Options for Reducing Vehicle Emissions

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How do vehicle emissions affect the earth?

Vehicle emissions are a major contributor to climate change because they release greenhouse gases such as carbon dioxide (CO_2). These gases trap heat in the atmosphere through the Greenhouse Effect, leading to global warming. As temperatures increase, earth experiences long-term climate changes, including more extreme weather events, melting ice caps, and rising sea levels.

In addition to the impact to the climate, vehicle emissions significantly degrade air quality. Pollutants such as nitrogen oxides, carbon monoxide, and particulate matter contribute to smog formation and can harm human health. Long-term exposure to polluted air increases the risk of respiratory conditions like Asthma and other cardiovascular problems, especially in densely populated urban areas[1].

Vehicle-related pollution also affects the natural environment. Harmful substances released into the air can settle on land and in water bodies, harming plants, animals, and entire eco-systems. These emissions contribute to Acid Rain, which can harm forests, acidify lakes, and reduce agricultural productivity, consequently disrupting biodiversity and food production.

Urban environments are more vulnerable to the effects of vehicle emissions. High traffic volumes intensify the heat, where buildings and pollution cause cities to retain more heat than rural areas. This results in higher temperatures and increased energy consumption for cooling in urban areas[2].

Finally, vehicle emissions play a key role in the formation of ground-level ozone, a harmful component of smog. Unlike the protective ozone layer in the upper atmosphere, ground-level ozone damages lung tissue, reduces crop yields, and negatively impacts ecosystems.

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[1] Environmental Impact of Cars, National Geographic https://www.nationalgeographic.com/environment/article/environmental-impact accessed on 30 March 2026

[2] Environmental Impact of Vehicle Emission Tarun Gehlot, Harshveer Singh Kachhwaha, Journal of Research and Administration (JRA) https://journlra.org/index.php/jra/article/view/228 accessed on 30 March 2026

Together, these effects highlight the significant environmental and climatic consequences of transportation-related emissions[3].

Considering the fact that vehicle emissions cause many negative effects that result in short term issues such as damage to habitats and health problems to long term problems such as global warming it would be prudent for us to consider looking at the different options available to reduce vehicle emissions.

Current laws and policies in force in Australia aimed at promoting alternative options for transportation and reducing vehicle emissions

Australia's approach to reducing vehicle emissions comprises a combination of regulatory standards, market-focused policies, and supporting measures.

They can be categorized as laws and policies;

A) aimed at reducing vehicle emissions;

B) focusing on limiting pollution;

C) improving fuel efficiency, and

D) encouraging cleaner technologies.

These can be grouped into a few key national frameworks:

Australia's primary regulatory system is the Australian Design Rules (ADRs), which are national standards covering vehicle safety and emissions. These rules require all new vehicles sold in Australia to meet specific limits on pollutants such as carbon monoxide, nitrogen oxides, and particulate matter before they can enter the market. The ADRs are enforced under the Road Vehicle Standards Act 2018[4], and has been progressively tightened over time to reduce environmental impact[5].

[3] ibid

[4] The *Road Vehicle Standards Act 2018* is the main Australian law that regulates vehicle safety, environmental performance, and compliance. It ensures that all vehicles supplied to the Australian market meet nationally consistent standards and are properly approved before use.https://www.legislation.gov.au/C2024A00035/latest/text accessed on 30 March 2026

[5] Australian Design Rules https://www.infrastructure.gov.au/infrastructure-transport-vehicles/vehicles/vehicle-design-regulation/australian-design-rules?utm_source=chatgpt.com accessed on 5 April 2026

Recent updates to the ADRs align Australia with international "Euro" standards[6]. For example, newer rules (such as ADR 79/05[7]) adopt Euro 6d–equivalent standards[8], which significantly reduce harmful exhaust emissions from vehicles[9]. These stricter standards began applying to new models from 2025 and will apply to all new vehicles by 2028, helping to improve air quality and reduce health risks.

