

**Submission
No 68**

**INFRASTRUCTURE FOR ELECTRIC AND ALTERNATIVE ENERGY SOURCE
VEHICLES IN NSW**

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Committee on Transport and Infrastructure
NSW Parliament

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Re: Submission to the NSW Government Inquiry into Infrastructure for Electric and Alternative Energy Source Vehicles in NSW

iMOVE is pleased to make this submission to the NSW Government Inquiry into Infrastructure for Electric and Alternative Energy Source Vehicles in NSW.

We believe that transport electrification plays a vital role in the clean energy transition, especially as progress towards other low carbon energy and fuel options is generally still at a very early stage in Australia. Having the right supporting infrastructure in place is critical to the success of electrification in Australia, as well as the roll out of other alternative energy sources.

General comments

We note up front the overarching need for evidence-based planning and coordination to ensure that funding models, location selection, and regulatory frameworks are effective and adaptable over time.

While this inquiry focuses on NSW, it is also important to align infrastructure planning with other states and territories to ensure interoperability and seamless movement between states and territories.

Transport is only one high demand use of the grid. The integration of charging infrastructure into the grid needs to be planned alongside other uses. iMOVE has been investigating this topic with research partners Centre for New Energy Technology and RMIT University and relevant projects are listed at the end of this submission.

Terms of reference responses

A) Funding and Location of EV Chargers and Infrastructure for Other Energy Sources

We base the following points partly on outcomes from iMOVE research projects and partly on the thousands of conversations we have had with transport stakeholders over the last eight years.

- **Differentiated Infrastructure Needs:** Charging requirements such as power level, footprint etc vary across the electric vehicle fleet (passenger vehicles, buses, light and heavy trucks, and micromobility options). Planning for charging infrastructure must recognise and accommodate the different use patterns while identifying opportunities for co-location.

- **Planning Integration:** Infrastructure planning should be embedded within broader land use and transport strategies and aligned across jurisdictions.
- **Truck and Bus Integration:** Infrastructure for charging of commercial fleets (e.g. freight and public transport) needs a strong power supply and large spatial footprint. The historic focus in refuelling on individual vehicles and fleets will need to be augmented by a more holistic approach that considers supply to geographic areas in support of multiple customers.
- **Urban Design Considerations:** We expect the different distribution system for electricity to small electric vehicles (cars & micromobility) compared with petrol and diesel will significantly increase the competition in specific locations for kerb access and footpath space, especially in high-density areas. To avoid cluttering pavements it will become necessary to develop guidelines for the deployment of kerbside or footpath-based charging facilities.
- **Parking and Charging Conflicts:** The need for cars to be parked while they are charged creates a parking space usage conflict with a danger that drivers may park their cars in charging bays regardless of whether they are actively charging. Parking bays with charging facilities have higher value than bays without but we currently have no way to ensure that the occupant of the bay pays accordingly. Strategies will need to be developed to address the intersection of 'limited charging access' and 'limited parking availability', especially in urban and peri-urban environments.
- **Location Selection Framework:** While some locations will enjoy sufficient demand for charging services to attract private sector investment in charging facilities, areas with thinner demand such as rural and regional may not support a commercially viable installation. A systematic method is needed to identify suitable charging sites across different vehicle classes and geographies with thresholds for public sector participation (co-investment) to be determined. This location selection framework needs to also be integrated with the strength of the local electricity distribution network in the corresponding area.
- **Flexible Funding and Operating Models:** Funding and operating models need to be developed which allow for both public and private investment, while recognising the government's role in setting strategic priorities, offering location guidance, and ensuring equitable access.
- **Network Scalability and Continuity:** Infrastructure planning for both charging facilities and electricity supply should not be a static process; rather, it must evolve with EV uptake, charging demand and technological changes (such as local availability of renewable energy generation and storage).



- **Power Management and Efficiency:** Policies should also respond to the need for energy efficiency and operational efficiency. For most commercial operators of EV's 'time is money', so charging facilities need to be designed to be both energy efficient for the infrastructure providers, but also time efficient for the energy consumers. (especially freight operators).
- **Vehicle-to-Grid Potential:** The use of EVs as distributed energy storage presents a significant opportunity; support should be given to pilot, to commercialise and scale up such solutions.
- **Supporting digital infrastructure:** Physical and digital infrastructure go hand in hand with the development of real-time information systems necessary to provide drivers or operators of vehicles with the information they need to ensure timely and efficient charging that integrates into overall demand on the grid.
- **Safety measures:** New technology is always accompanied by new risks, some of which are well understood and some which are not initially obvious. We have a duty of care to keep the community safe. We therefore recommend ongoing research and analysis of the risk associated with widespread deployment of EVs and EV charging infrastructure and development of appropriate risk mitigation strategies. IMOVE's research into the prevalence and causes of battery fires is an example of this.

B) Alternative Energy Sources for Freight and Heavy Vehicles in Regional Communities

Alternative energy sources will have a critical role in the decarbonisation of heavy vehicle transport and this is likely to play out across different time horizons as technologies emerge and mature. At this time, utilisation of alternative fuels by heavy transport is negligible, both in Australia and in fact, around the world.

There remain many uncertainties in:

- the supply of vehicles that can utilise alternative energy sources,
- the cost-effective production of the new fuel types,
- and the absence of distribution and availability of these fuels outside one or two locations in each capital city.

These uncertainties inhibit investment into the supply of vehicles and fuels and so the transition of freight and heavy vehicles to alternative fuel sources has become substantially stalled.

From an Australian and NSW perspective, the challenge is to identify the alternative fuels that are most likely to be accepted and then to map out (on a national basis) how those fuels are going to be produced and



distributed. The production of alternative fuels and the supporting infrastructure to deliver them both require significant capital investment and will likely need extensive financial support from government.

