

Next stop: Zero emissions buses by 2030

To reduce rising transport emissions, policies to support the electrification of public transport bus fleets by 2030 should be prioritised.

Audrey Quicke
Sienna Parrott

May 2022

ABOUT THE AUSTRALIA INSTITUTE

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. We barrack for ideas, not political parties or candidates. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

OUR PHILOSOPHY

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

OUR PURPOSE - 'RESEARCH THAT MATTERS'

The Institute publishes research that contributes to a more just, sustainable and peaceful society. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

The Institute is wholly independent and not affiliated with any other organisation. Donations to its Research Fund are tax deductible for the donor. Anyone wishing to donate can do so via the website at <https://www.australiainstitute.org.au> or by calling the Institute on [REDACTED]. Our secure and user-friendly website allows donors to make either one-off or regular monthly donations and we encourage everyone who can to donate in this way as it assists our research in the most significant manner.

Level 1, Endeavour House, 1 Franklin St
Canberra, ACT 2601



Email: mail@australiainstitute.org.au

Website: www.australiainstitute.org.au

ISSN: 1836-9014

Contents

Summary..... 1

Introduction..... 2

Bus use and emissions 3

Benefits of electric bus uptake 4

Addressing barriers to electric bus uptake..... 6

International movement to electric buses 7

Australian electric bus policy..... 9

Conclusion 12

Annex 1: zero emissions bus policies by state 13

Summary

Transport is the third highest emitting sector in Australia. Currently, Australia's transportation system focuses on private passenger vehicles rather than more sustainable and energy efficient options like public transport. The transition to a zero-emissions transportation sector will involve substantial changes to travel behaviour and urban structures, including lessening car dependency and the electrification of various public transport modes. The electrification of Australia's bus fleets by 2030 is a crucial component of this transition.

The full electrification of bus fleets is a widely popular policy option amongst Australians. The Climate of the Nation 2021 report shows that three in four Australians support the electrification of state bus fleets by 2030.¹

Already, some state and territory governments are accelerating the move to electric buses powered by renewable energy through targets and strategies. The NSW Government has committed to a 100% zero emissions fleet by 2030 and has a dedicated Zero Emissions Bus Transition Strategy.

Victoria has committed to 100% electric bus purchases from 2025. Queensland has committed to 100% of Translink-funded bus purchases being electric from 2025 in South-East Queensland and 2025-2030 across regional Queensland. The ACT is targeting a 100% zero emissions bus fleet by 2040.

Other states and territories are further behind in planning for the electric bus transition. Currently, the Northern Territory, Tasmania, Western Australia, and South Australia do not have any bus electrification targets. However, the Western Australian Government has announced plans to establish an electric bus manufacturing facility in Perth, in partnership with a Federal Labor Government – if elected.

There is a role to play at every government level to successfully transition Australia's bus fleets to zero emissions by 2030. Clear policy direction is necessary from all states and territories, as well as support from the Federal Government.

This report outlines measures that would accelerate Australia's transition to electric buses.

Federally, the government could develop an electric bus manufacturing study, introduce fuel efficiency and vehicle emissions standards that extend to buses, and fund bus driver and mechanic retraining programs. At the state level, governments could commit to more ambitious electric bus fleet and purchase targets and provide funding for charging infrastructure. Locally, councils could introduce low emissions zones and sign the *C40 Green and Healthy Streets Declaration*.

¹ Quicke (2021) *Climate of the Nation*, <https://australiainstitute.org.au/report/climate-of-the-nation-2021/>

Introduction

Australia is in the top ten per cent of polluters in the world. The highest polluting sector, electricity, has been the primary focus of decarbonisation efforts by governments, organisations and businesses. Renewables make up 24% of the National Electricity Market² and the Australian Energy Market Operator is preparing to handle 100% renewables by 2025.³ A majority renewable energy electricity grid is firmly in sight, allowing other sectors to 'plug-in' to zero emissions solutions.

Transport is the third highest emitting sector in Australia. Australia's transportation system currently focuses heavily on personal vehicles rather than more sustainable and energy efficient options like public and active transport, and the nation's transition to electric transport has been comparatively slow.

Shifting from private passenger vehicle use to zero emissions public transport will help curb Australia's rising transport emissions. When considering other factors, such as population growth - particularly in urban areas - and the significant non-CO2 pollutant emissions associated with traditional diesel buses, it is clear that electrification of buses should be a central pillar of any transport decarbonisation strategy.

