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RAC Response to the Light Vehicle Emission Standards for Cleaner Air Draft Regulation Impact Statement.

Thank you for the opportunity to respond to the Department of Infrastructure, Transport, Regional Development and Communications' *Light vehicle emissions standards for cleaner air—draft regulation impact statement* (Draft RIS). The introduction of more stringent light vehicle noxious emissions standards in Australia is an important priority for RAC and we are pleased to provide this submission on behalf of our more than 1.1 million members.

About RAC

RAC is a purpose-led member organisation and since our foundation more than 115 years ago, RAC has existed to be a driving force for a Better WA. We work collaboratively with government, industry, our members and all Western Australians to champion change that will deliver safer, sustainable and connected communities.

RAC's social and community impact activities seek to:

- reduce the number of people being killed or seriously injured on our roads;
- lower vehicle emissions for cleaner, healthier air; and
- ensure well-planned communities and transport that better connect people and places.

Background

This Draft RIS follows earlier consultation papers released in 2010 and 2016. The 2010 *Final RIS - Euro 5/6 Emission Standards for Light Vehicles* (2010 RIS) first considered the introduction of Euro 6 emissions standards in Australia. The 2010 RIS recommended a staged introduction of Euro 5 from April 2013 and Euro 6 emissions standards phased in from April 2017. Subsequently, Euro 5 equivalent noxious vehicle emissions standards were introduced through the Australian Design Rules (ADRs) 79/03 and 79/04 in 2013 for new vehicle models and 2016 for all new vehicles sold. In 2016, a further consultation occurred for the introduction of Euro 6, however despite a broad level of support no timeline was created outlining the introduction of Euro 6 or equivalent standards. It is unacceptable that almost five years have gone by and still no decision has been made; over this period thousands more Australians will have suffered from the harmful effects of air pollution.

To avoid vehicle operability issues, the Draft RIS notes full introduction of Euro 6 will be reliant upon the planned commencement of more stringent fuel quality standards in Australia in 2027. In 2018, the

Department of Environment and Energy released the *Better fuel for cleaner air—draft regulation impact statement* (Draft 2018 fuel RIS) which considered options including timeframes (2022, 2025 and 2027) for implementing stricter fuel quality standards in Australia. In its submission to the Draft 2018 fuel RIS, RAC called for the introduction of fuel improvements by 2022. In 2019 however, it was announced fuel quality improvements would not occur until July 2027.

The 2020 Draft RIS outlines four options regarding Euro 6 adoption in Australia. At a high level these options include:

> **Option 1:** Business as usual – allow the existing Euro 5 standards and market forces to provide a solution.
> **Option 2:** Fleet purchasing policies – maintain Euro 5 standards but seek to influence vehicle purchasing decisions by adopting minimum noxious emissions performance requirements in the Australian Government fleet.
> **Option 3:** Voluntary standards – maintain Euro 5 standards but encourage vehicle manufacturers, through peak industry groups, to enter into an agreement with the Australian Government to meet increased minimum noxious emissions performance requirements.
> **Option 4:** Increased mandatory standards – mandate Euro 6 for light vehicles under the *Road Vehicle Standards Act 2018* (RVSA).
>
> The draft RIS also considers staged implementation of Euro 6 through earlier implementation of Euro 6b which would introduce: the lower oxides of nitrogen (NOx) emission limits for diesel vehicles; tighter monitoring thresholds for on-board diagnostics (OBD); and an interim particle number limit for direct injection petrol vehicles. Euro 6d is the full implementation of Euro 6; in addition to the changes in 6b it introduces the remaining emission requirements (as per Table 1) along with the Worldwide harmonised Light vehicle Test Procedure (WLTP) and the Real Driving Emissions (RDE) test.

RAC supports Option 4, preferably to be introduced earlier than 2027, and agrees with the Draft RIS that options one to three will fail to achieve the necessary emissions reductions.

To demonstrate the need for change, our submission first explains vehicle emissions and their impact to human health and the environment, before discussing three key areas of change supported by RAC to address harmful vehicle emissions, which is an area of concern for our members:

- noxious vehicle emissions standards;
- fuel quality; and
- vehicle emissions testing.

Emissions in Australia

During fuel combustion, petrol and diesel fuelled vehicles emit a range of airborne pollutants and greenhouse gases such as NOx, particulate matter ($PM_{2.5}$ and PM_{10}) hydrocarbons (including methane, benzene, toluene, xylene, and benzo[a]pyrene), carbon monoxide (CO), oxides of sulfur (SOx), ozone (O_3) and carbon dioxide (CO_2) which collectively impact negatively on air quality, human health and the environment.

