Hydrogen Production Tax Incentive

Consultation Response

July 2024

PUBLIC SUBMISSION

EXECUTIVE SUMMARY – HYDROGEN PRODUCTION TAX INCENTIVE (HPTI) DESIGN

Hiringa appreciate the opportunity to provide feedback to the proposed HPTI scheme. Hiringa view this scheme as being a very material mechanism to enable and accelerate the adoption of commercially viable green hydrogen supply and support the majority of proposed HPTI design elements.

However, a key challenge we see is the **proposed restriction of HPTI eligibility to <u>single sites</u> with installed electrolysis capacity of 10 MW or greater.**

This 10MW minimum single-site restriction will significantly inhibit and delay deployment of a distributed-style hydrogen refuelling network utilising on-site production, which has been proven as a highly efficient, near-mid-term pathway to decarbonise several heavy road transport applications.

Hiringa, via its NZ network, has demonstrated efficacy of such an approach at a sub-10 MW scale and is in advances stages of development for a similar network in Australia. The Hiringa Refuelling Australia ("HRAU") Network is designed to include 5 MW sites, which has been modelled to be highly competitive against fossil fuels with HPTI support, resulting in an outcome consistent with HPTI objectives "to *bring forward project development [and] make renewable hydrogen available sooner"*.

Imposing a 10 MW capacity requirement for <u>individual</u> refuelling sites introduces unnecessary barriers to deployment by requiring unrealistically high levels of initial network participation to justify station economics, perpetuating the 'chicken or egg' dilemma between supply of hydrogen fuel cell electric vehicles ("HFCEV") and supporting refuelling infrastructure.

We urge Treasury to acknowledge the significant potential for hydrogen's immediate potential to decarbonise heavy transport, and the suitability of a 5 MW site design under a distributed network approach.

Compared to a 10 MW design, multiple distributed 5 MW sites will:

- *Accelerate industry development* by lowering barriers to infrastructure establishment (e.g. capital requirements, high HFCEV availability and uptake, development and regulatory approvals).
- *Minimise impact to the electricity network,* due to better load management and lower likelihood for network upgrades.
- *Be more practical to deploy,* such as by minimising footprint requirements allowing for wider disbursement near offtake markets, and due to maturity of 5 MW electrolyser technology sizing.

Hiringa acknowledge the administrative efficiency and budgetary responsibility in setting a minimum capacity requirement.

To uphold these outcomes, we recommend that:

1. The term 'facility' be replaced with 'project'; and
2. That a 'project' is able to include multiple interdependent sites for the purpose of aggregating capacity to meet the minimum 10 MW requirement. *See below for further detail.*

Hiringa also recommend that the entity eligibility requirements are made flexible, to complement existing project structures in order to most effectively crowd-in investment into Australia's hydrogen industry.

Yours faithfully,

Andrew Clennett
Chief Executive Officer
HIRINGA GREEN HYDROGEN POSITIVE ENERGY

APPROVED QUOTE FROM ALAN FINKEL

- Australian Chief Scientist (2016-2020)

"The proposed hydrogen production incentive outlines a sensible, effective framework to accelerate development of Australia's evolving hydrogen industry. I applaud the decision to minimise eligibility complexity by not mandating time matching and additionality requirements that would introduce further barriers to hydrogen projects.

Hiringa Energy's consultation response is well-constructed, and I endorse their recommendation to aggregate interdependent site capacities for the purpose of meeting minimum capacity requirements. The proposed 10 megawatt minimum for single sites would be prohibitive for many suitable hydrogen applications, such as establishing networks of hydrogen refuelling stations to decarbonise our heavy transport sector."

1. HYDROGEN IS AN EFFICIENT PATHWAY TO DECARBONISE AUSTRALIA'S EMISSIONS INTENSIVE TRANSPORT SECTOR, PARTICULARLY FOR HEAVY ROAD TASK

- Transport accounts for ~21% of Australia's total emissions and is forecast to become its highest emitting sector by 2030.[1]
- Trucks account for ~4.1% of Australia's total emissions, or ~20% of transport emissions.[2]
- Government projections indicate articulated and rigid truck emissions will continue to increase until 2030 where they will 7 million tonnes CO_2e higher than 2005 levels.[3] Transport is the only sector expected to increase its emissions over that period.

