WESTERN AUSTRALIAN GOVERNMENT SUBMISSION

VEHICLE EMISSIONS STANDARDS FOR CLEANER AIR – DRAFT REGULATION IMPACT STATEMENT

The Commonwealth Ministers for Urban Infrastructure, and Environment and Energy released the *Vehicle Emissions Standards for Cleaner Air – Draft Regulation Impact Statement* (DRIS) for public consultation which closed 10 March 2017. Feedback was sought on the estimated benefits and costs of the proposals, as well as the implementation timing.

Western Australia's (WA) consolidated response is summarised below.

Emissions benefits

Air quality in large urban areas varies considerably both spatially and temporally, mostly as a result of traffic emissions. Any strategy/regulation that reduces vehicle emissions is particularly important for areas with high traffic density.

In Perth, motor vehicles are the largest single source of smog precursors – volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) – and contribute significantly to emissions of fine particles (PM) and carbon monoxide (CO).

Vehicle emissions monitoring by the Department of Environment Regulation and its predecessor between 2007 and 2016 indicates that median fleet emissions of CO, hydrocarbons (HC), and nitric oxide (NO) have reduced by 45, 50 and 22 per cent respectively. Comparing emissions by year of manufacture and Australian Design Rules (ADRs) applicable for that year, 2007 vehicles emitted 19 times higher levels of CO and seven times higher levels of NO than vehicles manufactured from 2011 onwards.

The reduction in emissions has been achieved primarily through the progressive tightening of new vehicle emissions standards specified in the ADRs, and removal of older vehicles from the fleet through attrition.

While average individual vehicle emissions are reducing over time, these reductions are being offset by the increasing vehicle population in Perth. Ongoing effort is required to further reduce emissions of air pollutants.

Diesel vehicles make up an increasing proportion of the Australian light vehicle fleet (ABS Vehicle Census, 2016). The primary benefit of Euro 6 emissions standards is significantly reduced NO_x emissions in new diesel vehicles.

Health benefits

WA supports options that maximise benefits to health through lower emissions of air pollutants, which in this case is option 6. International evidence has consistently demonstrated that there is no lower threshold for the health effects of many air pollutants, including pollutants associated with vehicle emissions. For some air pollutants, the greatest rate of change in health effects occurs at concentrations below existing air quality standards. As outlined in the DRIS, health benefits will be realised for reductions in vehicle emissions even in Australia, where air quality is relatively good.

In-service testing

Although state and territory vehicle standards regulations require vehicles that are in-service to maintain emissions levels in line with ADR requirements, there are practical challenges in ensuring cost-effective compliance, for example periodic inspections or self-inspection by owner-operators.

There is no cost-effective means of ensuring that in-service vehicles continue to comply with ADR limits. This is of particular importance to the issue of air quality, as vehicles which are no longer new are the main source of vehicle emissions. The modification of vehicles or their deterioration over time may lead to substantial increases in emissions levels.

Although the ADR and fuel quality standards are important ways of ensuring acceptable vehicle emissions, the most cost-effective means of achieving improved air quality would be to establish practical standards and test procedures for emissions levels of in-service vehicles. This option is not addressed in the DRIS.

WA supports further research into the development of practical standards and test procedures for emissions levels of in-service vehicles in order to realise the air quality benefits of new emissions technology over the life of the vehicle.

The introduction of an on-road Real Driving Emissions (RDE) test, consistent with global testing protocols, will be important to ensure new vehicles entering the Australian market consistently meet the Euro 6 emissions standards. It is noted the DRIS does not include the costs associated with ongoing compliance testing for Euro 6 vehicles.

WESTERN AUSTRALIAN GOVERNMENT SUBMISSION

BETTER FUEL FOR CLEANER AIR – DISCUSSION PAPER

The Commonwealth Ministers for Urban Infrastructure, and Environment and Energy released the *Better Fuel for Cleaner Air Discussion Paper* for public consultation closing 10 March 2017. The paper discusses five options for updating existing fuel standards under the *Fuel Quality Standards Act 2000*. Feedback was sought on specific questions in the discussion paper where applicable.

