Submission No 33

INFRASTRUCTURE FOR ELECTRIC AND ALTERNATIVE ENERGY SOURCE VEHICLES IN NSW

Organisation: Transport Workers' Union of NSW

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Submission

Inquiry into infrastructure for electric and alternative energy source vehicles

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Transport Workers' Union of New South Wales

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1. Summary of Recommendations

1.1 The Transport Workers' Union of NSW (TWU) believes this inquiry is a necessary and very welcome step forward in the decarbonisation of the NSW freight task.

1.2 Below is a summary of the TWU's recommendations and insights for the inquiry, which are further contextualised in this submission.

- Numerous trials have been conducted for both electric and alternative energy source vehicles in NSW, either by the NSW Government or certain transport operators. Fewer long-distance trials (such as long-haul / interstate freight) have been conducted, and the results and impressions gathered from local government trials or shorter distance / urban work cannot necessarily be equated to long-haul. The TWU encourages further trials and research into the feasibility of electric and alternative energy source vehicles for long-haul freight applications.

- An advisory or "roundtable" type group to be established by the NSW Government consisting of the TWU, transport workers, peak transport industry bodies, energy providers, heavy vehicle manufacturers and any other relevant stakeholders, to provide long-term guidance and informed perspective to the NSW Government on all factors relating to mass adoption of electric or alternative energy source heavy vehicles.

- Major interstate freight links, such as the Hume Highway, New England Highway and Pacific Motorway will unquestionably require supporting infrastructure for electric trucks and/or alternative energy source trucks.

- Training and education for transport workers who may be exposed to electric or alternative fuel source vehicles, infrastructure and components, must be considered a priority if the NSW Government intends to facilitate the eventual mass adoption of modern vehicles. However, distribution of training is a challenge that will need to be addressed in collaboration between parties such as the TWU, other unions or training providers (for example, in the case of hydrogen training), and the industry.

- Given that technologies and vehicle types such as connected and autonomous vehicles (CAV) and on board telematics are typically associated with modern vehicles, such as electric trucks, the TWU urges the inquiry to consider that heavy vehicle drivers are typically adverse to such technologies – particularly when they are invasive in nature. Facilitation of electric and alternative energy source vehicles should be conducted with caution towards CAV and on-board telematics technology, such as inward facing cameras.

- Further consultation with the TWU on all related matters.

2. About the TWU

2.1 The TWU represents tens of thousands of people in Australia's road transport, aviation, oil, waste management, gas, passenger vehicle and freight logistics industries.

2.2 With over one hundred years' experience representing the workers who conduct Australia's crucial passenger and freight transport tasks, the TWU has been proactive in advocating for the establishment and improvement of industry standards which advance the lives and safety of transport workers, their families and the community at large.

3. Introduction

3.1 The TWU welcomes the opportunity to contribute to the *Inquiry into infrastructure for electric and alternative energy source vehicles*.

3.2 This is an extremely important inquiry that has the potential to guide the future direction of decarbonisation in NSW, and the transport industry as a whole. Preparing the industry and community for modern vehicles, particularly electric vehicles, is a challenging undertaking that can only be achieved with complete collaboration between the NSW Government, the transport industry and all other associated industries and stakeholders.

3.3 The TWU aims to provide specific transport industry insights in this submission, with a particular focus on the perspective of workers, best practice and potential safety outcomes.

4. Electric and Alternative Energy Source Vehicles – Transport Industry Context

4.1 The transport industry has long been the subject of interest regarding the facilitation of electric and alternative energy source vehicles. Government bodies and industry alike have both been enthusiastic about the prospect of such vehicles on NSW roads. Before providing recommendations and specific industry insights, it is worth acknowledging the transport industry's overall reception of, and willingness to adopt electric and alternative energy source vehicles.

4.2 In 2024, a notably significant trial started in NSW. Team Global Express (TGE) launched its electric truck fleet trial in Sydney, following the gradual transformation of its Bungarribee depot into one that is suitable to facilitate and service electric trucks long-term. The trial is intended to last five years, and TGE plans to share the results and insights of the trial with industry to benefit the entire sector at large[1].

4.3 Nationwide, there have been other trials and initiatives for electric vehicles across different transport industry sectors, including but not limited to buses, waste management and urban to long-haul road freight.