This report outlines the benefits and potential hurdles to electric bus procurement and provides some policy options to facilitate Australia's electric bus transition.

With clear policy direction from all states and territories, as well as support from the federal government, the ambitious goal of successfully transitioning Australia's bus fleets to zero emissions by 2030 is within reach.

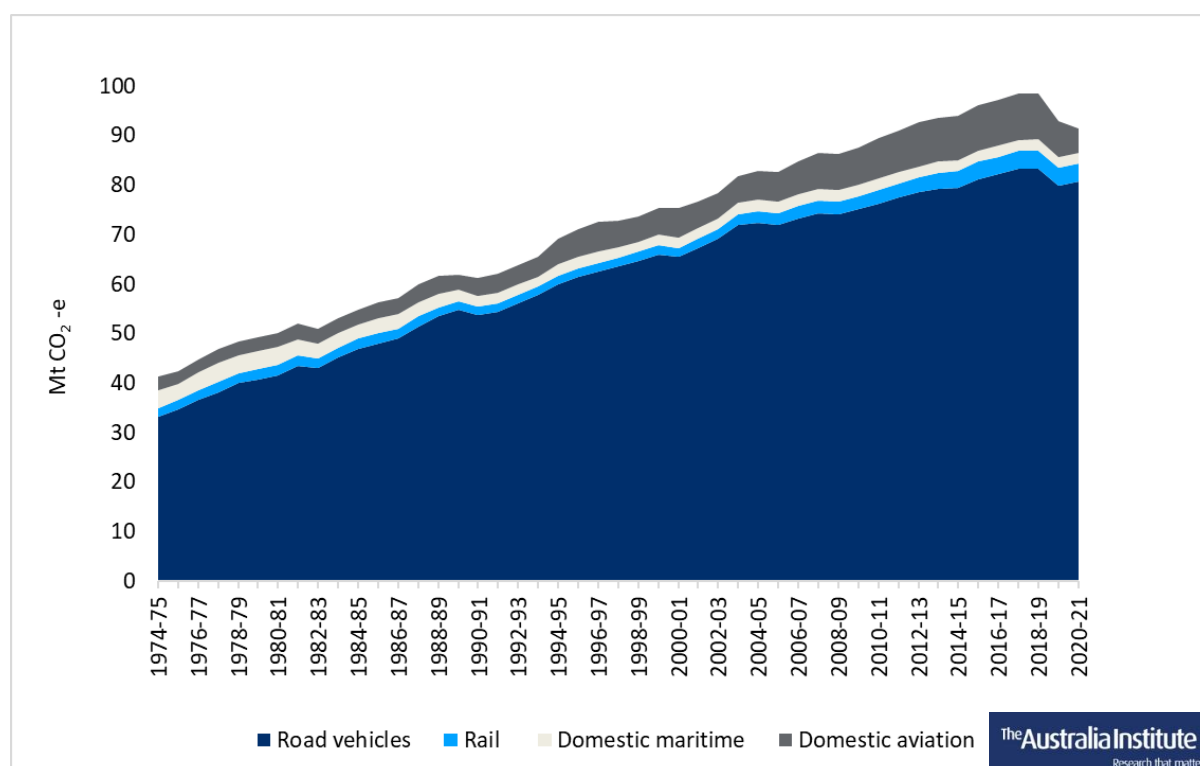
² Department of Industry, Science, Energy and Resources (2021) *Australian Energy Update 2021*, <https://www.energy.gov.au/publications/australian-energy-update-2021>

³ Macdonald-Smith (2021) *AEMO's new challenge: 100pc renewables by 2025*, <https://www.afr.com/companies/energy/aemo-s-new-challenge-100pc-renewables-by-2025-20210712-p5891j>

Bus use and emissions

Transport is the third highest emitting sector and one of the fast growing in terms of emissions. The vast majority (82%) of transport emissions come from road transport, and 62% come from private passenger vehicles alone.⁴ Shifting away from private vehicle use towards zero emissions public transport is a vital piece of the transport decarbonisation puzzle.

Figure 1: Transport (non-electric) greenhouse gas emissions, by vehicle type



Source: BITRE (2021) Australian Infrastructure and Transport Statistics – Yearbook 2021

There are approximately 100,000 registered buses in Australia today.⁵ The roll out of well serviced electric bus routes can encourage greater uptake of public transport, and substantially reduce road vehicle emissions if accompanied by a reduction in reliance of private vehicles.