Decarbonising heavy road vehicles will have an immediate and material impact on Australia's emission reduction targets, however little progress has been made.

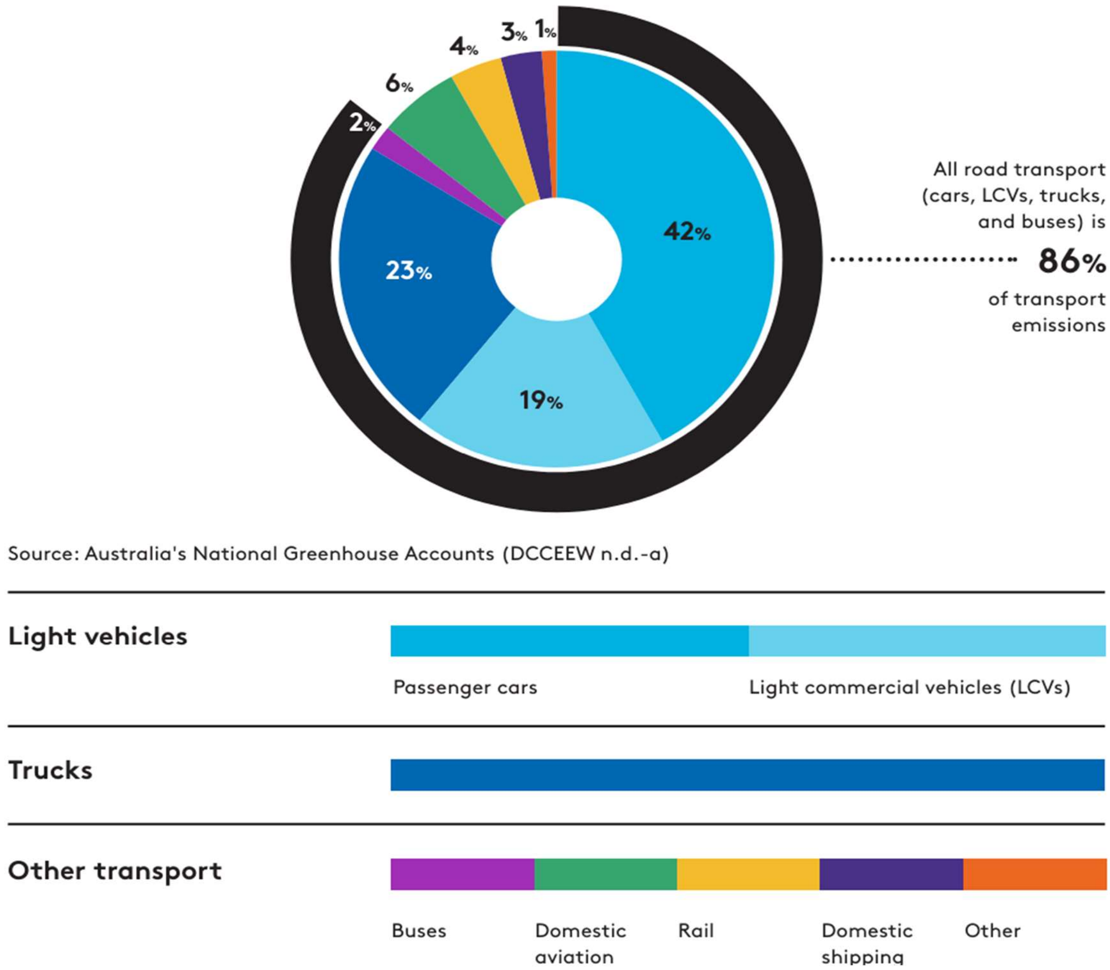


Figure 1 - Australia's transport emissions by subsector. Climateworks' 'Decarbonising Australia's Transport Sector' Report.