Western Australia's (WA) consolidated response is summarised below.

Question Set 1
Questions in relation to the fuel standards

Question 1. Can you provide evidence of the costs and/or benefits of any of the listed policy alternatives (A, B, C, D or E)?

WA has no specific evidence for costs or benefits for the five alternatives. There are good data, empirical and modelled, of health benefits of any improvement in air quality. As described in the discussion paper, there are no lower thresholds for the health effects of some air pollutants. For pollutants such as particles, the increases in health effects are relatively greater at lower concentrations. By extension, marginal health benefits are higher for reductions in low air pollution areas, such as Australia (Marshall *et al.*, 2015).[1]

Question 3. Are there any changes which would improve or clarify the operation of the fuel standards?

In the consultation paper *Vehicle Emissions Standards for Cleaner Air – Draft Regulation Impact Statement,* three of the four recommended options require the adoption of Euro 6 vehicle emissions standards in Australia. The outcome of this process should be the key factor in determining amendment options for fuel quality standards under the *Fuel Quality Standards Act 2000.*

If Euro 6 vehicle emissions standards are adopted in Australia, lowering the sulfur limit for unleaded petrol should be a priority. This will ensure new Euro 6 vehicles can operate efficiently using Australian fuels, and will align Australia with fuel quality standards in Europe and the United States.

Question 4. Should any other fuel standards be developed (other than the proposed fuel standard for the B20 diesel biodiesel blend)?

Fuel standards should exist for all fuels that, when combusted, emit air pollutants.

---

[1] Marshall, J.D., Apte, J.S., Coggins, J.S. and Goodkind, A.L. 2015. Blue Skies Bluer? Env Sci Technol, 49, 13929-13936.

Question 5. Can you provide evidence of the extent to which the current fuel standards limit the adoption/ importation of existing technologies and models that meet higher specifications?

A report produced by Orbital Australia for the Department of Sustainability, Environment, Water, Population and Communities in 2013 found that to facilitate the adoption of a wider choice of emerging emission control technologies, a reduction in fuel sulfur levels to 10 ppm would be required.[2]

Question 9. Are there any other issues you would like to raise in relation to the fuel standards?

Option D is the only option that includes standards for trace metal elements. WA supports further analysis regarding the inclusion of measurable fuel quality standards for heavy metals. An air emissions inventory for on-road vehicles in WA[3] found heavy metals from trace concentrations in fuel may represent the most significant emission risk from vehicle operation when accounting for the relative toxicity of emissions.

Improved fuel quality information (including information on trace metal elements) is required to improve emissions modelling as small changes in trace concentrations can significantly affect estimates derived from large volume fuel use.

Question Set 3
Comments in relation to the *Fuel Quality Standards Regulations 2001*

Question 13. Is the definition of 'fuel' adequate to enable all relevant standards to be made? For example, should the definition of fuel be expanded to cover marine diesel, synthetic diesel, methanol-based fuels, etc to enable standards to be made for these fuel types?

All fuels, when combusted, can emit pollutants that should be regulated. The definition of fuel for the purposes of fuel regulations should be broadened unless there are other available mechanisms that are adequate to regulate fuels not otherwise included in the definition.

Question 14. Currently, aviation gas (avgas) is explicitly excluded from the petrol standard. Do you believe avgas should be covered by a fuel standard?

Avgas should be covered by a fuel standard and fall under the expanded definition of 'fuel' in the *Fuel Quality Standards Regulations 2001*. Voluntary compliance and market forces alone are unlikely to be sufficient to drive changes or improvements to fuel standards for avgas when improvements are possible.

---

[2] Orbital Australia, 2013. Review of Sulphur Limits in Petrol. Report produced for Department of Sustainability, Environment, Water, Population and Communities (Cwlth)
[3] Department of Environment Regulation, 2016. Perth Vehicle Emissions Inventory (in preparation).

