

Transport and Infrastructure Net Zero Consultation Roadmap

Take the survey


Department of Climate Change, Energy, Environment and Water

Response received at:

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- 1 Confirm that you have read and understand this privacy notice.
Yes
- 2 Please indicate how and if you want your submission published.
Public
- 3 Published name
Electrical Trades Union of Australia
- 4 Confirm that you have read and understand this declaration.
Yes
- 5 First name
Katie
- 6 Last name
Hepworth
- 7 Email


- 8 Phone
[REDACTED]
- 9 Who are you answering on behalf of?
Organisation
- 10 Organisation name
Electrical Trades Union of Australia
- 11 What best describes you or your organisation?
Union
- 12 What sector do you represent?
Energy
Climate change/net zero
- 13 What state or territory do you live in?
New South Wales
- 14 Postcode
Not answered
- 15 What area best describes where you live?
City
- 16 1. Do you support the proposed guiding principles?
Not answered
- 17 1.1 Please add details to your response.
Not answered
- 18 2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Not answered

19 2.1 Please add details to your response.

Not answered

20 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Not answered

21 3.1 Please add details to your response.

Not answered

22 4. What should be included in a national policy framework for active and public transport and how should it be developed?

Not answered

23 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

Not answered

24 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Not answered

25 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

Not answered

26 7. Do you agree with the proposed net zero pathway for light road vehicles?

Not answered

27 7.1 Please add details to your response.

Not answered

28 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

Not answered

29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Not answered

30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

Not answered

31 9.1 Please add details to your response

Not answered

32 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

33 10.1 Please add details to your response. Why did you rank them in that order?

Not answered

- 34 11. What role should low carbon liquid fuels play in the heavy vehicle decarbonisation?
Not answered
- 35 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?
Not answered
- 36 13. Do you agree with the proposed net zero pathway for rail?
Not answered
- 37 13.1 Please add details to your response.
Not answered
- 38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels. Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.
Not answered
- 39 14.1 Please add details to your response. Why did you rank them in that order?
Not answered
- 40 15. What role should low carbon liquid fuels play in rail decarbonisation?
Not answered
- 41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?
Not answered

- 42 16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?
Not answered
- 43 17. Do you agree with the proposed net zero pathway for maritime?
Not answered
- 44 17.1 Please add details to your response.
Not answered
- 45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?
Not answered
- 46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?
Not answered
- 47 19. Do you agree with the proposed net zero pathway for aviation?
Not answered
- 48 19.1 Please add details to your response.
Not answered
- 49 20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.
Not answered

- 50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?
Not answered
- 51 21. Do you agree with the proposed net zero pathway for transport infrastructure?
Not answered
- 52 21.1 Please add details to your response.
Not answered
- 53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?
Not answered
- 54 22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?
Not answered
- 55 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?
Not answered
- 56 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?
Not answered

- 57 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?
Not answered
- 58 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?
Not answered
- 59 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?
Not answered
- 60 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?
Not answered
- 61 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?
Not answered
- 62 27. Do you have any feedback on the proposed review process?
Not answered
- 63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?
Not answered
- 64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?
Not answered

- 65 29. Is there any further information or documentation that you wish to be considered with your submission?
Not answered
- 66 Would you like to upload a document?
Yes
- 67 Have you removed any identifying information from your submission?
Yes
- 68 Upload a submission
ETU Submission - Transport and Infrastructure Net Zero Consultation Roadmap.pdf
- 69 Upload a submission
Not answered
- 70 Upload supporting file
Not answered
- 71 Upload supporting file
Not answered



Electrical Trades Union

Transport and Infrastructure Net Zero Consultation Roadmap

JULY 2024

Submission by the Electrical Trades Union (ETU)

About the ETU

The Electrical Trades Union of Australia ('the ETU')¹ is the principal union for electrical and electrotechnology tradespeople and apprentices in Australia, representing well over sixty-thousand workers around the country. The electrical workers we represent will form the backbone of Australia's clean energy workforce across all sectors and stages of the transition. In the transport sector, electricians will be installing and maintaining our national charging infrastructure at home and by the roadside, building new generation and transmission which will be required to power the electrification of transport modes, and managing the safe and environmentally responsible stewardship of electric vehicle related waste.

The ETU acknowledges the significant task ahead of building up a skilled workforce capable of delivering Australia's clean energy revolution, noting that there already exists a shortage of electrical tradespeople in every State and Territory across the country. Key to securing the necessary workforce in the transport sector will be requiring significant investment in vocational education and training from government and the private sector, alongside the development of nationally recognised training packages and consistent and fit-for-purpose licensing arrangements to establish best-practice protections for the safety of workers and consumers.

