

# Transport and Infrastructure Net Zero Consultation Roadmap

## Take the survey

Department of Climate Change, Energy, Environment and Water

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- 1 Confirm that you have read and understand this privacy notice.  
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Public
- 3 Published name  
Australian Electric Vehicle Association Ltd
- 4 Confirm that you have read and understand this declaration.  
Yes
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- 9 Who are you answering on behalf of?  
Organisation
- 10 Organisation name  
Australian Electric Vehicle Association (ACT Branch)
- 11 What best describes you or your organisation?  
Not for profit
- 12 What sector do you represent?  
All transport
- 13 What state or territory do you live in?  
Australian Capital Territory
- 14 Postcode  
2607
- 15 What area best describes where you live?  
City
- 16 1. Do you support the proposed guiding principles?  
Yes
- 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?  
Yes

- 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?  
Yes
- 21 3.1 Please add details to your response.  
See our full submission
- 22 4. What should be included in a national policy framework for active and public transport and how should it be developed?  
See our full submission
- 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?  
See our full submission
- 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?  
No

- 27 7.1 Please add details to your response.  
See our full submission
- 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?  
See our full submission
- 29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?  
See our full submission
- 30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?  
No
- 31 9.1 Please add details to your response  
See our full submission
- 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.  
1: Battery electric  
2: Hydrogen fuel cell  
3: Low carbon liquid fuels
- 33 10.1 Please add details to your response. Why did you rank them in that order?  
See our full submission

- 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

AEVA T and I NZ Roadmap Submission final.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered



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## **TRANSPORT AND INFRASTRUCTURE NET ZERO ROADMAP SUBMISSION 25 JULY 2024**

### **Introduction**

Dear Sir/Madam,

This submission is provided by the Australian Electric Vehicle Association Ltd (AEVA). Thank you for the opportunity to make this submission to the Transport and Infrastructure Net Zero Roadmap Consultation.

Since 1973, AEVA has been active in advocating for electric propulsion technology. AEVA represents the users and drivers of electric vehicles (EVs) and the enthusiasts for electromobility more broadly, including electric bikes, motorcycles and scooters, cars, vans, utes, trucks, buses, trams, trains, boats and aircraft.

Over the years AEVA has served many roles, including (but not limited to) assisting members of the public with advice on converting vehicles to electric drive; public education and information sessions on EV battery technology, motors and charging; and advocating to governments for more electric transport-friendly policies.

### **Responses to the roadmap questions**

#### ***Principles and frameworks***

#### ***(Questions 1 -3: Guiding principles, Avoid-Shift-Improve framework,)***

AEVA agrees with the roadmap's guiding principles – maximise emissions reduction; value for money; maximise economic opportunity; inclusive and equitable; evidence based. Of these principles, we regard maximising emissions reduction and evidence-based decision making as the most important and necessary steps. We note that the impact on climate is totally dependent on the 'area under the curve' – the cumulative impact of heat-trapping greenhouse gases necessitates substantial reductions this decade, rather than well into the 2040s.

AEVA supports the Avoid-Shift-Improve framework. While essential, electrification of transport technology is only one part of the transition. We see no point in debating the relative priorities of Avoid, Shift and Improve – strong action is needed on all three.

In terms of frameworks, AEVA commends FACTS (Framework for an Australian Clean Transport Strategy)<sup>1</sup> which was developed in 2022 by a group of transport researchers across nine Australian universities. We note that FACTS covers all three of the Avoid-Shift-Improve categories.

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<sup>1</sup> See <https://transportfacts.org/>

**Light vehicles and general comments on EVs  
(Questions 7, 8: Proposed net zero pathway for light road vehicles, Additional actions beyond the National EV Strategy)**

AEVA welcomes the development of both the National EV Strategy and the New Vehicle Efficiency Standard (NVES). We submit that *consistent, long-term* policies are now needed to fully decarbonise light passenger vehicles and accelerate EV adoption. We remain concerned that the NVES does not currently set tailpipe emissions targets beyond 2029, meaning vehicle importers and consumers have little certainty about plans beyond this decade. AEVA believes it is *essential* that the trajectory from 2029 to 2035 tightens emissions limits for both passenger vehicles and light commercial vehicles to zero grams of CO<sub>2</sub>-e/km by 2035. This is necessary as a substantial number of ICE vehicles will still be in circulation as late as 2050. The NVES includes a scheduled review and this would be an ideal opportunity to specify a post-2029 trajectory.