[1] *Climateworks (2024). Decarbonising Australia's Transport Sector Report.*

[2] *Climateworks (2024). Decarbonising Australia's Transport Sector Report.*

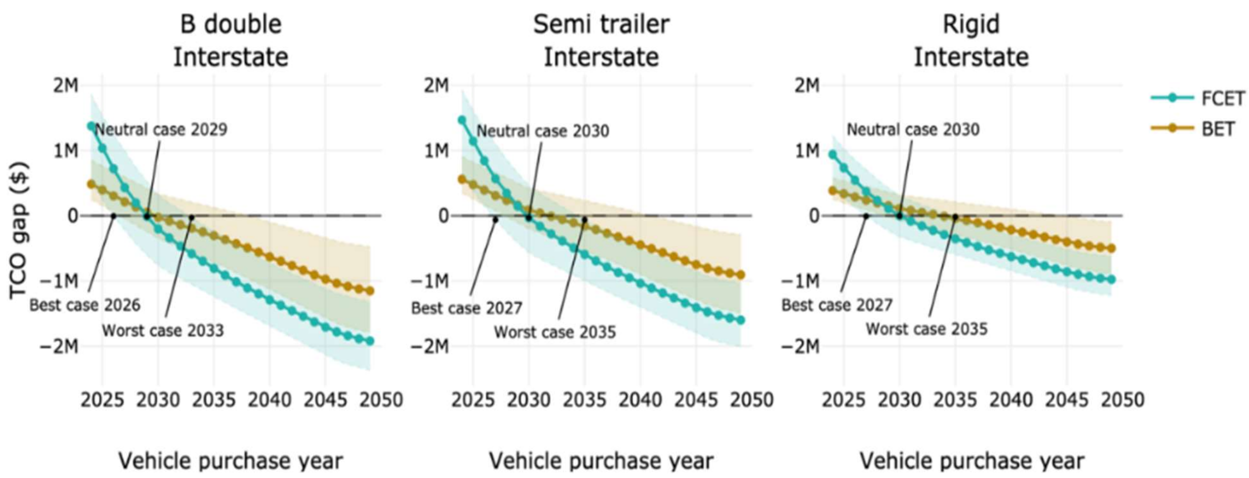
[3] *The Department of Industry, Science, Energy and Resource (2021) Australia's Emissions projections 2021.*

Using low-carbon hydrogen to displace liquid fossil fuels in heavy road vehicles is an efficient abatement pathway and assistance should be prioritised via the HPTI.

This is supported by the CSIRO's (2023) *Hydrogen Refuelling Infrastructure Report*, which found HFCEVs will play a material role decarbonising linehaul freight due to the following benefits compared to alternate solutions:[4]

- Comparatively short refuelling times, being especially important where time-cost is critical.
- Payload maximisation, through avoiding a substantial negative impact of carrying large, heavy batteries; and
- Greater range between refuelling / charging locations.

Recent total cost of ownership ("TCO") modelling undertaken by Swinburn University identified HFCEV technology as the fastest solution to achieve parity with fossil fuels for several heavy vehicle classes:



Vehicle	Technology type	The year of price parity		
		Best case	Neutral case	Worst case
B-double	BET	2027	2030	2039
	FCET	2026	2029	2033
Semi-trailer	BET	2029	2034	2045
	FCET	2027	2030	2035
Rigid truck	BET	2028	2032	2041
	FCET	2027	2030	2035

Figure 2 - TCO summary presented by Swinburn University at the Heavy Vehicle Industry Association's 'Truck show X' May

[4] *CSIRO (2023). Hydrogen Vehicle Refuelling Infrastructure Report.*

2. LARGE SCALE HYDROGEN PRODUCTION PROJECTS DO NOT SUPPORT NEAR-TERM ADOPTION OF HYDROGEN IN HEAVY TRANSPORT APPLICATION

Despite clear evidence supporting HFCEV technology as a logical abatement pathway for linehaul trucking, very few HFCEV trucks are operating on Australian roads.[5]

This is partly due to a lack of refuelling infrastructure, especially that which is fit-for-purpose for the above applications, such as B-doubles which are predominantly used for linehaul freight demand.