A noteworthy recent policy is the New Vehicle Efficiency Standard (NVES), introduced under the New Vehicle Efficiency Standard Act 2024. This policy sets limits on the average carbon dioxide (CO_2) emissions of new vehicles sold by manufacturers. Starting in 2025, car companies must meet declining emission targets across their range of products, encouraging the supply of more fuel-efficient, hybrid, and electric vehicles[10].

As a further step towards reducing vehicle emissions, Australia also regulates fuel quality standards (Fuel Quality Standards Act 2000), which limit the amount of harmful substances in petrol and diesel. Cleaner fuels allow modern engines and emission-control technologies to work more effectively, reducing overall pollution. Improvements to fuel quality (such as reducing sulfur and aromatics) are being introduced alongside stricter vehicle emission standards[11].

In addition, fuel consumption and emissions labelling laws[12] require new vehicles to display information about their fuel use and CO_2 emissions. Updated labelling standards (such as ADR 81/03[13]) use more accurate global testing methods, helping consumers compare vehicles and choose lower-emission options.

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[6] Introduced in 1991, Euro Standards are mandatory European Union regulations limiting tailpipe emissions of harmful pollutants like NOx, CO, and particulates from new vehicles.

[7] ADR 79/05 is an Australian Design Rule that sets limits on exhaust emissions from light vehicles, aligning closely with Euro 5 standards and helping reduce air pollution by requiring cleaner vehicle technologies.

[8] Euro 6d standards are strict, European-based emission regulations for new passenger and light commercial vehicles, focusing on reducing nitrogen oxides and particulate matter.

[9] What are the new ADRs for light vehicle noxious emissions? https://www.infrastructure.gov.au/questions-and-answers-new-adrs-light-vehicle-noxious-emissions accessed on 30 March 2026

[10] New Vehicle Efficiency Standard https://www.infrastructure.gov.au/infrastructure-transport-vehicles/vehicles/new-vehicle-efficiency-standard accessed on 5 April 2026

[11] Regulating Australian fuel quality 25 march 2026 https://www.dcceew.gov.au/climate-change/emissions-reduction/regulating-fuel-quality#toc_0 accessed on 05 April 2026

[12] Fuel consumption and emissions labelling laws are rules that require car manufacturers to clearly show how much fuel a vehicle uses and how much pollution it produces. New cars must display a Fuel Consumption LabelIt shows: Fuel use (L/100km) and CO_2 emissions (g/km)

[13] Fuel Consumption labels for light vehicles

The government encourages the use of Electric vehicles (EVs) and Hybrid vehicles through a mix of financial incentives, policies, and infrastructure support. The government has granted tax exemptions and reductions for electric and hybrid vehicles and increased charging facilities. The government has also started using electric vehicles to fulfill their official vehicle requirements[14].

It is evident that Australia has made a significant effort to reduce vehicle emissions with a combination of laws and policies aimed to reduce air pollution, lower greenhouse gas emissions, and encourage the transition of the transport sector to cleaner and more sustainable technologies.

Incentives given to Australian vehicle manufacturers and importers to encourage manufacture and import of low emission vehicles

It can be safely stated that incentives aimed specifically at vehicle manufacturers (i.e. to *produce or* supply low-emission vehicles) are relatively limited in Australia compared to other countries. The tax or exemptions are limited to Fringe Benefit Tax Exemption[15], Import Tariff Exemption[16] and Higher Luxury Car Threshold[17]. Instead, the system relies on a mix of regulatory pressure and indirect incentives[18]

Australia's main policy targeting manufacturers is the NVES, which sets limits on the average emissions of vehicles sold by each company. Manufacturers that exceed these limits face financial penalties, while those that supply lower or zero-emission vehicles earn credits. This system encourages companies to bring cleaner vehicles, like electric cars, into the Australian market.

Rather than directly supporting manufacturers, Australia focuses on making low-emission vehicles more attractive to buyers. Incentives such as Fringe Benefits Tax exemptions for EVs, reduced import tariffs, and higher luxury car tax thresholds increase demand. As more consumers choose cleaner vehicles, manufacturers are encouraged to supply more of them[19].

The Australian government has introduced broader strategies to support the transition to low-emission

[14] Commonwealth Fleet Vehicle Selection Policy https://www.finance.gov.au/government/procurement/v fleet-vehicle-selection-policy?utm_source=chatgpt.com a

[15] Eligible electric cars provided by employers to emplo ted leasing) are exempt from FBT.