The transport sector in Australia is currently responsible for 19 per cent of all greenhouse gas emissions produced (including the above), while cars and light commercial vehicles alone contribute

12 per cent of total greenhouse gases produced in Australia each year – over 63.6 million tonnes of CO_2-e (carbon dioxide equivalent)[1].

In 2015, 2,566 deaths were attributable to air pollution in Australia[2]; the Draft RIS quotes the International Council for Clean Transport (ICCT) as attributing approximately 620 deaths explicitly to ambient particulate matter ($PM_{2.5}$) and ozone[3] resulting from transport emissions[4]. The Organisation for Economic Co-operation and Development (OECD) confirms that while deaths from air pollution across Europe largely declined from 2005 to 2010, Australian deaths rose over the same period[5]. Further, air pollution in Australia is estimated to contribute to approximately 4.6 per cent of all cardiovascular disease, 1.6 per cent of all respiratory disease and 0.2 per cent of cancers[6].

NOx collectively refers to a group of highly reactive gases, predominantly nitric oxide (NO) and nitrogen dioxide (NO_2). Adverse effects of inhaling NOx include direct irritation and inflammation of the respiratory system, development or exacerbation of pre-existing asthma, as well as decreased immunity to respiratory infections such as colds, flu, and bronchitis, cardio-pulmonary disease, cardiovascular disease, allergies and organ inflammation[7]. NOx reacts with hydrocarbons to create photochemical smog such as ozone and $PM_{2.5}$[8]. NOx also reacts with substances in the atmosphere to form acid rain[9]. NO_2 is primarily released into the air through burning of fuel for transport and power plants[10]. The Australian Government estimates that, nationally, motor vehicles could contribute as much as 60-70 per cent of total NOx emissions[11].

PM_{10} refers to particulate matter 10 micrometres or less in diameter, while $PM_{2.5}$ is 2.5 micrometres or less in diameter, for perspective a human hair is approximately 100 micrometres in width. It is important to note PM is not one specific chemical or substance but rather the size of the particles and can be made up of any microscopic particle[12]. Most PM forms in the air due to chemical reactions from NOx and SOx[13]. Due to the small size, PM can be inhaled deep into the lungs where it can enter the blood stream.

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[1] Australian Greenhouse Gas Emissions Information System, 2020, National Greenhouse Gas Inventory – UNFCCC classifications. Accessed at https://ageis.climatechange.gov.au/.

[2] Australian Government - Australian Institute of Health and Welfare, 2019, Australian Burden of Disease Study Impact and causes of illness and death in Australia 2015. Accessed at https://www.aihw.gov.au/ getmedia/c076f42f-61ea-4348-9c0a-d996353e838f/aihw-bod-22.pdf.aspx?inline=true.

[3]Australian Government – Department of Infrastructure, Transport, Regional Development and Communications, 2020, Light Vehicle Emission Standards for Cleaner Air Draft Regulation Impact Statement, citing the International Council on Clean Transportation – Anenberg, S, Miller, J, Henze, D, Minjares, R., 2019, A Global Snapshot of the Air Pollution-Related Health Impacts of Transportation Sector Emissions in 2010 and 2015. Available at: https://theicct.org/publications/health-impacts-transport-emissions-2010-2015.

[4] This is a conservative estimate as it does not include deaths attributed to all pollutants released by vehicles.

[5]OECD, 2014, The Cost of Air pollution: Health Impacts of road Transport, OECD Publishing. http://www.keepeek.com/Digital-Asset-Management/oecd/environment/the-cost-of-air-pollution_9789264210448-en#page54.

[6] Australian Government - Australian Institute of Health and Welfare, 2019, Australian Burden of Disease Study Impact and causes of illness and death in Australia 2015. Accessed at https://www.aihw.gov.au/reports/burden-of-disease/burden-disease-study-illness-death-2015/summary.

[7] USA Environmental Protection Agency, 2016, Integrated Science Assessment (ISA) For Oxides of Nitrogen – Health Criteria (Final Report, 2016). Accessed at http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=526855.

[8] Australian Government, Vehicle Emissions Discussion Paper 2016 at page 3. Accessed at https://www.infrastructure.gov.au/vehicles/environment/forum/files/Vehicle_Emissions_Discussion_Paper.pdf.

[9] Tox Town, US National Library of Medicine, What are Nitrogen Oxides. Accessed at https://toxtown.nlm.nih.gov/chemicals-and-contaminants/nitrogen-oxides.

