Submission No 24

INFRASTRUCTURE FOR ELECTRIC AND ALTERNATIVE ENERGY SOURCE VEHICLES IN NSW

Organisation: Plumbing Industry Climate Action Centre

Date Received: 30 April 2025

30 April 2025

The Secretariat
Committee on Transport and Infrastructure
NSW Legislative Assembly

Via Email: transportinfrastructure@parliament.nsw.gov.au

Dear Secretariat

Inquiry into Infrastructure for Electric and Alternative Energy Source Vehicles in NSW.

Thank you for the opportunity to contribute to the Inquiry by the Committee on Transport and Infrastructure into infrastructure for electric and alternative energy source vehicles in NSW. This submission is from the NSW Plumbing and Fire Protection Industry (Industry) as represented by the Plumbing Industry Climate Action Centre (PICAC) and the NSW Plumbing and Pipe Trades Employees Union (PPTEU).

Industry supports the NSW Government's emissions reduction targets and its longer-term net zero ambitions. Achieving these goals will require decarbonisation of multiple sectors across the economy, including energy production, construction, manufacturing and many more including transport.

In this submission Industry seeks to make several key points:

a. **Hydrogen has a key role to play in decarbonising the transport sector** and Industry would strongly support any initiatives aimed at expanding and improving the infrastructure to support its wider adoption.

b. Unlike other vehicles that can diversify their energy sources, battery electric vehicles (BEVs) rely exclusively on the grid for charging. One way to **alleviate pressure on the grid** is to preserve it for uses for which there is no alternative. Increasing the role of renewable gasses (green hydrogen and biogas) in commercial, industrial and even domestic settings, frees up capacity in the electricity grid which in turn supports decarbonisation in other sectors, including in transport.

c. As the energy sector transitions away from fossil fuel generation and as extreme climate events intensify and become more frequent, access to backup power is becoming increasingly critical. **Stationary engines, including hydrogen fuel cell power generators** will have an increasingly important role in underpinning essential services and communications capability.

d. For hydrogen and renewable gas to reach its potential as a decarbonisation agent, **targeted training and skills development is essential**. Through PICAC, Industry is working collaboratively with the relevant National Jobs and Skills Council, BuildSkills, to develop and integrate (into existing plumbing and gasfitting training) the training required to support the safe expansion of the renewable gas sector.

1. Hydrogen has a Critical Role to Play

Industry's strong view is that in transport, like in energy production, manufacturing and other areas of the economy, there are multiple decarbonisation pathways, both existing and emerging. The road to net zero is inherently uncertain. Renewably generated electricity will play a critical role, but so too will renewable gasses, like green hydrogen. Key to long term success will be keeping decarbonisation options open and making the right implementation decisions to apply the most effective means of decarbonisation for different sectors.

Hydrogen is a case in point. It is becoming increasingly clear that renewable gasses —like green hydrogen and biogas — will play a crucial role in decarbonising the NSW and national economy, yet the exact nature of how they will be utilised is still being tested and proven. Renewable gasses are likely to be especially important for industries in NSW that rely on high heat, such as glassmaking and textiles, steel, aluminium, cement and chemical manufacturing and for long-distance transport, where full electrification remains a challenge.

The transport sector is responsible for about 20% of total carbon emissions in NSW. Transport is the second-highest emitting sector in NSW (behind electricity generation), with road transport responsible for 87% of these emissions (Annual Report – NSW Net Zero Commission 2024).

As noted by the CSIRO in their July 2023 report on hydrogen refuelling infrastructure, BEVs are currently the leading means of decarbonising road transport. However, fuel cell electric vehicles (FCEVs) are expected to play a significant role with heavy duty (HD) and linehaul freight transport, due to their ability to enable:

- much shorter refuelling times — especially important where time-cost is of key importance.
- payload maximisation, through avoiding a substantial negative impact of carrying large, heavy batteries.
- greater range between refuelling stops.