Acknowledgement

In the spirit of reconciliation, the ETU acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all First Nations peoples today.

Introduction

The ETU supports the government's ambition to decarbonise the transport and infrastructure sectors and become a global leader in renewable energy. The *Transport and Infrastructure Net Zero Consultation Roadmap* (hereafter the roadmap) identifies the electrification of significant transport segments, including light and commercial vehicles, as a key pathway for reducing emissions across the transport sector. Key challenges and risks that stand in the way of the widespread adoption of electric vehicles include:

- workforce shortages of electricians, automotive electricians and associated trades
- the lack of consistent licensing and training standards
- the lack of a common set of technical standards that ensure interoperability between vehicle and charger technologies
- the lack of coordination between interrelated government strategies and agencies.

Significantly, despite both Jobs and Skills Australia and industry identifying current and projected shortfalls in the numbers of EV mechanics and electricians, the roadmap fails to

¹ Being a division of the CEPU, a trade union registered under the *Fair Work (Registered Organisations) Act 2009* (Cth).

identify addressing workforce shortages as a key challenge in the electrification of Australia's transport sector. Developing the workforce is a necessary precondition to any progress in this space, and as such must be front and centre of any and all government strategies. The ETU notes that responsibility for developing a workforce strategy comes under the remit of the *New Energy Workforce Strategy*, the roadmap must identify the workforce as a key enabler of the transition and identify how it will work with other areas of government to address workforce shortages.

In addition to investing in training and growing the future electrical workforce, the decarbonisation of the transport sector will require significant new investments in the energy grid and transmission infrastructure, which comes under the remit of the *Electricity and Energy Sector Plan*, which the ETU is also consulting on.

Proper coordination between the Electricity and Energy Sector and Transport and Infrastructure Decarbonisation Plans and the New Energy Workforce Strategy is crucial to decarbonising the Australian economy and meeting the government's broader policy objectives. However, as we note in this submission, this roadmap fails to identify the intersections between plans. When related strategies operate in siloes, opportunities to share learning are missed, and areas of conflict may arise. As renowned economist Mariana Mazzucato states:

The old model of siloed delivery and accountability, even if effective in pockets at the turn of the century, is not sufficient for the scale of contemporary challenges; for achieving inclusive economic growth, boosting productivity, reducing health inequalities, adapting to technological advances and addressing the climate emergency.²

Recommendation 1: Share learnings across sector plans and intersecting strategies to avoid a siloed approach to decarbonising the Australian economy.

Recommendations

Recommendation 1: Share learnings across sector plans and intersecting strategies to avoid a siloed approach to decarbonising the Australian economy.

Recommendation 2: Actively engage with and integrate the work of the National New Energy Workforce strategy to identify solutions to grow and develop the necessary workforce for transport decarbonisation.

Recommendation 3: Implement recommendations in the ETU's Powering Australia plan (Appendix A) to increase the employment of apprentices and address current and long-term projected workforce shortages.

Recommendation 4: The Commonwealth must coordinate and incentivise states and territories to review and modernise their regulatory arrangements to achieve the highest possible protections for electrical safety and electrical licencing.

Recommendation 5: Develop a consistent and nationally recognised qualification and licensing framework with AUSMASA and ERAC, which takes a whole-of-life approach.

Recommendation 6: Ensure that learning from electrical licensing and qualification is brought across and there are no areas of conflict, with a particular focus on cross sector liaison

² Mariana Mazzucato. (2024). [Mission Critical 01 | Statecraft for the 21st century](#)

between relevant Jobs and Skills Councils, Electrical Regulators and Licensing bodies and Standards Australia Committees and industry stakeholders.

Recommendation 7: Establish clear delineation between responsibilities of EV mechanics and licenced electrical workers working on passenger and commercial vehicles and electric machinery, equipment and plant such as forklifts.

Recommendation 8: Work with AEMO to ensure that the decarbonisation plan is consistent with the Integrated Systems Plan, particularly with regard to the expansion of electric vehicles with bi-directional charging and vehicle to grid capabilities.

Recommendation 9: Establish national technical standards or content within existing standards that require interoperability between vehicle and charging technologies.

Recommendation 10: Establish minimum skills requirements to ensure the electrical workforce delivers safe and quality installation and charging infrastructure.