[10] United States Environmental protection agency, Nitrogen Dioxide (NO2) Pollution. Accessed at https://www.epa.gov/no2-pollution/basic-information-about-no2.

[11]Australian Government, 2016. Vehicle emissions standards for cleaner air, Draft Regulation Impact Statement December 2016. Accessed at https://www.infrastructure.gov.au/vehicles/environment/forum/files/Vehicle_NOxious_Emissions_RIS.pdf.

[12] National Pollutant Inventory, 2019, Particulate matter (PM10 and PM2.5). Accessed at https://www.npi.gov.au/resource/particulate-matter-pm10-and-pm25#:~:text=Description,be%20placed%20on%20its%20width.

[13] United States Environmental protection agency, Particulate Matter (PM) Pollution. Accessed at https://www.epa.gov/pm-pollution/particulate-matter-pm-basics.

Hydrocarbons (including methane, benzene, toluene, xylene, and benzo[a]pyrene) include known carcinogens. Hydrocarbons such as methane have 20 times the global warming impact of the same amount of CO_2. The World Health Organisation (WHO) advises *'Benzene is carcinogenic to humans, and no safe level of exposure can be recommended'*[14]. Benzene is (and has been) classified as a Group 1 carcinogen for over 30 years – the highest carcinogen classification[15]. Combustion engine vehicle emissions are the largest source of benzene, accounting for approximately 70 per cent of all benzene emissions in Europe with an additional 10 per cent attributed to petroleum refining and distribution[16].

CO is a colourless and odourless gas, which forms when carbon in fuels does not burn completely. It is commonly created by motor vehicle emissions and industry. CO deprives the blood of oxygen and can have serious health impacts on unborn babies[17]. CO also contributes to greenhouse gases.

SOx creates sulfuric acid in the atmosphere creating acid rain. Sulfur dioxide also impacts humans when inhaled. Sulfur is an irritant to the airways, including the nose and throat, and can cause coughing, wheezing, shortness of breath and tightness in the chest. People with respiratory conditions are most at risk of developing issues when inhaling sulfur. Sulfur can cause burning to the eyes and skin. Particles can be inhaled deep into the lungs causing further serious health problems[18].

Noxious vehicle emissions are also a significant contributor to ozone. Naturally occurring ozone is present in the upper atmosphere and absorbs some ultraviolet radiation, however tropospheric or ground level ozone is caused by chemical reactions from NOx and is toxic to humans. Ozone can impact negatively on the respiratory system and is one of the main contributors to smog. There is no safe level of ozone exposure[19]. Further, the Draft RIS states that Australia's average ozone exposure is *"…increasing at a faster rate than many other developed countries, most of which have adopted more stringent noxious emission standards".*

CO_2 is primarily released through human activities such as burning fossil fuels (including motor vehicles and power plants), and also through natural sources such as volcanic eruptions and respiration. It is estimated that humans have increased atmospheric CO_2 concentration by approximately 40 per cent since the 1700s[20]. If this situation continues, with a stronger greenhouse effect it is expected that regions will variably become hotter and dryer (and in other places, warmer and wetter), there will be more extreme weather events, the ocean's temperature and sea levels will continue to rise, and wildlife populations and habitats will shift for example (consequences of climate change - which encompasses global warming and the broader changes to the planet's weather and climate systems). **Australia is one of the few developed countries without a regulated CO_2 emissions standard for new light vehicles. While not within scope of the RIS, a long-standing priority for RAC has been for an impactful standard to be introduced as soon as possible.**

[14] World Health Organisation, 2010, Preventing disease through healthy environments. Accessed at http://www.who.int/ipcs/features/benzene.pdf.
[15] World Health Organisation, 2010, Preventing disease through healthy environments. Accessed at http://www.who.int/ipcs/features/benzene.pdf.
[16] Bassett, W.H., 1999, Clay's Handbook of Environmental Health, Eighteenth edition. Pg. 731. Accessed at https://books.google.com.au/books?id=ck2qO5Gyj40C&printsec=frontcover#v=onepage&q&f=false.
[17] NSW Government – Health, 2013, Carbon monoxide (CO). Accessed at: https://www.health.nsw.gov.au/environment/air/Pages/carbon-monoxide.aspx.
[18] Agency for Toxic substances and disease registry (US), 1998, Public health statement sulfur dioxide. Accessed at https://www.atsdr.cdc.gov/ToxProfiles/tp116-c1-b.pdf.
[19] Di Q, Dai L, Wang Y, Zanobetti A, Choirat C, Schwartz JD, Dominici F., 2017, Association of Short-Term Exposure to Air Pollution with Mortality in Older Adults. JAMA. Accessed at https://jamanetwork.com/journals/jama/fullarticle/2667069.
[20] Intergovernmental Panel on Climate Change (IPCC), 2013, Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Accessed at http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf.

