

2 September 2021

## Zero emission vehicles

Climate change has been described as an existential threat to humanity. As a signatory to the Paris Agreement, Australia has pledged to undertake initiatives to help keep the increase in global average temperature to below 2° Celsius.

Over the past three decades, Australia's transport sector has experienced the largest increase in emissions compared to all other sectors – up 63.5 per cent from 1990 to June 2019.<sup>i</sup> With the sector responsible for 18 per cent of Australia's emissions in 2020,<sup>ii</sup> reducing the country's transport emissions should be a national priority.

Zero emission vehicles (ZEVs) will play a critical role to that end as they release zero, or nearly zero, greenhouse gas emissions. Powered by non-polluting energy sources, the two main types of ZEVs include:

- **Battery Electric Vehicles (BAVs):** cars or other vehicles that are powered by electricity (produced from renewable energy sources), in the form of batteries that have been recharged from the electricity grid.
- **Hydrogen Fuel Cell Vehicles:** cars or other vehicles that are powered by electricity, produced from a fuel cell using compressed hydrogen.

ZEVs are expected to replace current, high-polluting Internal Combustion Engine (ICE) vehicles over the coming decades in Australia and globally.

Australia has been slow to embrace ZEVs. In 2020, less than one per cent of new vehicles purchased in Australia were electric vehicles (EVs), compared to approximately 10 per cent in the UK and EU, and 75 per cent in Norway.<sup>iii</sup>

### What are the benefits of adopting ZEVs?

**Climate change:** Switching from ICE vehicles to ZEVs presents an enormous opportunity to reduce the greenhouse gas emissions produced by Australia's transport sector. Australia's 2017 National Inventory Report on emissions noted "transport emissions are one of the strongest source of emissions growth in Australia" with road transportation accounting for 84.5 per cent of transport emissions.<sup>iv</sup>

**Economic growth and jobs:** Investing in ZEVs and Australian workers will help build the infrastructure required to support ZEVs at scale, as well as attract investment and create jobs. For example, as a leading global lithium producer, Australia could capitalise on growing demand for this product to produce batteries for BAVs, with market demand anticipated to increase to \$2 trillion by 2025; up from \$165 billion in 2020.<sup>v</sup> There will be additional opportunities in research and development, as well as for local automotive and manufacturing businesses that can adapt to the ZEV market.

**Better health:** Widespread uptake of ZEVs will help reduce pollution in Australia's cities and urban environments, leading to better health for individuals and communities. Up to \$706 million in health benefits could be delivered to Victorians in 2046 if the state's fleet was comprised entirely of ZEVs.<sup>vi</sup>

**Energy security:** Powered by locally produced renewable energy, widespread ZEV uptake would minimise foreign oil and petroleum dependence, thereby reducing supply chain vulnerabilities and bolstering national security. Australia's fuel security is precarious. We do not have the internationally mandated 90-day stockpile of fuel to protect the country from global supply shocks and on current trends, will be wholly reliant on imported petroleum by 2030.<sup>vii</sup>

### What is preventing ZEV adoption?

**Government policy:** The policy landscape supporting ZEV technology and uptake is different in each Australian jurisdiction. This fragmented approach has heightened the risk of duplicate investments of finite resources, incompatible technologies conflicting standards. A consistent national policy may help fast-track Australia's transition from ICE vehicles to ZEVs.

**Consumer incentives:** Consumers, whether individuals or companies, will be influenced by policy incentives when making purchasing decisions. Government incentives to encourage private ZEV ownership, as well as public and corporate fleet uptake, have not been strong enough to encourage more consumers to purchase ZEVs up to this point in time.

**Upfront purchase costs:** The upfront costs of purchasing ZEVs have inhibited widespread uptake. The technology associated with ZEVs is relatively expensive compared to ICE vehicles. Price parity between the technologies will help drive uptake. For BAVs, price parity is anticipated when the cost of a battery falls below \$100 per kilowatt hour.<sup>viii</sup> Battery prices fell to an average \$137 per kilowatt hour in 2020.<sup>ix</sup>

**Charging infrastructure:** The lack of nation-wide charging infrastructure has hampered ZEV uptake. Building the infrastructure network to support ZEVs at scale is required. It will require investment in infrastructure hardware, planning and design, administrative support and a stable energy transition network.

**Consumer misunderstanding:** Inaccurate information associated with ZEVs, including those related to charging times, charging infrastructure and range anxiety, have impacted consumer adoption.