⁴ Climateworks (2021) *Australia's Transport Emissions*, <https://www.climateworksaustralia.org/news/australias-transport-emissions-the-role-of-electric-vehicles-in-reaching-zero-emissions/>

⁵ Australian Bureau of Statistics (2021) *Motor Vehicle Census Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/motor-vehicle-census-australia/latest-release#methodology>

Australia's poor transport efficiency performance was recently highlighted in the 2022 International Energy Efficiency Scorecard, which examines the energy efficiency policies and performance of 25 of the world's top energy-consuming countries. Since 2016, Australia's rank and overall energy efficiency performance has declined. Overall, Australia ranks third last on transportation in the 2022 Scorecard, due to poor fuel economy for passenger vehicles and low public transit use. Australia ranked third last for its public transit use (of countries with publicly available data).⁶

BENEFITS OF ELECTRIC BUS UPTAKE

Transitioning Australia's bus fleet to electric vehicles powered by 100% renewable energy will bring a range of benefits. Beyond the reduction in greenhouse gas emissions, electric buses are quiet and clean – leading to air quality, health, and well-being benefits. Additionally, a well-managed network can help curb urban sprawl and congestion, be integrated with cycling and walking infrastructure, and provide affordable transport options for Australians.⁷

According to the *2016 Clean Air for NSW* report, there are 520 premature deaths in Sydney each year due to air pollution.⁸ For each replacement of an existing diesel bus by an electric bus, air pollution and health care costs decline. New York City's transition of 5,700 diesel buses to electric is predicted to save AUD \$150,000 per bus each year in health care costs.⁹ In Australia, the NSW Government estimates that \$1-2 billion in environmental and health costs could be saved over 30 years by transitioning the bus fleet from diesel to electric.¹⁰

Electric bus fleets can help overcome barriers to uptake of other electric transport options, including electric passenger vehicles. For many people, an electric bus may be their first interaction with an electric vehicle (EV). A visible and thriving electric bus fleet can help combat misconceptions about EVs, particularly perceived range and charging barriers.

⁶ American Council for an Energy-Efficient Economy (2022) *International Energy Efficiency Scorecard*, <https://www.aceee.org/sites/default/files/pdfs/i2201.pdf>

⁷ Stone et al. (2021) *Don't forget the need for zero-emission buses in the push for electric cars*, <https://theconversation.com/dont-forget-the-need-for-zero-emission-buses-in-the-push-for-electric-cars-160933>

⁸ NSW Government (2016) *Clean Air for NSW* page 10, <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/clean-air-nsw-160415.pdf?la=en&hash=EEF491BFDC5F5C7438AAA62C956B4F8CD392E7A2>

⁹ Legislative Assembly of New South Wales (2020) *Electric buses in regional and metropolitan public transport networks in NSW*, page 3 <https://www.parliament.nsw.gov.au/ladocs/inquiries/2563/Report%20-%20electric%20buses%20in%20regional%20and%20metropolitan%20public%20transport%20networks%20in%20NSW.pdf>

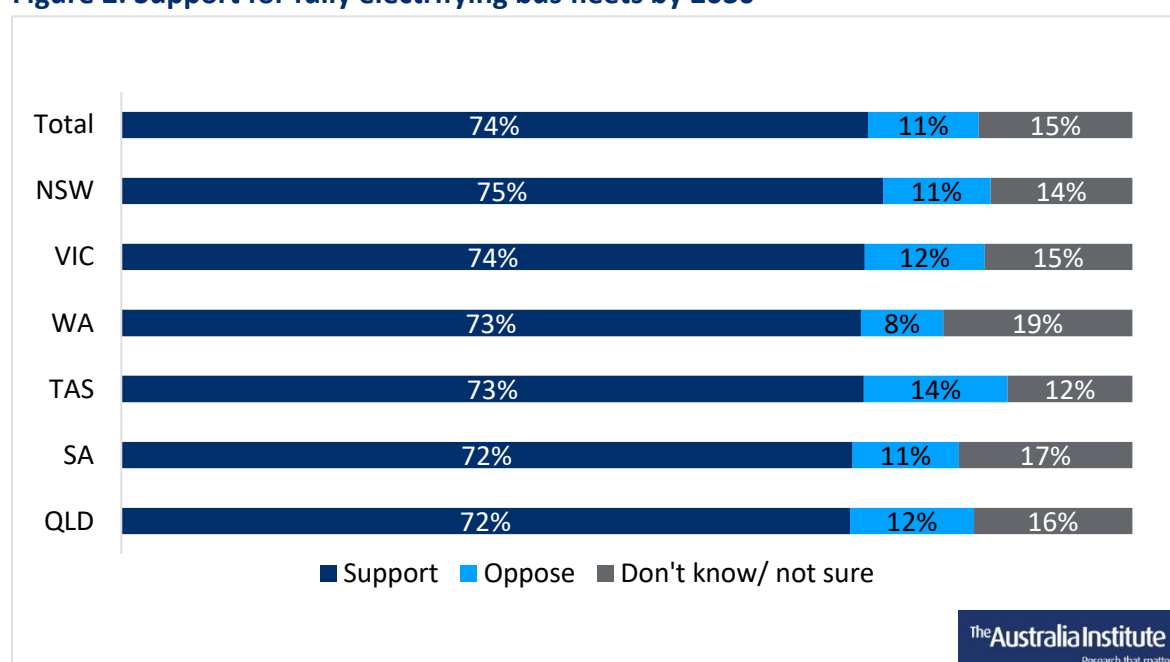
¹⁰ NSW Government (2021) *Zero Emission Buses*, <https://www.transport.nsw.gov.au/projects/current-projects/zero-emission-buses>

