

Response to ‘The Fuel Efficiency Standard – Cleaner, Cheaper to Run Vehicles for Australia Consultation paper’

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I welcome the opportunity to provide feedback on The Fuel Efficiency Standard for Australia.
I confirm that this submission can be made public.

GENERAL Guiding Principles: Are these the right guiding principles? Are there other principles that you think we should keep in mind?

- Health needs to be a key guiding principle.
- Holistic – climate, health and environmental measures of fuel efficiency for transport need to be considered – i.e. in addition to CO₂ - NO₂, PM_{2.5}, black carbon, VOCs, benzene, vehicle weight, brakes, tyres and air conditioning/battery cooling refrigerants
- Driver behaviour and vehicle maintenance are large determinants of fuel efficiency.
- Vehicle fuel efficiency should be reported for all vehicle sales (both new and used)

Note on Health and Premature Mortality

The Schofield et al., 2017 quoted number of 1,715 deaths in 2015 was derived simply by using 50% of all PM_{2.5} mortality. As noted in Schofield et al., 2017 mortality from traffic NO_x was not accounted for. When the HAPINZ3.0 methodology is applied to the Australian situation air pollution results in 11,105 premature adult deaths per year (Walter and Say, 2023). Therefore, for health and climate benefits NO₂ emissions, alongside PM_{2.5} and CO₂ must be considered holistically in a fuel efficiency standard.

Holistic Fuel Efficiency Standards

NO₂ per capita emissions for Australia are highest in the OECD, and Australia is the only country that reports an increasing trend. While nitrogen oxides result from all forms of combustion, traffic is a dominant source of NO₂, and diesel vehicles in particular result in high NO_x. Vehicle emission mitigation technologies for NO_x are poisoned by high sulfur content in fuels and CO₂ efficiencies are all poorer when high sulfur and low octane fuels are used (Schofield et al., 2017). So addressing fuel sulfur content and quality is essential in ensuring that manufacturers’ claims of fuel efficiencies can be realised in the Australian context.

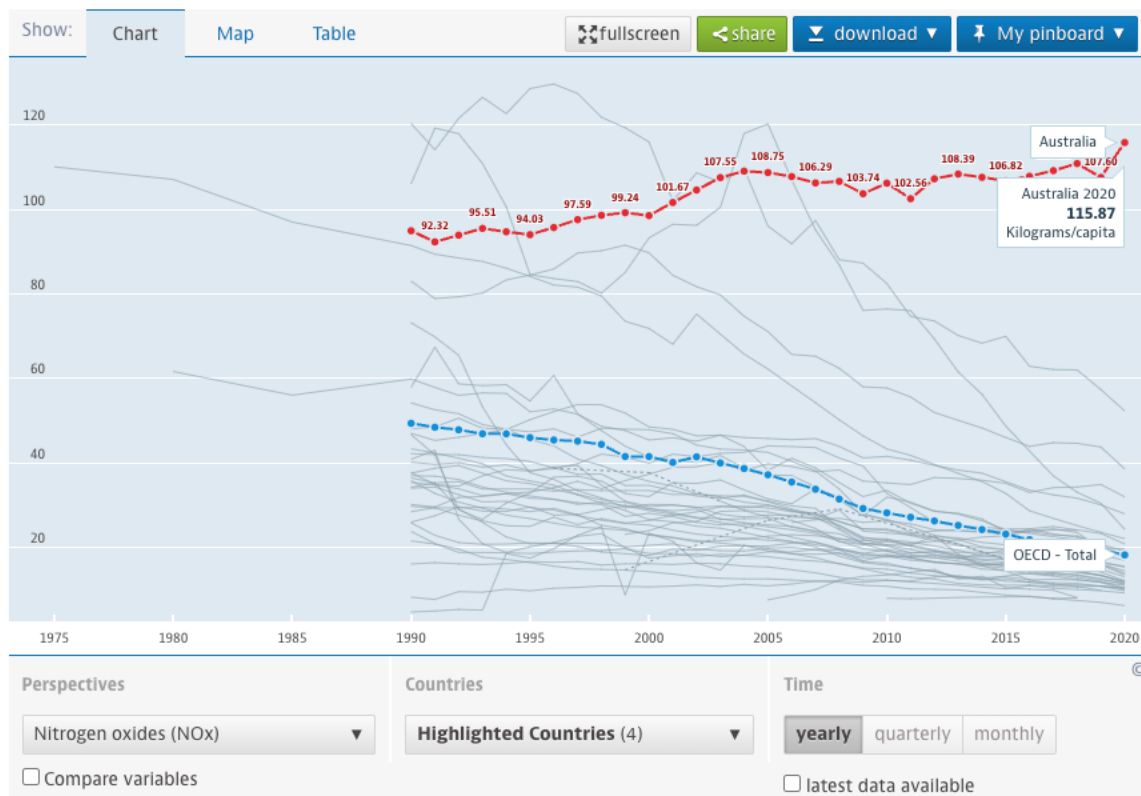


Figure 1: Nitrogen Oxides for all countries (grey background lines), Australia (red) and OECD average (blue) from <https://data.oecd.org/air/air-and-ghg-emissions.htm#indicator-chart>

Vehicle weights, brake quality and tyre quality influence both PM_{2.5} and microplastic emissions to the air.