Centralised, large-scale offsite production is likely to be an effective supply model for hydrogen refuelling over the long term. However, it is not the most efficient near-term approach for the following reasons:

- Hydrogen transport costs remain expensive, as reflected in *Figure 3*, eroding the value brought about by economies of scale of larger generation projects to distributed refuelling sites; and

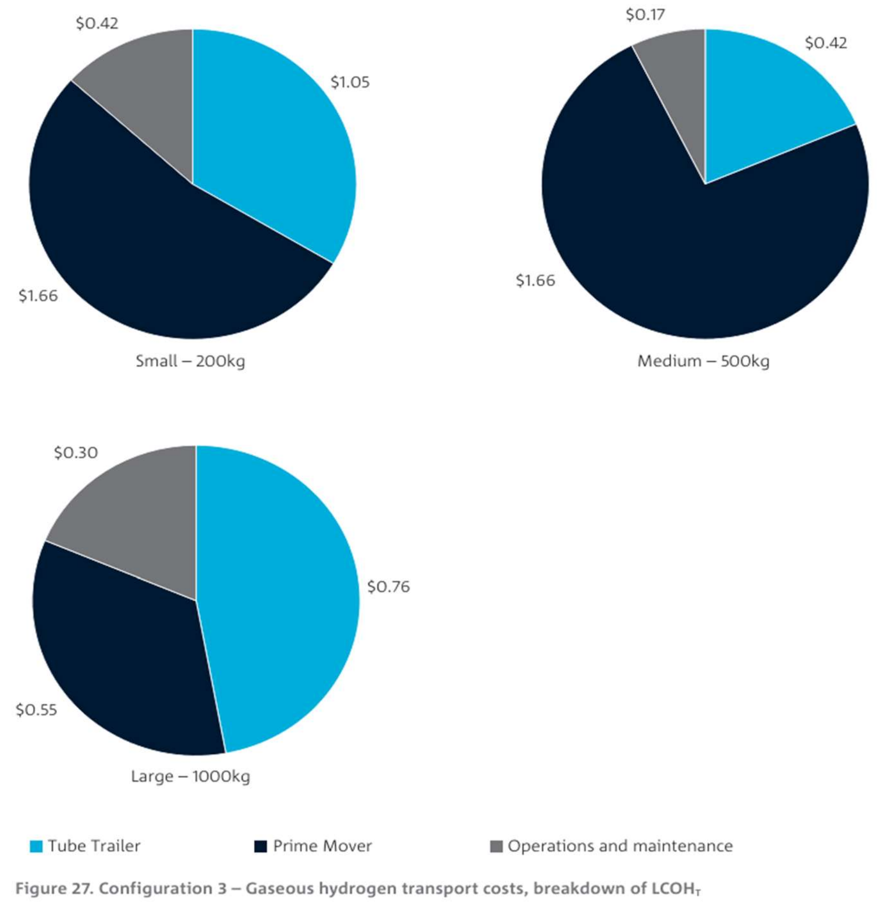


Figure 3 – Hydrogen delivery cost breakdown for different refuelling station sizes. CSIRO Hydrogen Refuelling Infrastructure Report

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[5] *The Truck Industry Council's T-Mark sales data shows 367 low- and zero-emissions trucks were sold in 2023 out of a total of 47,757 heavy, medium and light trucks and vans (McMullan 2024).*

- Very few large-scale projects have progressed to late stages of development, and fewer still have identified transport refuelling as prioritised offtake markets.

Until these limitations are overcome, an external delivery model is unable to bring about the supply security required by shipper and carrier networks to invest in relatively expensive HFCEV technologies (compared to internal combustion engines).