In AEVA's view, plug-in hybrid vehicles (PHEVs) should be discouraged as part of a net zero pathway. Numerous studies, including a 2024 report<sup>2</sup> by the European Environment Agency, have found actual emissions from PHEVs are on average, 3.5 times higher than their type approval values. New utility factors, based on fuel consumption data, are being developed in the EU. AEVA recommends that these EU utility factors be adopted as soon as the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) is introduced in Australia, to ensure that the emissions ratings of plug-in hybrid vehicles are realistic.

The roadmap refers to "road pricing reforms". AEVA accepts that as EVs begin to dominate the national passenger vehicle fleet, a *universal, mass x distance road user charge* (RUC) will become the accepted road pricing reform. This would be a sensible reform on the condition *all vehicles are subject to it*. Factoring vehicle weight with distance travelled means cost recovery is in line with damage inflicted on infrastructure. It also serves as a financial incentive for consumers (as well as manufacturers) to embrace lighter passenger vehicles.

This should be a Federal charge, administered by the states and territories as they already manage licensing systems. An odometer reading at renewal time would be submitted for calculation of the RUC. In AEVA's view, such an RUC must be universal, applying to all road-going passenger vehicles regardless of fuel source. We strongly advise against applying this RUC to EVs only, as it would likely stall uptake. More details can be found in our policy recommendations<sup>3</sup>.

The roadmap refers to "public awareness and education". AEVA has long played a role in countering myths and misconceptions about EVs, and educating new EV owners through our workshop programmes. We cover best practice for home charging, highway charging, use of charging apps and charging etiquette, and will continue to offer these services as the technology is embraced.

**Other sustainable transport actions  
(Question 5: Additional actions to reduce transport emissions for movement of people)**

Transport emissions reductions will be constrained by Australia's long retention of passenger vehicles. The most recent data<sup>4</sup> indicates that the average age of vehicles rose to about 11.3

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<sup>2</sup> European Environment Agency. Climate and energy in the EU. <https://climate-energy.eea.europa.eu/topics/transport/real-world-emissions/data>

<sup>3</sup> AEVA policy recommendations. <https://www.aeva.asn.au/files/2002/>. Pages 10-12.

<sup>4</sup> Bureau of Infrastructure and Transport Research Economics (BITRE). Statistical report; road vehicles Australia, January 2023. <https://www.bitre.gov.au/sites/default/files/documents/BITRE-Road-Vehicles-Australia-January-2023.pdf>

years in 2023, although vehicle life spans often exceed 20 years. It follows that an important policy would be to introduce measures which encourage the phase-out of ICE vehicles. Retaining the fuel excise, even if at a reduced rate, would serve as a strong disincentive to operate an ICE vehicle when an electric option exists.

Other actions to reduce transport emission should include:

- Avoiding unnecessary travel through better urban and regional planning, transit-oriented design of residential areas, and better connected cultural, educational and industry hubs.
- Assign a fixed proportion of transport budgets to cycling and walking infrastructure<sup>5</sup>.
- Shift funding away from demand-inducing road projects, and into more efficient and productive options like rail.
- Where appropriate, incorporate EV charging at park-and-ride stations, enabling EV charging during sunlight hours. This also provides charging options for those living without off-street parking.
- Improve the efficiency of all public transport through electrification, including more battery electric buses, expanding light rail projects and embracing electric personal mobility (electric bikes, scooters and motorcycles).
- All states and territories commit to the cessation of new ICE vehicle registrations, as foreshadowed in the ACT.

### ***Active and public transport***

#### ***(Question 4: National policy framework for active and public transport)***

A policy framework for active and public transport should include targets, agreed upon jointly by the Federal and State/Territory governments. For example, the FACTS framework recommends targets such as:

- By 2035, 50% of commuting journeys will be made by a combination of active and public transport
- By 2030, all urban buses will be zero emission buses.

The national policy framework should be developed by the Transport and Infrastructure Council in consultation with community groups who advocate for improved active travel infrastructure and improved public transport.

The Australian Government's \$100 million 'Active Transport Fund' provides a welcome first step in assisting this process, but we submit this program is woefully underfunded for the task, and requires a ten-fold increase to stimulate the mode shift necessary.