Question Set 4
Comments in relation to the Fuel Quality Standards (Register of Prohibited Fuel Additives) Guidelines 2003

Question 15. Do you agree with the Department's proposal to list the above additives on the Register of Prohibited Fuel Additives? If not, why not?

WA agrees with the Commonwealth assessment that the listed additives present a risk to human health and supports their inclusion on a register of Prohibited Fuel Additives.

Question 16. Should MMT (methylcyclopentadienyl manganese tricarbonyl) or other additives such as N-methylaniline be allowed in Australian fuel as an octane enhancer?

MMT or other additives such as N-methylaniline should not be allowed in Australian fuel as an octane enhancer unless there is evidence that there are no alternatives and that benefits outweigh any potential health effects.

Question Set 5
Comments in relation to the proposed Guidelines for more stringent fuel standards

Question 19. Are there any areas in Australia that require more stringent fuel standards? If so, which fuel standards should the more stringent standards apply to, and where should they be applied?

Petrol standards in WA are regulated to protect air quality and human health under the Western Australian Environmental Protection (Petrol) Regulations 1999 (Petrol Regulations). The Petrol Regulations include Reid Vapour Pressure and Methyl Tertiary Butyl Ether (MTBE) standards.

The MTBE standard in WA is 0.10 per cent volume for volume (v/v), which is more stringent than the Commonwealth MTBE petrol standard of 1.0 per cent v/v. The WA MTBE standard operates concurrently with the Commonwealth MTBE petrol standard under the *Fuel Quality Standards Act 2000*, and is designed to protect local drinking water supplies from contamination. Perth's groundwater substantially contributes to its water supply, and the aquifers are located in highly transmissive sandy soils.

If the Commonwealth plans to prescribe more stringent fuel quality standards in parts of Australia, it is recommended that State and Territory consultation and agreement occurs.

Question Set 6
General questions regarding the approach for assessing the policy alternatives

Question 21. Do you have any comments in relation to whether all likely costs or benefits have been identified?

In addition to reduced morbidity and mortality, indirect health benefits such as reduced absenteeism and restricted activities should be considered in the cost-benefit analysis.

When the costs and benefits of the preferred options are examined during development

of the regulation impact statement, there should be an analysis of the costs for refineries to produce low sulfur fuel (10 ppm) while maintaining the octane rating and without increasing the oxygenate content.

Question 22. Can you provide information that may improve the reliability of the cost and benefit estimates for any of the policy alternatives?

Two documents that may assist the cost-benefit analysis include:

- Jalaludin *et al.* (2009) *A Methodology for Cost-Benefit Analysis of Ambient Air Pollution Health Impacts*, Australian Government Department of the Environment, Water, Heritage and the Arts.
- Balair *et al.* (2002) *Estimating the Public Health Benefits of Proposed Air Pollution Regulations*, National Research Council, Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations.

Under the *Petroleum Products Pricing Act 1983*, Western Australian fuel retailers in all metropolitan locations and 80 per cent of regional sites are required to report prices for unleaded petrol (ULP) (91 Research Octane Number (RON)); premium unleaded petrol (PULP) (95 RON); 98 RON; diesel; and liquefied petroleum gas (LPG.) Similarly, fuel companies are required to report terminal gate prices for ULP, PULP and diesel.

WA Petroleum Products Pricing Unit (FuelWatch) data on retail fuel prices provide evidence regarding the change in retail price of premium unleaded petrol (95 RON) fuel if unleaded petrol (91 RON) fuel were to be phased out (assuming taxes etc. do not change), and may improve the reliability of the cost and benefit estimates for policy alternatives B and D.

Question 23. Do you have any evidence regarding the change in retail price of premium unleaded petrol (95 RON) fuel if unleaded petrol (91 RON) fuel were to be phased out (assuming taxes etc. do not change)?

FuelWatch monitors and publicly reports on WA wholesale and retail motor fuel prices. FuelWatch data should be considered for inclusion in the cost-benefit analysis to improve reliability of the cost and benefit estimates.