Noxious vehicle emissions standards

Euro vehicle emissions standards regulate noxious tailpipe emissions through defined limits for NOx, PM, total hydrocarbons, non-methane-hydrocarbons and CO. Since the introduction of Euro 1 in 1992, Europe has progressively tightened vehicle emissions standards introducing Euro 5 in 2009 (Australia's current equivalent standards), phasing in Euro 6b from 2014 and arriving at Euro 6d in 2017. Euro 6 or equivalent emissions standards have been adopted across the European Union (EU), US, Canada, United Kingdom, Japan, China, Korea and India, which "*account for over 80 per cent of global new vehicle sales*[21]*".* The United Nations (UN) has also adopted Euro 6 standards through the World Forum for Harmonization of Vehicle Regulation (WP. 29).

Table 1: Euro 5 and 6 noxious emissions limit comparison

			Limit values (g/km)											
		Reference mass (RW) (Vehicle weight)	Mass of carbon monoxide (CO)		Mass of oxides of nitrogen (NOx)		Mass of hydrocarbons (total and non-methane) (THC) (NMHC)		Combined mass of total hydrocarbons and oxides of nitrogen (THC+NOx)		Mass of particulates (PM)		Number of particles (#/km)	
Standard	Class		Petrol / LPG	Diesel	Petrol / LPG	Diesel	Petrol / LPG	Diesel	Petrol / LPG	Diesel	Petrol / LPG	Diesel	Petrol/LPG (direct injection petrol only)	Diesel
Euro 5	M (Passenger vehicles)	All weights	1.00	0.50	0.060	0.180	0.10, 0.068	-	-	0.23	0.0045	0.0045	-	$6x10^{11}$
	N_1 (Light commercial vehicles) I	RW ≤ 1305 kg	1.00	0.50	0.060	0.180	0.10, 0.068	-	-	0.23	0.0045	0.0045	-	$6x10^{11}$
	II	1305 kg < RW ≤ 1760 kg	1.81	0.63	0.075	0.235	0.13, 0.09	-	-	0.295	0.0045	0.0045	-	$6x10^{11}$
	III	1760 kg < RW	2.27	0.74	0.082	0.280	0.16, 0.108	-	-	0.350	0.0045	0.0045	-	$6x10^{11}$
Euro 6	M (passenger vehicles)	All weights	1.00	0.50	0.060	0.080	0.10, 0.068	-	-	0.17	0.0045	0.0045	$6x10^{11}$	$6x10^{11}$
	N_1 (Light commercial vehicles) I	RW ≤ 1305 kg	1.00	0.50	0.060	0.080	0.10, 0.068	-	-	0.17	0.0045	0.0045	$6x10^{11}$	$6x10^{11}$
	II	1305 kg < RW ≤ 1760 kg	1.81	0.63	0.075	0.105	0.13, 0.09	-	-	0.195	0.0045	0.0045	$6x10^{11}$	$6x10^{11}$
	III	1760 kg < RW	2.27	0.74	0.082	0.0125	0.16, 0.108	-	-	0.215	0.0045	0.0045	$6x10^{11}$	$6x10^{11}$

The key changes under Euro 6d equivalent standards when compared to Euro 5 are:

- a 55 per cent reduction in the emission limits for NOx for light diesel vehicles;
- introduction of a particle number limit to reduce fine particle emissions from direct injection petrol vehicles;
- tighter thresholds for OBD systems that monitor the performance of emission control systems; and
- replacement of the current drive cycle testing regime with the new WLTP along with the introduction of an on road RDE test.

RAC supports the introduction of Euro 6 vehicle emissions standards at the earliest possible introduction date.

A recent survey in October 2020, of almost 500 RAC members showed 75 per cent believe government should be doing more to address vehicle emissions; regulating emissions through national standards was identified as one of the top three actions that should be taken[22]. Introducing Euro 6 noxious vehicle emissions standards will allow the Australian market access to advanced, safer and cleaner vehicle technologies, and immediately begin to reduce our vehicle's impacts on air quality, the health of Australians and the environment.