Australia's cities need well-designed and fully electrified public transport networks capable of delivering frequent and reliable services, with a target of full electrification by the 2030s.

### ***Freight and heavy vehicles***

#### ***(Questions 6, 9-10, 12: Actions in addition to the National Freight and Supply Chain Strategy; Proposed net zero pathway for heavy road vehicles)***

In AEVA's opinion, the roadmap understates the prospects for conversion of road freight to battery electric drive. Battery electric semi-trailers are now entering the freight vehicle fleet in countries such as the United States, Norway and the Netherlands, with commensurate high power charging infrastructure. Trials concluded that routes in excess of 1,000 km per day

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<sup>5</sup> We note that the United Nations has called on countries to invest at least 20 per cent of their transport budgets in walking and cycling infrastructure. <https://www.unep.org/news-and-stories/press-release/urgent-investment-needed-walking-and-cycling-infrastructure-save>

were practical, and in a recent real-world test<sup>6</sup> a Tesla electric semi travelled over 1600 km in a single day.

There are significant opportunities to electrify the road freight sector through the conversion of articulated trucks coupled with highway battery-swapping services. We note the promising initiative of Janus Electric<sup>7</sup> in pioneering the conversion of heavy trucks and battery-swapping services. We see an opportunity for the Federal Government to provide financial assistance to accelerate these conversions, and to facilitate the roll-out of battery-swapping and recharging stations on national highways.

Ongoing support for heavy vehicle rapid charging stations in rural and regional centres will be necessary to cater for longer-haul routes. These could be based on rapidly deployable solar PV systems such as that developed by the Australian company 5B<sup>8</sup>.

We made a reference earlier to road pricing reforms. It must be acknowledged that heavy goods vehicles are the dominant cause of road damage. AEVA supports the implementation of a road costing scheme along similar lines as the mass × distance RUC, which better reflects the wear and tear on infrastructure caused by heavy vehicles.

Finally, the roadmap has mentioned hydrogen (H<sub>2</sub>) as a potential pathway for decarbonising some transport sectors. It is AEVA's opinion that H<sub>2</sub> remains economically and energetically unviable for decarbonising heavy road freight. In fact, H<sub>2</sub> for transport represents a significant distraction from general transport electrification and risks delaying the uptake of well-proven battery EVs. Assuming 'green' H<sub>2</sub> is produced by electrolysis using renewable energy, a fuel cell vehicle requires about three times more electricity<sup>9</sup> compared to charging an equivalent battery EV to drive the same distance. Hydrogen *may* see applications in some non-road heavy haulage transport applications like shipping and aviation, but battery EVs are already making faster progress in these sectors<sup>10</sup>.

## **Rail**

*(Questions 13, 14, 16: The proposed net zero pathway for rail; Additional actions to reduce rail emissions)*

A report by the Australasian Railway Association (ARA) found that rail freight generates up to 16 times fewer emissions than trucks<sup>11</sup> even when powered by diesel locomotives. While further analysis should be undertaken on the comparative emissions, it remains clear that the energy efficiency of rail freight is unsurpassed when considered over a range of tonnages and travel distances.

Overhead electrification of rail is a mature technology which allows even further emissions reductions per freight-ton-kilometre. However without a commitment to invest in rail more broadly, including improved alignments, passing loops and grade easements, electrification would represent a poor return on investment. AEVA notes that annual public investment in

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<sup>6</sup> <https://electrek.co/2023/09/29/tesla-semi-travels-over-1000-miles-in-a-single-day/>

<sup>7</sup> Janus Electric. <https://www.januselectric.com.au/>

<sup>8</sup> Large scale solar. <https://5b.co/>

<sup>9</sup> Seba, Tony. EnergyPost.eu, 23 October 2015. <https://energypost.eu/toyota-vs-tesla-can-hydrogen-fuel-cell-vehicles-compete-electric-vehicles/>

<sup>10</sup> Largest Electric, Battery-Powered Containerships Commissioned in China <https://maritime-executive.com/article/largest-electric-battery-powered-containerships-commissioned-in-china>

<sup>11</sup> The Guardian, 15 July 2024. <https://www.theguardian.com/australia-news/article/2024/jul/15/freight-operators-will-buy-new-diesel-trains-if-governments-dont-back-green-alternatives-industry-says>

rail in Australia amounts to just \$3.6 billion<sup>12</sup>, while road infrastructure receives almost ten times this.