Analysis of WA FuelWatch data and, in particular, the increasing gross indicative retail differences for premium fuels, suggests that the impact of the phase out of 91 RON will be a significant increase in retail fuel prices that would not necessarily be mitigated by increased efficiencies, resulting in much higher fuel costs for motorists who currently use 91 RON.

<u>Questions relating to the petrol standard</u>

Question 31. Do you think other parameters should be specified (e.g. methanol)?

The Worldwide Fuel Charter (WWFC)[4] standard for unleaded gasoline (categories 1-5) recommends against the use of methanol. WWFC technical background on oxygenates states: "*Methanol is not permitted. Methanol is an aggressive material that can cause corrosion of metallic components of fuel systems and the degradation of plastics and*

[4] WWFC Committee, 2013. Worldwide Fuel Charter 5th Edition.

polymers."

Question 33. Would there be a negative impact to the fuel or motor vehicle industry to implement the EU's MON and RON standards? If yes, please explain.

There are cost (especially fuel price) implications of the proposed measures which need to be included in the cost-benefit analysis.

Question 35. What would be the impact for the fuel and motor industry if MTBE limits remained at current limits in petrol? Should the level of MTBE in petrol be greater than 1 per cent?

Question 36. Should a limit of 5 per cent to 10 per cent MTBE be permitted in high octane petrol (98 RON) petrol? Should similar limits be applied to ethanol in high octane petrol (98 RON) petrol?

WA does not support increasing the concentration of MTBE in petrol above one per cent due to the potential for contamination of ground and surface waters in this state.

MTBE is regulated in WA under the Environmental Protection (Petrol) Regulations 1999 with a maximum limit of 0.1 per cent.

The combination of a high dependence on groundwater and a large number of single lined tanks at re-fuelling stations in the Perth metropolitan region requires that MTBE is kept below the analytical sampling method limit of detection of 0.1 per cent v/v.

Questions relating to the automotive diesel standard

Question 40. What would be the effect of reducing polycyclic aromatic hydrocarbons (PAH) in automotive diesel on industry and other stakeholders?

Aakko *et al.* (2006)[5] and de Souza and Correa (2016)[6] found that PAH emissions from automotive diesel were related to the PAH content in the fuel. Although de Souza and Correa (2016) found much of the PAH content of diesel fuel is combusted or remains in the lubricating oil (95-99%) both studies found that higher the concentrations of PAH in diesel fuel resulted in higher PAH emission factors in the exhaust emissions. The studies found that although a large amount of PAHs are removed during combustion, reducing the PAH in diesel would have a beneficial impact on air quality.

Question 42. Should the standard apply more broadly to all diesel engines, including ships operating around the Australian coast?

WA supports diesel standards applying more broadly to include ships operating around the Australian coast. The potential problem of maritime emissions has been outlined by Goldsworthy and others[7].

---

[5] Aakko, P., Harju, T. Niemi, M., and Rantanen-Kolehmainen, L. (2006). PAH Content of Diesel Fuel and Automotive Emissions. VTT Research Report VTT-R-1155-06. Finland.

[6] De Souza, C.V. and Correa, S. M. (2016) Polycyclic aromatic hydrocarbons in diesel emissions, diesel fuel and lubricant oil. Fuel (185) pp. 925-931.

[7] Goldsworthy, L. and Goldsworthy, B. 2013. Ship Engine Exhaust Emissions and Fuel Consumption in Australian Waters Including Ports. Stage 1 2010/11 emissions inventory. Estimations based on terrestrial AIS data. Mapping of spatial distribution of emissions. University of Tasmania Research Project 2914.
Australian Maritime College, University of Tasmania; *and,*
Goldsworthy, L. and Renilson, M. 2013. Ship Engine Exhaust Emission Estimates for the Port of Brisbane.
Air Quality and Climate Change 47 (2), 26-35.