Given the stated HPTI policy intention to "*bring forward project development, [and] make* renewable *hydrogen available sooner*", in our view eligibility should support realistic short-term application.

In the case of the heavy transport sector, over the short-term it is best to support a distributed, on-site production model to establish use, build trust and participation, and lay the foundations for large scale supply once available.

Hiringa's approach to network development aims to capitalise on the approaching price parity for vehicles predominantly utilised in linehaul and heavy road transport, both rapidly and sustainably driving availability of refuelling infrastructure and HFCEV uptake though:

- **Phased establishment of minimum viable networks** based on both combining both logistics and transport hubs and inter-region network nodes servicing major linehaul freight corridors, such as the Pacific and Hume highways and hub fleets. This will focus hydrogen supply toward identified early adopting vehicle classes where there is strong evidence supporting hydrogen as the most efficient abatement pathway.
- **A distributed layout, spacing sites every ~200-250 km** to ensure supply security and network redundancy for current 350 bar and emerging 700 bar HFCEV technologies. This layout also offers an operationally consistent experience to current fossil fuel refuelling, further reducing adoption barriers.
- **Onsite production, with installed capacity of 5 MW.** Required for initial network development to provide supply security and due to cost of transport and limited, expensive 3rd party supply options.

See Appendix for further information on Hiringa's HRNZ and HRAU networks.

3. 5 MW SIZING BRINGS AN ARRAY OF BENEFITS UNDER A DISTRIBUTED REFUELLING NETWORK MODEL

10 MW of installed capacity represents a significant increase in current refuelling station sizing and accepted definitions. For example, the CSIRO's (2023) Hydrogen Refuelling Infrastructure Report defines station sizes per the below characteristics:

Size	Max Daily Throughput	MW Capacity Eq.	Heavy Duty FCEV fills
Small:	200 kg	0.5 MW	3.3
Medium	500 kg	1.25 MW	8.3
Large	1,000 kg	2.5 MW	16.7

In Hiringa's view, 5 MW sizing for individual sites under a distributed refuelling network model is far more beneficial than the current 10 MW requirements and is already comparable to a medium-to-large diesel truck stop in Australia in terms of size and throughput (truck fills per day).[6]

5 MW sizing is more appropriate to support realistic near-term offtake, faster to deploy, less-challenging to finance, places less stress on the electricity network and is better suited to the current state of maturity of the global and local hydrogen supply chain.

3.1. 5 MW SIZING WILL ACCELERATE INDUSTRY DEVELOPMENT

Hiringa have modelled the economic case for the first phase of its HRAU Network. With HPTI support, this analysis demonstrates that with a 5 MW design and targeted electrolyser utilisation (~35 fills per station, per day), hydrogen can be priced competitively against diesel in the near term (supported by recent feedback from shipper and carrier networks).

Based on Hiringa's operational experience in NZ, this level of participation is achievable in the near term.

Conversely, a 10 MW capacity requirement will increase the capital cost base of individual stations, requiring higher levels of throughput and vehicle participation to establish supporting refuelling infrastructure.

Unfortunately, Australia's sovereign HFCEV manufacturing base is still maturing, and there are limited import options as many international suppliers design their solutions to meet the requirements of more progressed, larger markets such as Europe and North America (e.g. wider width and heavier axle weight limits, left-hand drive). Australia has made recent progress aligning its regulations (i.e. expanding truck width from 2.50 to 2.55 meters), however supply remains limited.

HFCEV supply is unlikely to substantially increase without concurrent refuelling infrastructure development, as OEMs and prospective buyers demand security that vehicles can be effectively utilised before production and purchase decisions are made at scale.

A 5 MW design requires lower initial participation (brought about through models such as Hiringa's foundational network partnerships), lowering deployment barriers and allowing industry foundations to be laid (catalytic investment simultaneously bringing the 'chicken and egg').

