TE MANATŪ WAKA (MOT)

TE RAUTAKI UEĀ ME TE RAUTAKI WHAKAWHIWHINGA O AOTEAROA

NEW ZEALAND FREIGHT & SUPPLY CHAIN ISSUES PAPER

HIRINGA ENERGY SUBMISSION

JUNE 2022

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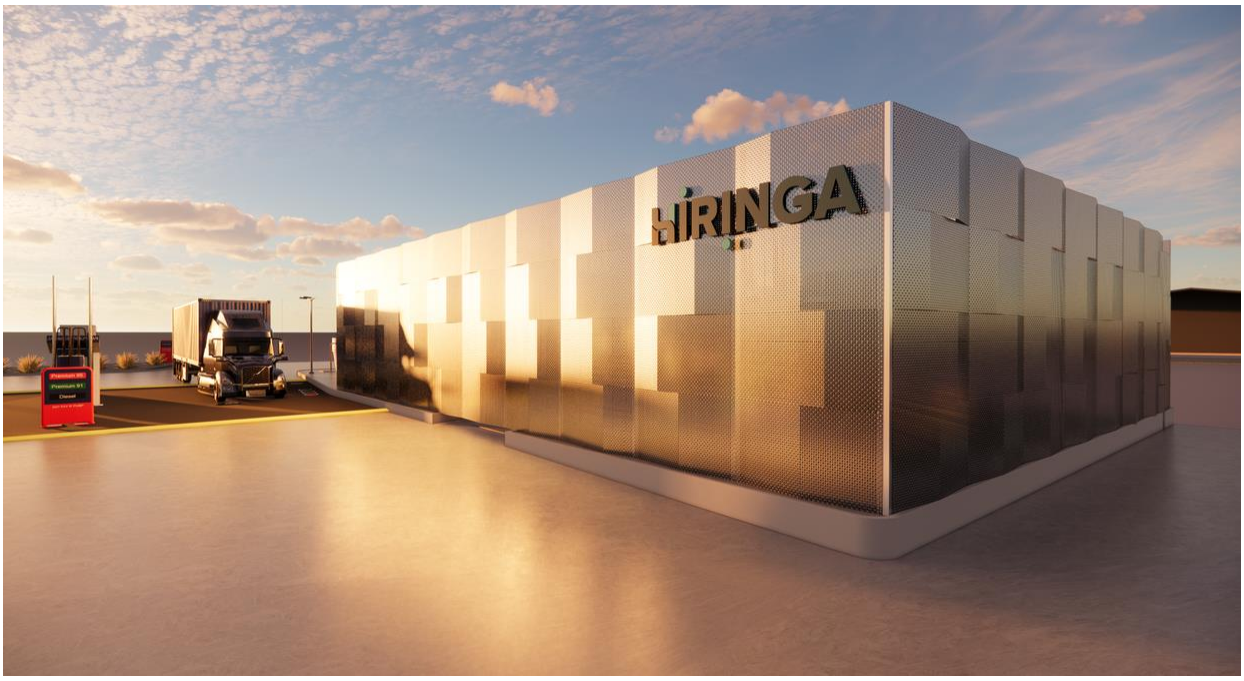


1. Introduction

1.1. Hiringa welcomes the opportunity to participate in the development of the Ministry of Transport's Freight and Supply Chain Strategy. We are pleased to see this workstream evolve into what it is now having been apart of the journey since before the Green Freight 2020 Strategic Working Paper and being a part of the Sustainable Business Council's Low Carbon Freight Pathway report in 2021 and Ara Ake's Long Distance Heavy Freight TCO Comparison Tool. Consolidating this work into one comprehensive strategy with a 30 year+ view is the logical next step.

1.2. In essence, we support the four suggested outcomes of low emissions, resilience, productivity & innovation and equity & safety, as the key pillars of the strategy. This submission will discuss the opportunities for green hydrogen to deliver on the outcomes proposed and identify solutions to the barriers stymying our progress towards them.

2. Key messages

2.1. Heavy vehicles comprise 23% of our transport emissions, even though they only account for 6% of the annual road vehicle kms travelled.[1] With freight volumes expected to increase 33% by 2050,[2] transitioning the heavy vehicle fleet to zero emission technology presents a critical opportunity to reduce our otherwise growing emissions.

2.2. The decarbonisation of freight will require a number of technologies applied in the right place at the right time i.e. battery electric, biofuels and green hydrogen (and derivatives). We concur with the Climate Change Commission's advice being *"Even if Aotearoa rapidly converts to EVs, biofuels or hydrogen will likely still be needed for ships, trains, aircraft, long-distance trucks and some off-road vehicles."*[3]

2.3. Green hydrogen technology is being commercially deployed in Aotearoa from 2022 and will enable the accelerated decarbonisation of multiple sectors, beginning with the emissions-intensive 'low hanging fruit' of the heavy transport sector.

2.4. The bulk of heavy truck fleets are owned by a few dozen commercially minded fleet operators (as opposed to millions of passenger vehicle owners). Empowering this segment is effort and cost efficient for Government, with a high emissions abatement return on investment.

2.5. While significant cost reductions have been experienced in recent years, the capital cost of zero emission heavy trucks remains a near term barrier to adoption. Developing a 'Clean Truck Discount' would be a highly effective way to get zero emission trucks into the fleet in the near term and reduce emissions quickly.

