AEVA POLICY RECOMMENDATIONS: EMISSIONS STANDARDS
APPROVED BY THE BOARD: 21 MAY 2024

Policy statements

[1] The AEVA recommends that the elimination of greenhouse gas emissions from the transport sector should be the primary goal of governments, achieved through a suite of measures including improved efficiency, substitution of modes, and full electrification of all sectors. These measures should be reviewed annually for progress.

[**2**] The AEVA supports legislation which seeks to end the sale of new internal combustion engine (ICE) passenger vehicles and motorcycles by 2035, and new ICE heavy vehicles by 2040.

[3] The AEVA supports the legislation of mandatory vehicle emissions standards for manufacturers of motorcycles, passenger and light commercial vehicles. While it appears that the initial target for 2025 will now be difficult to amend, the trajectories for passenger and light commercial vehicles must be set so that all new vehicles are zero emissions in operation by 2035. The trajectories from 2029 to 2035 are 58g CO2-e/km down to 0g CO2-e/km for passenger vehicles and 81g CO2-e/km down to 0g CO2-e/km for light commercial vehicles.

[4] The AEVA supports legislated mandatory emissions standards for road-going heavy vehicles (>4.5 tons GVM) of 56g CO_2-e/km-ton in 2023. This standard should be tightened by 2.5g CO_2-e/km/tonne each year until 2043, when all new heavy vehicles sold must be zero-emission in operation.

[5] The AEVA recommends that plug-in hybrid vehicles meet the following criteria to be eligible to be considered a plug-in hybrid: (a) electric-only range of at least 50 km, (b) DC charging of at least 50 kW, and (c) electric motor power greater than the power of the ICE. Otherwise, the vehicle is to be treated as a conventional hybrid vehicle.

[6] The AEVA recommends that the proposed 2027 EU utility factors be adopted when WLTP is introduced to ensure that the emissions testing of plug-in hybrid vehicles is realistic.

[7] The AEVA recommends requiring on-board fuel consumption monitoring on all new vehicles, as implemented in the EU, to enable the ongoing review of emissions testing.

Commentary

This paper sets out AEVA's policies for emission standards for light and heavy vehicles, including target timeframes for achieving zero emissions for new vehicles.

Transport (road, rail, sea and air) was responsible for 19% of Australia's domestic greenhouse gas emissions in 2022[1], with passenger and light commercial vehicles making up nearly two-thirds this total.

Until legislation for a New Vehicle Efficiency Standard (NVES) was passed by the Parliament in May 2024, Australia did not have a minimum standard of fuel efficiency for passenger vehicles (gross vehicle mass of less than 4.5 tonnes). Australia does have emissions limits on noxious substances like carbon monoxide, nitrogen oxides and particulates for all new vehicles sold. From December 2025, all new vehicles sold in Australia must meet the "Euro 6" standards. Thankfully, electric passenger vehicles do not release these substances in operation, but the emissions intensity of grid electricity used to charge these vehicles is well documented in the greenhouse gas accounts factors, updated annually. The Australian Government's Green Vehicle Guide uses the national average emissions intensity of electricity to determine the emissions intensity of all vehicles: electric, petrol, gas or diesel. In general, emissions standards are based on the tailpipe emissions of a vehicle – that is, it does not include the emissions associated with upstream processing of the energy source (petrol, diesel, or electricity). This makes sense, as the electricity grids are continually reducing their emissions and likely to approach zero over the lifetime of a vehicle sold today.

Around the world, vehicle emissions standards have been implemented and are designed to be steadily tightened. By mandating improvements in vehicle efficiency, under threat of some financial penalty, overall emissions intensity is reduced. In the EU, a fleet average emissions intensity of 95 g CO_2-e/km is set for passenger vehicles and 147 g CO_2-e/km for light commercial vehicles. This has had the impact of motivating manufacturers to produce more fuel-efficient vehicles and EVs for sale in those markets. Crucially, it also increased competition for specific vehicle segments, putting downward pressure on new EV prices in key segments like people movers, sedans, wagons and light commercial vehicles. However it has also motivated manufacturers to offload their more polluting models into the few markets which do not have these restrictions, including Australia. Thus, an enforced emissions standard for Australia will close this loophole.

The NVES which was legislated in 2024 specifies two categories with separate trajectories: one for passenger vehicles and one for light commercial vehicles (LCVs). These categories are

[1] Dept of Climate Change, Energy, Environment and Water. Reducing transport emissions. https://www.dcceew.gov.au/energy/transport

likely to encourage some manufacturers to redefine their passenger vehicle offerings as light commercial vehicles, thus giving them a less stringent emissions standard. This has fuelled the substantial growth in less efficient, heavier vehicles, particularly in the USA[2]. AEVA has previously argued against classifying large sport utility vehicles (SUVs) as LCVs for this reason.

Criticism of the fuel efficiency standard largely revolves around limited access to low-emission vehicles for specific market segments, particularly motorcycles, vans, commercial and farm vehicles, and eventually, heavy vehicles. The NVES does not extend beyond passenger and light commercial vehicles. For example, ICE motorcycles currently range from 60 g CO_2-e/km for a small-bore road bike, to over 130 g CO_2-e/km for a sports tourer. Motorcycles could be included in the passenger vehicle emissions standards, in an effort to drive innovation in efficiency and eventually full electrification. Suzuki Motorcycles have discontinued sales of their flagship sports bike[3] in Japan and the EU, in part due to tighter emissions regulations.

