
FCAI Response to “Working towards a National Clean Air Agreement” Discussion Paper



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1.0 INTRODUCTION

The FCAI welcomes the opportunity to respond to the Federal Government's "Working towards a National Clean Air Agreement" Discussion Paper¹. The Federal Chamber of Automotive Industries (FCAI) is the peak industry organisation representing the manufacturers and importers of passenger vehicles, light commercial vehicles and motorcycles in Australia.

The Discussion Paper provides an overview of why the Government considers that a National Clean Air Agreement is needed in Australia. The purpose of the Discussion Paper is to start the engagement with business, industry and community representatives to help inform the development of a National Clean Air Agreement.

The FCAI and our member brands support improved air quality for citizens and fuel efficiency of motor vehicles. This should be done through the consistent application of measures at technological, behavioral and regulatory levels.

The issues that are of direct interest to the FCAI and member brands identified by the Discussion Paper include;

- Evaluate the health and environmental impact of emissions from light vehicles.
- Health impacts of particulate matter (PM) emitted from diesel exhaust.
- Review of Australia's fuel quality standards.

The FCAI also notes that the Government has recently released an Issues Paper on "Setting Australia's post-2020 target for greenhouse gas emissions". It is likely that the impact of CO₂ from new light vehicles will be considered during any development of Australia's post-2020 greenhouse gas (GHG) targets.

The FCAI and member companies' long standing position is that fuel quality standards, GHG emission targets (i.e. CO₂ standards or targets) and pollutant emission standards all need to be considered together, as they are all interrelated. This position is shared by the global automotive industry, regulators and research organisations.

The FCAI and member companies consider that a whole of Government approach is required that incorporates all associated issues, including fuel quality standards, which have a significant impact on vehicles' ability to meet both CO₂ targets and air pollution emission standards.

¹ Australian Government, Department of the Environment, "Working towards a National Clean Air Agreement", Discussion Paper, March 2015

2.0 INTER-RELATIONSHIP OF POLLUTANT EMISSIONS, CO₂ AND FUEL QUALITY

The FCAI's longstanding position is that pollutant emission standards (i.e. ADR 79/0x or Euro 5/6), GHG emission standards (i.e. CO₂ standards or targets) and fuel quality standards all need to be considered together, as they are all interrelated. This position is not unique and is shared by the global automotive industry, regulators and research organisations alike.

To fully deliver the expected air quality benefits (i.e. reduction in pollutant emissions) from the introduction of advanced vehicle pollutant emission standards (e.g. Euro 5 as ADR 79/04 or Euro 6 as ADR79/05) market fuel of the relevant quality standard (i.e. consistent with the certification fuel quality standard) must be available. If appropriate market fuel quality is not available, higher exhaust emissions (both CO₂ and pollutants) will be generated during a vehicles' operation with lower than expected improvements to air quality and health outcomes.

Vehicles are designed and developed to meet air pollutant emission standards (and CO₂ targets) with an expectation of fuel quality in a particular market. While air pollution emission standards (Euro 5 as ADR 79/04) have been introduced into Australian legislation, the Government has not mandated the concomitant fuel quality standards (95 RON 10 ppm sulphur petrol).

The FCAI and member companies consider that a whole of Government approach is required to incorporate all associated issues, including fuel quality standards, which have a significant impact on vehicles' ability to meet both air pollution emission standards. Otherwise, Australians will not receive the full benefit of the additional cost for improved emission technology in new cars.

3.0 MOTOR VEHICLE POLLUTANT EMISSIONS

Through the Australian Design Rules, the Government has introduced successively more stringent air quality standards (pollutant emission standards) for vehicles. New light vehicles (passenger cars, SUVs and light commercial vehicles) introduced into Australia need to meet the Euro 5 standards (ADR 79/03 introduced from 1 November 2013 and ADR 79/04 introduced from 1 November 2016).²

The progressive tightening of vehicle emissions standards, especially over the last 10+ years as Australia has progressed from Euro 2, through Euro 3 to Euro 4 and now Euro 5 standards, has contributed to improvements in air quality in Australian cities. For example, a 2013 study by the CSIRO for the Victorian EPA found that by 2030 total motor vehicle exhaust emissions will have significantly reduced and that improved technology is entering the vehicle fleet at a faster rate than growth of vehicle use³.