Workforce

The roadmap identifies that delivering the ambitious decarbonisation of the transport and infrastructure sectors will involve a substantial rollout of electric vehicles and charging infrastructure. This will require a significantly expanded workforce of electricians, automotive electricians and electric vehicle mechanics. Jobs & Skills Australia estimates that Australia will require an additional 42,500 electricians by 2030, and by 2050, it estimates the demand for automotive electricians will also have grown from 8,800 to 11,500.³

According to the Mining and Automotive Skills Alliance (AUSMASA), a workforce of at least 900–1,200 qualified electric vehicle mechanics (EV mechanics) and support staff is needed to maintain the electric vehicle fleet right now, yet only 41% of advertised EV mechanics roles were filled in 2023.⁴ The only dedicated electric vehicle qualification (Certificate III in Automotive Electric Vehicle Technology) is still in its infancy, with only a handful of completions each year. As the certificate has not received a vocational training order or been recognised by Fair Trading NSW as a sufficient qualification for a motor vehicle tradesperson certificate, it is still unable to be offered as an apprenticeship in NSW.

The ETU has identified several barriers to addressing projected workforce shortages, which include a shortage of training places and VET trainers, and a failure of many employers to employ apprentices. The ETU has outlined solutions to this projected shortage in our Powering Australia plan (**Appendix A**), including attaching industry standards as conditionality to special investment vehicle funding facilities, expanding industry Registered Training Organisations and Group Training Organisations, and investing in and reforming apprentice mentorship.

Significantly, the roadmap does not identify the workforce as a key enabler of the decarbonisation of the transport sector and fails to identify how it will intersect with other areas of government policy. The ETU recognises the ongoing efforts of the government to address workforce shortages in electrical-related industries, including through the development of a National Energy Workforce Strategy, to be released by the end of 2024.⁵ However, it is critical that workforce planning is integrated into broader government strategies such as the sector decarbonisation plans, to ensure that workforce strategies are targeted at areas of key strategic

³ Jobs and Skills Australia. (2023). [The Clean Energy Generation](#)

⁴ Deloitte Access Economics. (2024). [Skills shortages in the Australian automotive industry](#)

⁵ Department of Climate Change, Energy, the Environment and Water. [National Energy Workforce Strategy](#)

value to the energy transition. The government should work with the ETU, the Electrical Regulatory Authorities Council (ERAC), and relevant industry groups such as the National Electrical Contractors Association (NECA) and Master Electricians Australia (MEA), to develop a workforce plan which considers both the increase in demand for automotive electricians, and for traditional electricians, and which complements the National Energy Workforce Strategy.

Recommendation 2: Actively engage with and integrate the work of the National New Energy Workforce strategy to identify solutions to grow and develop the necessary workforce for transport decarbonisation.

Recommendation 3: Implement recommendations in the ETU's Powering Australia plan (Appendix A) to increase the employment of apprentices and address current and long-term projected workforce shortages.

Licensing

Adequate licensing provisions for all workers working on EVs during the whole life of the vehicle and its components are key to ensuring the safe and environmentally responsible management of Australia's electric vehicle fleet. As training packages develop to meet new competencies, EV mechanics will require knowledge about electrical safety and work on electrical installations which will increase in complexity and risk with the size of the vehicle. For this reason, there are roles that are suited to EV mechanics, and roles which are the responsibility of traditional electrical workers.

For example, EV mechanics are well-equipped to work on passenger vehicles, which require diagnosis and installation of out-of-the-box components that have met safety regulatory standards during the manufacturing process. However, working on larger commercial vehicles such as articulated trucks involves making alterations to high voltage cables, requiring knowledge of bending radius, sheath integrity, fault finding, maximum demand, and current carrying capacity. Regulatory arrangements should make it clear that these tasks are the responsibility of a licensed electrical worker.

EV mechanic licensing should be developed with the Mining and Automotive Skills Alliance (AUSMASA) and Powering Skills Organisation (PSO) Jobs and Skills Councils and coordinated with ERAC. Acknowledging the serious dangers of working on high voltage equipment, licensing should clearly delineate between the responsibilities of EV mechanics and licenced electrical workers when performing different work types, to ensure that workers are only performing tasks for which they are trained and qualified.

Development of licencing should seek to carry over learnings from traditional electrical licensing to ensure that there are no areas of conflict which undermine current regulatory standards, as has occurred in the past. The ETU identified some conflicts between the Certificate III in Automotive Electric Vehicle Technology (AUR32721), and the Wiring Rules (AS/NZS 3000:2018, Electrical installations), including different definitions of high and low voltage, different types of electrical work, and, disturbingly, normalised working on live and non-isolated electric vehicles and equipment. Industry is working to resolve these issues which arose due to a failure to engage in proper consultation prior to launch.

It is also critical that qualifications and licensing arrangements are consistent across jurisdictions. The Commonwealth should encourage states to harmonise their electrical licensing arrangements by ensuring that qualifications are compatible, adequate, and fit-for-purpose. Currently several states are in the process of, or have recently completed, reviewing

their regulatory arrangements pertaining to electrical safety and electrical licencing with a view to modernising their laws and ensuring they are contemporary to the emerging risks arising through the energy transitions. The Commonwealth must play a role in coordinating and encouraging states to review their regulatory arrangements to both improve their regulatory frameworks and to achieve greater consistency in the application.