[1] https://www.transport.govt.nz//assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf
[2] https://www.sbc.org.nz/insights/2021/low-carbon-freight-pathway
[3] https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf

3. Context

3.1. The speed at which we need to take action has been highlighted in the recent IPCC Working Group report[4] which said that *"Without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C is beyond reach."* The report went on to say that *"Limiting global warming will require major transitions in the energy sector. This will involve a substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency, and use of alternative fuels (such as **hydrogen**)."*

3.2. The European Union's Hydrogen Strategy for a Climate Neutral Europe 2020 outlines how the European Union sees hydrogen as "…an intrinsic part of an integrated energy system". "In the integrated energy system of the future hydrogen will play a role, alongside renewable electrification, to achieve a more efficient and circular use of resources. Large-scale deployment of clean hydrogen at a fast pace is key for the EU to achieve a higher climate ambition… in a cost-effective way."[5]

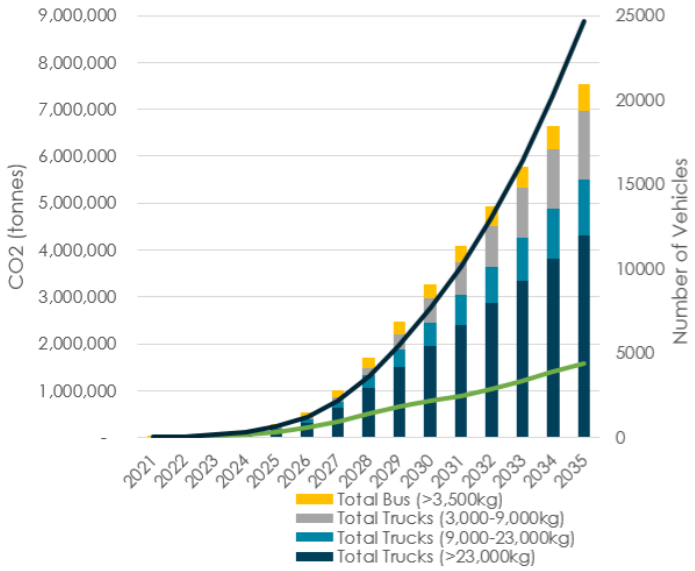
3.3. "In the International Energy Agency's 'Net Zero by 2050: A Roadmap for the Global Energy Sector', hydrogen use extends to several parts of the energy sector and grows sixfold from today's levels to meet 10% of total (global) final energy consumption by 2050. This is all supplied from low-carbon sources."[6]

3.4. There is significant domestic investment in green hydrogen planned over the next 10 years which should continue to be recognised and supported by the Government, as has been done by governments abroad. Over 30 countries have released hydrogen roadmaps, and governments worldwide have committed more than USD 70 billion in public funding.[7] In response to global energy challenges, under the REPowerEU programme, the EU has set a target of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of imports by 2030, to replace natural gas, coal and oil in hard-to-decarbonise industries and transport sectors.[8]

3.5. The New Zealand Government recognised the opportunity to decarbonise that medium and heavy vehicles present when signing the 'Global Commercial Vehicle - Drive to Zero' memorandum of understanding,[9] committing to 100% of new truck and sales being zero emission vehicles by 2040 and 30% by 2030.

3.6. Heavy fleet turnover will take several decades with New Zealand only purchasing around 6,500 heavy vehicles each year. Even if we only purchased zero emission trucks from now on, it will take over 20 years to transition the heavy fleet. Encouraging a rapid increase in zero emission heavy vehicle uptake is critical. Given the significant volume and cost constraints on B100 type biofuels, every purchase of an ICE heavy vehicle locks in up to 20 years of diesel emissions. Refer to Figure 1.

[4] https://www.ipcc.ch/
[5] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN
[6] https://www.iea.org/reports/global-hydrogen-review-2021?utm_source=SendGrid&utm_medium=Email&utm_campaign=IEA+newsletters
[7] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf
[8] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
[9] https://globaldrivetozero.org/mou-nations



IMPACTS OF MODEST FLEET UPTAKE

By 2035:

- 20,000+ heavy vehicles replaced by fuel cell vehicles (>13% of fleet)
- 9,000,000 tonnes CO_2 abated

By 2050:

- >64,000 fuel cell vehicles on road (>40% of fleet)
- ~60 million tonnes CO_2 emissions abated

Figure 1 CO_2 Reductions achieved through modest hydrogen heavy vehicle uptake

4. Green hydrogen can help achieve 'Outcome 1 – Low Emissions'

Heavy road freight

4.1. Hiringa support's New Zealand's vehicle fleet rapidly becoming a combination of technologies, with the best technology being applied in the most appropriate place. Battery electric vehicles make sense for lighter regional use, with renewable liquid and gaseous fuels well suited for longer and heavier duty applications. We agree with the Climate Change Commission's final advice to Government,[10] being "Hydrogen fuel cell trucks offer advantages such as being faster to refuel, travelling longer distances and not having heavy batteries that take the place of freight."

4.2. The heaviest trucks in our fleet drive the most kilometres and emit over 150 times more CO_2 than average passenger vehicles, as indicated in Figure 2. Replacing these heaviest trucks with green hydrogen fuel cell electric trucks (FCEV) prevents approximately 300 tons of CO_2 from entering our environment each year depending on payload (based on 225,000kms per annum for existing operating line haul freight trucks).