4.4 The bus sector has been a very specific article of interest, particularly for the NSW Government, for the facilitation and funding of electric vehicles. In 2024, the NSW Government launched its $25 million zero-emissions bus trial project in the regional areas of Armidale and Tweed[2].

[1] Big Rigs. (2024). *Team Global Express begins electric truck fleet trial in Sydney.* [online] Big Rigs. Available at: https://bigrigs.com.au/2024/03/14/team-global-express-begins-electric-truck-fleet-trial-in-sydney/
[2] Mortell, S. (2024). *First zero-emissions bus trials begin for NSW project.* [online] Australasian Bus and Coach. Available at: https://www.busnews.com.au/first-zero-emissions-bus-trials-begin-for-nsw-project/.

4.5 Alternative energy source vehicles have also seen an increasing level of interest from industry and stakeholders. In 2023, ACFS Port Logistics concluded a 3-month trial of a hydrogen powered Mack Granite truck. ACFS Port Logistics reported highly satisfying results, so much so that it expressed interest in rolling the system out nationally[3].

4.6 In 2024, the City of Newcastle began its 12-month trial of a hydrogen-powered waste collection truck, in collaboration with Australian clean energy business, Pure Hydrogen, in its commitment to achieved net zero emissions. Depending on the outcome of the trial, the lease for the vehicle could be extended to four years[4].

4.7 It is evident that the industry, local governments and energy providers have a clear interest and willingness to at the very least trial the use and long-term viability of both electric and alternative energy source vehicles. However, the TWU observes that there are less long-haul based trials for freight compared to local and urban-based work, meaning that certain productivity and viability outcomes cannot necessarily be equated to longer-distance trips.

4.8 Therefore, the TWU encourages further trials and research into the feasibility of electric and alternative energy source vehicles for long-haul freight applications. However, this must be done in consultation with the TWU and transport workers, and workers must be educated and trained on the risks associated with the technologies involved. Hazards associated with electric and alternative energy source vehicles will be raised further within this submission.

5. Location for Infrastructure

5.1 Currently, Australia's electric vehicle charging infrastructure lags well behind other countries, even those with large landmasses like the United States of America[5]. In the context of electric heavy vehicles, this issue is only further exacerbated, given the specialised equipment required. The same can be said for alternative energy sources.

5.2 For perspective, based on landmass area and number of charge points, the number of square kilometres of land for each electric vehicle public charge point in Australia is 3356 km. In the United States of America, the figure is 143 square kilometres[6]. There are serious challenges in the pursuit of decarbonising transport in both NSW an Australia as a whole.

5.3 Long-term consultation between the NSW Government, TWU and industry is recommended for accurate and specialised feedback. However, the TWU will use this as an opportunity to provide broad insight into key freight routes across NSW and interstate, as well as general infrastructure considerations.

5.4 The Hume Highway serves as the major freight link for Sydney to Melbourne. Between Sydney and Brisbane, both the New England Highways and Pacific Motorway are considered

[3] Prime Mover Magazine. (2023). *ACFS Port Logistics trials Hydrogen-powered Mack.* [online] Prime Mover Magazine. Available at: https://primemovermag.com.au/acfs-port-logistics-trials-hydrogen-powered-mack/
[4] City of Newcastle. (2024). *City of Newcastle backs zero emissions future with hydrogen truck trial.* [online] Available at: https://ncc.nsw.gov.au/about-us/news-and-updates/latest-news/city-of-newcastle-backs-zero-emissions-future-with-hydrogen-truck-trial
[5] Dwyer, S. *et al.* (2021). An Australian Perspective on Local Government Investment in Electric Vehicle Charging Infrastructure. *Sustainability*, 13(12), p.6590.
[6] Ibid.

the primary routes to use for interstate truck drivers. It is without question that infrastructure should be positioned in areas along these critical corridors. Determining where charging infrastructure or refuelling areas should be placed specifically along these lengthy routes is the challenge.

5.5 Freight intensive areas in the Sydney basin are centralised in the Western suburbs and industrial areas, located along the M5 and M7 freeways respectively. Without further consultation and industry perspective, the TWU considers the M5 and M7 freeways to be plausible candidates for electric charging and fuelling infrastructure in Sydney. Additionally, the M4 motorway may also be a reasonable option due to the existence of a service area on both sides of the motorway. However, at the time of this submission, there is ongoing work being conducted at this site, making them limited in their capacity and services.