The transition to electric buses also has economic and commercial benefits. Electric buses are more fuel efficient and cheaper to run than diesel buses, and total cost of ownership is approaching parity with diesel buses.¹¹

Australia has an opportunity to become a major player in the manufacturing and assembly of electric buses. Between 2017 and 2020 around two thirds of buses sold in Australia (64%) were built locally using imported chassis or structures, while a third (36%) were fully imported.¹² Many of the new buses required to transition state and territory fleets to zero emissions could be, in part, manufactured and assembled in Australia.¹³ Many Australian state and territory governments have stated aims to meet electric bus procurement targets with locally manufactured buses or component parts (discussed further below).

The full electrification of bus fleets is also a widely popular policy option amongst Australians. The Climate of the Nation 2021 report shows strong national support (74%) for fully electrifying state bus fleets by 2030.¹⁴ This support is consistent across all states and territories, ranging from 72% support in South Australia and Queensland to 75% support in New South Wales.

Figure 2: Support for fully electrifying bus fleets by 2030



Source: Climate of the Nation (2021)

¹¹ NSW Government (2021) *Zero Emission Buses*, <https://www.transport.nsw.gov.au/projects/current-projects/zero-emission-buses>

¹² Bus Industry Confederation (2020) *Bus Manufacturing*, <https://movingpeople.com.au/industry-stats/2020-bus-manufacturing-stats/#:~:text=Buses%20sold%20in%20Australia,chassis%20or%20as%20a%20monocoque>.

¹³ Dean (2022) *Rebuilding Vehicle Manufacturing in Australia: Industrial Opportunities in an Electrified Future*, <https://australiainstitute.org.au/report/rebuilding-vehicle-manufacturing-in-australia/>

¹⁴ Quicke (2021) *Climate of the Nation*, <https://australiainstitute.org.au/report/climate-of-the-nation-2021/>

ADDRESSING BARRIERS TO ELECTRIC BUS UPTAKE

A successful transition to electric bus fleets will require a collaborative effort across all levels of government, the private sector, manufacturers, bus operators, and the broader community. Some existing challenges to electric bus roll out are expected to decline as technology becomes more readily available, while other challenges can be managed through proper policy direction, planning and investment.

Electric buses currently have a higher upfront cost compared to Internal Combustion Engine (ICE) alternatives. Diesel buses cost around \$480,000, whereas an electric bus costs between \$550,000 and \$900,000.¹⁵ Additionally, some bus types currently in use in Australia such as some double decker and articulated configurations (also known as bendybuses) do not have a readily available electric version.¹⁶ However, electric bus technology is rapidly evolving and lower operating costs will result in long-term savings over vehicle lifetime.

The ability to quickly transition bus fleets to electric is dependent on the age of the fleets. Some bus fleets are relatively young, and not due for replacement within the near future. This can delay goals to electrify fleets but can be managed by complementing fleet commitments with commitments not to purchase new ICE buses.