[10] https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf

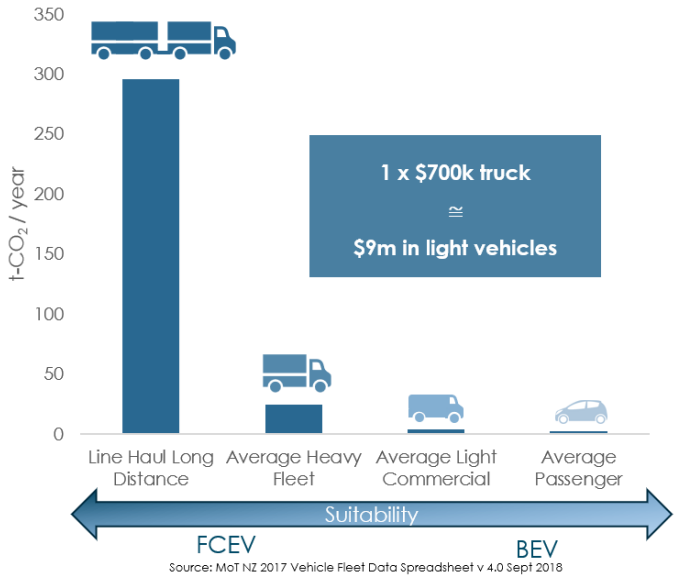


Figure 2 CO_2 Comparison of emissions from different vehicle types and investment comparison (in box)

4.3. Utilising green hydrogen to decarbonise our heaviest vehicles goes beyond 'low emissions' (grid based battery recharging and biofuels) to be 'zero emissions' as 100% of the electricity used in the production of green hydrogen will come from renewable resources (also stimulating investment in new renewable electricity generation and 'firming' existing renewable generation).

Aviation

4.4. Airlines carry 16% of our exports and 22% of our imports by value but only 1% by volume.[11] Therefore the aviation sector plays a critical role in our high value commodity trade. Aviation is also a key element of our transportation network given our economic dependence on it for freight, tourism and commerce, in addition to it enabling kiwis to physically connect with the rest of the world. However, decarbonisation within the industry is needed.

4.5. Air New Zealand are taking a global leadership role in the decarbonisation of the aviation sector. The Product Requirement Document[12] released last year highlights their ambition, with low/zero emission domestic aircraft delivery required by 2025, within the scope outlined in Figure 3 below. Hydrogen plays a key role in the zero carbon options targeted.

[11] https://www.transport.govt.nz//assets/Uploads/MOT-4381-FS-Chain-A3_P4.pdf
[12] https://www.airnewzealand.co.nz/sustainability-carbon-reduction-management#zeroemissions

	Hybrid/ Turbo-Electric	Carbon Zero Designs	Carbon Zero Plus	Zero Emissions
Emission reductions	Low	Moderate	High	Highest
Description	Gross emissions are partly reduced[2]	Zero carbon, but residual, non-carbon emissions remain[1,2]	Zero carbon emissions with reduced non-carbon emissions[1,2]	Zero aircraft emissions
Technology solutions	Hybrid electrification of gas turbine engines SAF use possible	Direct hydrogen combustion	Hybrid hydrogen combustion and hydrogen fuel cell	Hydrogen fuel cell Battery Electric

Figure 3 Scope of AirNZ's Product Requirement Document

4.6. "Hydrogen at scale can cost-effectively decarbonize flights up to the short and medium range categories, which account for 70% of global aviation CO_2e emissions. Beyond the 10,000km range, the storage space requirements make hydrogen unfeasible in terms of cost".[13] Therefore for long-range flights, which account for 30% of global aviation CO_2e emissions, synfuel and advanced SAFs (such as 'power to liquid SAF') are the most cost competitive decarbonisation options, both requiring significant volumes of hydrogen.

Rail

4.7. Aotearoa's share of freight moved by rail is set to increase from 5.6% at present.[14] The central North Island rail route benefits from electrification infrastructure which will go a long way to deliver low emission (grid based) rail freight services. It is recommended that Ministry of Transport connects with Kiwirail in relation to its current planning around future locomotive options. Powering locomotives servicing areas away from the North Island's electrified central trunk with locally produced green hydrogen is an option to watch over time. Retrofitting Kiwirail's South Island diesel locomotive fleet with hydrogen technology is something we would also advocate exploring.

4.8. Alstrom's Coradia iLint hydrogen powered train has been operating since 2016.[15] The H2goesRail project from Deustsche Bahn and Siemens Mobility is a more recent project announcement, with an operating range of 800 kilometers. In the freight sector, Canadian Pacific is building North America's first line-haul hydrogen-powered locomotive using fuel cells and batteries to power the locomotive's electric traction motors. Canadian Pacific is now expanding its Hydrogen Locomotive Program from one to three locomotives, with expected delivery in 2022.[16]

[13] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf
[14] https://www.transport.govt.nz//assets/Uploads/MOT-4381-FS-Chain-A3_P4.pdf
[15] https://www.alstom.com/solutions/rolling-stock/coradia-ilinttm-worlds-1st-hydrogen-powered-train
[16] https://www.greencarcongress.com/2022/01/20220122-cp.html

Figure 4 Canada Pacific's hydrogen linehaul freight locomotive

Coastal shipping

4.9. The current share of freight carried via coastal shipping (1.6%)[17] will grow overtime and the industry will need to find low emission fuel options if they are to help Aotearoa transition to a zero emission economy. There are a number of low emission maritime fuels emerging with clean ammonia and clean methanol gaining traction globally.