The CSIRO report also notes that despite the very significant decarbonisation benefits associated with reducing emissions in Australia which is so dependent on road freight and heavy haulage transport, the FCEV market in Australia is still in the early development stage. Nationwide, FCEVs number in the hundreds, and in 2023 there were only five functioning Hydrogen Refuelling Stations (HRS) in Australia, including one in NSW. There are up to another 20 under development, but there is clear scope to enable wider uptake of FCEVs through providing more refuelling opportunities, which will in turn drive the wider take up of FCEVs for long haul freight.

This is "low hanging fruit" in terms of readily achievable emission reductions and other countries (which like Australia have economies which rely on long haul road freight) are currently seizing this opportunity. The CSIRO Report refers to five key overseas jurisdictions which have made and are continuing to make, substantial progress in rolling out HRSs. Germany, Japan, California, South Korea and China between them have around 600 HRSs, being over 80% of the world's total, that service close to 50,000 FCEVs. See Table 5 extracted from the CSIRO report:

Table 5. Global numbers of HRSs and FCEVs[7]

	California	China	Germany	Japan	South Korea	Rest of the world	Total
HRSs	67	147	91	169	114	141	**729**
Percentage of total	9%	20%	12%	23%	16%	19%	**100%**
FCEVs	12,358	8,474	1,549	6,741	19,404	2,911	**51,437**
Percentage of global FCEVs	24%	16%	3%	13%	38%	6%	**100%**
FCEVs per HRS	184	58	17	40	170	21	**71**

Progress in these jurisdictions has been primarily driven by strategic partnerships and financial incentives underpinned by clear government strategies. This is supported by robust regulations and standards to provide clarity for project developers. Industry would encourage a similar strategic approach to the development of the renewable gas sector in NSW.

2. Alleviate Pressure on the Electricity Grid

Developing the hydrogen sector in NSW, which includes the infrastructure to support hydrogen FCEVs, is critical for decarbonising the road transport and freight sectors. It is also important to develop the renewable gas sector more broadly because the more parts of the economy which can be decarbonised by using renewable gas rather than electricity, the more capacity there is in the energy grid to support EV charging. Industry's view is that developing a renewable gas industry in NSW will augment the overall renewable energy capacity of the State and support a decarbonised transport sector and the economy more broadly.

3. Back up Generation Capability is Critical

An important, yet often under-appreciated element of the infrastructure which supports the energy transition, is stand alone, back up energy capability. This is often in the form of a stationary engine or motor.

Stationary engines, usually fuelled by diesel, have been commonplace in regional and remote areas of Australia for decades, in some cases providing the only source of electricity. Beyond agricultural applications, stationary engines are also crucial in providing back up generation capacity in critical settings. Stationary engines provide the back up for fire safety systems, powering the pumps if the network fails.

In hospitals, airports, data centres and in a myriad of other contexts including (road transport re-fuelling capability) where back up capacity is essential, stationary engines are being utilised. As more construction projects are undertaken, there is a need for reliable and efficient power supply solutions, particularly in remote locations where access to the grid may be limited. When the electricity grid fails or is not available, or the duration and/or capacity demand will extend well beyond what a battery could provide, stationary engines provide a secure supply.

In the context of a changing climate, where extreme fire and other weather events are forecast to intensify and become more frequent, interruptions to power supplies and critical communications infrastructure will likely also increase, making standalone generation capacity even more important.

The stationary power generator market is growing, decarbonising and rapidly evolving. A research report "Australia Generator Sales Market Research Report, 2028," published by Actual Market Research (Australia Generator Sales Market Size, Share, Analysis, Trends) found that the Australian Generator Sales market is expected to grow at above 7.01% from 2023 to 2028. It points to several key reasons for the forecast growth year on year, including:

- increasing demand for backup power solutions in the country. This is fuelled by factors including extreme weather events, such as bushfires and storms, which have led to power outages in various parts of the country.
- advances in technology have enabled the development of smart and connected generators that can be monitored and controlled remotely. These generators can provide real-time data on performance and fuel consumption, allowing users to optimise their usage and reduce costs.
- a growing focus on reducing emissions and improving energy efficiency. Manufacturers are developing generators that use less fuel and emit fewer pollutants and utilise renewable sources like green hydrogen.