Additionally, investment in supporting charging infrastructure upgrades at bus depots and upgrades to the electricity grid will be necessary. Land availability for charging depots can be a major constraint to electric bus roll out, particularly in highly developed urban areas, and working with distribution networks to set up electric charging depots is essential. In regional communities, strategies for charging infrastructure roll out will need to be developed and tailored to regional and rural needs. Regional school buses are often driven by members of the local community and parked in private garages, so the provision of charging infrastructure for these buses will be significantly different to roll out in urban areas.

Challenges may stem from the perceived negative experiences some bus drivers had during early electric bus trials. Results from the ACT Government trial of electric buses in 2019 (informed largely by bus driver surveys) found that electric buses performed best in relation to emissions, efficiency and whole of life costs, however some drivers noted 'uncertainty regarding their reliability'.¹⁷ While these concerns have been largely addressed through technology improvements, training programs for bus operators, drivers and mechanics can also help alleviate concerns.

Three notable initiatives to support workers to up-skill in the industry and to diversify the industry have been introduced by the ACT, NSW and Victorian governments. The ACT

¹⁵ Boyd (2021) *Start-up rides high on electric buses*, <https://www.afr.com/chanticleer/start-up-rides-high-on-electric-buses-20211008-p58ych>

¹⁶ NSW Government (2021) *Zero Emission Buses*, <https://www.transport.nsw.gov.au/projects/current-projects/zero-emission-buses>

¹⁷ Transport Canberra (2019) *Alternative Fuel Bus Trial Assessment*, <https://nla.gov.au/nla.obj-1905079110/view>

Government is supporting diesel bus mechanics to gain skills to work with new electric models.¹⁸ TAFE NSW is delivering an electric vehicle training strategy to standardise safety regulations and support industry transition to electric buses.¹⁹ The Victorian Government is seeking to improve gender diversity and equality in the bus industry through targeted scholarships and initiatives to encourage women to develop careers in the bus industry.²⁰

The transition to electric buses could be hampered if governments wait for hydrogen fuel cell technology to develop. Currently, battery technology is more progressed and affordable than hydrogen fuel-cell bus technology. As discussed below, this can delay the transition to electric buses as governments wait for hydrogen technology to progress before making electric bus commitments. The French city of Montpellier recently switched from hydrogen to electric bus contracts based predominantly on operation costs.²¹

INTERNATIONAL MOVEMENT TO ELECTRIC BUSES

A number of national and sub-national governments have set targets to phase out ICE buses or procure 100% electric buses. Seven countries have a target for a 100% electric bus fleet (Denmark, The Netherlands, New Zealand, Austria, Cape Verde, Chile, and Colombia). A number of large sub-national governments have similar targets, including California (2029 target year for 100% electric bus procurement, and 2040 target year for 100% electric bus fleet).²²

¹⁸ ACT Government (2021) *Canberra's bus mechanics go electric with future-focused training*, https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/chris-steel-mla-media-releases/2021/canberras-bus-mechanics-go-electric-with-future-focused-training

¹⁹ NSW Government (2021) *Zero Emission Buses*, <https://www.transport.nsw.gov.au/projects/current-projects/zero-emission-buses>

²⁰ Victorian Government (2021) *Victoria's Bus Plan*, https://mtf.org.au/wp-content/uploads/2021/06/DoT_Victorias_Bus_Plan_June_21.pdf

²¹ Hanley (2022) *French city cancels hydrogen bus contract, opts for electric buses*, <https://cleantechnica.com/2022/01/11/french-city-cancels-hydrogen-bus-contract-opts-for-electric-buses/>

²² Wappelhorst and Rodriguez (2021) *Decarbonising bus fleets: global overview of targets for phasing out combustion engine vehicles*, <https://theicct.org/decarbonizing-bus-fleets-global-overview-of-targets-for-phasing-out-combustion-engine-vehicles/>

Table 1: National targets for 100% zero emission buses

Country	Target year for 100% electric new bus procurements	Target year for 100% electric bus fleet
Denmark	2025* buses in cities	2030* buses in cities
Netherlands	2025	2030
New Zealand	2025	2035
Austria	2032	Not specified
Cape Verde	2035	2050
Chile	2035	Not specified
Columbia	2035	Not specified

Source: The International Council on Clean Transport (2021)



Shenzhen, China, with a population of 12.59 million was the first major city in the world to switch its entire bus fleet to electric.²³ The city's fleet electrification took place over a relatively short time frame, from 2009 to 2017.