Figure 5 Eidesvik Offshore's Viking Lady being retrofitted with ammonia-powered fuel cells[18]

4.10. There are potential security of supply and affordability benefits to be gained if our coastal shipping industry was fuelled by domestically produced low emission maritime fuels. These fuels could leverage the emerging power-to-X industry in locations such as Taranaki, which are suitable for large scale commodity production and export using renewable electricity as the feedstock. Many of New Zealand's larger ports are also looking to decarbonise their dockside operations, creating synergies between the green hydrogen they need and the hydrogen derived maritime fuels needed by the shipping industry.

[17] https://www.transport.govt.nz//assets/Uploads/MOT-4381-FS-Chain-A3_P4.pdf
[18] https://www.ammoniaenergy.org/articles/fortescue-lmg-marin-and-eidesvik-to-launch-ammonia-powered-ships/

Ferries

4.11. The Government's investment in the new iRex ferries is an exciting one, with 40% emission reductions estimated.[19] There is potential for the diesel elements of these ferries to be retrofitted with green hydrogen technology in the future which would significantly reduce the emissions of interisland freight movements.

4.12. Norled is now operating a green hydrogen powered car and passenger ferry in Norway.[20] The ferry was named Ship of the Year by the industry magazine Skipsrevyen, demonstrating that this technology is well developed and ready for commercialisation.

Figure 6 Norled's MF 'Hydra' hydrogen ferry[21]

4.13. Auckland Transport is actively exploring its options for decarbonising the longer routes within the Hauraki Gulf and sees hydrogen technology as a strong contender. Fullers 360 is also investigating zero emission options and see their future service offering being a combination of battery electric (EV) and hydrogen (E2 Hybrid) technology as demonstrated in Figure 7.

Figure 7 Hauraki Gulf ferries will be a combination of battery & hydrogen technologies

[19] https://www.irex.co.nz/new-ferries
[20] https://fuelcellsworks.com/news/norway-mf-hydra-the-worlds-first-hydrogen-operated-ferry-wins-ship-of-the-year-2021/
[21] https://fuelcellsworks.com/news/norway-mf-hydra-the-worlds-first-hydrogen-operated-ferry-wins-ship-of-the-year-2021/

Airport, seaport and rail zero emission hubs

4.14. There is growing interest in using hydrogen for aviation within Aotearoa. Hiringa is working with the country's largest airports as well as a number of regional airports and operators investigating the opportunities. Airports are well suited to the hydrogen hub model, where production and multiple use (high utilisation/heavy duty) consumption is clustered together. As a result, decarbonising airports will be key to decarbonising the freight sector. It is recommended that the Ministry of Transport connects with the Ministry of Business Innovation and Employment in relation to their current investigation into 'airport hydrogen hubs'.

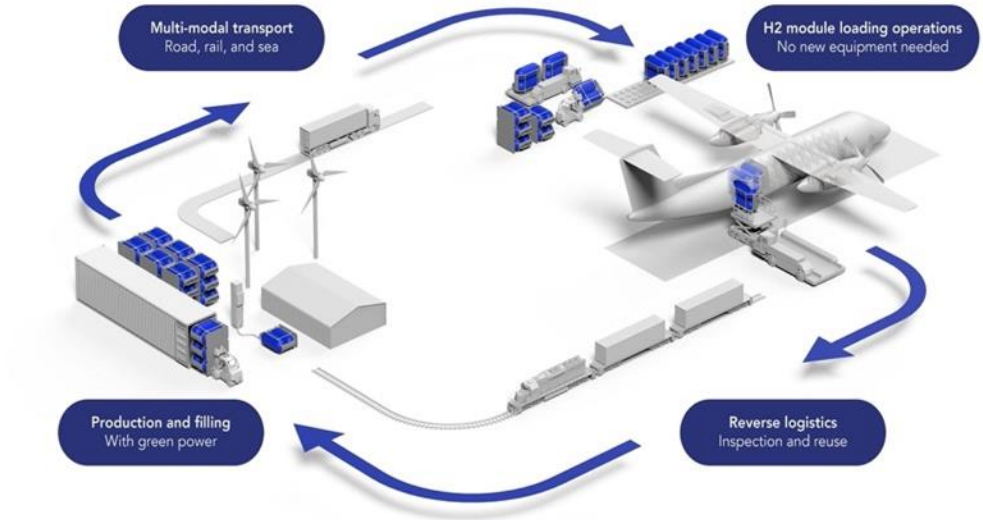


Figure 8 Universal Hydrogen's hydrogen refuelling solution for aviation

4.15. Hiringa is also working with a number of seaports who are also looking for ways to decarbonise operations. Like airports, seaports and rail hubs are well suited to the hydrogen hub model and their decarbonisation will be key to decarbonising the freight sector. Technology providers such as Gaussin[22] have battery electric and hydrogen mobility solutions commercially available, with Centreport in Wellington already operating one of the former.