[16] The 5% import tariff on eligible electric vehicles has been removed.

[17] For the 2025-26 financial year, the LCT threshold for fuel-efficient vehicles (including EVs) is $91,387, which is significantly higher than the $80,567 threshold for standard petrol/diesel vehicles.

[18]Government Initiatives Supporting Electric Vehicles https://www.energy.gov.au/electric-vehicles/government-initiatives-supporting-electric-vehicles?utm accessed on 30 March 2026

[19]WhipSmart Drives Down EV Costs for Australians With Fringe Benefits Tax Exemption on Novated Leases https://www.aap.com.au/aapreleases/globenewswire9571687/ accessed on 5 April 2026

transport. These include expanding charging infrastructure and improving access to electric vehicles. While these policies help shape the market, they mainly influence manufacturers indirectly rather than providing direct financial support[20].

Unlike some other countries, Australia offers very few direct financial incentives to vehicle manufacturers. There are no large-scale subsidies for building EV factories or major tax credits given to vehicle producers. This is due to Australia's smaller domestic manufacturing industry and its reliance on imported vehicles[21].

The most appropriate and efficient method to encourage the general public to use more cleaner and energy efficient modes of transport is by making such modes more accessible, economical and attractive to the general public. However, In the above circumstances it is clear that Australia's approach relies more on regulation and market forces than direct subsidies that would help the manufacturers to make the vehicle more attractive by reduced prices. Manufacturers are encouraged to reduce emissions through penalties and credit systems, while consumer incentives help drive demand for cleaner vehicles.

Have the laws and regulations put in place to reduce vehicle emissions been successful?

Australia's new vehicle policies have begun to reduce emissions, but the impact so far is small. Early results show that emissions from new cars are decreasing, with many manufacturers meeting targets and more low-emission vehicles being sold. This suggests the policies are affecting what types of vehicles are entering the market[22].

However, the overall reduction in emissions across the entire transport sector is still limited. While new vehicles are cleaner, total transport emissions have not dropped significantly and have increased over the long term. This means the broader environmental impact is still developing[23].

One reason for this is that cars remain on the road for many years, so older, high-emission vehicles are still widely used. In addition, the policies are very recent, having only been introduced in 2025, so there has not been enough time to see large-scale changes.

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[20] Ibid

[21] David Bonnici How Australia's EV Incentives stack up against the world "Which car by wheels" https://www.whichcar.com.au/advice/how-australias-ev-incentives-compare accessed on 5 April 2026

[22] Damian Smy, Australia's new vehicle emissions regulations delivering results, says Bowen Car Expert, 25 February 2026 https://www.carexpert.com.au/car-news/australias-new-vehicle-emissions-regulations-delivering-results-says-bowen accessed on 31 March 2026

[23] Ged Bulmer, First NVES report divides opinions 26 February 2026 https://www.racq.com.au/articles/car-updates/first-nves-report-divides-opinions accessed on 30 March 2026

Another factor is that electric vehicles still make up a relatively small share of total car sales. Although their numbers are growing, most vehicles sold are still petrol, diesel, or hybrid Government projections show that transport emissions in Australia are expected to decrease by about 6% between 2025 and 2030, and by around 22% by 2040. These reductions are largely driven by policies like the New Vehicle Efficiency Standard (NVES) and increased uptake of low-emission vehicles[24].

Under current policies, emissions from new vehicles are projected to drop rapidly. The NVES aims for roughly a 60% reduction in emission intensity of new passenger vehicles by the late 2020s, meaning each new car will produce far less CO_2 than today[25].

By 2030, the vehicle efficiency standards are expected to cut emissions by tens of millions of tonnes, and by 2050 this could reach hundreds of millions of tonnes of avoided emissions. This shows that while early reductions may not be significant, the long-term impact is substantial[26].