Should government decide not to introduce Euro 6d before 1 July 2027, it must consider implementing Euro 6b as a first step[23]. However, it is important that this interim measure does not further delay full

[21] Australian Government – Department of Infrastructure, Transport, Regional Development and Communications, 2020, Light Vehicle Emission Standards for Cleaner Air Draft Regulation Impact Statement. Accessed at https://www.infrastructure.gov.au/vehicles/environment/forum/files/light-vehicle-emission-standards-for-cleaner-air.pdf.

[22] RAC Member Priorities Tracker survey on environmental sustainability, with 358 from the Perth and Peel region, 123 from regional WA and 6 outside of Western Australia. Age, gender and location sampling quotas were applied, and data has been post-weighted to be representative of RAC's membership (which is broadly consistent with the WA population profile) – the margin of error at total sample level is +/-5% at the 95% confidence level. 110 members answered the question on government actions.

[23] The introduction of Euro 6b would see the early Euro 6b standards (lower NOx emission limits for diesel vehicles; tighter OBD monitoring thresholds; and an interim particle number limit for direct injection petrol vehicles) introduced.

implementation of Euro 6d beyond 2027. Steps that advance us towards cleaner air and better health outcomes are critical, especially when there are settings – such as low-sulfur diesel fuel – that already exist in Australia to accommodate more stringent regulations.

The Bureau of Infrastructure and Transport Research Economics modelling in the Draft RIS shows significant reductions in PM and NOx under Euro 6d and *"found that there would be a direct benefit to the health and wellbeing of the Australian community of $6,385 million by 2050 as a result of a reduction in air pollution".* This benefit is from a 2027 introduction date; bringing the start date forward could be expected to further increase the health benefits (potentially saving lives).

The Draft RIS points out the further risk that if "*Australian regulation does not keep pace with international standards that are prevalent across the global vehicle market, then we run the risk of foregoing the benefits of technology available in other countries. Manufacturers may still find it more cost effective to continue supplying older technology to the Australian market, affecting the range and choice of models available to Australian consumers."* The current proposed introduction date would further slow Australia down in terms of emissions reductions and it is important to consider that the EU is exploring the adoption of 'Euro 7' by the fourth quarter of 2021[24]. The EU's Inception Impact Statement on the development of post-Euro 6 emission standards for cars, vans, lorries and buses states *"…because the current emission limits (Euro 6) were adopted [into regulation] over a decade ago, they no longer represent the state of the art in emission reduction. Notably, several pollutants that are of concern today were not included in the past for various reasons".* **It is prudent that Australia continues to monitor this development (and those in other countries) over the next couple of years to ensure we keep pace.**

There are also concerns as to how Australia lagging behind would impact on our access to safer vehicle and emissions reductions technologies. An introduction date of at least six years away further reduces Australia's ability to adopt technologies as they are introduced, and we may see a backwards turn in terms of technology adoption. The Draft RIS comments that this is already being observed through decreased fuel efficiency and the flow of increased vehicle emissions "*many new vehicle models released in Australia are less efficient when compared to a previous generation of the same model".* Manufacturers may deem it cost-prohibitive to install cutting edge safety, emissions reductions, and other technologies into vehicles for the Australian market, which is both small and niche.

Fuel quality in Australia

The final stage of Euro 6d requires better fuel quality than is currently available for sale in Australia[25] and so must be considered within the scope of this consultation. The quality of fuel combusted by a vehicle engine while driving, directly impacts noxious emissions produced. High levels of sulfur impacts on catalytic converters in vehicles, which limits the ability of the catalytic converter to convert noxious emissions into less harmful components. Sulfur content also impacts on emission control systems, so restricts the Australian market's access to new engine and emissions control technologies.

[24] European Commission. (2020). European vehicle emissions standards – Euro 7 for cars, vans, lorries and buses. Retrieved from: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12313-European-vehicle-emissions-standards-Euro-7-for-cars-vans-lorries-and-buses.

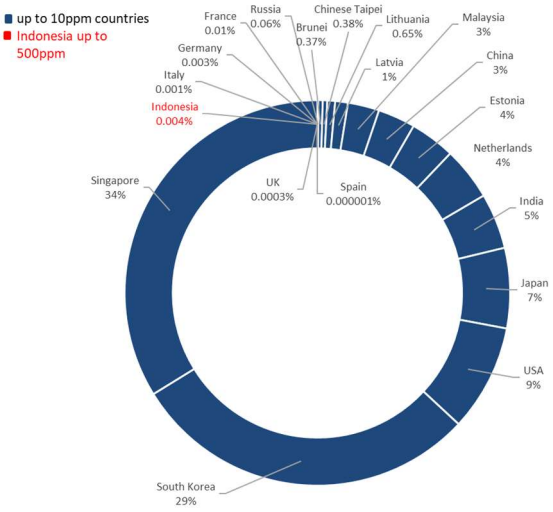
[25] Australian Government – Department of Infrastructure, Transport, Regional Development and Communications, 2020, Light Vehicle Emission Standards for Cleaner Air Draft Regulation Impact Statement. Accessed at https://www.infrastructure.gov.au/vehicles/environment/forum/files/light-vehicle-emission-standards-for-cleaner-air.pdf.