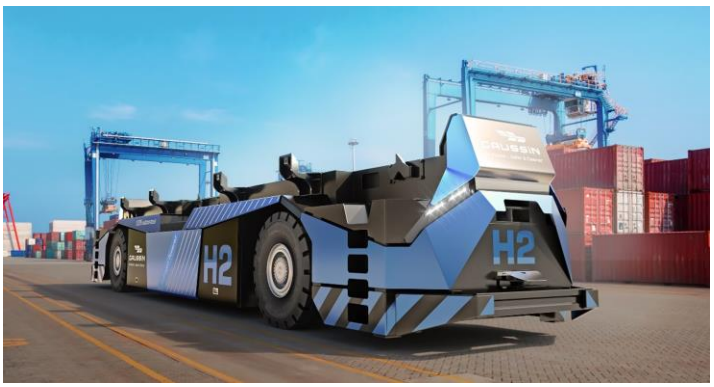


Figure 9 Gaussin's hydrogen mobility solution for seaports

[22] https://www.gaussin.com

Green hydrogen refuelling infrastructure

4.16. The construction of a high-capacity green hydrogen refuelling station is already underway in Palmerston North, with three other refuelling stations coming online within the next six months (refer to Figure 10). These four refuelling stations will provide for over 95% of North Island freight routes. Hiringa is planning the roll out of 24 refuelling stations across the North and South Islands by 2026, removing access to hydrogen refuelling infrastructure as a barrier.

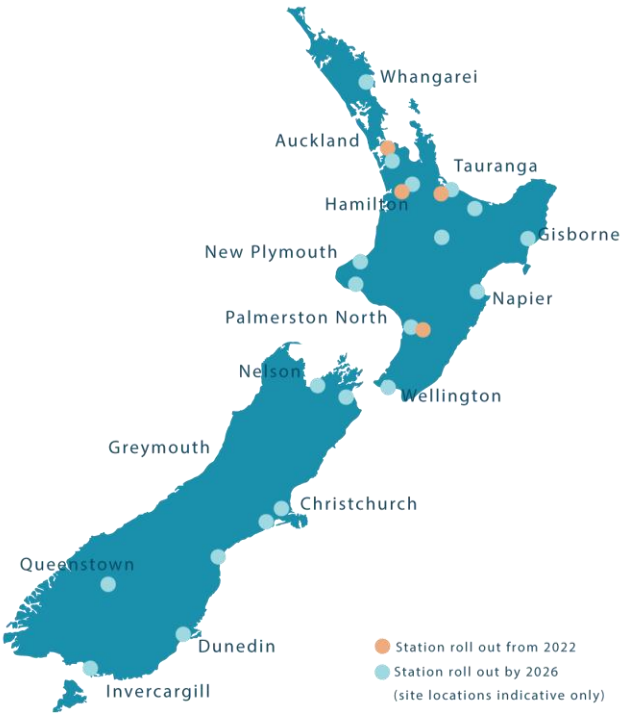


Figure 10 Hiringa high-capacity green hydrogen refuelling stations

Green hydrogen cost

4.17. The cost of green hydrogen production is dropping rapidly, driven by the global acceleration of its commercialisation and ability to close-couple with the reducing costs of intermittent renewables such as wind and solar. Industrial scale production facilities such as those proposed at the Kapuni Green Hydrogen Project[23] result in economies of scale and reduced production costs.

5. Green hydrogen can help achieve 'Outcome 2 – Resilience'

5.1. With the Marsden Point Oil Refinery now converting to an import-only terminal, our importation of refined liquid fuels will increase. This reliance on the importation of energy for mobility will make Aotearoa even more susceptible to global supply and pricing trends. By transitioning our heavy fleet, airports, seaports and rail hubs to domestically produced zero emission fuels we increase our energy resilience through security of supply.

[23] https://www.greenhydrogennz.com/

5.2. When we store our renewable electricity in the form of green hydrogen we are diversifying the mix of energy we have at our disposal. Energy diversity can assist Aotearoa when faced with climate change, natural hazards or market induced energy shortages.

6. Green hydrogen can help achieve 'Outcome 3 – Productivity & Innovation'

6.1. An upswing in zero emission vehicles will not only reduce our emissions, but drive the build of more renewable energy assets, stimulate new jobs and contribute to our targeted global positioning as a low emission economy producing high quality goods and services. The New Zealand Government's recent Memorandum of Cooperation with California is an example of climate leadership creating international opportunities for trade.

6.2. Air New Zealand's ambition to decarbonise mentioned in section 4 will not only reduce air freight emissions but build on New Zealand's position as a front runner in low emission aviation, contributing to our strong international brand.

6.3. When considering productivity, green hydrogen is seen by many within the heavy freight industry as the preferred zero emission mobility technology because of its operational efficiency benefits:

a. Green hydrogen maximises the payload able to be carried due to the fuel's high energy density and therefore revenue per trip.
b. Refuelling with green hydrogen is similar to refuelling with diesel, which means vehicles are back on the road quicker.
c. Green hydrogen vehicles have long ranges, which means stopping less often and more time on the road.
d. Green hydrogen vehicle fleets can be smaller with no need to have an additional vehicle recharging while others are on the road, then rotating vehicles.
e. Green hydrogen refuelling infrastructure is owned by a third party and centrally located, meaning operators can invest capital otherwise invested in grid upgrades back into their businesses.

7. Green hydrogen can help achieve 'Outcome 4 – Equity & Safety'

7.1. Green hydrogen is acknowledged as a cornerstone of our Just Transition within the energy sector through the creation of new domestic energy, fuel supply chains, 'green jobs' and even commodity export opportunities. Transitioning the energy sector workforce is essential, especially with job losses already being seen in Taranaki.