The successful introduction of the next step in light vehicle pollutant emission standards, Euro 6, is dependent on suitable fuel quality standards, i.e. 95 RON, 10 ppm sulphur petrol.

² DIRD Vehicle Emission Standards, www.infrastructure.gov.au [accessed 3 March 2015]

³ EPA Victoria, Future air quality in Victoria-Final Report, Publication 1535 July 2013

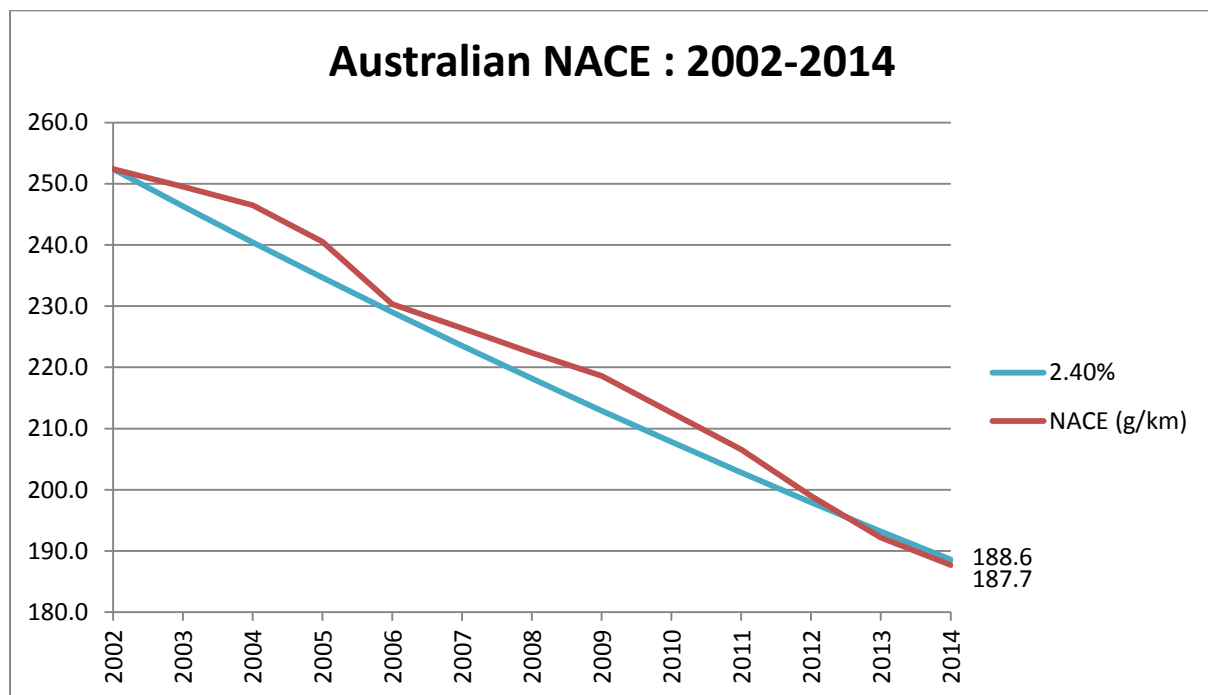
4.0 MOTOR VEHICLE CO₂ EMISSIONS

New light vehicles⁴ have provided a year-on-year reduction in CO₂ (or fuel consumption) as demonstrated by the National Road Transport Commission's (NTC) annual update⁵.

All new passenger cars, SUVs and light commercial utilities, vans and buses (up to 3.5 tonnes) are included in calculating the National Average Carbon Emissions (NACE) figure. The Australian NACE is a broader measure than in most other advanced markets (including the US and Europe) as it includes many more vehicle types than CO₂ measures used in other markets. As such, face value comparisons of CO₂ data from other markets will be misleading unless appropriate adjustments are made.

The NACE for all new light vehicles (including passenger cars, SUVs and light commercial vehicles) sold in Australia for each calendar year from 2002 to 2014 (Figure 1) reduced from 252.4 gCO₂/km to 187.7 gCO₂/km. This is an overall reduction of 25.6 per cent with an average annual reduction of 2.4 per cent.