Given the limited utility of battery-electric technology for heavy freight, a multi-fuel strategy is needed. Options include:

- **Biodiesel and Renewable Diesel** (feasibility varies with feedstock availability and cost)
- **Ethanol** (limited power output, requires substantial ramp up in production and establishment of distribution systems)
- **Hydrogen** (requires bespoke vehicles and refuelling infrastructure, and a massive investment (of \$\$ and electric power) in production facilities. To boost efforts we can learn from other states' ongoing trials and production efforts, such as [Viva Hydrogen in Geelong](#).

We note significant knowledge gaps in how to best approach heavy transport decarbonisation. In-depth studies are needed to assess the feasibility, scalability, and commercial potential of alternative fuels—particularly in rural contexts.

We should be informed where possible by best practice approaches to freight decarbonisation from around the world, but we must also appreciate that the dimensions of the long-haul freight task in Australia are very different from nearly every other country.

Australia would benefit from a concerted and coordinated decarbonisation effort/ coordination mechanism for heavy transport, which is currently lacking. Such an initiative would be government supported but industry-driven (aware of commercial sensitivities) and able to align efforts nationally in this space.

Finally, we note that Australia's ambition to reach net zero by 20250 will be severely challenged if no means can be found to convert our freight and heavy transport sector to alternative energy sources. Action on this question is urgent and iMOVE will continue to support R&D that advances knowledge and technology in this space until its closure in 2027.

C) Use of Existing Infrastructure

The cost of establishing a completely new energy and fuel distribution structure is very high and consequently there is heavy emphasis on those alternative transport energy systems that can utilise existing assets. This focuses the spotlight onto battery electric vehicles (cars and trucks) and onto diesel trucks that could utilise biodiesel and renewable diesel.



There is a prospective opportunity to use the existing electricity distribution system to provide power to a scattering of EV charging stations across regional NSW. However, this scenario will be challenged by the (in)ability of the grid to deliver the requisite power (particularly for truck recharging) at all destinations across the state, and by the sub-commercial level of usage and demand that will be present at most of these locations.

There is also a prospective opportunity to supply the existing fleet of diesel trucks with additional fuel options (biodiesel and renewable diesel) at the existing refuelling stations. This scenario is challenged by the dramatically higher price and very limited availability of the alternative diesel products and the perpetual competition they face from the relatively cheap fossil diesel.

We believe it will be important to utilise a whole range of existing infrastructure and assets (including refuelling stations, petrol stations, rest stops, regional hubs, intermodal hubs, regional airports, local solar farms, wind farms, community batteries etc.) Wherever possible, new charging and refuelling facilities should be co-located. However, on its own, this will not be sufficient to induce a material increase in the transition to low carbon transport in rural and regional NSW.

D) Workforce Transition

We recognise that the shift to clean energy is a wide-ranging industrial reconfiguration which will have a clear impact on skills and job opportunities. This is not unusual in the history of industrialisation, and while some jobs may become less in demand, others will take their place. We see a need for, and opportunities with:

- **Training and Reskilling:** Introduce and expand training programs for EV maintenance and operations, including for the heavy vehicle and freight sectors. With an eye on the roll out of other alternative fuels, consider skills and develop courses in conjunction with the introduction and scaling of new technologies.
- **Attracting New Talent:** Electrification and digitalisation shifts offer attractive new career opportunities. This could potentially address the longstanding challenge of making freight and logistics careers more appealing.



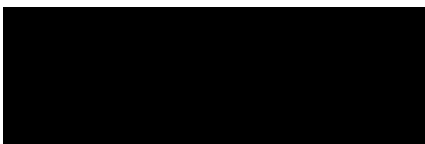
A path forward

While there are many options for the approach to rolling out new energy infrastructure, we believe that it must be holistic and integrated such that it:

- considers the interdependence of the transport and energy sectors, as well as other demands on the grid,
- takes advantage of the digital transformation to make real-time, data driven decisions and provide accurate up-to-date information to users,
- integrates planning across energy, transport and land use areas.
- is aligned and seamless across all states and territories
- would benefit from a national coordination team or centre that is able to:
 - Establish and coordinate multi state efforts to develop understanding and technology,
 - Share knowledge for the benefit of the nation.

I would welcome the opportunity to further discuss these ideas with the Committee for Transport and Infrastructure in due course.

Your Sincerely



Ian Christensen
IMOVE CRC Managing Director

Links to related iMOVE projects

- <https://imoveaustralia.com/project/bidirectional-charging/>
- <https://imoveaustralia.com/project/project-outcomes/being-a-v2g-trailblazer-lessons-for-mass-market-adoption/>
- <https://imoveaustralia.com/project/accessibility-guidelines-lzev-charging-infrastructure/>
- <https://imoveaustralia.com/project/project-outcomes/planning-electrification-victorian-bus-fleet/>
- <https://imoveaustralia.com/project/electric-vehicles-supporting-uptake-investigating-smart-charging/>
- <https://imoveaustralia.com/project/fire-safety-for-evs-and-micromobility-best-practice-assessment/>



- <https://imoveaustralia.com/project/electric-school-buses-for-metro-regional-wa-enabling-the-shift/>
- <https://imoveaustralia.com/project/project-outcomes/managing-rapid-consumer-adoption-new-energy-technologies/>
- <https://imoveaustralia.com/project/project-outcomes/decarbonising-freight-transport-australia/>
- <https://imoveaustralia.com/project/zero-emissions-heavy-vehicles-analysis-planning-policy/>
- <https://imoveaustralia.com/project/project-outcomes/facts-a-framework-for-an-australian-clean-transport-strategy/>