There has been extensive research and development work in Australia and overseas in recent years leading to the development of a range of hydrogen fuel cell stationary power generators. Australian companies are manufacturing clean, sustainable, 24-7 fuel cell power generation for remote, stand-by and continuous power operations. These stationary hydrogen power systems can integrate seamlessly with batteries, grid power and renewables to form part of a complete energy system solution.

Fuel cells have emerged as an innovative technology, revolutionising the way electricity is generated - providing a clean and highly efficient alternative to traditional combustion-based systems. Fuel cells can be described as a special type of battery that generates electricity through a chemical reaction. Unlike traditional batteries that store energy, fuel cells directly convert the energy stored in fuel into electrical power. This makes them an appealing option for various mobility and stationary applications and for small domestic or commercial settings right through to major industrial applications.

In Victoria for example, the Victorian hydrogen company Energys has unveiled its third generation, locally manufactured Hydrogen Fuel Cell Generators, five of which are to provide backup power for Telstra's remote telecommunications towers as part of a Victorian pilot. The pilot will see Energys' 10 kW fuel cell systems deployed at Telstra's telecommunications towers in five locations, all of which have a history of storm-related power blackouts. The systems are intended to be a "drop-in zero emissions replacement" for the diesel generators currently being used at those sites. These hydrogen systems are expected to provide 72 hours of backup power to the sites.

4. Training A Key Enabler of Decarbonisation

To truly harness the potential of renewable gas, training is critical. Investing in training and skills development will help ensure the NSW workforce is equipped to safely and effectively integrate these technologies and systems into our energy future. As an Industry, we are committed to ensuring that training is not a blocker, but an enabler. Our goal, through PICAC, is to ensure the workforce has the skills to enable decarbonisation, whatever the ultimate energy mix looks like, or which energy source becomes dominant.

The NSW Government has identified the importance of equipping NSW with the hydrogen skills it needs now and in the future and has contributed significantly (via a $25M investment) to the new PICAC industry training development at Glenwood in Sydney's west. This development will increase the Industry's capacity to develop and deliver training and upskilling to thousands of NSW plumbers and gasfitters and increases the capacity of PICAC to continue high quality training within the Industry. This in turn boosts NSW's pipeline of work-ready plumbers and delivers additional skills and new opportunities emerging from the transition to renewable energy technologies.

When it comes to hydrogen and renewable gasses, developing and embedding training which is current and directly industry informed is critically important. Hydrogen was not an available energy source when most existing plumbers and gasfitters underwent their training. Currently, there are no officially qualified technicians available to install, maintain, or service hydrogen systems or appliances. The installation of commercial hydrogen has already commenced in Australia, making it essential to have capable plumbing and gas fitting technicians who can safely complete the work.

There has been some very good progress made in recent times towards this goal. Industry, through PICAC, is working closely with BuildSkills Australia to develop a hydrogen specific training package which can be incorporated into the existing training frameworks for plumbing and gas fitting.

BuildSkills has raised what it calls a “Case for Change” and is currently engaging with stakeholders to develop 20 hydrogen specific training units on subjects including:

- The preparation of safe design systems for hydrogen
- How to construct hydrogen safe pipelines
- How to safely commission or decommission gas pipelines used for hydrogen
- Commission, operate and maintain electrolysers
- Fault find and repair hydrogen storage equipment
- Inject hydrogen gas into distribution networks.

Thank you for the opportunity to contribute to the Inquiry by the Committee on Transport and Infrastructure into infrastructure for electric and alternative energy source vehicles in NSW. Should you wish to discuss these matters further, please contact me directly on [redacted] or by email: [redacted] .

Yours sincerely

[redacted]

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