High aromatic / hydrocarbon content such as benzene and its derivatives form combustion chamber deposits and increase PM and other harmful carcinogenic vehicle emissions.

As fuel quality regulations are increasingly tightened throughout the world, Australia is falling well behind other nations in fuel quality rankings, currently coming in at 85th behind Argentina (84th), Bosnia and Herzegovina (83rd), Algeria (82nd), Iraq (81st) and Mexico (80th). Of all OECD countries, Australia has the lowest quality fuel[26]. Across Europe, the US and Canada, Russia, and most of Asia, the sulfur limit is 10ppm. With up to 150ppm allowable sulfur content in Australian unleaded petrol – Australian fuel standards permit up to 15 times the 'international standard', to the detriment of Australian health, environment and vehicle operability[27].

A key argument against increased fuel standards in Australia outlined in the draft 2018 fuel RIS was the difficulty for existing refineries to produce higher quality fuel but **there is a case for the Australian Government decision to delay increased fuel quality to be re-examined**, especially given the large-scale impact better fuel quality would have and the flow on effects of allowing other emissions reductions regulations to go ahead.

In 2019-20, approximately 60 per cent of total automotive petroleum consumed in Australia was refined here – but the amount refined in Australia has decreased by 41 per cent over the prior decade (and for diesel refinement the decline has been 35 per cent)[28]. Of the fuel refined in Australia in 2019-20, 73 per cent was from imported crude oil stocks[29]. In total, Australia refines just 0.6 per cent of total world oil[30].



In recent years, Australia has become more and more reliant on imported refined fuel, with Australian based refineries closing and converting into import storage terminals. In 2010, Australia had seven operating oil refineries but this will have declined to two by mid-late 2021, with the announced closures of Kwinana and Altona refineries, and with further speculation that one of the remaining two operating refineries will also see an announced closure later this year[31].

Figure 1: Breakdown of imported refined automotive petroleum origin countries and sulfur limits[32,33]

[26] Stratas Advisors, 2020, 15 Countries Move Up in Top 100 Ranking on Gasoline Sulfur Limits. Accessed at https://stratasadvisors.com/insights/2020/07022020-top-100-gasoline-sulfur-ranking.
[27] ICCT, 2014, China V gasoline and fuel quality standards, January 2014. Accessed at http://theicct.org/sites/default/files/publications/ICCTupdate_ChinaVfuelquality_jan2014.pdf.
[28] Department of Environment and Energy, 2021, Australian Petroleum Statistics, Table 2, December 2020. Accessed at https://www.energy.gov.au/publications/australian-petroleum-statistics-2020.
[29] Department of Environment and Energy, 2021, Australian Petroleum Statistics, Table 4B, December 2020. Accessed at https://www.energy.gov.au/publications/australian-petroleum-statistics-2020.
[30] BP, 2020, Statistical review of world energy, 69th edition. Accessed at https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2020-full-report.pdf.
[31] The Age, 2021, 'Nowhere to go': Devastated workers vent over closure of Altona fuel refinery, 10 February 2021. Accessed at https://www.theage.com.au/national/victoria/exxon-set-to-close-altona-refinery-350-jobs-at-risk-20210210-p5711w.html.
[32] Department of Environment and Energy, 2021, Australian Petroleum Statistics, Table 4b, December 2020. Accessed at https://www.energy.gov.au/publications/australian-petroleum-statistics-2020.
[33] Fuels Europe, 2019, Statistical Report 2019. Available at https://www.fuelseurope.eu/wp-content/uploads/FuelsEurope-Statistical-Report-2019-2.pdf.

The Australian Government is providing domestic refineries operating subsidies (as part of its $2.3 billion package for fuel security)[34], the **examination of whether these payments could be redirected to include refinery upgrades is an important conversation in this context.**

Over 99.99 per cent of countries that Australia imports refined automotive petroleum from already have minimum fuel specifications for sulfur content of 10ppm[35] (Figure 1). Diesel fuel in Australia has met minimum 10ppm sulfur content specifications since January 2009.