7.2. Infrastructure requirements associated with energy system transition need to be considered and communicated. Under an electrification-only scenario the cost may be borne by taxpayers in the form of lines charges, irrespective of their consumption or ability to pay. Hydrogen infrastructure, on the other hand, will be largely private sector funded and provides the ability for any price premium to be covered on a user pays basis.

7.3. The Emissions Trading Scheme (ETS) is a powerful but blunt instrument. As the price of carbon increases over time, so too will the price of liquid fuels. This increase in fuel price will affect all

parts of our community, including those who can afford it least. Liquid fuel consumption is relatively inelastic, as people still need to travel to work and to supply goods and services. A targeted instrument such as the Road User Charge exemption for fuel cell electric heavy vehicles provides an incentive for change, without directly negatively impacting our economy. Refer to section 8 for further discussion around recommended actions.

7.4. In discussions with local and central government, it has become apparent that the road damage associated with heavier zero emission vehicles is becoming a problem as the technology is scaled up. Hydrogen powered heavy vehicles have a high energy density and are therefore lighter than battery electric counterparts, reinforcing that there is a natural point in vehicle size where switching from battery electric to hydrogen technology makes sense. Some within the roading industry have submitted to the Ministry that zero emission vehicles should pay their share of Road User Charges i.e. their exemption should not be extended. It must be noted that there can be a large difference in weight between zero emission technologies which needs to be considered when making policy settings.

7.5. Like all fuels, green hydrogen needs to be managed properly, and the unique properties of hydrogen considered in the design of hydrogen systems. Hydrogen is no more dangerous than other flammable fuels or the batteries used in electric cars. Being new technology, hydrogen vehicles coming into New Zealand are highly scrutinised to ensure compliance with strict international standards. Please refer to our website for more information www.hiringa.co.nz

8. Actions needed to deliver these outcomes

8.1. Green hydrogen has a critical role to play in decarbonising our freight system. There is an opportunity to get immediate emissions reductions with high capacity green hydrogen refuelling infrastructure and zero emission line haul truck technology commercially available. Hiringa and partners are in the process of rolling out zero emission refuelling and truck technology, but like fossil fuel and battery electric markets, this requires Government activation, after which industry momentum will build and Government support can lessen. The Government has multiple 'levers' at its disposal that can be pulled to accelerate freight decarbonisation, as listed below and explained in subsequent sections:

a. Capital cost barrier reduction through a 'Clean Truck Discount' scheme.
b. Exempting zero emission heavy vehicles from Road User Charges until 2030.
c. Allowing increased weight for zero emission heavy vehicles under the VDAM Land Transport Rule.
d. Streamlining the zero emission vehicle compliance regime.
e. Government procurement requirement of zero emission freight services.
f. Providing a fuel rebate on green hydrogen produced and supplied to the transport market.
g. Developing a Low Carbon Fuel Standard similar to those implemented internationally.

A 'Clean Truck Discount' scheme would reduce the capex barrier

8.2. The capital cost of zero emission heavy trucks is a near term barrier to adoption until cost downs are achieved. Zero emission heavy truck prices will rapidly reduce with manufacturing volume. However, in order to achieve economies of scale we need to activate the market.

8.3. A zero emission heavy vehicle rebate similar to the Clean Car Discount would have high impact and be quick to implement. Figure 11 demonstrates that on the same Government dollar spent per kilogram of CO_2 abated ratio used in the Clean Car Discount scheme for light vehicles, a zero emission heavy vehicle would receive a rebate of $1.2 million dollars. This rebate would exceed the capex cost of a hydrogen powered heavy truck, but highlights the fact that even a lower Government dollar spent per kilogram of CO_2 abated ratio would have a tremendous enabling impact on decarbonising the heavy fleet.

Metric	Units	Nissan Leaf	HYZON HGV450
Emissions Avoided	kgCO2e/km	0.170	1.480
Distance travelled per year	KM	11,000	200,000
Duration of first ownership	years	8	8
First ownership distance	KM	110,000	1,600,000
Government rebate	**$NZD**	**$8,625**	**$1,200,000 eqiv**

Figure 11 Clean Car Discount Equivalent for Zero Emission Heavy Vehicles

8.4. Developing a 'Clean Truck Discount' would be a highly effective way to get zero emission trucks into the fleet in the near term which would then move through a number of use cases as the trucks transition through their various 'lives'. Figure 12 demonstrates that the bigger trucks doing the most kms per annum are the highest emitters. Decarbonisation incentives in this segment will provide the best carbon abatement return on investment on a dollar-per-dollar basis for Government, and provides a multi-pronged approach, as opposed to just relying on light fleet decarbonisation.