Hiringa have also evaluated a combination of stations comprising 10 MW of on-site production capacity, and non-producing sites accepting delivery from producing sites within the HRAU network. Unfortunately, due to the high cost of hydrogen transport (*see*

[6] *Australia current supplies ~90 million litres of diesel and petrol per day via 7,000 service stations. These figures equate to an average throughput of 12,857 L of diesel and petrol product per day, per station. This is the equivalent of filling ~25 trucks with a 500 L tank capacity per day.*
Source: https://www.abc.net.au/news/science/2021-11-22/petrol-stations-can-they-survive-electric-car-uptake/100627312

figure 3), a large proportion of the HPTI benefit is eroded and the network is unable to achieve required economics over the near-term without additional support.

3.2. 5 MW SIZING WILL MINIMISE IMPACT TO THE ELECTRICITY NETWORK

AEMO's Integrated Services Plan ("ISP") identifies the inherent trade-off between developing Australia's hydrogen industry and the resulting constraint on our electricity networks.

Aggregating multiple, 5 MW stations is likely to require less upgrades to distribution and transmission networks and improve network management through flexible load sharing and lowering lines utilisation.

These benefits, particularly minimising upgrade requirements, are particularly important in regional and remote communities where refuelling will be required, as these jurisdictions often lack dedicated investment in electrical infrastructure (particularly where not located in a Renewable Energy Zone). They are also less likely to be in close proximity to large hydrogen generation projects, meaning onsite generation for refuelling may be essential due to the increased cost of delivered hydrogen from long distances.

Finally, these benefits will also reduce the complexity and accelerate timing for connection agreements for refuelling projects. AEMO's 2024 ISP highlights the likely increase in connection delays moving forward

3.3. 5 MW SIZING IS MORE PRACTICAL TO DEPLOY

As both a developer and operator of electrolytic hydrogen projects across multiple countries, Hiringa engage comprehensively with a diverse base of technology suppliers, particularly electrolyser manufacturers across Australia, New Zealand and globally. Based on both historic and ongoing supply chain engagement, as well as Hiringa's own project development and operational experience:

- 5 MW electrolysers are a far more practical module size considering current and medium-term technology maturity, improving timing for procurement.
- 5 MW of installed capacity requires a smaller site footprint, increasing the likelihood of being able to use existing fossil fuel infrastructure, or develop new greenfield sites in locations which make the most sense for deployment and near end-use.

4. OUR RECCOMENDATIONS

4.1. THE AGGREGATED CAPACITY OF INTERDEPENDENT SITES SHOULD BE ACCEPTED AS A BASIS FOR MEETING MINIMUM I CAPACITY REQUIREMENTS

Hiringa recommend that the term 'facility' be replaced with 'project, and that a 'project' is able to include multiple interdependent sites for the purpose of aggregating capacity to meet the minimum 10 MW requirement.

This recommendation could be achieved via the following amendment:

Currently proposed design:

Eligible facilities	• Facilities must be located in Australia and meet the minimum capacity and emissions intensity thresholds below. • Each facility must be located on a single site.
Minimum capacity	• The production facility must include a minimum capacity equivalent to a 10 megawatt (MW) electrolyser (measured as the nameplate capacity of the electrolysis deployment, or equivalent for alternative production methods).

Suggested revision:

Eligible projects	• Projects must be located in Australia and meet the minimum capacity and emissions intensity thresholds below.
	• A project may include multiple interdependent sites.
	• Sites are interdependent when:
	  ○ Each sites operation, functionality, or efficiency is influenced by or dependent on the performance and status of other sites within the network; and
	  ○ All sites are included in a network funded under a single FID (on or before 30 June 2030)

Minimum capacity	• The project must include a minimum aggregate production capacity equivalent to a 10 megawatt (MW) electrolyser (measured as the nameplate capacity of the electrolysis deployment, or equivalent for alternative production methods).

4.2. ENTITY ELIGIBILITY SHOULD BE KEPT FLEXIBLE

Hiringa recommends that the entity eligibility requirements are made flexible, to complement investment structures that are not only Corporations by altering "eligible Australian resident corporations" to "eligible Australian resident entities".

