage of BEV trucks in the market is a global figure, or New Zealand specific. It should also be considered that as FCEV becomes cheaper, that dual fuel demand would diminish as it is likely to be transitional solution.

Do you agree with the key factors we have set out that are likely to determine how hydrogen deployment could play out?

Given New Zealand's scale in comparison to the rest of the world, Z believes international demand and uptake for hydrogen will determine both the speed of technology development for hydrogen solutions and commodity prices. This in turn will determine the hydrogen use cases that will be adopted domestically and influence domestic pricing and producers' decisions on whether to prioritise export of their products.

Additionally, supply chains of hydrogen equipment are likely to impact on our ability to build a domestic hydrogen industry as its most likely international suppliers will prioritise their own domestic supply rather than to New Zealand.

What do you think needs to happen to address these factors?

Z believes that these factors will only be overcome through the identification of large-scale hydrogen demand (including through existing use cases), to build the foundations for a stable, domestic market. Clear government signalling will be an important part of achieving this and building certainty about a future hydrogen market.

Do you have any evidence to help us build a clearer picture?

Z does not feel best placed to respond to this question.

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?

With respect to the transport sector specifically, we acknowledge that hydrogen is an option to meet the needs of some transport operates for certain use-cases. While it will take some time for cost-effective hydrogen fuelled vehicles to grow to material volume, there is a possibility that large-scale demand for hydrogen does not eventuate given the feasible alternative BEVs present.

Do you have any insights we should consider on what is needed to make hydrogen commercially viable?

As technology keeps developing to reduce the capital costs associated with hydrogen, the main barrier around commercial viability is likely to be electricity prices and utilisation. As we note in our response below, a key challenge for hydrogen is the significant renewable electricity generation build-out it would require. Should demand for hydrogen be established in the short-medium term, industry and government will need to work together to ensure that sufficient electricity generation and transmission is being consented and built in line with the demand for electricity for hydrogen production.

As the document acknowledges, clear and stable regulatory settings and standards are important for providing the confidence needed to enable industry to produce, store, transport and use hydrogen safely. We note that mass and dimension rules are a barrier for many zero-to-low emissions vehicles (including hydrogen) as payloads are reduced, so welcome that the *Land Transport Rule: Vehicle Dimesons and Mass 2016* is in scope for review.

Is there any further evidence you think we should be considering?

Nothing further to what is already mentioned above.

Section 3: Government position and actions

Do you agree with our policy objectives?

Z agrees with the high-level policy objectives set out within the Interim Roadmap.

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

As the Interim Roadmap acknowledges, a key challenge for hydrogen is the significant renewable electricity generation build-out it would require. Should demand for hydrogen be established in the short-medium term, industry and government will need to work together to ensure that sufficient electricity generation and transmission is being consented and built in line with the demand for electricity for hydrogen production.

As the document acknowledges, if this does occur, it will be important to ensure that any necessary electricity generation / transmission can be consented and built in line with hydrogen production, to avoid compromising decarbonisation in other sectors that will rely on electrification.

While we acknowledge that export could play a role in underpinning the commercial viability of hydrogen production in New Zealand, Z has long held the view that export hydrogen could be challenging given New Zealand's relative competitiveness.

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

Z broadly agrees with the proposed actions and considerations that have been made under each focus area in the Interim Roadmap.

We note that much of the capital invested so far in hydrogen is in trying to build new supply and new demand together, which is challenging. Given there is existing demand in New Zealand (albeit the

number of existing users is quite low), it may be easier to focus on converting these use cases to green hydrogen and using that as a launching pad for other demand.

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

Nothing further to what is already mentioned above.

ENDS