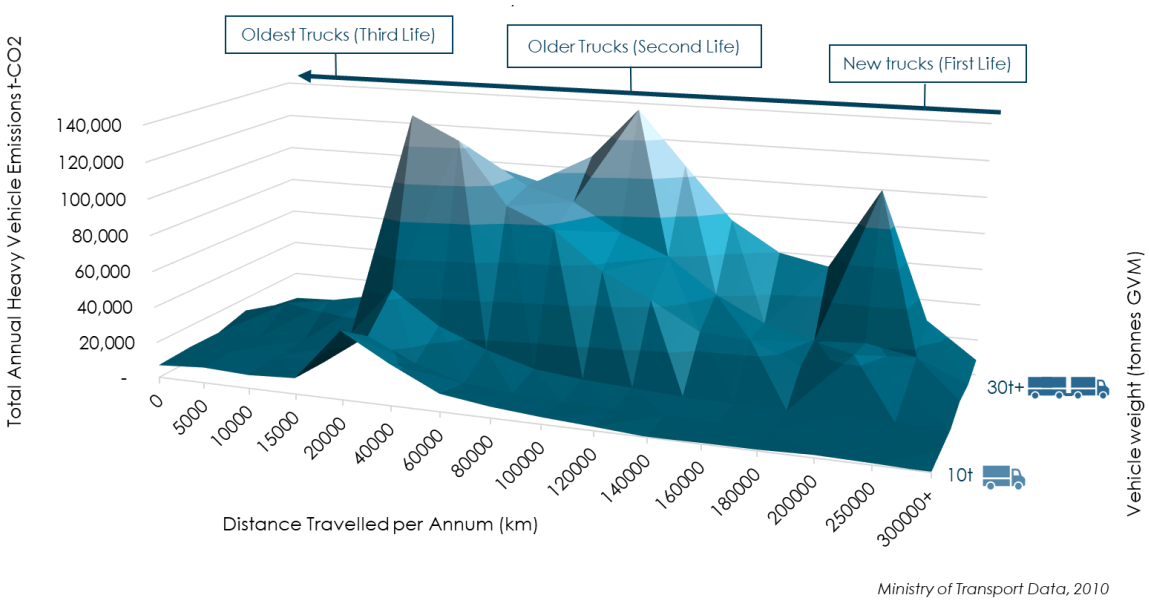


Figure 12 Cumulative emissions by truck size and annual distance travelled

8.5. Government incentivisation for heavy fleet decarbonisation could be delivered in the following three phases between now and 2030:

a. Phase one is the Low Emission Transport Fund administered by EECA which has successfully supported the demonstration of low and zero emission heavy transport technology.

b. Phase two would be a 'Clean Truck Discount - Scale up' that enabled the scaling up of zero emission transport technology over 10 tonnes (GVM), trucks above this weight are the biggest emitters as demonstrated in Figure 12. The purpose of this rebate would echo that of the Clean Car Discount. New Zealand imports approximately 6,500 trucks per year. If $6,000 was collected per >10t diesel truck imported, Government would accumulate ~$39 million per year that can be used to incentivise zero emission trucks. Using this budget to offer a rebate of $200,000 on new zero emission truck purchases, the $39 million would enable 195 trucks per annum, supporting the establishment of economies of scale to drive 'cost-downs', and achieve an emissions abatement equivalent to taking 30,000 ICE cars off the road (if the trucks were doing line-haul duty).

c. Phase three would be a 'Clean Truck Discount – Acceleration' that saw Government contributions per vehicle reducing and spreading wider. If $6,000 was collected per >10t diesel truck imported, Government would accumulate ~$39 million per year that can be used to incentivise zero emission trucks. Using this budget to offer a rebate of $45,000 on new zero emission truck purchases, the $39 million would enable ~866 trucks, which is equivalent to taking ~130,000 ICE cars off the road (if the trucks were doing line-haul duty).

8.6. Figure 13 demonstrates how the Total Cost of Ownership of hydrogen fuel cell trucks is impacted by Government support mechanisms in conjunction with economies of scale and increasing diesel prices. The phases of Government support discussed in this section are overlayed for context.