The speculated introduction date of Euro 6d in 2027 is based on the start date of increased fuel quality in Australia. **RAC holds true to its long-standing position that fuel quality in Australia should be improved in the shortest possible timeframe.** RAC reiterates the immediate and widespread impact increased fuel quality standards will have an on reducing harmful emissions across the entire vehicle fleet, as well as allowing Australia to adopt Euro 6d noxious vehicle standards and allow Australians access to the best and safest vehicle technologies[36].

Globally, increasing fuel quality has been on the agenda since the early 1990s, and the shift towards higher quality fuel has occurred since then across the developed world. In Australia, increasing fuel quality began in the early 2000s with a reduction in permissible sulfur content in diesel fuel from 500ppm in 2002 down to 10ppm in 2009 – in step with European fuel quality improvements. For unleaded petrol a three-year reduction in sulfur content from 500ppm in 2002 to 150ppm in 2005 (the current standard). By 2027, there will be a 22-year gap in improving unleaded fuel quality in Australia. This gap has provided significant lead times for both regulation and the inevitable required planning and investment by refinery owners.

Diesel is already of a standard to adopt Euro 6b, and this should be considered as a priority due to the disproportionate level of NOx produced by diesel vehicles. Under the current Australian regulations (the Australian Design Rules Standard 79/04), new diesel passenger vehicles being sold in Australia can emit three times the allowable NOx emissions limit for petrol passenger vehicles (180 milligrams of NOx per km (180mg/km) and 60mg/km respectively), and new diesel light commercial vehicles are permitted to produce three and a half times the limit for comparative petrol vehicles[37].

Where possible Euro 6b, as a stepping-stone to Euro 6d, should also occur for unleaded petrol vehicles which accept 'premium' fuel. It is important to note however, even so called 'premium' fuel quality in Australia fluctuates widely[38] and is still not subject to the more stringent fuel quality standards seen in most other countries.

Bringing forward the implementation date for increased fuel quality in Australia would seem appropriate given the above and would have multi-faceted positive impacts and cease to hold-up

[34]Australian Government. (2020, December 14). *Immediate support for Australia's refineries and fuel security*. Accessed at https://www.minister.industry.gov.au/ministers/taylor/media-releases/immediate-support-australias-refineries-and-fuel-security.
[35] Department of Environment and Energy, 2021, Australian Petroleum Statistics, Table 4b, December 2020. Accessed at https://www.energy.gov.au/publications/australian-petroleum-statistics-2020.
[36] RAC, 2018, Better Fuel for Cleaner Air RAC Response to the Department of Environment and Energy's Draft Regulation Impact Statement January 2018. Accessed at https://www-cdn.rac.com.au/-/media/files/rac-website/about-rac/advocacy/rac-submission---better-fuel-for-cleaner-air (1).pdf?la=en&modified=20200416061208&hash=803232823CB97B8A2F41EBF8465F5E152863A1C8&_ga=2.80242131.518855169.1610678697-987787363.1595918227.
[37] Australian Government, 2016. Vehicle emissions standards for cleaner air, Draft Regulation Impact Statement December 2016. Accessed at https://www.infrastructure.gov.au/vehicles/environment/forum/files/Vehicle_NOxious_Emissions_RIS.pdf
[38] RAC independent study conducted in 2018, overview contained in RAC, 2018, Better Fuel for Cleaner Air RAC Response to the Department of Environment and Energy's Draft Regulation Impact Statement January 2018. Accessed at https://www-cdn.rac.com.au/-/media/files/rac-website/about-rac/advocacy/rac-submission---better-fuel-for-cleaner-air-(1).pdf?la=en&modified=20200416061208&hash=803232823CB97B8A2F41EBF8465F5E152863A1C8&_ga=2.80242131.518855169.1610678697-987787363.1595918227.

other components of the Australian Government's Ministerial Forum on Vehicle Emissions package (Better fuel for cleaner air, Light vehicle emissions standards for cleaner air and Improving the efficiency of new light vehicles (e.g. through vehicle CO_2 emissions standards)) – established in 2015 and created to reduce vehicle impacts on health and the environment.

Vehicle emissions testing

Vehicle emissions testing is designed to inform the consumer of fuel consumption and vehicle emissions, and also to ensure regulatory compliance for noxious vehicle emissions. Globally, there has been a shift to ensure noxious vehicle emissions limits are being complied with. In Europe, and as part of the Euro 6d standards there has been a shift away from the previous laboratory testing procedure (the New European Driving Cycle (NEDC) testing), to a testing regime that is more reflective of real world driving (the WLTP). And in response to issues surrounding 'defeat devices' and the discrepancy between laboratory test results and fuel consumption and emissions produced while driving, a secondary 'real world' component (the RDE test) is included[39].