5.6 The TWU raises that the NSW Government has shown interest in the development of heavy vehicle rest areas (HVRA), and the improvement of existing ones. It is reasonable to consider that HVRAs may also be candidates for electric truck charging infrastructure, particularly in the case of HVRAs that may be developed in the future, given that more land may be necessary to accommodate the infrastructure in question.

5.7 Port Kembla boasts Australia's first commercial hydrogen refuelling station for zero emissions heavy vehicles. Likewise, Port Botany is a key freight destination that could also be a prime candidate for a "hydrogen hub".

6. Viability of Alternative Energy Sources for Freight and Heavy Vehicles in Regional Communities

6.1 As discussed, there is a lack of suitable infrastructure on regional road corridors to support electric trucks for commercialised long-haul work. Alternative energy source vehicles are subject to a similar case. One of the major challenges in adopting alternative energy sources is the geographical spread of regional NSW.

6.2 Historically, industry has lacked any practical incentive to employ the mass adoption of electric or alternative energy source vehicles due to the absence of supporting infrastructure, such as charging stations or fueling sites respectively. However, on the other hand, government and energy providers similarly lacked the incentive to invest in the development of infrastructure without tangible vehicles ready to utilise the technology and create a return on investment.

6.3 Australia in its entirety credits an extreme reliance on road transport for the delivery of goods, particularly to regional or otherwise vulnerable communities. With this in mind, the long-term commercialisation and cost-effectiveness of electric trucks and the necessary infrastructure is another challenge that inadvertently looms over government and industry's head.

6.4 Though electric and alternative energy source vehicles may be considered "niche" in the transport industry, market demand and interest has steadily been increasing for the last few years. The need for clean power sources in vehicle technology is increasing due to the negative consequences of toxic emissions from internal combustion engines[7]. Additionally,

[7] Albatayneh, A. *et al.* (2023). Future of Electric and Hydrogen Cars and Trucks: An Overview. *Energies*, [online] 16(7), p.3230.

industry considers the possible long-term cost benefits theorised alongside electric or alternative energy usage.

6.5 In 2023, 367 low and zero (LZEV) trucks were sold in Australia. This marked a significant increase compared to 2022, where only 99 LZEV trucks were sold across the country. The most important takeaway, however, is that approximately 90 per cent of the LZEV trucks sold in 2023 were purchased without government financial assistance[8]. This demonstrates two things – that industry uptake of LZEVs, whilst increasing, is still in its infancy, but at the same time, the market is seemingly more receptive to electric trucks than ever before.

6.6 One particular study on the heterogeneous motivation in update of LZEVs in Australia, published in 2025, found that many freight operators are willing to pay extra for LZEV trucks, but overall willingness to uptake the technologies in question may depend on certain factors such as the operational culture of specific businesses, the actual type of work being performed, as well as individual personnel characteristics, such as the actual age of decision-makers in the industry. Overall, however, the study determines that it *"… is providing possibly the strongest evidence yet in academic literature that the freight industry, at least in Australia, are slowly beginning to embrace the shift towards new technologies."*[9].

6.7 Hydrogen fuel cell trucks have been emerging onto Australian roads, with the first registered Hydrogen Prime Mover having begun operation in QLD in 2024[10]. Currently, there are trials being conducted for hydrogen prime movers and even waste trucks. However, the mass adoption of hydrogen trucks for commercial settings is a far-off reality.

6.8 In 2022, the Electric Vehicle Council and Australian Trucking Association confirmed that there were a total of 14 electric truck and van models available in the Australian market at the time[11]. More offerings have emerged on the market since then, demonstrating that the supply for vehicles is certainly present. With the increasing supply and potential for demand to continuously grow, the natural completion of this equation is the guarantee and delivery of supporting infrastructure.

6.9 The TWU believes that electric and alternative energy source vehicles certainly have the potential to be viable for the industry long-term. However, commitments are required on part of the NSW Government (and where applicable, Federal Government) to provide the necessary supporting infrastructure.