In the absence of signals from government about a rail infrastructure plan, rail freight operators are facing the prospect of reinvesting in diesel locomotives, ultimately harming their ability to decarbonise in coming decades<sup>13</sup>.

AEVA notes the benefits of rail electrification in Queensland, and points to the success of electrification in India, who boasts over 63,000 km of electric overhead rail. In AEVA's view, the combination of electric overhead rail and electric delivery trucks would significantly reduce emissions in the land-transport freight sector, but only after significant investments in improving the efficiency of the current rail and intermodal freight network.

We note that high speed passenger rail services must also be developed, linking regional centres. Overseas experience has shown that linking smaller sections with clear patronage demand first is more economically sustainable than capital to capital projects. High speed electric passenger rail is the only proven low-emissions alternative to domestic aviation.

### **Aviation**

#### ***(Questions 19-20: The proposed net zero pathway for aviation; Additional actions to reduce aviation emissions)***

In fitting with the Avoid-Shift-Improve hierarchy, a shift to electric high-speed passenger rail is effectively replacing some short and medium-haul flights in East Asia and Europe. France recently imposed a ban on short-haul domestic flights, decreeing that any journeys that are possible in less than two-and-a-half hours by train cannot be taken as a flight<sup>14</sup>. With investments in Australia's rail networks, our busiest air routes could see a similar shift.

We note the roadmap's position that sustainable aviation fuels (SAF) are a key technology for improving the emissions intensity of the aviation sector, and identified battery electric and hydrogen powered aircraft as promising technologies. Substantial progress is already being made in battery electric aviation. Scandinavian Airlines have committed to electric short-haul aircraft by 2028<sup>15</sup> while pioneering Australian company FlyOnE has already reported over 1600 electric passenger movements already, boasting five active airport charging hubs<sup>16</sup>.

AEVA recommends where short-haul flights are unavoidable, the aircraft should be electric at every opportunity.

### **Maritime**

#### ***(Questions 17-18: Proposed net zero pathway for maritime; Additional actions needed)***

Noting that "Maritime is a hard-to-electrify sector" the Roadmap report concedes full electrification of the marine transport sector will be challenging. In the short term, developments in H<sub>2</sub> derived low-carbon fuels (such as green hydrogen, green ammonia, and synthetic fuels), are more likely to progress the sector.

Electric shipping vessels for short routes are being developed successfully with additional measures to improve their efficiency in transit. However it must be noted that 40% of all

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<sup>12</sup> Australian Infrastructure and Transport Statistics. <https://www.bitre.gov.au/sites/default/files/documents/bitre-yearbook-2023.pdf>

<sup>13</sup> See footnote 11.

<sup>14</sup> Euronews, 23 May 2023. <https://www.euronews.com/green/2022/12/02/is-france-banning-private-jets-everything-we-know-from-a-week-of-green-transport-proposals>

<sup>15</sup> Scandinavian Airlines. The future of aviation. <https://travel.flysas.com/electric>

<sup>16</sup> FlyOne. Australia's advanced air mobility network: now flying. <https://flyone.com.au/about-contact-us/investor-eoi/>

seaborne shipping is the transport of fossil fuels<sup>17</sup>. Thus, a global transition to electrify land transport and stationary electricity generation would cause a commensurate reduction in emissions in the maritime sector.

### **Conclusion**

The AEVA remains optimistic that Australia will embrace a broader transport decarbonisation approach which endorses the Avoid-Shift-Improve framework. The greatest emissions reductions will occur when all three strategies are deployed. As proponents of electric propulsion for over 50 years, we see electrification as essential to improving the emissions intensity of all transport modes. But this will only be effective when combined with a plan to avoid unnecessary transport movements in all long-term developments, and a commitment to investments in infrastructure which enables appropriate modal shifts.

The approaches and technologies which allow for change are already within reach. We trust that responsible leadership will follow, and make a commitment to achieve full decarbonisation by 2050.

Yours sincerely,



Chris Jones  
President, Australian Electric Vehicle Association

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<sup>17</sup> Quartz, 14 January 2022. <https://qz.com/2113243/forty-percent-of-all-shipping-cargo-consists-of-fossil-fuels>