Comparative analysis of Australian laws and policies and laws and policies of other developed countries in relation to vehicle emission

Australia mainly relies on regulation and demand and there is very limited direct financial support for manufacturers. This is in sharp contrast to laws and policies adopted by many other developed countries. The United Kingdom uses a mix of strict regulation and some targeted support. There is a requirement for manufacturers to sell a growing percentage of electric vehicles each year or face fines. While direct subsidies for manufacturers are limited, the UK supports battery production and EV supply chains through grants and industrial funding programs. The United States provides strong direct incentives for manufacturers. Under the Inflation Reduction Act[27]companies receive large tax credits and subsidies for producing EVs and batteries domestically. There are also strict emissions standards. The European Union (EU) focuses heavily on strict emissions regulations, such as fleet-wide CO_2 limits and a planned phase-out of new petrol and diesel cars by 2035. While direct subsidies vary by country, many EU nations (such as Germany and France) provide funding for EV factories and battery production. China offers the most extensive support for manufacturers. The government provides large subsidies, tax exemptions, and low-cost financing for EV production. Policies like the New Energy Vehicle (NEV) mandate require manufacturers to meet EV quotas, similar to a credit system. China also heavily invests in battery supply chains, making it a global leader in EV manufacturing[28].

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[24] Australia's emissions projections 2025 https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2025?utm_source=chatgpt.com accessed on 05 April 2026

[25] Ibid

[26] Ibid

[27] **Inflation Reduction Act of 2022, Public Law 117–169, 136 Stat. 1818 (2022)**

[28] Global comparison study reveals Australia's EV policy challenge Arcadis, NOV 17, 2021 https://www.arcadis.com/en-au/news/australia/australia/2021/11/global-comparison-study-reveals-australias-ev-policy-challenge accessed on 31 March 2026

In view of the above it is clear that most other developed countries have adopted more far reaching, proactive and overarching measures to reduce vehicle emission as opposed to Australia.

Moving towards reducing vehicle emissions - Australian and International Conferences

There are several recent and upcoming conferences focused on reducing vehicle emissions and advancing sustainable transport, both in Australia and globally. In Australia, one of the most relevant emerging events is MOVE Australia 2026, which is expected to become a key national platform for discussions around zero-emission transport, electric vehicles, infrastructure, and mobility systems. It brings together stakeholders from government, industry, and energy sectors, making it especially useful for anyone interested in the transition to low-emission transport[29]. Another Australian event, Sustainability Business Live, covers a broader sustainability agenda but still includes important discussions on electrification, energy efficiency, and transport emissions, offering a wider perspective[30].

Internationally, there are several major conferences with strong relevance to vehicle emissions reduction. The Zero Emission Transit & Mobility Conference focuses specifically on decarbonising public transport systems, including electric buses, hydrogen fleets, and large-scale deployment strategies. It is an annual event organised by the Canadian Urban Transit Research & Innovation Consortium (CUTRIC), focused on advancing zero-emission public transport systems. The conference brings together transport agencies, policymakers, industry experts, and researchers to discuss the challenges and opportunities involved in transitioning to low and zero-emission modes of transport[31].

Meanwhile, the ITS World Congress explores how intelligent transport systems such as AI-driven traffic management and connected vehicle technologies can help reduce emissions through improved efficiency[32]. This conference theme addresses all modes of transport including public and private transport, air, sea and land transport and logistics. On a broader scale, the UN Climate Conference (COP31), scheduled for 2026, will include extensive discussions on transport emissions policy, as the transport sector remains a significant contributor to global greenhouse gas emissions[33].

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[29] Move Australia official website - https://www.terrapinn.com/exhibition/move-au/index.stm accessed 04 April 2026

[30] Sustainability Business Live official website https://sustainabilitybusinesslive.com.au/?utm_ accessed on 04 April 2026

[31] Official website for CUTRIC https://cutric-crituc.org/cutric-zero-emission-transit-mobility-conference/?utm_accessed on 04 April 2026

[32] Official website for ITS World Conference https://2026.itseuropeancongress.com/programme/congress-theme-topics accessed on 04 April 2026

[33] Official website for UN Climate Change Conference https://unfccc.int/cop31?utm_accessed on 04 April 2026

In addition to these, there are more specialized, industry-focused conferences that examine emissions from a lifecycle or technical perspective. For example, the Sustainable Vehicle Production conference[34] looks at reducing emissions in vehicle manufacturing, including materials, supply chains, and production processes. Another specific but increasingly important area is covered by the Tyre Emissions & Sustainability conference[35], which focuses on non-exhaust emissions such as tyre wear particles and microplastics, an area gaining attention as exhaust emissions decline with electrification.