6.10 Economic considerations indicate that government subsidies are likely a realistic means of providing financial incentive and support for industry uptake of electric and alternative energy source vehicles. A German study published in 2020 determined that *"… a close collaboration between truck manufacturers, customers, infrastructure companies, and policymakers is*

[8] McMullan, T. (2024). *Low and zero emission truck sales take off.* [online] Prime Mover Magazine. Available at: https://primemovermag.com.au/low-and-zero-emission-truck-sales-take-off/
[9] Moglia, M. *et al.* (2025). Who doesn't like a battery electric truck? Heterogeneous motivations in the uptake of low-emissions trucks in Australia. *Transportation Research Part A: Policy and Practice,* 193, p.104396.
[10] Gullaci, D. (2024). *Australia's first registered hydrogen prime mover to hit the road in Queensland.* [online] Big Rigs. Available at: https://bigrigs.com.au/2024/08/16/australias-first-registered-hydrogen-prime-mover-to-hit-the-road-in-queensland/.
[11] Electric trucks: Keeping shelves stocked in a net zero world. (2022). *Electric Vehicle Council | Australian Trucking Association*.

essential to spur the penetration of autonomous and alternative fuel-powered heavy-duty trucks."[12]

6.11 For players in the transport industry, concessions or reduced registration fees and road user charges may serve to incentivise the uptake of electric or alternative energy source vehicles. From the perspective of suppliers, however, other factors towards grants and co-investment for infrastructure must be considered.

6.12 The TWU believes that the current standing of electric and alternative energy source vehicles in the Australian market make it difficult to provide any meaningful guidance on policy direction pertaining to finance and any potential government support. Furthermore, despite being in the earlier stages of adoption, the market for alternative heavy vehicles is quick to evolve, but still remains at a stage where determining the long-term viability of electric and alternative energy source vehicles is uncertain with regional work and long-haul in mind.

6.13 As such, the TWU urges that a collaborative approach be taken by the NSW Government to engage with the TWU and broader transport industry, including transport operators, individual owner drivers, heavy vehicle manufacturers and energy providers to establish a committee or "roundtable" type group for long-term consultation on the topics of feasibility, financing, and all other measures of preparation.

7. Transition of Workers from Affected Industries and Industry Standards

7.1 Regardless of which vehicle type is considered, the training and education of workers in transport should be considered a priority by both industry and the NSW Government. Though training and education would serve as a means to upskill and facilitate professionalisation within the transport workforce, the underlying need to educate workers within the emergence of modern vehicles is fundamentally a safety matter. There are unique conditions and hazards involved with electric and alternative energy source vehicles.

7.2 Hydrogen, for example, is a colorless, odorless and tasteless gas that is extremely flammable over a wide range of concentrations. Hydrogen is considered a clean fuel because when consumed in a fuel cell, it produces only water, heat and electricity[13]. Notably, Hydrogen typically requires specific forms of storage of which there are currently three:

- High pressure storage in the gaseous form
- Very low temperature storage in the liquid form
- Hybrid-based storage in the solid form

7.3 For vehicular purposes, hydrogen is typically stored in the gaseous form at high pressure. Fuels that are currently adopted for commercial use have hazards associated with their use, and hydrogen is no exception. While it isn't necessarily any less safe than other fuels, it isn't without its own unique hazards.

[12] Anderhofstat, B. and Spinler, S. (2020). Preferences for autonomous and alternative fuel-powered heavy-duty trucks in Germany. *Transportation Research Part D: Transport and Environment*, 79, p102232.
[13] Hydrogen Fuel Cells: Fire and Explosion. (2021). *United States Department of Labor*.

7.4 Unique properties of hydrogen that contribute to potential hazards include –

- Hydrogen is combustible over a wide range of concentrations. At atmospheric pressure, hydrogen is combustible at concentrations from 4% to 74.2% by volume.
- Hydrogen has very low ignition energy. Hydrogen has a lower ignition energy than gasoline or natural gas, effectively meaning it can ignite more easily.
- Hydrogen burns with a nonluminous flame, which can be invisible under bright light.
- In terms of size, hydrogen is molecular. This means it can easily pass through porous materials, and can even be absorbed by some containment materials. This has the potential to result in loss of ductility or embrittlement. Containment and piping materials, such as carbon steel, could subsequently see reduced performance[14].

7.5 Hydrogen used in fuel cells is a very flammable gas and can cause fires and explosions if note handled correctly. As outlined above, hydrogen fires can be near invisible under certain conditions, and if a worker believes that there is a hydrogen leak, then it should always be assumed that a flame is present. Moreover, one cannot smell or conventionally detect a hydrogen leak from the cabin of a truck naturally, due to the gas' almost odorless nature.

