

# Transport and Infrastructure Net Zero Consultation Roadmap

## Take the survey

Department of Climate Change, Energy, Environment and Water

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Response received at:

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1 Confirm that you have read and understand this privacy notice.

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- 9 Who are you answering on behalf of?  
Organisation
- 10 Organisation name  
Climateworks Centre
- 11 What best describes you or your organisation?  
Not for profit
- 12 What sector do you represent?  
Climate change/net zero
- 13 What state or territory do you live in?  
Victoria
- 14 Postcode  
3168
- 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.  
Climateworks Centre has a list of recommendations related to this and other questions, that are in the attached submission document.
- 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.

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

There are a range of recommendations in Climateworks' submission that support active and public transport, including getting decision making settings, funding and project requirements in place, including:

Recommendation 2.2: Strengthen methods for assessing and prioritising transport projects to avoid enabled emissions (those created by end users) as well as operational and embodied emissions.

Recommendation 2.5: Include a mechanism to prioritise projects aligning with the sustainable transport goals outlined in the National Urban Policy and relevant state-based urban planning within the project assessment process.

Recommendation 2.6: Strengthen requirements to incorporate walking, cycling and public transport links and connectivity into current and future transport projects.

Recommendation 2.7: Implement a carefully designed use-based pricing scheme and consider new funding mechanisms.

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

Transport\_and\_Infrastructure\_Net\_Zero\_Roadmap\_Submission\_Climateworks\_Centre\_August\_2024.1ea456b5.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

**71** Upload supporting file

Not answered

6 August 2024

Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Submitted electronically

To whom it may concern,

**Climateworks Centre submission on the Transport and Infrastructure Net Zero Consultation Roadmap**

Climateworks Centre welcomes the opportunity to provide input to the Australian Government's Transport and Infrastructure Net Zero Roadmap and Action Plan on the pathways, actions and policies needed to achieve transport decarbonisation.

We welcome the recognition of the need for more ambitious emissions reductions from the transport sector. This sector is the third-highest source of greenhouse gas emissions in Australia, and it is on track to be the largest by 2030. This makes transport decarbonisation a critical consideration in achieving Australia's climate goals. Done well, reducing emissions from transport can lead to solutions that move people and goods more efficiently, reduce congestion, improve livability, increase productivity and reduce the pressure to fund additional infrastructure.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We develop specialist knowledge to accelerate emissions reduction, in line with the global 1.5 degree Celsius temperature goal, across Australia, Southeast Asia and the Pacific. This is especially urgent given the window to keep global warming within 1.5 degrees is still open, but rapidly narrowing.

Climateworks has conducted extensive whole-of-economy scenario modelling that shows Australia can still achieve an emissions reduction trajectory compatible with the Paris Agreement goal of limiting global warming to 1.5°C. This scenario reaches an 85 per cent reduction in emissions by 2035, based on 2005 levels (Climateworks Centre 2023c). Our recent report, *Decarbonising Australia's transport sector* builds on this whole-of-economy analysis by exploring more detailed transport decarbonisation scenarios (Climateworks Centre 2024a). This latest work highlights the importance of expanding Australia's focus from electric vehicles to a diverse suite of solutions to decarbonise transport. Rather than relying on electric vehicles alone, incorporating all available solutions could help manage risks and provide contingencies to ensure emissions reductions remain on track.

**Summary of Submission**

The Transport and Infrastructure Net Zero Roadmap and Action Plan provides an ideal opportunity to incorporate an integrated approach to decarbonise transport and develop a credible decarbonisation plan. Climateworks defines a 'credible plan' as one that: uses all available transport decarbonisation

solutions, as per the globally recognised Avoid, Shift and Improve (ASI) framework; supports the Paris Agreement goal of limiting global warming to 1.5°C; and achieves better outcomes for the transport system as a whole. Together, these solutions from across the ASI framework form Climateworks' recommended 'diverse solutions' approach that improves efficiency and transport choice, while also reducing emissions (Climateworks Centre 2024a).

This submission considers recommendations on individual solutions and structural reforms to implement a 'diverse solutions' approach. While the focus of our submission is on reducing road transport emissions due to their significance in national emissions, we also recognise that government and industry action are important to decarbonise the aviation and maritime sub-sectors. Overall, taking a more ambitious approach to emissions reductions can be an opportunity for Australia to show leadership in climate action.

The summary of all our recommendations for the Transport and Infrastructure Net Zero Roadmap and Action Plan can be found on pages 11-12 of this document.

## **Focusing the Transport and Infrastructure Net Zero Roadmap and Action Plan on delivering sectoral change in line with the 1.5°C goal of the Paris Agreement**

Climateworks recent report, *Decarbonising Australia's transport sector* explores a number of scenarios to reduce transport emissions (Climateworks Centre 2024a). This provides valuable sector-specific modelling to inform the development of the Transport and Infrastructure Net Zero Roadmap and Action Plan. The modelling assesses which decarbonisation solutions could be deployed for Australia to reduce its emissions in line with limiting global warming to 1.5°C.

Based on this modelling, we recommend implementing a diverse portfolio of solutions and applying the best-practice ASI framework to achieve Paris Agreement-aligned goals. This requires taking every opportunity to increase the uptake of zero-emissions vehicles (i.e. electric or hydrogen fuel cell light and heavy vehicles), as well as implementing solutions that reduce emissions through mode shift and the reduction of avoidable travel.

In reviewing the approach and principles set out in the Transport and Infrastructure Net Zero Consultation Roadmap, Climateworks makes the following recommendations:

### **Recommendation 1.1: Select a suite of solutions and actions in the Transport and Infrastructure Net Zero Roadmap and Action Plan that have been assessed to ensure that their combined emissions reductions align with achieving the Paris Agreement goals.**

Selecting the necessary suite of solutions to decarbonise the transport sector means expanding the focus from a few solutions to all solutions that will need to work in concert to achieve Paris Agreement goals. Taking this approach, the Transport and Infrastructure Net Zero Roadmap and Action Plan could provide a credible approach for Australia to achieve these goals.

### **Recommendation 1.2: Apply the Avoid, Shift and Improve framework as a guiding principle in developing and implementing the Transport and Infrastructure Net Zero Roadmap and Action plan.**

Aligning with international best practices, applying the ASI framework ensures all solutions to decarbonise transport are considered and also encourages solutions that can achieve deeper emissions reductions, greater transport efficiency and improved liveability. Reducing avoidable travel can reduce emissions, infrastructure costs and costs to businesses by increasing transport efficiency. Shifting to the low-emissions transport modes, such as public transport, likewise provides an opportunity to reduce embodied carbon, for example where increasing the use of these modes results in needing less new infrastructure as people and goods are moved more efficiently (Infrastructure

Victoria 2023; Transport for NSW 2022). These modes can also help to reduce congestion and make cities more liveable.

**Recommendation 1.3: Expand the current timeline to include detailed milestones for a diverse range of solutions beyond technology-based pathways.**

This would see milestones for solutions across the ASI framework, including mode shift and broader transport efficiency measures, incorporated into the timeline included on page 7 of the Transport and Infrastructure Net Zero Consultation Roadmap. Setting milestones for broader transport efficiency could also help reduce infrastructure emissions by decreasing the amount of infrastructure that needs to be built or through implementing a ‘build less’ approach (see recommendation 2.4 for more information). To make this most effective, an integrated transport decarbonisation pathway that considers all transport sub-sectors and solutions could underpin these milestones.

**Recommendation 1.4: Integrate policies across modes, fuels, technologies and infrastructure to create a cohesive Transport and Infrastructure Net Zero Roadmap and Action Plan.**

Climateworks recommends that the Transport and Infrastructure Net Zero Roadmap and Action Plan present a highly integrated set of policies across modes, fuels, technologies and infrastructure representing a cohesive approach to transport decarbonisation.

Integration can be achieved by specifying the optimal target or limits on the role of specific solutions. For example, setting targets on the amount of road freight to move to rail, specifying the technology uptake by different modes, or setting the share of road transport energy to come from low carbon liquid fuels (LCLFs) could help ensure that these solutions contribute without running at cross-purposes. This could also help industry better assess long-term investment risks. The targets could cumulatively support transformative change in line with the Paris Agreement goals of limiting global warming to well below 2°C and striving for 1.5°C.

## Getting the settings right – a reform agenda for planning and funding transport and infrastructure

Decarbonising transport is a significant, multi-decade task. Getting the right settings in place is critical to ensuring each decision directs Australia’s effort to the most efficient forms of transport – for emissions and beyond.

Delivering on each of the solutions in our modelled ‘diverse solutions’ approach requires a step change – whether in the uptake of zero-emissions vehicles, the mode shift required or in reducing some of the overall transport demand. Therefore, we propose the following eight recommendations to get the settings right across government and to align funding and investment to deliver transport decarbonisation on time. These recommendations also align with the Government’s focus on ‘rethinking our transport networks and systems’ and ensure priority flows to the lowest emissions options.

**Recommendation 2.1: Expand government collaboration and set clear roles for each level of government.**

Decarbonising transport will require sustained effort and coordination across different levels of government over the coming decades. It is important that the Transport and Infrastructure Net Zero Roadmap and Action Plan clearly sets out the role for the federal government in achieving transport decarbonisation, including areas of direct responsibility and roles in supporting and coordinating other levels of government.

Delivering on the Transport and Infrastructure Net Zero Roadmap and Action Plan will require the Government to put in place mechanisms that enable different levels of government to work together on all transport decarbonisation solutions. We recommend expanding the scope of collaboration across state and federal governments to align with the scope of implementation of decarbonisation

solutions, including through forums such as the Infrastructure and Transport Ministers' Meetings (ITMM). The ITMM's focus could be expanded to include reforming transport decision-making processes, shifting to public transport and freight on rail and improving transport efficiency, including through pricing mechanisms such as those considered under recommendation 2.7 below.

Tailored collaboration mechanisms could be considered. For example, one model that could be applied is a transport transition partnership similar to the National Energy Transformation Partnership that is underpinning the energy sector transition.

**Recommendation 2.2: Strengthen methods for assessing and prioritising transport projects to avoid enabled emissions (those created by end users) as well as operational and embodied emissions.**

The types of transport projects that are funded have substantial impacts on transport emissions. This recommendation includes strengthening methods for infrastructure projects and other business case assessment processes and developing an assessment tool to measure the emissions implications of transport projects and policies. Such a tool would enable prioritisation across different investment types to drive down emissions, including infrastructure and services such as prioritising improved bus services. This could be a useful tool for all levels of government when assessing transport investments and policies.

**Recommendation 2.3: Build on recent updates<sup>1</sup> to the value of carbon in infrastructure assessments by increasing the value over time and expanding its application to a wider scope of project size, cost and jurisdiction**

The absence of an adequate value being placed on carbon leads to an undersupply of projects that are driving down transport emissions with business as usual leading to projects with high emissions impacts. Increasing the value of carbon over time and expanding the scope of projects it applies to could ensure emissions are adequately considered within planning assessments, project development, procurement processes, construction and operation. It could also ensure emissions are measured, reported and reduced consistently across infrastructure types and jurisdictions.

**Recommendation 2.4: Actively apply a 'build less' principle to transport infrastructure investment programs.**

The emissions reduction benefits of building less infrastructure have been highlighted in recent state government reports (Infrastructure Victoria 2023; Transport for NSW 2022). Operationalising this principle is critical to optimise transport efficiency, reduce infrastructure costs and embodied, operational and enabled emissions. The 'build less' principle does not imply not building infrastructure, but rather first ensuring Australia makes the best use of existing infrastructure before deciding where to invest. This includes moving people and goods more efficiently through mode shift, encouraging trips during less busy times of the day and reducing avoidable trips through land use planning and pricing mechanisms.

**Recommendation 2.5: Include a mechanism to prioritise projects aligning with the sustainable transport goals outlined in the National Urban Policy and relevant state-based urban planning within the project assessment process.**

Transport emissions are concentrated in urban areas, with approximately 76 per cent of car travel occurring there (Climateworks Centre 2024a). Reducing emissions in urban areas requires solutions that do not negatively impact liveability and productivity. This recommendation ensures investment creates a win-win for emissions reduction and core transport outcomes including productivity, liveability, reducing congestion and supporting housing affordability. It also acknowledges that the forms of transport that help make cities more livable, such as active transport, are also the least emissions-intensive.

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<sup>1</sup> Recent updates in the *Embodied carbon projections for Australian infrastructure and buildings* report (Infrastructure Australia 2024)

**Recommendation 2.6: Strengthen requirements to incorporate walking, cycling and public transport links and connectivity into current and future transport projects.**

New transport projects could be required to include additional emissions reduction measures, including opportunities to integrate walking, cycling, rail freight and charging infrastructure. Additionally, committed projects could be retrofitted to include these requirements. Existing projects could be reviewed for emissions impact, and projects with high lifecycle emissions could be re-evaluated.

**Recommendation 2.7: Implement a carefully designed use-based pricing scheme and consider new funding mechanisms.**

As Australians transition from fuel-powered to electric vehicles, road-use pricing will be needed to replace the existing fuel excise tax. Designed efficiently, road-use pricing can not only cover the cost of road use but also help to manage urban congestion and incentivise the shift to low-emissions transport alternatives. Learning from London's experience (The Conversation 2018), a well-designed scheme could see funding linked to providing more Australians with zero-emissions transport options that work for them. This could include, for example, improving public transport options in underserved regional and suburban areas. Other funding mechanisms will need to be considered, such as expanding the use of value capture as part of new developments and infrastructure investment to support the delivery of low-emissions transport options. Value capture is a mechanism for funding infrastructure by seeking contributions from businesses and individuals who privately benefit from government investment or planning decisions, for example through increased land value due to new public transport investments (Infrastructure Victoria 2016).

**Recommendation 2.8: Improve government and private sector investment, decisions and reporting by providing support, research, monitoring and reporting needs for the transition.**

Another key pillar is the information, research and development needed for the transition over the coming decades, including through research hubs and dedicated agencies providing information and support. Industry and individuals will have more confidence in making decisions if the transition is well-planned and based on clear research and data.

Setting out an approach for monitoring and reporting transport emissions, including a national strategy to have fit-for-purpose transport data, could provide greater confidence in government and private sector investment decisions.

**Implement a diverse portfolio of solutions, increasing the focus on mode shift and improving transport efficiency**

Climateworks recommends deploying a diverse portfolio of solutions to avoid having a single point of failure that may arise from relying on one solution. Diverse solutions include measures to increase the mode share of public and active transport, increase freight on rail and move people and goods more efficiently. It also includes continuing to accelerate uptake of zero-emissions vehicles from current levels.

Our modelling shows that without diverse solutions, Australia's transport sector could miss the window of opportunity to be 1.5°C aligned (Climateworks Centre 2024a).

**Recommendation 3.1: Prioritise shifting passenger transport to public and active modes and shifting road freight to rail.**

Climateworks recommends that the Government prioritise shifting as much transport as possible to lower-emissions modes, such as public and active transport for passengers and rail for freight.

Our 'Diverse solutions' scenarios shows that the transport sector could be 1.5°C-aligned by deploying zero-emissions vehicles and shifting (by 2040):

- 35 per cent of passenger kilometres travelled to public and active transport<sup>2</sup>;
- 15 per cent of articulated trucks tonne-kilometres travelled to rail;
- 5 per cent of rigid trucks tonne-kilometres travelled to rail;
- 7 per cent of domestic aviation passenger-kilometres travelled to rail;
- 4 per cent of light commercial vehicles tonne-kilometres travelled to urban micro-mobility (Climateworks Centre 2024a).

Such shifts necessitate well-integrated policies across transport modes, infrastructure and land-use planning. A mode shift to rail freight also requires addressing the long-standing challenges in interoperability, operational efficiency, productivity, infrastructure and high handling costs. Quick wins in mode shifting include measures to increase the use of existing infrastructure and services, including getting more people on public transport. We also recommend setting benchmarks for mode-share supported by mode shift incentive schemes, especially in urban-passenger and key freight corridors.

### **Recommendation 3.2: Establish ongoing national transport funds supporting mode shift**

Climateworks recommends that the Government build on the National Active Transport Fund, the Thriving Suburbs Program and the Urban Precincts and Partnerships Program and commit to ongoing funding streams that support mode shift projects. Given the low emissions intensity of rail (Climateworks Centre 2023b), exploiting opportunities to increase its mode share could be a key action in the Transport and Infrastructure Net Zero Roadmap and Action Plan.

The Government's continued commitment to the ongoing National Rail Action Plan and the rail standards harmonisation project are important steps to address and improve rail's competitiveness (Climateworks Centre 2023b). Further, the Government could leverage its investment in state-based rail projects to support a national approach that would boost rail's modal share (Australasian Railway Association and Freight on Rail Group 2023).

### **Recommendation 3.3: Improve transport efficiency by supporting market-driven innovations and optimisations.**

Climateworks recommends that the Government improve transport efficiency with solutions that link logistics optimisation with decarbonisation. As recommended in our report, *Delivering freight decarbonisation*, the Government could build ambition by providing a regulatory environment that supports market innovations and optimisation. These actions have the potential to simultaneously reduce emissions and make the transport system more efficient, accessible and productive.

Government policies could encourage businesses to align and optimise their efficiency metrics (e.g. load factors, vehicle utilisation and route optimisation) with transport decarbonisation goals. Further, the Government could enable businesses to explore digital and technological innovation, design-based innovations and capacity-building measures to improve transport efficiencies<sup>3</sup> (Climateworks Centre 2023b).

### **Recommendation 3.4: Reduce overall transport demand through effective land-use planning and related mechanisms.**

Climateworks recommends that the Government support reducing overall transport demand through integrating transport and land-use planning to encourage shorter trips in the implementation of the National Urban Policy (NUP) and other federal government land-use responsibilities. The recent appointment of a Minister for Cities provides another key opportunity to drive emissions reduction in cities.

Land-use planning through transit-oriented development can reduce overall transport demand by bringing living, working, education and recreation areas closer to and more integrated with

<sup>2</sup> Public and active transport includes low-carbon modes such as buses, light rail, rail, cycling, scooters and walking. Urban micro-mobility includes e-cargo bikes.

<sup>3</sup> Examples of digital and technological innovation are telematics, automation, platooning. Examples of design-based innovations are regenerative braking, low rolling resistance tyres, aerodynamic designs, and light-weighting. Driver training is an example of capacity-building measures.

low-emissions transport options, such as public transport (The Urban Developer 2024a, 2024b; ABC News 28 April 2024; Infrastructure Magazine 2024). For example, Infrastructure Victoria's (2023a) *Choosing Victoria's future* report links less dispersed cities with lower vehicle emissions. For freight, land-use planning can be used to optimise the location of intermodals to encourage rail freight and when considering rail network expansions.

As noted under recommendation 2.7, another significant mechanism for managing transport demand is implementing a road use-based pricing scheme that puts a value on transport externalities. The resulting funds could help develop low emissions transport options.

## Take every opportunity to increase zero-emissions vehicle uptake and define the transitional role of low carbon liquid fuels

Accelerating the uptake of zero-emissions vehicles from existing levels remains a critical part of the 'diverse solutions' approach.

To illustrate, all of our modelled scenarios in the *Decarbonising Australia's transport sector* report have high zero-emissions vehicle<sup>4</sup> uptake. Our 'moderated scenarios' have a zero-emissions vehicle uptake of 56 per cent by 2030, while the 'rapid scenarios' have a 72 per cent uptake (Climateworks Centre 2024a). Further, if the uptake of zero-emissions trucks progresses slowly due to potential real-world barriers, the uptake of light commercial and passenger zero-emissions vehicles would need to be rapid to compensate for this.

The following recommendations therefore lay out actions that can accelerate the uptake of both light and heavy zero-emissions vehicles.

### **Recommendation 4.1: Ratchet up the New Vehicle Efficiency Standard in future reviews and implement similar policies to promote zero-emission heavy vehicles.**

Climateworks recommends ratcheting up the New Vehicle Efficiency Standard (NVES) in future reviews including by targeting 0 gmCO<sub>2</sub> per km by 2035 for all new light vehicles<sup>5</sup>. This gives fifteen years for the remaining internal combustion engine vehicles to transition out of the fleet, providing adequate time to achieve an electrified vehicle fleet by 2050 (Climateworks Centre 2023a).

We also recommend that similar policies be implemented to boost the supply and uptake of heavy zero-emissions vehicles, such as setting sales targets or vehicle efficiency standards similar to the NVES. Although the Government is not considering a vehicle efficiency standard for heavy vehicles, we reiterate that such standards are being implemented in similar economies – the United States has recently finalised new greenhouse gas standards for medium-heavy duty vehicles, while the Council of the European Union has ratified the agreement on the upward revision of carbon dioxide emissions standards for heavy-duty vehicles (United States EPA 2024; The International Council on Clean Transportation 2024). The Climate Change Authority (2023) has also recommended vehicle efficiency standards as a key lever for decarbonising heavy vehicles.

### **Recommendation 4.2: Implement complementary policies to increase zero-emissions vehicle uptake and make the transition more equitable.**

Climateworks recommends implementing complementary policies that will unlock the supply and uptake of zero-emissions vehicles and make the transition more accessible and affordable. In addition to the Government's continued investment in charging infrastructure, other supporting policies are set

<sup>4</sup> This includes both light vehicles and trucks.

<sup>5</sup> This is for both Type 1 and 2 vehicle classifications of the implemented NVES.

out in our *Accelerating EV uptake* and *Delivering freight decarbonisation* reports. Key supporting policies are listed below.

- Policies to develop a strong second-hand market for light zero-emissions vehicles could improve uptake. Existing Government fleet-conversion policies<sup>6</sup> could be bolstered by policies to ease import restrictions and by designing supportive conditions for parallel imports<sup>7</sup> (Climateworks Centre 2022).
- Regulatory limits on axle mass currently inhibit the uptake of heavy zero-emissions vehicles in the range of 4.5–40 tonnes (where electric models are available). We recommend that the Government increase the axle-mass limits, initially restricting such changes only to zero-emissions trucks (Climateworks Centre 2023b).
- As the uptake of zero-emissions heavy vehicles increases, small transport logistics businesses risk being left out of the transition<sup>8</sup>. We recommend that the Government consider funding mechanisms<sup>9</sup> to support owner-drivers with smaller fleets. A fund for smaller operators could ease the transition by offering targeted support, such as scaled-down trials, low-interest loans, better lease terms or schemes to support scrappage, refurbishments and retrofits.

#### **Recommendation 4.3: Support research and development to address the challenges of articulated and long-distance zero-emissions trucks.**

Climateworks recommends the Government continue to support and extend its support for research and development to address the current challenges in delivering the range, payload, safety and commercial requirements of long-distance heavy-duty zero-emissions vehicles. Additional research needs could also be considered. Support could be given through the Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA). The current challenges suggest that a transition to zero-emissions vehicles in the heaviest vehicles category is likely to be the last phase of transition for road transport.

However, this is also a dynamic space with rapid cost-reductions and design evolutions expected to reduce limitations within the next decade (International Council on Clean Transportation 2022; National Heavy Vehicle Regulator 2023). Supporting research and development will require the Government to convene working groups with industry and enable transparent information-sharing and showcasing of tools and frameworks that can be used to evaluate new technologies and investment (Australasian Railway Association 2024; Transport for NSW 2023). This can enable the Australian transport industry to leap-frog ahead once a technology becomes commercially viable.

#### **Recommendation 4.4: Define the role of low carbon liquid fuels (LCLFs) in decarbonising road transport.**

Climateworks recommends that LCLFs be deployed in instances where zero-emissions vehicles or mode shifts are not applicable. For example, prioritising the use of 'sustainable aviation fuel' where other options are not viable.

Our economy-wide modelling shows that LCLFs make up less than 16 per cent of total transport energy in 2050, with the highest use in the aviation sector (energy data from *Climateworks Centre*

<sup>6</sup> 'Commonwealth Fleet Vehicle Selection Policy' and similar policies across all states and territories.

<sup>7</sup> Buying a car directly from a foreign seller without passing through an established automaker or dealership

<sup>8</sup> We expect zero-emissions heavy vehicles to improve competitiveness through reduced operating expenses, preferential access ('low-emissions freight delivery zone', 'low-delivery access maps'), emissions-based access and fees (Climateworks Centre 2023b). In addition, as businesses start integrating their metrics and corporate reporting with emissions reduction across their value chains, small transport logistics businesses that continue to run on diesel could get adversely impacted.

<sup>9</sup> The peak body of small owner-operators has even suggested that a Clean Transport Fund of \$3 billion be established for this purpose (NATROAD 2023).

*decarbonisation scenarios 2023*). Modelling by ARENA under their ‘Targeted deployment’ scenario shows that bioenergy in road transport could account for about 7 per cent of the total road transport fuel market by 2030 (Australian Renewable Energy Agency 2021). Further, Europe’s Renewable Energy Directive III sets a target of 5.5 per cent for a combination of advanced biofuels and renewable fuels of non-biological origin (European Parliament and the Council 2023).

Therefore for road transport, we recommend the use of LCLFs, such as ‘renewable diesel’, be based on assessments of the emissions reduction potential, likely costs and impacts on other measures of decarbonisation. By not specifying a limit on the share of road transport energy from ‘renewable diesel based on such an assessment’, fossil-fuel infrastructure can be perpetuated and the uptake of zero-emissions vehicles could be delayed<sup>10</sup>.

We also recommend that environmental obligations be incorporated in government LCLF investment and assurance frameworks to avoid negative ecological outcomes. Biomass production for LCLFs can have a significant impact on biodiversity and deforestation, with the latter impacting land-based sequestration potential and existing carbon stocks. This is critical given the significant amount of land-based carbon sequestration, including environmental plantings, required to stay within the bounds of the Paris Agreement temperature goals and the Global Biodiversity Framework (Climateworks Centre 2023c)<sup>11</sup>.

## Coordination beyond the transport sector

**Recommendation 5.1: Coordinate areas of crossover between the Transport and Infrastructure Net Zero Roadmap and Action Plan, the five other sector plans being developed and other relevant national policies.**

Climateworks welcomes that the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) are working together, along with other relevant departments to ensure alignment and coordination between sector plans. In particular, we recommend close alignment with the Electricity and Energy Sector Plan, including enabling two-way charging of electric vehicles, as well as with the Built Environment Sector Plan through transport infrastructure considerations.

Beyond the sector plans, we recommend the Transport and Infrastructure Net Zero Roadmap and Action Plan also align with the NUP and the National Health and Climate Strategy to optimise cross-cutting outcomes. For instance, public and active transport are key components of the NUP’s sustainability, health and productivity objectives. Initiatives to decarbonise transport could therefore be aligned with these areas to ensure coordination and progress for the overall NUP framework. Sustainable modes, such as public and active transport, that align to improving urban outcomes also have lower emissions intensity compared to electric vehicles (Institute for Sensible Transport n.d.).

**Recommendation 5.2: Develop precinct-scale spatial planning that incorporates electricity capacity for charging and related distribution infrastructure.**

In the 1.5°C scenario in Climateworks’ *Decarbonisation scenarios 2023*, zero-emission passenger vehicles account for 73 per cent of new vehicle sales by 2030. Electrifying the transport sector, including production of hydrogen fuel, requires 25 TWh of electricity in 2030 and 228 TWh in 2050 (Climateworks Centre 2024b). Analysis that provides detail on the unique electricity and energy

<sup>10</sup> Global studies have also shown that the scale of LCLF in transport will also depend on the underlying assumptions made on fuel prices, taxes and mandates (Alizadeh et al. 2020). Regulatory uncertainty, including the lack of national mandates on both conventional and advanced biofuels has often been cited to explain the uneven development of conventional biofuels in the past (IRENA 2019; International Energy Association 2022).

<sup>11</sup> In order to analyse the complex interplay between agricultural production, climate mitigation, biodiversity and water use, Climateworks has developed the upgraded ‘Land Use Trade Offs (LUTO2)’ model. We welcome the opportunity to brief the Government on how LUTO2 can be used to analyse biomass availability and its implications.

transition requirements of different regions will improve planning and guidance on investment, infrastructure, and by showing the expected benefits, could foster social licence.

Climateworks therefore recommends utilising precinct-scale spatial planning that incorporates zero-emissions vehicles' infrastructure and energy requirements across different urban environments. Such planning could include a protocol that would see the Australian Energy Regulator (AER) require Distribution Network Service Providers to prepare infrastructure plans that support the roll-out of charging infrastructure. Furthermore, national (i.e. Integrated System Plan) and precinct-scale system planning would benefit from fully considering the benefits of integrating electric vehicles into the energy system in a way that enables them to provide energy storage, firming and other energy services. Electric vehicles can also offer the largest demand-side resource for load flexibility or demand management (i.e. balancing renewable energy variability with emergency processes for discharging electric vehicle batteries to the grid) (Australian Renewable Energy Agency 2022).

**Recommendation 5.3: Align funding and investment with the Australian Sustainable Finance Strategy.**

Climateworks welcomes signs that DITRDCA and DCCEEW are working with the Treasury to align funding and investment for the Transport and Infrastructure Net Zero Roadmap and Action Plan with all elements of the Australian Sustainable Finance Strategy, including the recently-released *Sustainable Finance Roadmap*. We see particular advantages of using appropriate elements of the Sustainable Finance Taxonomy as criteria to complement infrastructure planning. The Sustainable Finance Taxonomy is currently being developed by the Australian Sustainable Finance Institute in line with international best practice. Aligning finance, planning and investment across all sector plans is crucial to ensure they are effectively implemented. Implementing the Sustainable Finance Strategy in a way that provides appropriate incentives for network efficiency and technology improvements (and disincentives for practices that are creating barriers or inappropriate investments) will be a key lever to create change.

The International Monetary Fund and the World Bank recently highlighted gaps in the creation of global, aligned, interoperable sustainable finance system architecture (International Monetary Fund 2023). In our view Australia is well-positioned to demonstrate global leadership and address this gap as it creates and implements the Sustainable Finance Strategy. Continuing the development of an ambitious Sustainable Finance Taxonomy that incorporates 1.5°C-aligned climate goals and nature-related goals will be an important lever for directing financial capital and combatting greenwashing.

Thank you for taking the time to consider our submission. We would welcome an opportunity to brief your team if you would like to explore our responses in further detail.

Yours sincerely,

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## Summary of recommendations

<p><b>Focusing the Transport and Infrastructure Net Zero Roadmap and Action Plan on delivering sectoral change in line with the 1.5°C goal of the Paris Agreement</b></p>
<p>Recommendation 1.1: Select a suite of solutions and actions in the Transport and Infrastructure Net Zero Roadmap and Action Plan that have been assessed to ensure that their combined emissions reductions align with achieving the Paris Agreement goals.</p>
<p>Recommendation 1.2: Apply the Avoid, Shift and Improve framework as a guiding principle in developing and implementing the Transport and Infrastructure Net Zero Roadmap and Action plan.</p>
<p>Recommendation 1.3: Expand the current timeline to include detailed milestones for a diverse range of solutions beyond technology-based pathways.</p>
<p>Recommendation 1.4: Integrate policies across modes, fuels, technologies and infrastructure to create a cohesive Transport and Infrastructure Net Zero Roadmap and Action Plan.</p>
<p><b>Getting the settings right – a reform agenda for planning and funding transport and infrastructure</b></p>
<p>Recommendation 2.1: Expand government collaboration and set clear roles for each level of government.</p>
<p>Recommendation 2.2: Strengthen methods for assessing and prioritising transport projects to avoid enabled emissions (those created by end users) as well as operational and embodied emissions.</p>
<p>Recommendation 2.3: Build on recent updates to the value of carbon in infrastructure assessments by increasing the value over time and expanding its application to a wider scope of project size, cost and jurisdiction.</p>
<p>Recommendation 2.4: Actively apply a 'build less' principle to transport infrastructure investment programs.</p>
<p>Recommendation 2.5: Include a mechanism to prioritise projects aligning with the sustainable transport goals outlined in the National Urban Policy and relevant state-based urban planning within the project assessment process.</p>
<p>Recommendation 2.6: Strengthen requirements to incorporate walking, cycling and public transport links and connectivity into current and future transport projects.</p>
<p>Recommendation 2.7: Implement a carefully designed use-based pricing scheme and consider new funding mechanisms.</p>
<p>Recommendation 2.8: Improve government and private sector investment, decisions and reporting by providing support, research, monitoring and reporting needs for the transition.</p>
<p><b>Implement a diverse portfolio of solutions, increasing the focus on mode shift and improving transport efficiency</b></p>
<p>Recommendation 3.1: Prioritise shifting passenger transport to public and active modes and shifting road freight to rail.</p>

Recommendation 3.2: Establish ongoing national transport funds supporting mode shift
Recommendation 3.3: Improve transport efficiency by supporting market-driven innovations and optimisations.
Recommendation 3.4: Reduce overall transport demand through effective land-use planning and related mechanisms.
<b>Take every opportunity to increase zero-emissions vehicle uptake and define the transitional role of low carbon liquid fuels</b>
Recommendation 4.1: Ratchet up the New Vehicle Efficiency Standard in future reviews and implement similar policies to promote zero-emission heavy vehicles.
Recommendation 4.2: Implement complementary policies to increase zero-emissions vehicle uptake and make the transition more equitable.
Recommendation 4.3: Support research and development to address the challenges of articulated and long-distance zero-emissions trucks.
Recommendation 4.4: Define the role of low carbon liquid fuels (LCLFs) in decarbonising road transport.
<b>Coordination beyond the transport sector</b>
Recommendation 5.1: Coordinate areas of crossover between the Transport and Infrastructure Net Zero Roadmap and Action Plan, the five other sector plans being developed and other relevant national policies.
Recommendation 5.2: Develop precinct-scale spatial planning that incorporates electricity capacity for charging and related distribution infrastructure.
Recommendation 5.3: Align funding and investment with the Australian Sustainable Finance Strategy.

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