Overall, all these conferences highlight the impact of transport on increasing greenhouse gases and the consequent impact on global warming and climate change and the urgent need to address these issues to minimise the effects, as individual countries and as a global community.

What further steps should Australia take to reduce vehicle emissions?

- **Strengthen emission standards:** Australia could make the New Vehicle Efficiency Standard (NVES) stricter over time and align it more closely with leading regions like Europe. Tighter limits would push manufacturers to supply lower and zero-emission vehicles faster.
- **Increase incentives for electric vehicles:** Providing stronger financial incentives such as tax credits, or subsidies would make electric vehicles more affordable. This would speed up adoption and increase demand for low-emission cars.
- **Invest in charging infrastructure:** Expanding public charging networks, especially in regional and remote areas, would make EV ownership more practical. Reliable and widespread charging access is essential for large-scale adoption.
- **Support local industry and innovation:** Australia could invest in battery production, EV manufacturing, and research into low-emission technologies. This would reduce reliance on imports and strengthen the clean transport sector.
- **Improve public transport and urban planning:** Better public transport systems and more walkable, bike-friendly cities can reduce reliance on private cars. Fewer cars on the road means lower overall emissions.
- **Encourage behavioural change:** Programs that promote carpooling, remote work, and fuel-efficient driving can reduce emissions without requiring major technological changes.
- **Transition of heavy transport:** Policies targeting trucks and freight such as supporting electric or hydrogen-powered heavy vehicles would address a major source of transport emissions that is often harder to reduce[36]

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[34] Official website for Sustainable Vehicle Production Conference https://www.itbgroup.com/sustainable-vehicle-production-2026?utm_ accessed on 04 April 2026

[35] Official Website for Tyre Emissions & Sustainability conference https://www.emissionsanalytics.com/conferences-tyres-us26?utm

[36] Towards net zero for transport and infrastructure https://www.infrastructure.gov.au/infrastructure-transport-vehicles/towards-net-zero-transport-and-infrastructure?utm_ accessed on 5 April 2026

What are the options available for the general public to reduce vehicle emissions?

- **Choosing low-emission vehicles**
  Individuals can reduce emissions by choosing more fuel-efficient cars, hybrids, or electric vehicles when purchasing a vehicle. As more people choose these options, demand increases, which encourages manufacturers to supply cleaner vehicles. However, it is noted that fuel-efficient cars have to be an economical option for the general public to consider them as an option.
- **Reducing car use**
  People can lower emissions by driving less and using alternatives such as public transport, carpooling, cycling, or walking. Even small reductions in car use can significantly cut overall emissions when adopted by many people.
- **Maintaining vehicles properly**
  Regular servicing, correct tyre pressure, and efficient driving habits (like smooth acceleration and avoiding excessive idling) help vehicles run more efficiently and produce fewer emissions.
- **Supporting policies and behavioural change**
  The public can support government policies aimed at reducing emissions, such as emissions standards or investment in public transport. Social acceptance and behavioural change make these policies more effective.
- **Adopting cleaner energy use**
  For those using electric vehicles, charging with renewable energy (like solar power) further reduces overall emissions. This ensures that the shift to EVs delivers maximum environmental benefit.

Conclusion

There are many options available for the general public that can be considered as reasonable options to reduce vehicle emissions. Although the general public has the responsibility to take the move towards more energy efficient vehicles, it is the responsibility of the government to make such options more attractive by making them more economical options. In the circumstances it is clear that responsibility of reducing vehicle emissions falls on both the government and the general public. While governments and manufacturers set the framework, it is the responsibility of the general public to make informed and sustainable transport choices. Widespread individual action is essential to achieve significant reductions in vehicle emissions and minimize its effect on the natural environment.

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