HFCs are internationally regulated under that Kigali amendment to the Montreal protocol. Implementation of Australia's HFC phase down currently excludes pre-charged equipment such as vehicle air conditioning systems.¹ Australia's phase down is based on a quota system of bulk gases whereby HFCs will only be able to be imported with GWP<700 (again this has a pre-charge exemption). The ability to limit high GWP gases imported to recharge equipment is the only current HFC management strategy. This threatens to become extremely problematic with EVs that have air conditioning and battery cooling systems that both require refrigerants. HFC-134a (GWP 1430²) is a dominant refrigerant used in many new vehicles (including many EVs) at present. The 2022 WMO Ozone Assessment noted that "global total CO₂-eq emissions due to HFCs were 60-70% higher than those of CFCs (chlorofluoroCarbons) or HCFCs", with HFC-134a constituting 30% and increasing globally.³

HFO-1234yf (GWP<1)⁴ is the new HFC-134a replacement refrigerant used in vehicle air conditioners. Both HFC-134a and HFO-1234yf degrade in the environment to trifluoroacetic

¹ <https://www.dcceew.gov.au/sites/default/files/documents/hfc-phase-down-factsheet.pdf>

² <https://www.dcceew.gov.au/environment/protection/ozone/rac/global-warming-potential-values-hfc-refrigerants>

³ <https://csl.noaa.gov/assessments/ozone/2022/executivesummary/#section-5>

⁴ <https://csl.noaa.gov/assessments/ozone/2022/downloads/2022OzoneAssessment.pdf>

acid (TFA) – a persistent and toxic chemical (PFAS compound). The 2022 WMO Ozone Assessment noting “Potential environmental impacts of TFA require future evaluation due to its persistence”².

It is interesting to note that for refrigerants in pre-charged equipment including mobile air conditioners (i.e. all vehicles) the HFC emissions are accounted for in the country of production (not the country of consumption) under the Montreal Protocol accounting system. This is not the case for GHG accounting under the UNFCCC processes / Paris agreement where emissions are accounted for in the country of consumption but not production (i.e. compare to LPG industry where Australia as the country of manufacture is not held accountable for Carbon emissions at the point of consumption). Checking where GHG accounting occurs for HFCs in pre-charged equipment within the Australian Carbon accounting system will be important in the new vehicle life cycle analysis. As the release of CO₂e from HFCs by pre-charged equipment to the environment will occur in Australia – not the point of manufacture – this should be examined closely. A system to track imports of all imported pre-charged HFCs to Australia so that the size of our ‘bank’, ‘emissions’ and ‘recovered’ HFCs are tracked will be important to avoid a situation where HCF-134a is required in vast quantities to recharge mobile air conditioning units and granted large exemptions under the quota system of the HCF phase down - rendering Australia’s Kigali implementation ineffectual. Australia’s success in phase down of CFCs was due to it being a comprehensive ban of imports (i.e. fridges) – with exemptions granted only under quarantine and pre-shipment biosecurity uses. Australia’s Kigali HFC phase-down implementation allowing pre-charged equipment exemption has created a loophole that is not replicated in the US⁵ or Europe.

Driver behaviour and vehicle maintenance

Anti-idling zones and best driving practices for fuel efficiency should be considered in commercial and private licencing (as is standard in German driver licencing), and there should be real penalties for breaches (fines, revoking etc – see Schofield et al., 2017 for international best practice). This should be seen as an efficiency measure ripe for public awareness campaign such as ‘turn off the tap’ is for water conservation. Fuel is currently wastefully burnt through complacency and ignorance of drivers.

Most countries with fuel efficiency standards have testing facilities to ensure that real world emissions standards are met. Australia does not require that vehicles are well maintained and relies on public reporting of non-compliance (i.e. smoky vehicles) to regulators such as the Environmental Protection Authorities for compliance – this encourages driver distraction (i.e. taking of photos by drivers, and uploading to report) or under-reporting and it is non-transparent if any actions are followed up upon. Regulations need to be supported by robust testing, and compliance systems. Ideally smoky vehicles could be identified via traffic camera surveillance, provided with education, requested to pass emission testing and there should be penalties for repeat offenses and wilful pollution. Emission efficiency re-testing should be part of road worthy certification at all point of sales, such as is standard practice in other countries i.e. Colorado and California in the US require annual emission testing.