The Shenzhen experience provides a useful case study of bus electrification and highlights the importance of collaboration. According to the International Energy Agency's analysis of the Shenzhen bus transition, "the partnership among bus operators, bus manufacturers, financial organisations and charging companies significantly alleviated the technology uncertainty and spread the cost burden."²⁴ It also highlights the importance of subsidies from multiple levels of government.

Shenzhen is the first of many cities making the switch to electric buses. Currently over 30 cities including London, Copenhagen and, closer to home - Auckland, have signed the *C40 Green and Healthy Streets Declaration*, pledging to buy only electric buses from 2025.²⁵ No Australian cities have yet signed up.

²³ Keegan (2018) *Shenzhen's silent revolution: world's first fully electric bus fleet quietens Chinese megacity*, <https://www.theguardian.com/cities/2018/dec/12/silence-shenzhen-world-first-electric-bus-fleet>

²⁴ International Energy Agency (2020) *Case Study: Electric buses in Shenzhen, China*, <https://iea.blob.core.windows.net/assets/db408b53-276c-47d6-8b05-52e53b1208e1/e-bus-case-study-Shenzhen.pdf>

²⁵ C40 Cities Climate Leadership Group (n.d.) *Green & Healthy Streets Declaration*, <https://www.c40.org/declarations/green-healthy-streets-declaration/>

AUSTRALIAN ELECTRIC BUS POLICY

The Federal Government provides some co-funding for electric bus trials, pilots and new vehicle deployment – often by directing existing funding from the Clean Energy Finance Corporation (CEFC) or the Australian Renewable Energy Agency (ARENA). For example, \$29m was recently provided by CEFC and ARENA to support 40 new electric buses deployed across Sydney.²⁶

Most states and territories own the buses in part or full and therefore have a central role to play in the electric bus transition. Bus electrification policies vary across state and territory governments. NSW currently has the most comprehensive bus electrification policies, laid out in the NSW Zero Emissions Bus Transition Strategy. The NSW Government has committed to a 100% zero emissions fleet by 2030.

Queensland has committed to 100% of Translink-funded bus purchases being electric from 2025 in South-East Queensland and from 2025-2030 across regional Queensland. The urban focus in South-East Queensland is part of Queensland's infrastructure investment for the 2032 Brisbane Olympic and Paralympic Games.²⁷ In addition to Queensland's purchase targets, the Government recently opened a 100% renewable energy electric bus depot, which is expected to house 14 electric buses.²⁸ To accelerate the state's transition to electric buses, Queensland could introduce a fleet target to complement the purchase targets.

The ACT is targeting 100% zero emissions bus fleet by 2040. While there are suggestions that the ACT hopes to transition the entire fleet far earlier, the Territory could move the official position forward to be in line with other leading states.

Victoria has committed to 100% electric bus purchases from 2025 but does not have a fleet target. While this purchase commitment is a good start, it could be bolstered by a complimentary fleet target in line with NSW's.

The Northern Territory, Tasmania, Western Australia, and South Australia do not have any bus electrification targets. According to the Northern Territory's electric vehicle plan, the territory is 'investigating the feasibility of trialing low and zero emission buses' from 2021-2026.²⁹ Metro Tasmania is currently undertaking a similar trial for zero emissions buses to

²⁶ Department of Industry, Science, Energy and Resources (2021) *Supporting Australia's biggest electric bus fleet*, <https://www.energy.gov.au/news-media/news/supporting-australias-biggest-electric-bus-fleet>

²⁷ Bailey (2021) *Making the connection: plan to drive Queensland's transport future*, <https://statements.qld.gov.au/statements/92901>

²⁸ Utting (2022) *Electric buses to be rolled out in Queensland as Australian-first bus depot open on Gold Coast*, <https://www.abc.net.au/news/2022-04-13/electric-buses-rolled-out-queensland-environment/100984570>

²⁹ Northern Territory Government (2021) *Northern Territory Electric Vehicle Strategy and Implementation Plan 2021-2026*, https://dipl.nt.gov.au/__data/assets/pdf_file/0007/1027483/electric-vehicle-strategy-implementation-plan.PDF

decide between purchasing hydrogen or electric buses for its fleet.³⁰ According to South Australia's electric vehicle plan, South Australia intends to 'deliver an electric bus grid integration study' to decide between hydrogen and electric buses.³¹