7.6 A hydrogen odorant must be added to the gas for it to be detected before a fire or explosion occurs. However, all currently known odorants contaminate hydrogen fuel cells, leaving the only practical measures for on the road hazard detection to other applications such as sensors or new, hypothetical odorant technology that has yet to exist.

7.7 Electric vehicles also possess their associated hazards. Electric heavy vehicles may typically operate at higher voltages than electric cars and motorcycles, heightening the risks involved. Some of the specific risks associated with electric heavy vehicles include:

- Fires caused by electrical faults or short circuits, particularly relating to battery circuitry
- Thermal runaway leading to explosions
- Highly flammable toxic gases released from explosions
- Electric shocks
- Arc flashes that cause burns
- Exposure to battery electrolytes[15]

[14] Lee Jolly, W. (2019). Hydrogen | Properties, Uses & Facts. In: *Encyclopædia Britannica*. [online] Available at: https://www.britannica.com/science/hydrogen.
[15] Electric vehicle guidance. (2023). *WorkSafe QLD.* Available at: https://www.worksafe.qld.gov.au/safety-and-prevention/hazards/electricity/electric-vehicle-guidance

7.8 Being an approved training provider (ATP) through the SafeWork NSW authority and the Comcare authority, as well as possessing a dedicated Work Health and Safety (WHS), the TWU always considers industry training and safety a subject of absolute importance. The unique conditions and hazards associated with these vehicle technologies would require proactive training initiatives.

7.9 Given that the idea of mass LZEV adoption across the industry is still in its infancy, the TWU argues that no concrete solutions or answers can be provided at this stage. However, the TWU urges for long-term consultation between itself, industry and the NSW Government on the development of transport industry training programs and required steps amidst the facilitaton of electric and alternative energy source vehicles.

7.10 Training for electric and alternative energy source vehicles will require catered and specialised courses, as well as potential cross-industry partnership. This will likely require collaboration between, for example, accredited hydrogen training providers who may be able to conduct and provide the training and material in question, and the TWU, who can facilitate the delivery of training to workers in transport.

8. Associated Technology Considerations and Implications

8.1 Electric and alternative energy source vehicles can be described as "modern", or even "modern high productivity vehicles" in a broad sense. In 2024, the NSW Government released a consultation process for its Heavy Vehicle Access Policy that included discussion and policy considerations for modern vehicles and access to road infrastructure, among other things.

8.2 Included were implications regarding interest and potential facilitation of CAVs, and the further facilitation and encouragement of vehicle telematics by tying them to certain access provisions.

8.3 The TWU raises this as such technologies are typically associated with modern vehicles, such as electric trucks specifically. The TWU understands that this subject may largely be beyond the scope of the terms of reference, but would urge the inquiry to consider that heavy vehicle drivers are typically adverse to onboard telematics that monitor their performance through the use of invasive inward facing cameras, rather than those that merely monitor the road ahead of the truck.

8.4 Regarding CAVs, proponents claim that the technology will deliver greater safety outcomes on roads. However, the path to CAV harmonisation is a long and complicated process that will require a whole industry agreement, as well as understanding and acceptance from both transport workers and the community at large. Research indicates that the proposed safety outcomes associated with autonomous vehicles cannot actually be achieved until CAV penetration levels are high enough. The necessary penetration level would be one where CAVs have a significant, if not equivalent road presence to traditional vehicles, and that low levels of CAV penetration may actually have adverse traffic and safety impacts[16].

[16] Calvert, S.C. *et al*. (2017). Will Automated Vehicles Negatively Impact Traffic Flow? *Journal of Advanced Transportation,* 2017, pp.1-17.

9. Conclusion

9.1 The TWU thanks the Committee for the opportunity to provide a written submission to what is an extremely important inquiry that has the potential to guide the future direction of decarbonisation in NSW, and the transport industry as a whole.

9.2 The TWU is enthusiastic about the future of modern vehicles in the transport industry, but as discussed in this submission, there are many questions and considerations that can only be answered through industry collaboration. Additionally, there are certain factors that must be approached with caution, including the typical link between modern electric vehicles and associated autonomous and invasive telematics technology.