By requiring automakers to achieve a *fleet average*, rather than a prescribed value for all new vehicles, manufacturers are still able to sell vehicles for key segments (such as utes, minibuses and vans) concurrently with zero emissions vehicles. The higher profitability of larger, heavier, and generally more polluting vehicles remains a significant impediment to reducing emissions, so a timeline of increasingly stringent emissions targets should be employed to motivate change.

The AEVA remains concerned that the NVES does not set targets beyond 2029, so vehicle importers have little certainty about the trajectory beyond 2029. This set up a strong incentive to continue lobbying for a weakening of the scheme before 2029. AEVA believes it is essential that the trajectory for 2029 to 2035 tightens tailpipe emissions for both passenger vehicles and light commercial vehicles to 0 g/km CO2-e/km by 2035. The NVES legislation contains a scheduled review and this is the only prescribed opportunity to specify a post-2029 trajectory.

Previously, AEVA was supportive of plug-in hybrid vehicles (PHEV) as a 'stop-gap' technology providing lower emissions vehicles that could complete journeys that were otherwise limited by poor charging infrastructure and a lack of affordable, longer-range BEVs. While it is possible for a diligent PHEV owner to achieve low fuel consumption, our members reported difficulty achieving this in practice.

PHEV emissions are tested in Australia using a protocol specified in Australian Design Rule 81 and based on the now outdated New European Driving Cycle (NEDC) test standard. For PHEVs, the test is repeated with a charged battery (“charge depleting” mode) and a depleted

[2] Zipper, David. Vox, 28 April 2024. https://www.vox.com/future-perfect/24139147/suvs-trucks-popularity-federal-policy-pollution

[3] Punsalang, Enrico. RideApart, 6 November 2022. https://www.rideapart.com/news/620343/suzuki-gsxr1000-discontinued-japan-europe/

battery ("charge sustaining" mode). Emissions are then calculated as a distance weighted average of emissions in charge depleting and charge sustaining modes. The formula includes an assumption that 25 km is driven with the battery depleted before being recharged. The test therefore assumes that the vehicle will be charged regularly and used predominantly for short trips. This test method is crude, but easy to understand.

As part of the proposed New Vehicle Efficiency Standard, the Australian Government has indicated its intention to replace the NEDC test procedure with the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) by 2028. WLTP is regarded as producing more realistic figures for consumers in general, but has been criticised for continuing to dramatically underestimate the real-world emissions of PHEVs. The WLTP calculation uses a *utility factor* which, for a given electric-only range, estimates the percentage of driving the vehicle will do in electric-only mode. Since 2021, all vehicles sold in the EU have been fitted with on-board fuel consumption monitoring equipment to report true fuel consumption. Numerous studies in Europe, including a 2024 report[4] by the European Environment Agency, have found that the actual emissions from PHEVs can be, on average, 3.5 times higher than their type approval values. Fuel consumption data have been used to adjust the utility factors. In 2025, new utility factors will be adopted followed by another revision in 2027. These improvements will bring type approval values for PHEVs closer to their on-road emissions.

The European studies have also identified a number of explanations for the wide discrepancy in PHEV emissions. The primary reason is that drivers are not as motivated to charge them as they are a BEV. Studies have identified even higher fuel consumption in fleet vehicles where the driver is given a fuel card but not compensated for the use of their home electricity. Other reasons include some PHEVs having very small batteries (for example, one Mercedes-Benz model has a V8 engine combined with a tiny electric-only range of only 13 km) and having underpowered electric motors. This causes the vehicle to start the internal combustion engine to assist when power demand exceeds the capability of the electric motor. Even when its battery is sufficiently charged, PHEVs can continue to emit CO_2 in some circumstances.

Emissions standards may also serve as a valuable way to timetable an eventual phase-out of polluting vehicles. Several jurisdictions around the world[5] have set a goal of banning the sale of new ICE vehicles by 2035. Clear targets like this create an unambiguous timeline for manufacturers to adjust. In Australia, the ACT Government has committed to not permitting new registrations of ICE passenger vehicles from 2035 [6].

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[4] European Environment Agency. Climate and energy in the EU. https://climate-energy.eea.europa.eu/topics/transport/real-world-emissions/data

[5] https://en.wikipedia.org/wiki/Phase-out_of_fossil_fuel_vehicles#Places_with_planned_fossil-fuel_vehicle_restrictions

[6] ACT's Zero Emissions Vehicles Strategy, 2022-2030. https://www.climatechoices.act.gov.au/__data/assets/pdf_file/0006/2038497/2022_ZEV_Strategy.pdf

Heavy vehicles like trucks and road trains present a challenge as they are moving variable masses of goods, changing the CO_2-e/km considerably. As the tare mass varies depending on the class of heavy vehicle, a gross vehicle mass (GVM) component would need to be included to account for such variation in load sizes. The European Automobile Manufacturers Association found the average emissions intensity of the most common heavy vehicle class (5-axle, long-haul articulated tractor trailers) was 56.5 g CO_2/ton-km [7]. They also found little deviation from this mean, indicating competition in efficiency measures was already strong. While electrification of heavy vehicles is progressing well, the step changes in battery energy density required for full electrification are yet to be realised. For this reason, a longer timeframe for the total phase-out of ICE heavy vehicles may be necessary. However, there is no room for complacency as heavy vehicles typically remain in revenue service far longer than light vehicles. It also highlights the significant opportunity for more goods to be moved by electric rail in the coming years.

[7] European Automobile Manufacturers Association. CO_2 emissions from heavy-duty vehicles. https://www.acea.auto/files/ACEA_preliminary_CO2_baseline_heavy-duty_vehicles.pdf