In 2021, Transperth (providers of public transport services for the Perth metro area) trialed electric buses, deploying the first electric bus on the Joondalup Central Area Transit circuit in January 2022.³² The Western Australian Premier Mark McGowan has recently announced that the Western Australian Government would commit to purchasing and manufacturing 130 electric buses in partnership with a federal Labor government, if elected – with both governments committing \$250 million towards a local electric bus manufacturing facility.³³

There are opportunities for local governments and councils in Australia to accelerate the transition to electric buses and decarbonise the transport sector. Local governments can introduce low emission zones and prioritise active transport in cities, which are two policies outlined in the *C40 Green and Healthy Streets Declaration*.³⁴ Signing the Declaration would also signal local governments' commitment to purchase electric buses only from 2025. Low emissions zones, which involve limiting fossil-fuel vehicle access in cities or certain areas, have been enforced in more than 250 European cities.³⁵ Implementing low emissions zones in school zones could also be an effective way to bring down emissions in densely populated areas.

Potential policy options to support the transition to electric buses are suggested below:

Local Government level

- Introduce **low emissions zones** (particularly in school zones) to apply to both light and heavy vehicles.
- Sign the **C40 Green and Healthy Streets Declaration** – pledge to only buy electric buses from 2025.

State level

- Commit to **zero-emissions bus fleet by 2030**.

³⁰ Gutwein (2020) *Ambitious 100% Electric Vehicle Target*, https://www.premier.tas.gov.au/budget_2020/budget_releases/ambitious_100_electric_vehicle_target

³¹ South Australia Government (2020) *South Australia's Electric Vehicle Action Plan*, https://www.energymining.sa.gov.au/__data/assets/pdf_file/0020/376130/201216_Electric_Vehicle_Action_Plan.pdf

³² Western Australia Government (2021) *Transperth's first electric bus getting ready for Joondalup trial*, <https://www.pta.wa.gov.au/news/media-statements/transperths-first-electric-bus-getting-ready-for-joondalup-trial>

³³ ALP (2022) *Making Electric Buses in Perth*, <https://www.alp.org.au/policies/making-electric-buses-in-perth>

³⁴ C40 Cities (n.d.) *Green & Healthy Streets Declaration*, <https://www.c40.org/declarations/green-healthy-streets-declaration/>

³⁵ McGrath (2019) *ULEZ: How does London's new emissions zone compare?*, [bbc.com/news/science-environment-47816360](https://www.bbc.com/news/science-environment-47816360)

- Implement 2030 targets in those states and territories currently without any – Western Australia, Tasmania, and the Northern Territory.
- Implement a 2030 fleet target in Queensland to complement the existing purchase targets.
- Bringing forward the target year in the ACT to 2030.
- Include interim targets underneath the current long-term goals in every state/territory – so progress towards targets can be measured. (for example – 40% of the bus fleet zero-emissions by 2025)
- Commit to **buying or leasing only zero emissions buses from 2025**.
- Provide **funding for charging infrastructure and bus depot upgrades**.
- Prioritise **school buses**. State and Territory Governments could commit to **zero emissions school buses** (public buses that either travel on specific school travel routes, or on public routes that with lots of school children).

Federal level

- Develop an **electric bus manufacturing study** to coordinate transport manufacturing and facilitate joint procurement.
- Introduce fuel efficiency and vehicle emissions standards which extend to buses.
- Fund bus driver, operator and mechanic **retraining programs**.
- Explore **co-funding commitments**.
 - Similar to the Shenzhen, China case where national subsidies for electric buses were matched by local governments
 - Propose new funding models that would alleviate some of the higher upfront cost and risk associated with electric bus purchases.

Conclusion

The transition to a zero-emissions transportation sector in Australia will involve a range of transport solutions - electrifying passenger transport, investing in public and active transport, and shifting freight vehicles from road to rail. Electrifying our bus fleets is a vital piece of this decarbonisation puzzle.

There is a role to play at every level to accelerate the electric bus transition. Public and private sector collaboration will be key, as will input from distribution network operators, bus drivers, and bus users.

Policy certainty from state governments and financial support from the federal government will play a central role in achieving the widely supported endeavor of transitioning to electric bus fleets by 2030.