The investment structure should not create a barrier to overseas investment where operating entities are Australian resident entities of any form, as this is more effective in crowding-in investment to Australia's hydrogen industry.

5. APPENDIX – OVERVIEW OF HIRINGA ENERGY'S REFUELLING NETWORKS

Hiringa Energy is a privately owned hydrogen company founded in New Zealand, with a strategic focus on hydrogen solutions for hard-to-abate sectors including heavy transport and chemical feedstocks, specialising in the commercial development and operation of hydrogen production, storage, distribution, and supply infrastructure.

Hiringa brings a unique mix of in-house expertise via energy, engineering and commercial professionals with a broad background and skills including clean technology product development, major energy and infrastructure development, engineering, construction and operation.

Hiringa is active in Australia with a Sydney-based team, pursuing this strategy including via the Good Earth Green Hydrogen and Ammonia ("GEGHA") Project and development of the HRAU Network.

5.1. The Hiringa Refuelling New Zealand Network

Hiringa's network design philosophy is vertically-integrated for initial throughput, including the manufacturing of green hydrogen, distribution, storage and dispensing.

The HRNZ Network reached financial close for Phase 1 in September 2021 and was formally launched on 23rd April 2024.

Phase 1 comprises an initial four hydrogen refuelling station ("HRS") locations to service up to 95% of New Zealand's North Island heavy freight movements.

Auckland, Hamilton and Palmerston North sites are currently operational with Tauranga undergoing construction.

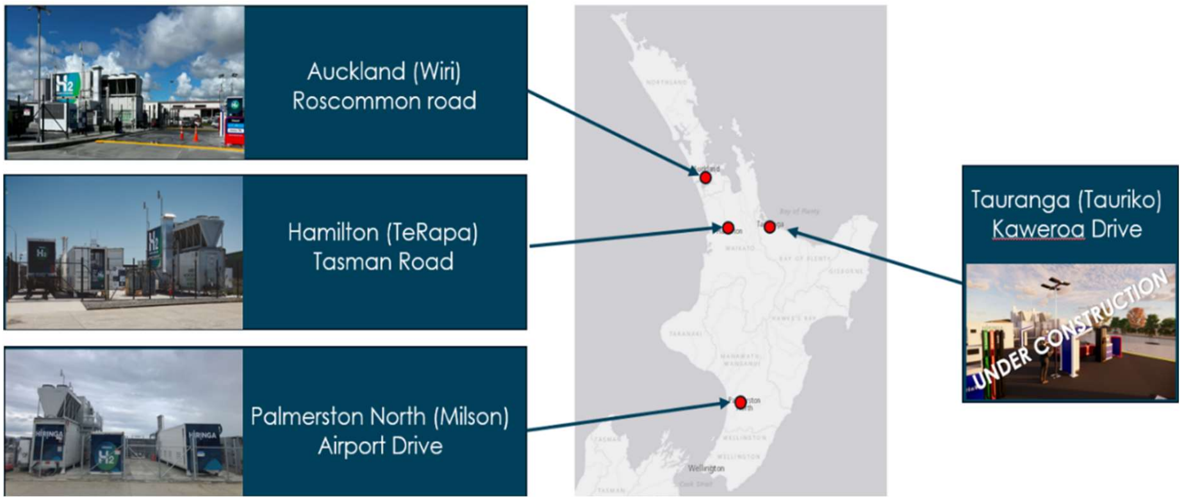

Figure 5 - Layout of HRNZ Phase 1

Hiringa's site design is proven, replicable and highly scalable. Each station has the capacity to install up to 2 MW of electrolysis, as well and accept external hydrogen supply. HRNZ Phase 1 stations are capable of rapidly filling more than 60 heavy trucks or 100 buses per day.