### What is needed to increase ZEV adoption?

**Government vision and strategy:** The Federal Government has a role in driving the shift towards ZEVs. This includes developing a national vision and implementing a corresponding strategy. Relying on market forces and new technologies is unlikely to ensure a timely shift and subsequent reduction in emissions to reach net zero by 2050. A national end date for the sale and registration of ICE vehicles would fast-track the transition to ZEVs. Consistent and transparent state government policies, with clear transition targets and goals, may also encourage private sector investment and consumer uptake.

**National fleet emissions standard:** A national fleet emissions standard, particularly for new passenger and light commercial vehicles, would help increase ZEV adoption. The lack of standards in Australia means the country's light vehicle fleet is less efficient than many other countries. The introduction of light vehicle emissions standards would ensure that Australians have access to the latest vehicle technologies.

**Incentives to encourage uptake:** The introduction of a variety of incentives, including tax incentives, could be applied to encourage uptake. Government subsidisation of individual or corporate ZEV purchases is worthy of consideration. In the next two to seven years, the cost of EVs is expected to fall to the same level as ICE vehicles in certain car markets.<sup>x</sup> Incentives to reduce the price discrepancy between EVs and ICE vehicles over this period would help reduce those upfront purchase costs.

**Charging infrastructure:** Easier and better access to public charging stations will be important to convincing more people to purchase ZEVs. For prospective EV owners who may live in multiple-occupancy buildings and are unable to install home charging equipment, access to public charging infrastructure will be critical. Governments could consider not only making public charging more easily available, but free to use with minimal wait times and in locations that offer other things to do.

**Consumer awareness campaign:** a public awareness campaign to dispel myths and misinformation associated with ZEVs could be considered. Such a campaign would highlight the benefits of purchasing ZEVs for individuals, companies, the economy and the natural environment. It would simultaneously seek to inform people of misinformation and how to recognise it.

### Further Reading

Grattan Institute | Towards net zero: Practical policies to reduce transport emissions

Infrastructure Victoria | Driving down emissions: accelerating Victoria's zero emission vehicle uptake

PwC | Australia's road to zero transport emissions (three volumes)

---

<sup>i</sup> "Australia stuck in slow lane on electric vehicles", *Sydney Morning Herald*, 19 January, 2020, <https://www.smh.com.au/environment/sustainability/australia-stuck-in-slow-lane-on-electric-vehicles-20200119-p53ssp.html>

<sup>ii</sup> T. Wood, A. Reeve and J. Ha (2021). Towards net zero: Practical policies to reduce transport emissions. Grattan Institute, Report No. 2021-07, p. 3, <https://grattan.edu.au/wp-content/uploads/2021/04/Towards-net-zero-Practical-policies-to-reduce-transport-emissions-Grattan-Report.pdf>

<sup>iii</sup> E. Black, "Federal Greens fight state governments' attempts to tax electric vehicles", *The New Daily*, 4 March, 2021, <https://thenewdaily.com.au/finance/consumer/2021/03/04/greens-electric-vehicles-senate-bill/>

<sup>iv</sup> National Inventory Report 2017: Volume 1. Department of the Environment and Energy, Canberra, p. 45. <https://www.industry.gov.au/sites/default/files/2020-07/national-inventory-report-2017-volume-1.pdf>

<sup>v</sup> PwC (2021). Australia's road to zero transport emissions 01. Australia's road to a clean transport future,

p. 5, [https://www.pwc.com.au/government/Australias-road-to-zero-transport-emissions\\_1.pdf](https://www.pwc.com.au/government/Australias-road-to-zero-transport-emissions_1.pdf)

<sup>vi</sup> Infrastructure Victoria (2018). Advice on automated and zero emissions vehicles infrastructure, p. 4. <https://www.infrastructurevictoria.com.au/wp-content/uploads/2019/04/Advice-on-automated-and-zero-emissions-vehicles-October-2018.pdf>

<sup>vii</sup> A. Richardson, "Australia imports almost all of its oil, and there are pitfalls all over the globe", *The Conversation*, May 24, 2018, <https://theconversation.com/australia-imports-almost-all-of-its-oil-and-there-are-pitfalls-all-over-the-globe-97070>

<sup>viii</sup> Infrastructure Victoria (2021). Driving down emissions: accelerating Victoria's zero emission vehicle uptake, p. 19, <https://www.infrastructurevictoria.com.au/wp-content/uploads/2021/08/Driving-Down-Emissions-Accelerating-Victorias-Zero-Emission-Vehicle-Uptake.pdf>

<sup>ix</sup> "Battery Pack Prices Cited Below \$100/kWh for the First Time in 2020, While Market Average Sits at \$137/kWh", *Bloomberg NEF*, 16 December, 2020, <https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/>

<sup>x</sup> Infrastructure Victoria, Driving down emissions, 19.