The WLTP is designed to better reflect real world driving emissions in a laboratory setting. To be able to accurately and appropriately compare vehicle emissions, a standardised and repeatable test is required. The variability in testing would otherwise be too great and would provide too much ambiguity and imprecision for like comparisons. The WLTP has been redesigned through a compilation of global real-world driving data, better representing commonplace driving profiles[40]. The WLTP was designed by the European Commission and is progressively being adopted across other countries and by the UN, as the new standard vehicle emissions testing procedure[41].

The RDE is conducted in the 'real world' and is measured by a portable emission measuring systems (PEMS), which is fitted to the outside of a car, driven outside on the road, in the real world. The PEMS measures vehicle emissions being produced while driving and ensures that in the 'real world' the emissions produced, particularly NOx, do not exceed the specified limits and provides more realistic emissions figures while driving in real conditions on the road[42]. The RDE testing is complementary to the WLTP testing, however, does not replace laboratory testing.

Updated vehicle emissions testing procedures that support Euro 6 and better reflect emissions and fuel consumption are supported. In addition, introduction of both tests should be informed by international evaluation and improvement. Recently the European Commission has noted: *"….real-world emissions are still not measured under all conditions of use in Euro 6/VI. In addition, air pollutant emissions are still not monitored throughout the entire lifetime of vehicles on EU roads such as to test under a greater variety of conditions".*

Summary and recommendations

RAC agrees with the Draft RIS which states *"The globalisation of the motor vehicle industry and the relatively small size of the vehicle market in Australia (1.2 per cent of global new vehicle sales) makes the development of unique Australian standards, and the manufacture of cars tailored specifically for our market, undesirable."* Government should ensure Australia keeps pace with international

[39] European Commission, 2017, EU action to curb air pollution by cars: Questions and Answers. Accessed at https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_2821.
[40] ACEA, 2017, What is WLTP and how does it work. Accessed at https://www.wltpfacts.eu/what-is-wltp-how-will-it-work/.
[41] UNECE, 2019, UNECE endorses stringent new vehicle emissions regulation, 19 January 2020. Accessed at https://unece.org/transport/press/unece-endorses-stringent-new-vehicle-emissions-regulation.
[42] European Commission, 2017, EU action to curb air pollution by cars: Questions and Answers. Accessed at https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_2821.

regulation. Already, we are more than a decade behind the EU's decision to introduce Euro 6 and should Euro 7 be introduced into regulation this year, some of the issues we are seeking to address through the introduction of Euro 6 (such as access to advanced technologies) may continue.

As outlined in our submission, there is a clear and urgent need for more stringent noxious vehicle emissions standards in Australia, coupled with improved fuel quality and vehicle emissions testing, as well as an impactful CO_2 emission standard for new light vehicles.

In regard to health impacts in particular, the most serious, toxic and even deadly outcomes have long been known and documented across numerous studies in the 1980s, 1990s and 2000s. We must act now, and it is critical that what we decide makes a meaningful impact on our air quality to ensure Australians can breathe cleaner, healthier air now and into the future.

In summary, RAC supports:

1. **Increased and more stringent mandatory emissions standards**
   RAC supports introduction of Euro 6d noxious vehicle emissions standards in Australia prior to 2027, with the introduction of Euro 6b as an interim but immediate measure. At the same time, an impactful CO_2 standard for light vehicles should also be introduced.
2. **Improving Australian fuel quality**
   RAC supports increasing fuel quality standards in Australia earlier than the planned start date in 2027, to bring forward introduction of Euro 6d standards and achieve broad reaching emissions reductions.
3. **Introducing WLTP and RDE emissions testing**
   RAC supports the introduction of WLTP emissions testing as a necessary component to Euro 6d standards, complimented by introduction of the RDE. Both tests should be informed by international developments over the coming years prior to the proposed introduction date.

RAC has welcomed the opportunity to participate in the Australian Government's Ministerial Forum on Vehicle Emissions, through the Draft RIS. We trust RAC's response, which is based on providing Western Australians with higher levels of protection from harmful vehicle emissions, is useful in progressing the much-needed adoption of Euro 6 noxious vehicle emissions standards in Australia. In support of our submission we enclose RAC's previous response to the Draft 2018 fuel RIS.