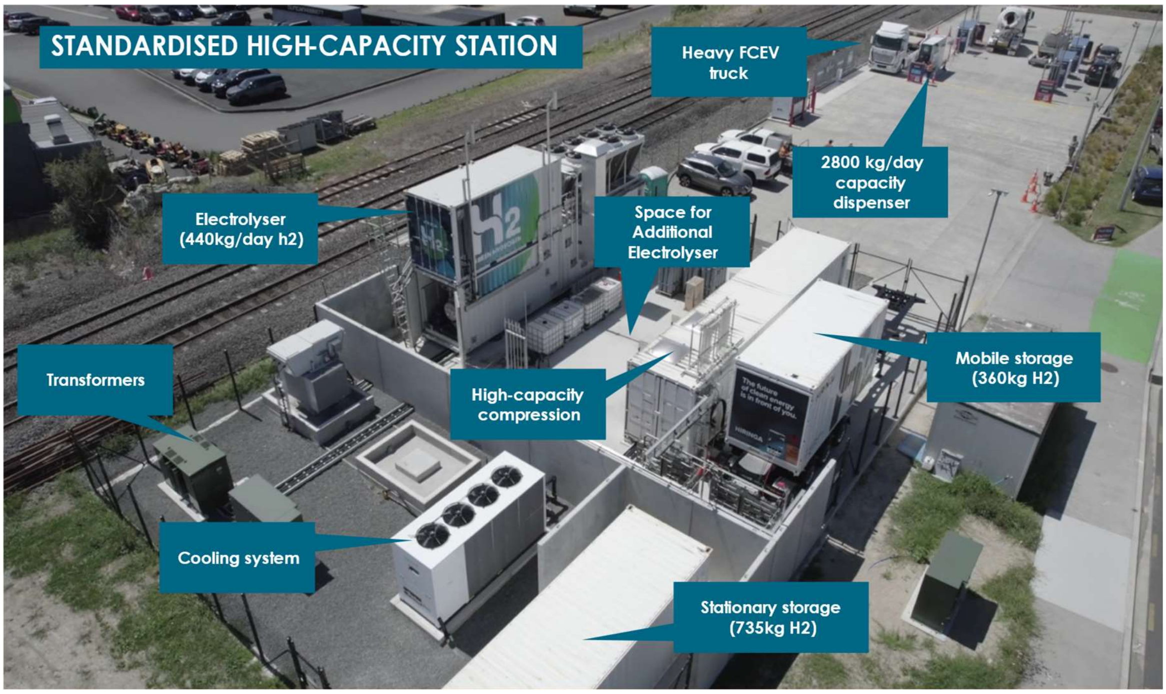

Figure 6 - Hiringa's standardised hydrogen refuelling station design. This site was designed to accommodate 2 MW of installed capacity based on suitable capacity at the time of deployment.

5.2. HIRINGA REFUELLING AUSTRALIA NETWORK

The HRAU Network will leverage Hiringa's New Zealand experience adapted to Australia's unique geography and supply chain requirements. HRAU's ambition is to establish 40+ stations across Australia's East Coast by 2035:

- Hiringa's initial network phases will form the foundation for large-Scale, transformational hydrogen refuelling station investment.
- Initial investment will prioritise sites across the Pacific and Hume Highways, as well as agricultural corridors.
- HRAU will leverage HRNZ's site layout and design model which is commercially and technically proven in New Zealand – significantly de-risking government investment. Hiringa's approach is specifically referenced on page 22 of the NSW Hydrogen

Strategy as an internationally reputable example of hydrogen investment for heavy transport application.

- Sites will be based on 5 MW design and be suitable for both 350 barg and 700 barg HFCEVs.
- The design will be compliant with Australian standards, incorporates additional learning from projects in US, EU and Asia, and will be implemented by a team with deep hydrogen and Australian operating experience.
- Hiringa's consortium model will facilitate rapid, equitable and diverse industry participation. This will include collaborating with major fleet leasing company TR Group, shipper and carrier networks, OEM vehicle and technology suppliers.
- The Project will catalyse significant investment and capability building in Australia.
- Market activation will be achieved by setting a hydrogen fuel price that is competitive with diesel and accessing a large addressable market via direct channels to end shipper demand.