Recommendation 4: The Commonwealth must coordinate and incentivise states and territories to review and modernise their regulatory arrangements to achieve the highest possible protections for electrical safety and electrical licencing.

Whole-of-life approach

Along with an expansion of the role of electric vehicles in our transport system, comes an increasing challenge for stewardship of electric vehicle waste, particularly batteries. The demand for minerals used in electric vehicle batteries is forecast to grow by at least 30 times by 2040.⁶ This presents an opportunity for the government to make progress towards a circular economy and support its critical minerals strategy, by investing in battery recycling. However, managing the stewardship of electrical vehicle batteries is a complex task which poses significant environmental and safety risks. It is therefore critical that a whole-of-life approach is taken to the development of licensing, so that it extends not just to installation and repair, but also includes decommissioning of vehicles and waste stewardship.

Recommendation 5: Develop a consistent and nationally recognised qualification and licensing framework with AUSMASA and ERAC, which takes a whole-of-life approach.

Recommendation 6: Ensure that learning from electrical licensing and qualification is brought across and there are no areas of conflict, with a particular focus on cross sector liaison between relevant Jobs and Skills Councils, Electrical Regulators and Licensing bodies and Standards Australia Committees and industry stakeholders.

Recommendation 7: Establish clear delineation between responsibilities of EV mechanics and licenced electrical workers working on passenger and commercial vehicles and electric machinery, equipment and plant such as forklifts.

Infrastructure

The ETU welcomes the government’s commitment to delivering a national charging network. Australia will have 3 million EVs by 2030, requiring 2.8 million charging points.⁷ Rolling out this infrastructure will require a nationally coordinated program that ensures technologies and systems are consistent and interoperable and works closely with energy regulators to manage the impacts on the energy grid.

One of the barriers to achieving this identified by Jobs and Skills Australia is proprietary technologies and practices which “hinder the VET sector's ability to develop and deliver consistent training for EVs”.⁷ The government should look to the European Union’s legislative innovation requiring a single universal charger for a wide range of electronic equipment as a model for resolving this.⁸ Establishing national technical standards that require interoperability between vehicle and charger technologies will encourage competition by reducing the ‘lock-in

⁶ International Energy Agency. (2021). [The Role of Critical Minerals in Clean Energy Transitions](#)

⁷ Jobs and Skills Australia. (2023). [The Clean Energy Generation](#)

⁸ European Parliament. (2022). [Long-awaited common charger for mobile devices will be a reality in 2024](#)

effect' on consumers, and avert needless disposal of products that are within their technical life, but have become incompatible with companion products. The government should work with the Standards Australia EL-001 Committee, who are already working on charging stations and installation wiring requirements, to design a model which is robust and fit-for-purpose.

The rapid and substantial expansion of electric vehicles will have significant impacts on the energy grid which need to be considered. Innovations such as bi-directional charging and vehicle to grid capabilities are popular with consumers and present an opportunity to smooth peaks and troughs in the energy grid as they allow electric vehicles to become a source of dispatchable supply. However, the expansion of consumer energy resources (CER) must be planned and coordinated with energy regulators to avoid unexpected demand fluctuations and maintain grid stability and safety. AEMO's Integrated Systems Plan forecasts that CER (including electric vehicles with vehicle to grid capabilities) will make up 15% of the national energy market's total capacity, and half of its dispatchable capacity in 2050.⁹ The decarbonisation plan must recognise these touchpoints with other government strategies and ensure they are in alignment.

The roadmap should also recognise the work already done in states like Victoria to introduce minimum standards for upskilling the electrical workforce to ensure safe and quality installation of charging infrastructure. This pilot program, funded by the Victorian Government, is tailored for qualified electricians. It covers consulting with clients about electric vehicle charging infrastructure (EVCI) needs, assessing how new EVCI can integrate with existing residential and small commercial electrical setups, designing compliant EVCI based on usage, configuration, and budget requirements, as well as evaluating options and testing and commissioning suitable EVCI to meet these needs.

Recommendation 8: Work with AEMO to ensure that the decarbonisation plan is consistent with the Integrated Systems Plan, particularly with regard to the expansion of electric vehicles with bi-directional charging and vehicle to grid capabilities.

Recommendation 9: Establish national technical standards or content within existing standards that require interoperability between vehicle and charging technologies.

Recommendation 10: Establish minimum skills requirements to ensure the electrical workforce delivers safe and quality installation and charging infrastructure.

⁹ AEMO. (2024). [2024 Integrated System Plan](#)