Questions relating to the autogas standard

Question 46. Should a standard be prescribed for Compressed Natural Gas (CNG)?

Question 47. Should a standard be prescribed for Liquid Natural Gas (LNG)?

WA prefers that CNG and LNG be covered by a fuel standard and fall under the expanded definition of 'fuel' in the Fuel Quality Regulations 2001. Voluntary compliance and market forces alone are not likely to be sufficient to drive changes or improvements to fuel standards for CNG and LNG when improvements are possible. Therefore, regulatory mechanisms need to be in place for all fuels.

WESTERN AUSTRALIAN GOVERNMENT SUBMISSION

IMPROVING THE EFFICIENCY OF NEW LIGHT VEHICLES – DRAFT REGULATION IMPACT STATEMENT

The Commonwealth Ministers for Urban Infrastructure, and Environment and Energy, released the *Improving the Efficiency of New Light Vehicles – Draft Regulation Impact Statement* (DRIS) for public consultation closing 10 March 2017. Feedback was sought on its key proposals, particularly:

- the implications of the range of potential target(s) which might apply under the standards based on an assessment of compliance costs and consumer/societal benefits; and
- the appropriate regulatory design for implementing the standard (stakeholders were invited to consider questions in the DRIS where applicable).

Western Australia's (WA) consolidated response is summarised below.

Vehicle efficiency targets

WA prefers that the Australian vehicle market aligns with international markets such as Europe and the United States and adopts a vehicle efficiency target of 105gCO_2/km (Target A). This would ensure the highest efficiency vehicles available internationally are also available to Australian consumers to reduce the dumping that may occur when Australian requirements do not keep pace with international standards.

Greenhouse gas emissions from transport in WA continue to rise. Implementing initiatives that have a negative cost of abatement and maximise net benefits makes good economic sense and will assist to reduce the need for more challenging or costly emissions reduction measures in the future.

WA supports Option 4 as an effective means to improving vehicle efficiency and reducing all vehicle emissions in addition to CO_2. Benefits to health are achieved for any improvement in air quality, even if air pollutants are below the relevant national standards. Any measure that has a positive impact on vehicle noxious emissions (particles and other gases), while achieving the CO_2 target, should be considered as a priority.

Regulatory design

Question 1. What parameter (CO_2 emissions or fuel consumption) should be used for an Australian fuel efficiency standard and why?

From a technical perspective, improved fuel efficiency does not always equate with reduced emissions. There are circumstances in which measures to make engines more efficient have resulted in increased emissions and other instances where noxious emissions reducing technologies lead to lower engine efficiency. However, as a general rule, reduced fuel consumption leads to lower emissions of CO_2.

Whether grams of carbon dioxide emitted per kilometre should be considered as a vehicle efficiency measure or a measure of emissions depends primarily on the objectives of the measure.

In Table 2 of the DRIS, the carbon dioxide emissions benefit for an electric vehicle is listed as 100 per cent. Consideration should be given to the carbon dioxide produced for energy (for example at power stations) to power the vehicle.

Question 6. If SUVs are subject to a different target to passenger cars, how should SUVs be defined, and why?

WA supports the European approach to classifying SUVs as passenger vehicles. SUVs make up more than 20 per cent of the domestic vehicle market in WA. WA supports the application of the target of 105gCO_2/km to SUVs.

WA also supports an ambitious target applied to light commercial vehicles (which made up 18 per cent of Perth vehicles in 2011-12 (Perth vehicle emissions inventory)).

Discussions with fleet managers at WA State Government departments in 2014 indicated that fleet vehicle efficiency targets were circumvented by the classification of SUVs and other light vehicles (such as light utilities) as commercial vehicles despite their day to day use as pool vehicles and vehicles for home garaging. SUVs and light commercial vehicles make up a significant and growing portion (over 38 per cent) of the Perth vehicle fleet and account for an increasing volume of vehicle emissions. Passenger vehicle efficiency targets should be applied to this segment of the fleet in order to realise the full health and climate benefits of vehicle efficiency regulation.