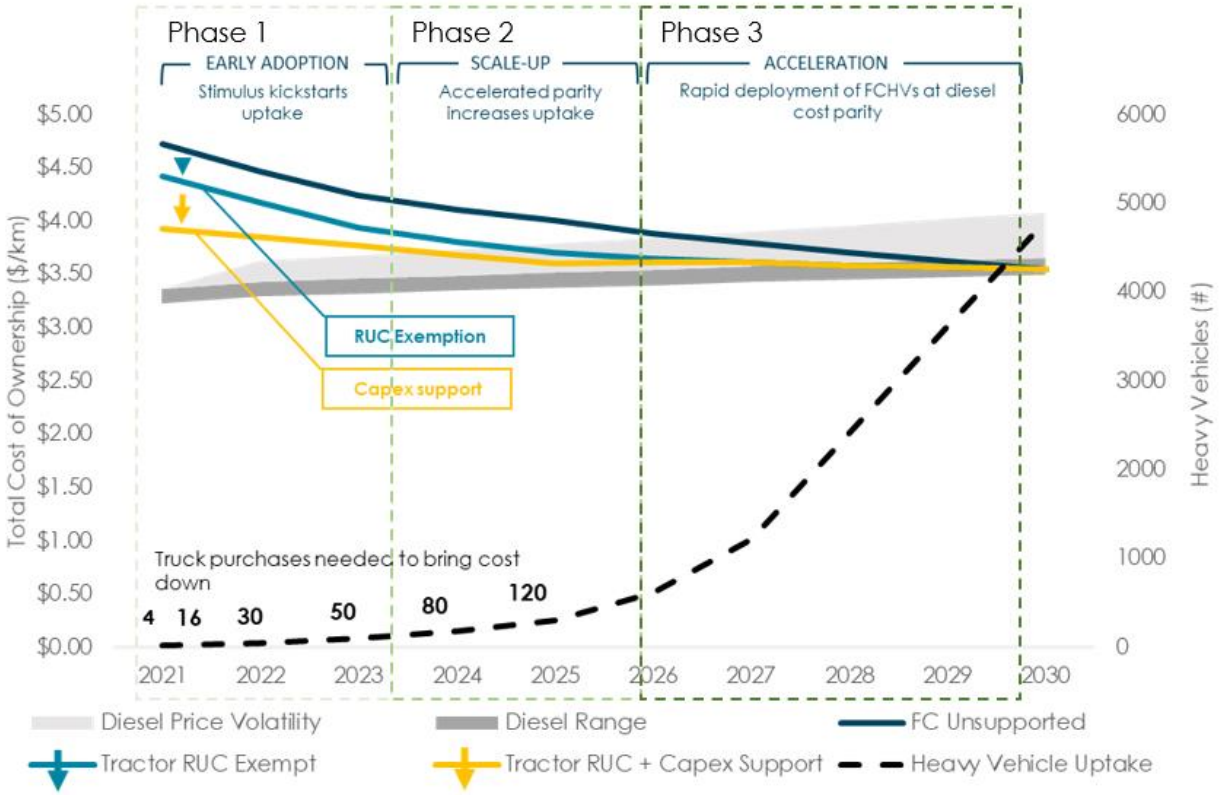


Figure 13 Interventions needed to lower the Total Cost of Ownership of hydrogen trucks and scale up

8.7. EECA's Low Emission Transport Fund has been the mechanism for low emission vehicle capex support to date, but this has historically been used for demonstration cases, limiting the volume of vehicles, and its contestable nature introduces significant uncertainty.

Recommended amendments to the Road User Charge system

8.8. With the support of Government, TR Group is importing 20 hydrogen fuel cell heavy trucks which will be leased to many of New Zealand's largest truck fleet operators from early 2023. A key enabler for these fleet operators has been the RUC exemption available[24] until the end of 2025. Given the significant impact this Government 'lever' has had on the uptake of zero emission heavy trucks (at no immediate cost to tax payers), it is paramount that this incentive continues uninterrupted until at least 2030 to give the technology the momentum needed.

8.9. Hiringa's trucking partners have advised that the RUC costs associated with type 309 vehicles are approximately 30 cents/km, with a B-train being another 22 cents/km. These combine to cost operators approximately 52 cents/km at 120,000kms or $62,400 per year, which is a material proportion of operating costs. Removing this cost is a considerable enabler that the Government

[24] The 20 Hyzon trucks have plugs allowing an external source of electricity to recharge their on-board batteries

can continue to use in order to help close the gap between diesel powered and zero emission trucks in the short term.

8.10. Hiringa and trucking partners view the existing RUC exemption for zero emission heavy vehicles as a fast, low-cost and well understood tool that Government can continue to use to encourage the decarbonisation of an otherwise hard-to-treat segment of the transportation sector. To develop a new incentivization tool would take time, at the cost of years of zero emission uptake and risks putting New Zealand down the priority list of Original Equipment Manufacturers (OEMs) who are receiving unprecedented demand from much larger economies around the world. New Zealand has secured a position near the top of the technology queue with OEMs, however this position will slip if truck orders wane.

Allow zero emission heavy vehicles increased weight in VDAM

8.11. Amending the Vehicle Dimensions and Mass Land Transport Rule to allow hydrogen powered heavy vehicles to carry additional payload would be an enticing incentive for freight operators and should be considered as a swift, low cost enabler that Government has control over.

Government procurement can increase early zero emission fuel demand

8.12. As a large consumer of goods and services, Government has the ability to encourage transition within the industry should it prescribe low emission supply chains as a prerequisite of suppliers. This would ultimately increase demand for low emission fuels and therefore assist in their commercialisation.

8.13. Including a variety of battery electric and hydrogen fuel cell vehicles in the All of Government procurement programme would also be an effective way to start establishing international supply, on-selling second hand low emission vehicles on the domestic market (trickle-down effect), setting up domestic recharging/refuelling infrastructure and beginning the social acceptance process.

Zero emission fuel rebate

8.14. A fuel rebate on green hydrogen produced and supplied to the transport market is another way of reducing the operational costs and therefore incentivising zero emission heavy vehicles. With green hydrogen being the only type of hydrogen that received the rebate, this approach would address any concerns about grey or blue hydrogen being incentivised via a RUC exemption or similar. Of note, BEVs currently receive a rebate as a part of the Clean Car Discount, despite the electrical grid only being approximately 80% renewable. Also of note, in order for liquid fossil fuels to establish themselves it took decades of global subsidisation/tax breaks, therefore subsidisation of fuels is not a new concept. We acknowledge the work done by the Ministry of Foreign Affairs and Trade to address the liquid fossil fuel subsidies that remain today.

Develop a Low Carbon Fuel Standard

8.15. A longer-term strategy for decarbonising freight (and other transportation sectors) would be to connect with the California Air Resources Board under our Memorandum of Cooperation recently signed with California, learn about their Low Carbon Fuel Standard,[25] and begin understanding what a Standard of this nature could look like for Aotearoa. Given the complexity of such standards it is recommended that this pathway is explored in parallel with other more immediate incentives in order to reduce freight emissions in the near term. We would see hydrogen being one of many zero emission technologies incentivised under a standard such as this.

[25] https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard