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Queensland Zero Emission Vehicle (ZEV) Strategy Development team
Department of Transport and Main Roads
Submitted via email: zevstrategy@tmr.qld.gov.au

9 July 2021

To Whom It May Concern,

RE: ClimateWorks Australia submission to Queensland's Zero Emission Vehicle (ZEV) Strategy

ClimateWorks Australia welcomes the opportunity to provide input to Queensland's new *Zero Emission Vehicle (ZEV) Strategy*. ClimateWorks Australia develops expert, independent advice to assist the transition to net zero emissions for Australia, South-east Asia and the Pacific. A non-profit organisation, it was co-founded in 2009 by The Myer Foundation and Monash University and works within Monash Sustainable Development Institute.

Now is the right time for the Queensland Government to set the State up with a strong strategy to support electric vehicle implementation in line with emissions reduction objectives and to support its community, businesses and industries to transition to a new technology, in line with rapid take up around the world. Setting timelines, targets and substantial budgets will support implementation for government and businesses, and monitoring and evaluation of policies. As priorities, we suggest incentives, best practice standards and infrastructure to support emissions reductions. It is also important for the strategy to also address freight and public transport emissions. We recommend earmarking resources for long term work to manage smooth transition to a zero-emissions transport system including reducing travel demand, supporting mode shift, and improving our vehicles.

In preparing our submission we have drawn from:

- our [Decarbonisation Futures](#) scenario modelling,
- our [Moving to Zero](#) transport report, and
- a comparison of current Queensland zero-emissions vehicles policy and leading policies in other states and territories.

ClimateWorks offers the following specific recommendations for the final *strategy* :

1. **Recommendation 1: set clear targets for the transition to a zero-emissions transport system, including specific metrics for travel demand reduction, mode shift, network efficiency, phasing out internal combustion engines and supporting the uptake of zero-emissions vehicles. A target greater than 50% of new car sales being zero emissions by 2030**
 - 1.1. A commitment to work with other Australian governments to increase zero emissions model availability in the country
 - 1.2. A commitment to transition the Queensland government passenger fleet to 100% zero emissions by 2030, powering battery vehicles with renewable energy and hydrogen fuel cell vehicles with renewable hydrogen
 - 1.3. Set local content requirements and use procurement strategies to stimulate local industry development

2. **Recommendation 2: Establish short-term subsidies, and financial incentives through tax rebates or reductions, for vehicle purchases until the electric vehicles market in Australia is established**
 - 2.1. Set rebates for new and used battery and hydrogen fuel cell passenger vehicles at an appropriate, evidence based rate to effect behaviour change, at a minimum of \$3000 (to match NSW/VIC policy) but preferably \$8000 (NZ policy)
 - 2.2. Discounts for stamp duty and registration fees of battery and hydrogen fuel cell vehicles
 - 2.3. Introducing a road user charging when the Australian EV market is further established, for example when the annual electric vehicle sales reach a minimum of 30%
 - 2.4. Support electric vehicle uptake in shared car services which also reduce embedded emissions of car ownership

3. **Recommendation 3: Commit to work with other jurisdictions and industry to set best practice minimum vehicle emissions standards and fuel efficiency standards to attract more vehicles to Australia**

4. **Recommendation 4: Substantial investments in charging infrastructure with clear language and directives that assuage range anxiety and accessibility, for example a commitment that by 2025 chargers will be available at 100km intervals on major highways, 5km intervals on major roads in metropolitan areas, and that residents without off-street parking or access to home charging, will live within 5km of charging stations**
 - 4.1. A requirement for new apartment buildings to be 'electric vehicle ready'

5. **Recommendation 5: Set freight targets including specific metrics for travel demand reduction, mode shift, network efficiency, phasing out internal combustion engines and supporting the uptake of zero-emissions vehicles. A target of 50% or more light commercial vehicles being zero emissions by 2030, and a target of 25% or more heavy commercial vehicles being zero emissions by 2030**
 - 5.1. A commitment to work with other Australian governments to reduce freight emissions in the country

- 5.2. **Set rebates for new and used battery and hydrogen fuel cell light commercial vehicles at an appropriate, evidence based rate to effect behaviour change, at a minimum of \$3000 (to match NSW/VIC policy) but preferably \$8000 (NZ policy)**
 - 5.3. **Discounts for stamp duty and registration fees of battery and hydrogen fuel cell vehicles**
 - 5.4. **A commitment to transition the Queensland government commercial vehicle fleet to 100% zero emissions by 2030, powering battery vehicles with renewable energy and hydrogen fuel cell vehicles with renewable hydrogen**
 - 5.5. **A program to drive energy efficiency in road freight fleets. For example, a program that combines efficiency audits and government co-contributions for upgrades in the manner of Queensland's Business Energy Savers Program**
 - 5.6. **A program to support the uptake of zero emissions vehicles at large industrial sites such as mines. For example, through co-funding of hydrogen refueller projects**
 - 5.7. **A freight mode shifting incentive scheme to support the transition of freight from road to rail**
 - 5.8. **Substantial investments in charging infrastructure with clear language and directives that assuage range anxiety, for example a commitment that by 2025 chargers will be available at 100km intervals on major highways, at intermodal freight hubs and on major freight routes in metropolitan areas**
6. **Recommendation 6: Set public transport electrification targets, including:**
- 6.1. **A commitment for all electric passenger rail to be powered by renewables by 2025, and for any non-electrified rail to be electrified as soon as possible**
 - 6.2. **A commitment for all public buses to be transitioned to zero emissions vehicles by 2030**
 - 6.3. **A commitment for an increase in the mode share of public and active transport modes with substantial funding allocated to increase infrastructure and services to support this target**

Further detail on these recommendations are set out in the subsequent pages.

On behalf of ClimateWorks, we thank you for the opportunity to provide input in the development of Queensland's new *Zero Emission Vehicle (ZEV) Strategy*. We would welcome an opportunity to brief your team on this submission. Please do not hesitate to contact us if you have any further questions.

Kind regards,

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Queensland's new *Zero Emission Vehicle (ZEV) Strategy* can accelerate the transition to cleaner transport networks, enabling Queensland to benefit from a zero-emissions world

Queensland can shift to a zero-emissions passenger transport network at the same time as meeting the demands of a growing and urbanising population (ClimateWorks, 2020a). Reducing the need for trips where possible, shifting to more efficient transport modes, and improving technology performance all have a role to play in meeting growing demand while reducing emissions. Planning, infrastructure, services and market incentives are all key levers to reduce transport emissions and meet future challenges.

Electric vehicles are recognised internationally as a mature technology for the passenger and light vehicles market (IEA, 2021), ready to be deployed on a large scale in Queensland, if provided with the right supporting environment. The purchase cost of electric passenger cars is expected to become cost competitive or even cheaper than conventional vehicles by the mid-2020s (BloombergNEF, 2021). Australia is likely tracking behind, given the lack of policy here and that our vehicle market is smaller, highly fragmented, remote from many production centres and requires right-hand drive vehicles, which could limit options without active intervention (ClimateWorks, 2016). Combined with a renewable-powered electricity grid, electric vehicles can play a pivotal role in bringing passenger transport emissions to zero, alongside providing health benefits and addressing fuel security in Australia.

They also present significant benefits to the community and business in the form of reduced running costs. Electric vehicles reduce public health costs by producing less air and noise pollution than petrol and diesel vehicles. Electric vehicles also provide household and business cost savings, with lower total cost of ownership due to savings in fuel and maintenance (ClimateWorks, 2019). Recent Australian oil refinery closure announcements present a risk to our long term energy security (Macdonald-Smith and Durkin, 2021). The Queensland government can play a proactive role in mitigating this risk by increasing efficiency of vehicles, accelerating the transition to electric vehicles and zero emission energy sources, and reducing our oil dependency.

Electric vehicles can be integrated into the grid as a battery source and be a net positive for Australia's electricity networks. Dynamic pricing and smart remote charging can allow consumers to turn charging off and on in response to prices, flattening demand in the process. University of Melbourne modelling showed that the Australian grid can support up to 80 per cent of electric vehicle uptake with targeted smart demand management, compared to only 10 per cent if unmanaged (Brazil, 2019). While electric vehicles will increase overall electricity demand, they can also absorb surplus generation from solar PV during the day and return it to the grid at a later time. This allows for greater renewable penetration and improves grid stability and resilience. The average electric vehicle can store approximately 60 kilowatt hours (kWh) of energy, enough to provide back-up power to an average household for two days (World Resource Institute, 2019). Vehicle-to-grid integration capability needs further focus to understand the impact on overall battery life, new infrastructure requirements, metering systems and policies to manage demand.

Key industry reports are increasingly calling for rapid change. Globally, to meet net zero by 2050 targets, the IEA (2021) Net Zero report analysis requires zero private car trips by 2030 and the end of fossil fueled vehicles sales by 2035. Austroads—representing Australian and New Zealand transport agencies at all levels of government—found accelerated retirement of internal combustion engine (ICE) vehicles is needed to decarbonise the transport sector (Austroads, 2020). Their scenario analysis found sales of ICE passenger vehicles must end by 2024 to ensure all vehicles on the road in 2050 are zero-emissions¹. These reports all call for more rapid EV uptake than the Department of Industry, Science, Energy and Resources’ Emissions Projections (2020), which anticipates only 26 per cent of new car sales will be battery electric or plug-in hybrid in 2030. Closer to home, ClimateWorks has unpublished analysis of transport policy for all states and territories, see highlights below.

Table 2: Private passenger transport policy highlights in Australia and New Zealand

Government	Private passenger transport policy highlights
New South Wales	<ul style="list-style-type: none"> ● An intention for EVs to be 52% of new car sales by 2030-31 ● Rebates of \$3000 for 25,000 new EVs sold for under \$68,750 ● Stamp duty waiver for all EVs under \$78,000 ● \$171 million to fund EV charging infrastructure ● Transitioning the entire government fleet to electric by 2030 ● EV drivers allowed to use T2 and T3 transit lanes in the short term ● Grants for regional businesses to install charging points for their guests
Victoria	<ul style="list-style-type: none"> ● A target for EVs to be 50% of new car sales by 2030 ● Subsidies of \$3000 for 20,000 new EVs sold for under \$68,740 ● A \$5 million commercial sector zero emissions vehicle innovation fund ● A \$298,000 ‘EV-readiness’ in new buildings study ● An expert advisory panel to recommend policies, enabling investments and timelines to support the achievement of the 2030 target
New Zealand	<ul style="list-style-type: none"> ● Rebates of up to NZD\$8,625 for new (and NZD\$3,450 for used) EVs under NZD\$80,000 ● Electric vehicle chargers available every 75km along most highways ● EVs exempt from road user charges ● EV access to special transit lanes ● Emissions standards for imported new and used cars

ClimateWorks (2020c) modelled three scenarios of the Australian economy in *Decarbonisation Futures*. Two of these scenarios are aligned to two degrees warming globally, and net zero by 2050 Australia-wide, differing in the assumptions and uptake rates of technologies. The third scenario is aligned to 1.5 degrees of warming globally and net zero by 2035 Australia-wide. The scenarios focused on technological innovations and regulatory policy mechanisms. Future scenario modelling is needed to explore the emissions-reduction potential of other policy mechanisms, the impact of

¹ AustRoads also found fossil-fuel powered vehicles sales need to end by 2017 for buses, 2011 for light commercial vehicles and 2000 for heavy vehicles.

strategic planning, infrastructure and service provision decisions. Table 1 outlines benchmarks for the scale of change in Queensland’s transport sector by 2030 in these three scenarios.

Table 1: Queensland transport benchmarks for 2030 in scenarios aligned to 1.5 and two degrees of warming

Emissions-reducing solution	Benchmark of progress in 2030 that is aligned to two degrees of warming and net zero by 2050	Benchmark of progress aligned to 1.5 degrees of warming and net zero by 2035
Increase the uptake of zero emissions cars and motorcycles	50% of new-car sales and 15% of total fleet electric, and 490,000 - 525,000 battery or fuel cell electric private passenger vehicles on the road in Queensland	76% of new-car sales, 28% of total fleet electric and 897,000 battery or fuel cell electric private passenger vehicles on the road in Queensland
Set up electric vehicle charging infrastructure	An estimated 490,000 - 525,000 home chargers, 177,000-178,000 private chargers for electric road freight vehicles, and 35,000 - 37,000 total public chargers in Queensland ²	An estimated 897,000 home chargers, 341,000 private chargers for electric road freight vehicles, and 65,000 total public chargers in Queensland ³
Increase the uptake of zero emissions light commercial vehicles	50% of new-car sales and 15% of total fleet electric, and 152,000 - 163,000 battery or fuel cell electric light commercial vehicles on the road in Queensland	76% of new-car sales, 28% of total fleet electric, and 295,000 battery or fuel cell electric light commercial vehicles on the road in Queensland
Increase the uptake of zero emissions heavy commercial vehicles	25-39% of new-truck sales, 8-13% of total fleet electric, and 16,000 to 24,000 battery or fuel cell electric trucks on the road in Queensland	59% of new-truck sales, 24% of total fleet, and 46,000 battery or fuel cell electric trucks on the road in Queensland
Increase volume of zero-emissions fuels use (bioenergy and hydrogen)	83-111 PJ used Australia-wide in 2030 (a 171-265% increase on 2020)	134 PJ Australia-wide in 2030 (a 338% increase on 2020)
Improve rail rolling stock energy efficiency	24-33% improvement in rail rolling stock energy efficiency between 2020 and 2030 Australia-wide	54% improvement in rail rolling stock energy efficiency between 2020 and 2030 Australia-wide

² Estimated charging requirements based on ClimateWorks’ modelling of vehicle uptake combined with the Electric Vehicle Council’s (2018) estimate of one public charger being required for every 19 electric vehicles

³ *ibid.*

The Queensland Climate Transition Strategy – Pathways to a clean growth economy sets a goal for Queensland to achieve net zero emissions by 2050⁴. Land transport currently contributes 12% of the state’s annual greenhouse gas emissions⁵. Transport emissions have increased consistently since 1990, particularly in the freight sector. A strong electric vehicle policy would assist Queensland to turn this trajectory around.

Queensland’s policy framework of private passenger electric vehicles currently consists of:

- The initiatives established as part of [The Future is Electric](#) strategy, which include: establishing the Queensland Electric Vehicle Council and pilot trials for workplace EV charging stations
- [The QFleet Electric Vehicle Strategy](#)
- [Reduced registration fees and duty rates](#) for electric vehicles
- Investments in charging infrastructure, such as Queensland’s [Electric Super Highway](#)

Although a good starting point, this policy suite will not achieve the scale of changes that needs to occur. Decarbonising transport systems is critical to achieving the Queensland Government’s net zero emissions objective. To reduce emissions in the transport sector, Queensland can adopt well-established solutions, such as zero-emission electric vehicles, to achieve significant emissions reductions this decade. Investment is also needed now to set Queensland up to reach a zero-emissions transport sector by 2050 and help the State take up the broader benefits of new technology (ClimateWorks, 2020b). States can drive rapid transition to reduce emissions by electrifying vehicles and rolling stock and, importantly, by powering vehicles with 100% renewable energy⁶. Vehicles included in scope should be trains, light rail, buses, bikes, as well as supporting uptake in passenger, light commercial and heavy vehicles, share car and mobility as a service offerings.

Our specific recommendations are set out below under the themes of: setting targets to support implementation, incentives and best practice standards, infrastructure, freight transport and public transport.

Setting government strategies up to support actions and implementation in line with emissions reduction objectives

Current Queensland transport policies will be insufficient in achieving the emissions reductions needed this decade to achieve net zero emissions by 2050. To achieve the scale of change outlined in Table 1, a comprehensive policy suite is required including specific targets, timelines and budget to guide the implementation of the listed actions. Industry needs clarity on policy timeframes and market confidence to align with the strategic direction set-up in government strategies. Timelines, targets and substantial budget will support implementation for government and businesses, and monitoring and evaluation of policies. Climateworks Australia recommends that the final Strategy be completed with specific targets and timelines for each area of action.

⁴ https://www.qld.gov.au/_data/assets/pdf_file/0026/67283/qld-climate-transition-strategy.pdf

⁵ NSW Department of Planning, Industry and Environment. 2017. NSW Emissions. Viewed 6 December 2019: <https://climatechange.environment.nsw.gov.au/About-climate-change-in-NSW/NSW-emissions>

⁶ Climate Council. 2018. Waiting for the Green Light: Transport Solutions to Climate Change. Viewed 6 December 2019: www.climatecouncil.org.au/wp-content/uploads/2018/10/CC_MVSA0154-Report-Transport_V6-FA_Low-Res_Single-Pages.pdf

1. Recommendation 1: set clear targets for the transition to a zero-emissions transport system, including specific metrics for travel demand reduction, mode shift, network efficiency, phasing out internal combustion engines and supporting the uptake of zero-emissions vehicles. A target greater than 50% of new car sales being zero emissions by 2030

1.1. A commitment to work with other Australian governments to increase zero emissions model availability in the country

Australia risks being limited to dirtier, older and more expensive vehicle models. ClimateWorks recommends the Queensland Government sets targets for the transition to zero-emissions vehicles to ensure access to future vehicle choices, and assist with reducing transport emissions. This includes specific metrics to set the pathway for phasing out ICE vehicles and supporting the uptake of zero-emissions vehicles would support government agencies, for example, in determining infrastructure and technology investment requirements for achieving these metrics. To maximise benefits, coordination with other jurisdictions is vital, to ensure the transition to zero-emissions vehicles progresses consistently and does not result in perverse outcomes for early adopters or impacts for late adopters.

1.2. A commitment to transition the Queensland government passenger fleet to 100% zero emissions by 2030, powering battery vehicles with renewable energy and hydrogen fuel cell vehicles with renewable hydrogen

ClimateWorks supports electric vehicle fleet strategies, as fleet procurement guidelines have a large influence on the future composition of Australia's total vehicle fleet. Business and government fleets made up 50 per cent of annual new vehicle sales in Australia in 2020, and serve as an important source to the second-hand market (National Transport Commission, 2020). Fleet targets also demonstrate national appetite for electric vehicles to manufacturers, and can provide a necessary boost for increased investment in charging infrastructure. Transitioning fleets to electric vehicles would normalise their use and provide the opportunity to educate employees and the broader community, overcoming any misconceptions and demonstrating the significant benefits of electric vehicles. In this commitment, the Queensland Government can take a leadership role, encouraging other large businesses and fleet managers to make the switch.

1.3. Set local content requirements and use procurement strategies to stimulate local industry development

A local electric vehicle market also presents an opportunity to support a growing modern manufacturing sector and associated industries in Queensland. Jobs could be generated in construction, electrical trades, administrative roles and infrastructure manufacturing, among others. Australia has access to recently retrenched skilled automotive industry workers; education providers that can retrain in specialised skills; and regions with established infrastructure, supply chains, and import and export networks. PwC found that building infrastructure to support three million electric vehicles is estimated to generate a net increase of 13,400 jobs in 2030, compared to 2017 (PwC, 2018).

For zero-emissions vehicles uptake to grow, Queensland needs incentives and best practice standards

Growing numbers of countries and cities are setting targets to phase out fossil-fuel powered cars, including scheduled bans on new fossil-fuelled car sales in the UK, Canada, France, China, and India. Countries introducing incentives for electric vehicle sales include Japan, South Korea, Ireland and Denmark (Centre for Climate Protection, 2018). Norway's electric vehicle incentives have had broad support across governments since the 1990s and electric vehicles have reached a 50 per cent market share of new vehicles in 2018. Incentives include tax reductions or subsidies on vehicles, road taxes and tolls, and parking; financial compensation for scrapping fossil-fuelled vehicles; and infrastructure for charging, parking and priority road access (Norsk elbilforening, 2020).

Manufacturers' business models are changing in response, although Australian consumers are not currently able to access these new and growing markets due to our lack of targets and standards. General Motors, the largest vehicle manufacturer in the US is planning to be carbon neutral by 2040 in its global products and operations, and aspires to end the sales of fossil fuelled light-duty vehicles by 2035 (General Motors, 2021). Daimler is electrifying the entire Mercedes-Benz portfolio, providing options of at least one electric alternative for every model of car and van, taking the total to 50 models overall by 2039 (Daimler, 2021). The breadth of these offerings is not currently coming to the Australian market, reducing consumer choice and the opportunities to decarbonise in road transport. There are steps that the Queensland Government can take here.

- 2. Recommendation 2: Establish short-term subsidies, and financial incentives through tax rebates or reductions, for vehicle purchases until the electric vehicles market in Australia is established**
 - 2.1. Set rebates for new and used battery and hydrogen fuel cell passenger vehicles at an appropriate, evidence based rate to effect behaviour change, at a minimum of \$3000 (to match NSW/VIC policy) but preferably \$8000 (NZ policy)**
 - 2.2. Discounts for stamp duty and registration fees of battery and hydrogen fuel cell vehicles**
 - 2.3. Introducing a road user charging when the Australian EV market is further established, for example when the annual electric vehicle sales reach a minimum of 30%**
 - 2.4. Support electric vehicle uptake in shared car services which also reduce embedded emissions of car ownership**

ClimateWorks supports incentivising electric vehicles and stimulating development of a local electric vehicle market. Using financial incentives remains important to bring forward the upfront price parity cost of electric vehicles in the near future, until expected price parity in the mid-2020's in international markets (BloombergNEF, 2021). Australia is likely tracking some way behind, given the lack of policy here. Incentives will signal to vehicle manufacturers the demand for them to bring more models to our market, increasing customer choice and supporting associated investment (e.g. charging infrastructure, skills and training for mechanics, etc). Even as global electric vehicle costs fall, our vehicle market is smaller, highly fragmented, remote from many production centres and

requires right-hand drive vehicles, which could limit options without active intervention (ClimateWorks, 2016).

ClimateWorks suggests these subsidies be designed to respond to the size of the market, with greater incentives while the market is small, and a planned wind-down once vehicle sales hit higher milestones. This approach has been employed effectively in other countries. To ensure economic efficiency, incentives could be targeted towards particular product types or buyers, for example working with fleets. In some jurisdictions, the market for electric vehicles has matured such that they are now beginning to gradually roll back support, such as China, the UK and parts of the USA (International Council on Clean Transport, 2019).

Australia can learn from previous technology uptake to ensure we plan appropriately for both the supportive measures to establish a market, and the timing and process to wind back support. For example, feed-in-tariffs and certificate schemes have supported Australian households to install solar PV and rapidly reduce costs. However, accelerated take-up of PV subsidies went beyond governments' budget and expectations. This led to rapid winding back of government support and a significant boom and bust cycle for the PV industry (Grattan Institute, 2015). To avoid consumer confusion or risk market confidence, the Queensland Government should set short-term subsidies for electric vehicles, with plans to scale it according to the market size.

3. Recommendation 3: Commit to work with other jurisdictions and industry to set best practice minimum vehicle emissions standards and fuel efficiency standards to attract more vehicles to Australia

To maintain competitiveness in comparison to the international vehicle market and ensure Australian buyers have access to the best vehicles, Australian regulations need to be aligned with international standards. Vehicle emissions standards enable transport users to benefit from innovations by leading manufacturers who are already delivering zero-emissions vehicles. General Motors, the largest vehicle manufacturer in the US, is planning to be carbon neutral by 2040 in its global products and operations, and aspires to end the sales of fossil fuelled light-duty vehicles by 2035 (General Motors, 2021). By 2025, Volvo has committed to 50 per cent of new vehicle sales to be electric cars (Volvo, 2018). General Motors, Hyundai, Volkswagen and Volvo all have targets for over one million annual sales of electric vehicles by 2025 (Electric Vehicle Council, 2020). Manufacturers are currently being drawn to markets setting strong standards to supply electric vehicles, as standards both put requirements on them and also indicate likely growth in demand for electric vehicle sales.

Best practice light vehicle CO₂ emission standards and improving the fuel efficiency of Australia's light vehicle fleet create financial savings for vehicle owners, improved energy security, health and economic benefits and least cost emissions reductions for Australia (Climate Change Authority, 2014). Australia would be advised to join other markets with standards in place such as the US, EU, Japan, Mexico and Saudi Arabia (ClimateWorks and Future Climate Australia, 2017). The bipartisan Ministerial Forum on Vehicle Emissions (Department of Infrastructure, Transport, Regional Development and Communications, 2017) found introducing a Fuel Efficiency Standard for Light Vehicles provided the opportunity to contribute a net benefit of \$13.9 billion to 2040. Based on the Ministerial Forum on Vehicle Emissions cost benefit analysis, setting an ambitious but feasible target

(105 gCO₂/km by 2025) provides 65 Mt CO₂ of abatement to 2030 and 231 Mt CO₂ to 2040, whilst delivering an additional \$13.9 billion in net benefit to 2040. The QLD Government should coordinate with other jurisdictions and industry to build on existing work by the Ministerial Forum on Vehicle Emissions and implement best practice vehicle emissions standards (Posner, 2021).

Infrastructure can lay the foundation for a net zero future

4. **Recommendation 4: Substantial investments in charging infrastructure with clear language and directives that assuage range anxiety and accessibility, for example a commitment that by 2025 chargers will be available at 100km intervals on major highways, 5km intervals on major roads in metropolitan areas, and that residents without off-street parking or access to home charging, will live within 5km of charging stations**

- 4.1. **A requirement for new apartment buildings to be 'electric vehicle ready'**

Australia's public and private sectors are making unprecedented investments in transport infrastructure. Given the long lived nature of these assets, and their influence on travel behaviour, it is vital the pipeline of transport infrastructure enables emissions reductions. The Infrastructure Sustainability Council of Australia (ISCA), ClimateWorks and the Australian Sustainable Built Environment Council (ASBEC)'s *Issues Paper: Reshaping Infrastructure for a net zero emissions future* (2020) found infrastructure influences 70 per cent of Australia's emissions⁷. Decisions made about infrastructure today will shape Australia's future, including its emissions trajectory, for decades to come.

The disruption and economic impact of COVID-19 has increased focus on infrastructure, and provides an opportunity to ensure investments are aligned to a green recovery. ClimateWorks's *Recover and Reduce* (2020b) identifies government investment opportunities, including infrastructure, that will meet key COVID-19 economic recovery objectives of job creation and productivity growth, while also making material progress towards net zero emissions.

A key investment area is electric vehicle charging infrastructure, estimated to have a job multiplier of 12.5 jobs per \$1m spent (AlphaBeta, 2020). *Recover and Reduce* found that to align with 2 degrees of warming, 93,000 public chargers and three million home chargers are required in Australia by 2030, requiring \$3.2 billion in public and private capital investment (see Table 1). The NSW Government recently announced \$171 million to fund EV charging infrastructure. Policies are also needed to ensure homes are EV-ready; guidelines have been adopted by US governments to ensure planning for electric vehicles is included in all new building constructions (The Driven, 2020). Meanwhile, Canada is investing CAD\$280 million in a 5-year Zero Emission Vehicle Infrastructure Program (Government of Canada, 2021), and the UK Government has announced £1.3 billion for public and home charging infrastructure (Department for Transport, 2020a). The Queensland ZEV Strategy will need to be matched with appropriate funding to accelerate supporting infrastructure roll out to meet the scale of the task.

⁷ From energy, transport, water, waste and telecommunications infrastructure.

The Zero Emissions Vehicle Strategy should identify, prioritise and address electric vehicle charging infrastructure coordination. When financially unviable for commercial operators to provide infrastructure, government should lead investment to fill these gaps.

The growing freight transport task needs to be addressed

- 5. Recommendation 5: Set freight targets including specific metrics for travel demand reduction, mode shift, network efficiency, phasing out internal combustion engines and supporting the uptake of zero-emissions vehicles. A target of 50% or more light commercial vehicles being zero emissions by 2030, and a target of 25% or more heavy commercial vehicles being zero emissions by 2030**
 - 5.1. A commitment to work with other Australian governments to reduce freight emissions in the country**
 - 5.2. Set rebates for new and used battery and hydrogen fuel cell light commercial vehicles at an appropriate, evidence based rate to effect behaviour change, at a minimum of \$3000 (to match NSW/VIC policy) but preferably \$8000 (NZ policy)**
 - 5.3. Discounts for stamp duty and registration fees of battery and hydrogen fuel cell vehicles**
 - 5.4. A commitment to transition the Queensland government commercial vehicle fleet to 100% zero emissions by 2030, powering battery vehicles with renewable energy and hydrogen fuel cell vehicles with renewable hydrogen**
 - 5.5. A program to drive energy efficiency in road freight fleets. For example, a program that combines efficiency audits and government co-contributions for upgrades in the manner of Queensland's Business Energy Savers Program**
 - 5.6. A program to support the uptake of zero emissions vehicles at large industrial sites such as mines. For example, through co-funding of hydrogen refueller projects**
 - 5.7. A freight mode shifting incentive scheme to support the transition of freight from road to rail**
 - 5.8. Substantial investments in charging infrastructure with clear language and directives that assuage range anxiety, for example a commitment that by 2025 chargers will be available at 100km intervals on major highways, at intermodal freight hubs and on major freight routes in metropolitan areas**

Currently, Queensland has no policies in place that will directly deliver emissions reductions in the freight transport sector. Queensland's freight transport emissions are the second highest of any state and territory; only New South Wales' freight emissions are higher. Currently, policies across Australia for freight emissions are piecemeal and insufficient. Queensland has the opportunity to lead Australia in freight transport policy if the Zero Emissions Vehicle Policy sufficiently targets freight modes and supports large sectors of industry and business to transition.

Solutions to reduce emissions in freight transport are less mature than in passenger transport, but urgent attention is required by Australian governments to address this growing emissions source. Key solutions include:

- Mode shifting freight from road to electrified rail where possible
- Improving rail rolling stock energy efficiency
- Improving road freight vehicle fleet efficiency (in the short term) by reducing unnecessary kilometres, freight load-management technology, greater data transparency and increased communication and coordination between stakeholders in the sector.
- Increasing the uptake of zero emissions fuels (such as hydrogen and biodiesel) and battery commercial vehicles and trucks

Coordination and collaboration is needed for this substantial challenge, and this approach is being applied overseas. In the United States, sixteen jurisdictions have signed a joint memorandum of understanding that commits them to work collaboratively to advance and accelerate the market for electric medium- and heavy-duty vehicles (California Air Resources Board, 2020). The goal is to ensure that 100 percent of all new medium- and heavy-duty vehicle sales be zero emission vehicles by 2050 with an interim target of 30 percent zero-emission vehicle sales by 2030. See Table 3 for more policy details.

Table 3: Freight transport policy highlights in Australia and North America

Government	Freight transport policy highlights
Western Australia	<ul style="list-style-type: none"> ● Support for ATCO's hydrogen refueller project in Jandakot ● Support for FMG H2's \$32 million renewable hydrogen mobility project in Pilbara ● Goal for renewable hydrogen to be widely used in mining haulage vehicles and regional transportation by 2030
New South Wales	<ul style="list-style-type: none"> ● Government provided funding for hydrogen refuelling station at the Port Kembla site of BlueScope Steelworks
Victoria	<ul style="list-style-type: none"> ● Establishing of a network of port-rail shuttles and intermodal terminals to enable more freight to be transported by rail
Canada	<ul style="list-style-type: none"> ● Green Freight Assessment Program funds third party fleet energy assessments and recommendations for companies, and provides up to \$100,000 for the implementation of those recommendations and user training of new equipment and retrofits.
Sixteen U.S. jurisdictions including California, Colorado, New York, and Pennsylvania	<ul style="list-style-type: none"> ● Joint memorandum of understanding (MOU), committing to work collaboratively to advance and accelerate the market for electric medium- and heavy-duty vehicles. The goal is to ensure that 100 percent of all new medium- and heavy-duty vehicle sales be zero emission vehicles by 2050 with an interim target of 30 percent zero-emission vehicle sales by 2030

Electric vehicles include public transport

States can drive a rapid transition to reduce emissions by electrifying public transport fleets and powering vehicles and rail networks with 100% renewable energy⁸. Emissions from Queensland's buses were 419.40 kt of CO₂e in 2019, and a share of the 579.40 kt of CO₂e emissions from railways were from passenger rail (Australian Government, 2021). While public transport emissions in Queensland are lower than those of private passenger and freight transport, these modes are within the realm of government control unlike other modes. The Queensland government can enact policies to bring these emissions to near zero in the next decade, using contracting and procurement processes to drive this change at the lowest cost and largest social and economic benefit. Electric buses, light rail, trains and ebikes are all mature technologies, ready to be deployed on a large scale in Australia (see Table 4). Additionally, if public transport infrastructure and services are expanded, these will reduce emissions from private passenger transport as people shift to lower emissions public modes.

- 6. Recommendation 6: Set public transport electrification targets, including:**
 - 6.1. A commitment for all electric passenger rail to be powered by renewables by 2025, and for any non-electrified rail to be electrified as soon as possible**
 - 6.2. A commitment for all public buses to be transitioned to zero emissions vehicles by 2030**
 - 6.3. A commitment for an increase in the mode share of public and active transport modes with substantial funding allocated to increase infrastructure and services to support this target**

The whole public transport system can support decarbonisation by transitioning to mature technologies such as electric trains, light rail and buses, powered by renewable energy. Queensland is currently lacking policies, while other jurisdictions such as Victoria, the Australian Capital Territory and New South Wales have policies in place to achieve decarbonisation of public transport. Electric bus trials are already underway in most Australian states, and show the technology and industry are ready for policy to support electric bus rollout. A trial is being undertaken for electric buses in Brisbane, however this uptake is not at scale (Transdev, 2021). Queensland can also demonstrate leadership by making commitments to power the train and light rail networks with renewable power.

There is an opportunity for Queensland to build on these trials to rapidly expand the renewable-powered electrification of the entire public transport fleet and support its net zero emissions aspirations.

⁸ Climate Council. 2018. Waiting for the Green Light: Transport Solutions to Climate Change. Viewed 6 December 2019: www.climatecouncil.org.au/wp-content/uploads/2018/10/CC_MVSA0154-Report-Transport_V6-FA_Low-Res_Single-Pages.pdf

Table 4: Public transport policy highlights in Australia

Government	Public transport policy highlights
Australian Capital Territory	<ul style="list-style-type: none"> ● Plan to implement a pathway for the ACT to use only zero emissions public transport, garbage trucks, taxi and rideshare vehicles by the mid 2030s - with no further purchase of non-zero emissions buses ● Metro light rail powered by 100% renewable electricity
Victoria	<ul style="list-style-type: none"> ● A target for all public transport bus purchases to be ZEVs from 2025 ● A \$20 million for a ZEV public transport bus trial ● All metropolitan trams and trains to be powered by 100% renewable electricity by 2025 ● A target to increase active transport mode share to 25% by 2030
New South Wales	<ul style="list-style-type: none"> ● A target for transitioning all 8,000 state buses to zero emissions by 2030 ● A target of net zero emissions from electricity used to run Sydney Trains and NSW TrainLink by 2025

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