⁵ <https://www.epa.gov/newsreleases/epa-announces-enforcement-actions-control-hydrofluoroCarbon-imports>

Point of Sale Fuel Efficiency reporting

It is strongly recommended that emission efficiency testing facilities are developed and that all vehicle re-sales require emission efficiencies to be supplied by vendors, so all consumers are well-informed of ongoing fuel costs at any vehicle point of sale. There is a very large second-hand vehicle market in Australia, and by exempting motor vehicle dealers from having to 'deal' with real world emission efficiencies is a major missed opportunity for consumer education. All new and used Vehicle sales should have to report CO₂ and NO₂ per kilometre – from point of sale emission testing reports for consumer informed choice and confidence. This would also provide important checks on manufacturer claims of fuel efficiencies for Australian conditions (temperatures, fuels etc).

Fuel efficiency principles only applying on average to vehicles sold new to the market will be a missed opportunity as much of the vehicle fuel inefficiency are due to an aging, poorly maintained fleet and driver behaviours.

GENERAL Design assumptions

Mandatory and embedded in legislation is welcome in the design assumptions.

- *Are there any design assumptions that you think will put at risk the implementation of a good FES for Australia?*

Yes. As noted above motor vehicle dealers (in fact all point of sale transactions) should not be exempt from fuel efficiency reporting for consumer informed consent.

Heavy vehicles should also not be exempt given the health and climate implications of fuel emissions from our roads. Trucks and buses on our urban streets are major air pollution emission sources and should not be exempt from the benefits to be gained for all via a strong fuel efficiency standard being introduced.

- *Are the exclusions for military, law enforcement, emergency services, agricultural equipment and motorcycles the right ones?*

No. A blanket exclusion will be exploited and expose these end users to 'dumping' practices by suppliers – with high running costs and climate implications into the future.

GENERAL Starting emissions level limit and approach

- *What principles should we consider when setting the targets?*

A strong start with a goal of quickly approaching 95g/km CO₂, setting an emission standard of 60mg/km of NO_x gases⁶ would bring Australia into line with international best practice (i.e. 2025 EU targets / Euro 7 standards)⁷.

Introducing emission standards that covers also brakes and tyres is also required to avoid toxic particulate matter from poor brake materials and microplastic pollution from inferior quality tyres. This ensures that the transition to EVs as well as policies that have resulted in a heavier vehicle fleet doesn't have further ongoing environmental impacts via brake and tyre wear.

⁶ https://ec.europa.eu/commission/presscorner/detail/en/ip_22_6495

⁷ https://www.greenpeace.org/static/planet4-eastasia-stateless/2021/09/66f9a849-countdown-to-zero_20210922.pdf

GENERAL Adjustments of limit level

- *How many years ahead should the Government set emissions targets, and with what review mechanism to set limits for the following period?*

Given learnings required with the introduction of fuel efficiency standards a short review cycle is initially beneficial – i.e. 4 years. Given the pace of the vehicle electrification 10 years would be far too long.

- *How should the Government address the risks of the standard being found to be too weak or too strong while it is operating?*

Annual reporting will inform whether the decarbonization and health objectives are being met through this mechanism. It will also make 4 year review not too arduous on the communities involved. Given that UNFCCC meets and reports annually keeping reporting simple and effective will be key to ensuring desired outcomes.

TECHNICAL Attribute-based emissions limit curve

A modelling study should be performed to optimize the mass versus CO₂ issue – it should include expected pollution from brakes, tyres and road health/safety concerns due to stopping distances. Avoiding inadvertently encouraging very heavy new ICEs and EVs will be key.

TECHNICAL Air conditioning refrigerant gas credits

- *Should an Australian FES include credits for using low global warming potential air conditioning refrigerants, and if so, for how long should this credit be available?*

For the first review cycle only – i.e. 4 years.

- *Could the issue of high global warming potential refrigerants be better dealt with by another policy or legislative framework?*

Yes - the current exemption of pre-charged equipment from HFC phase-down under the Kigali amendment to the Montreal protocol implementation in Australia is ineffectual. Currently, this policy allows HFC134a (GWP=1430) unfettered importation in new vehicles. The hope that replacement gases and technical advancements will address this is naïve as we cannot simply recharge units with available low GWP refrigerants – i.e. HFO1234yf or hydrocarbon refrigerants as these have higher flammability and would require complete air conditioning unit replacements in Australia. The Montreal Protocol and Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 worked most effectively for CFC phase out from mobile and stationary air conditioning, fridges etc in the past – with clear labelling and import bans for all consumer items. However, the current HFC exemption for pre-charged units means this management Act won't have the same efficiency for preventing large emissions and banks of HFCs entering Australia -> this needs urgent attention.

- *If such a credit is permitted, should the emissions target be lowered to ensure consumers realise the fuel cost savings and LZEV availability benefits of a FES?*

I don't think confusing on-road fuel cost savings and air conditioning refrigerants is useful.

TECHNICAL When should a FES start?

As soon as possible but not later than 1 January 2024 for new vehicles – we are so far behind the rest of the world. Where emission testing facilities are required for point of sale this should be implemented from 1 January 2025.

References and Resources

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