ANNEX 1: ZERO EMISSIONS BUS POLICIES BY STATE

State	Zero emission bus target	Strategy document	Current bus fleet	Possible improvements
NSW	100% zero emissions bus fleet by 2030.	NSW Zero Emissions Bus Transition Strategy. ¹	Over 8,300 mostly diesel buses.	Introduce interim target to make sure 2030 target is on track.
Queensland	100% of Translink-funded bus purchases will be zero emissions from 2025 in South-East Queensland and from 2025-2030 across regional Queensland. ²	<i>No stand-alone e-bus strategy.</i>	Total 2,400 buses. 1,200 operated by Brisbane City Council and 1,200 privately operated. ³	Introduce 2030 fleet target to complement purchase targets. Introduce stand-alone e-bus strategy.
Victoria	100% zero emissions bus purchases from 2025. ⁴	Victoria's Bus Plan. ⁵	4,000+ buses. ⁶	Introduce 2030 fleet target to complement purchase target.
ACT	100% zero emissions bus fleet by 2040 or earlier. ⁷	Zero-emissions Transition Plan for Transport Canberra. ⁸	451 buses. Combination of diesel, CNG and one electric bus. ⁹	Bring 2040 target forward, in line with leading states.
Northern Territory	<i>None</i>	<i>No stand-alone e-bus strategy.</i> ¹⁰	190 buses, currently all diesel fleet. ¹¹	Introduce bus electrification target and a stand-alone e-bus strategy.
Tasmania	<i>None</i>	<i>No stand-alone e-bus strategy.</i>	224 buses. ¹²	Introduce bus electrification target and a stand-alone e-bus strategy.
Western Australia	<i>None</i>	<i>No stand-alone e-bus strategy.</i>	1,631 buses. ¹³	Introduce bus electrification target and a stand-alone e-bus strategy.
South Australia	<i>None</i>	<i>No stand-alone e-bus strategy.</i> ¹⁴	1,000 buses. ¹⁵	Introduce bus electrification target and a stand-alone e-bus strategy.

-
- ¹ NSW Government (2021) *Zero Emission Buses*, <https://www.transport.nsw.gov.au/projects/current-projects/zero-emission-buses>
- ² Queensland Government (2021) *Making the connection: plan to drive Queensland's transport future*, <https://statements.qld.gov.au/statements/92901>
- ³ Brisbane City Council (n.d.) *Your buses*, <https://www.brisbane.qld.gov.au/traffic-and-transport/public-transport/buses/your-buses>
- ⁴ Andrews (2021) *New bus franchise to jump start zero emissions pledge*, <https://www.premier.vic.gov.au/new-bus-franchise-jump-start-zero-emissions-pledge>
- ⁵ Ibid.
- ⁶ Victorian Government (n.d.) *Buses vital to integrated network*, <https://transport.vic.gov.au/getting-around/public-transport/buses>
- ⁷ ACT Government (n.d.) *Market sounding: first tranche of battery electric buses*, <https://www.transport.act.gov.au/about-us/planning-for-the-future/zero-emission-transition-plan-for-transport/market-sounding-first-tranche-of-zero-emissions-buses>
- ⁸ ACT Government (n.d.) *Zero Emissions Transition Plan for Transport Canberra*, https://www.transport.act.gov.au/__data/assets/pdf_file/0010/1625095/ZERO-EMISSION-TRANSITION-FINAL-.pdf
- ⁹ <https://www.transport.act.gov.au/about-us/planning-for-the-future/zero-emission-transition-plan-for-transport/transport-canberra#:~:text=The%20Transport%20Canberra%20fleet%2C%20summarised,electric%20bus%20also%20in%20service.>
- ¹⁰ Northern Territory Government (2021) *Northern Territory Electric Vehicle Strategy and Implementation Plan 2021-2026*, https://dipl.nt.gov.au/__data/assets/pdf_file/0007/1027483/electric-vehicle-strategy-implementation-plan.PDF
- ¹¹ Northern Territory Government (2019) *Preparing the Northern Territory for Electric Vehicles*, https://dipl.nt.gov.au/__data/assets/pdf_file/0007/742759/electric-vehicle-discussion-paper-2019.pdf
- ¹² Metro Tasmania (2021) <https://www.metrotas.com.au/>
- ¹³ Perth Bus (2021) *PTA Summary by chassis type*, <https://perthbus.info/prequery.php?qqid=151501500000000&ccid=20.0>
- ¹⁴ South Australia Government (2020) *South Australia's Electric Vehicle Action Plan*, https://www.energymining.sa.gov.au/__data/assets/pdf_file/0020/376130/201216_Electric_Vehicle_Action_Plan.pdf
- ¹⁵ SouthLink (n.d.) <https://www.southlink.com.au/>