Figure 1 – NACE 2002-2014



The FCAI expects that this trend will continue and by 2020 the NACE of new light vehicles delivered to the market in Australia will reduce by another 13 per cent. By 2030 a 50 per cent improvement over 2002 levels will have been achieved.

⁴ Light vehicles in this submission refers to passenger cars, sport utility vehicles (SUVs) and light commercial vehicles up to 3.5 tonne GVM (LCVs)

⁵ NTC Australia, Carbon Dioxide Emissions from New Australian Vehicles 2013, Information Paper, May 2014

This is in excess of the Government's economy wide target of a five per cent reduction on 2000 levels by 2020⁶ and also the Department of the Environment's expectation that light vehicle CO₂ emissions will fall by more than 25% from 2012-14 to 2034-35⁷.

The FCAI's expectation that the annual reduction will continue at this rate assumes that the current market and operating environment will continue to change as has happened in the past 10 years, i.e. changes in both consumer preference and the introduction of new technology. As the Australian new vehicle market is one of the most competitive in the world, with over 65 brands offering more than 400 models, it is expected that the trend of an annual reduction in CO₂ will continue as brands continue to introduce state of the art fuel efficient vehicles.

However, the choice of engine technology that can be introduced into Australia is limited by the national fuel quality standards and the resulting available market fuel (especially ULP; 91 RON and 150 ppm sulphur).

The average new light vehicle sold in Australia is now at least 25% more efficient than it was in 2000. The annual 2.4 per cent improvements in the NACE demonstrates the industry's commitment to a marking strong contribution to national efforts to reduce the impact of global climate change through continuing to improve fuel efficiency and reduce carbon dioxide emissions from new vehicles.

Emerging vehicle technologies such as hydrogen and electric vehicles present an opportunity for achievement of further vehicle efficiencies. As per other markets, such as Japan where Government led consumer incentives and infrastructure investment have promoted the uptake of these vehicles, the Australian Government should consider what role it intends to play in this space.

5.0 FUEL QUALITY STANDARDS

Vehicles are designed and developed to meet air pollutant emission standards and/or CO₂ targets with an expectation of fuel quality in a particular market. While air quality (or vehicle pollution emission) standards have been introduced into Australian legislation (ADR 79/05), the Government has not mandated the concomitant fuel quality standards (95RON 10 ppm sulphur petrol). Improving the quality of fuel available in Australia will deliver improvements for the entire motor vehicle fleet, not just new motor vehicles.

The Australian transport fuel standards are lower than other major markets, especially the EU, Japan and the USA. This restricts the introduction of some engine variants and inhibits the performance of the latest generation of engines (i.e. Euro 6 compliant), particularly due to higher sulphur concentration in petrol. Additionally, poor fuel quality can lead to increased operating and maintenance costs for consumers. For example, poor fuel can lead to increased fuel consumption

⁶ Australian Government, Department of the Prime Minister and Cabinet, "Setting Australia's post-2020 target for greenhouse gas emissions", Issues Paper, March 2015

⁷ Commonwealth of Australian (Department of Environment) 2015, Australia's emissions projections 2014-15, pp. 19-20.

from the engine needing to run rich more often to increase the exhaust gas temperature to de-sulphurise the catalyst. More frequent de-sulphurisation cycles will also reduce the service life of the catalyst leading to need for more frequent replacement.

To make further CO₂ improvements (more closely aligned to Europe), vehicles increasingly need access to lower sulphur content fuels to bring certain engine technologies to market - equivalent to those already available overseas. Maintaining multiple fuels (E10, E85, ULP & PULP, LPG, diesel, etc.) across all states (and metro/rural) creates additional complexity and costs to fuel suppliers that will be passed onto the consumer.

The consumer preferences in the new Australian light vehicle market have changed significantly from 2000 to 2014 (see figure A.1). This includes significant growth in the SUV segment, a large proportion of which are diesel vehicles.

Over the five year period from 2009, there has been a significant change in the number of passenger vehicles and light commercial vehicles registered with diesel engines increased by 103.6% and 65.4% respectively⁸. This growth in the particulate intensive diesel segment has implications for air quality. Any policy addressing petrol emissions needs to also reflect changes in preferences for diesel vehicles.

With much of Australia's automotive fuel now imported due to the decline of local refining and the introduction of international vehicle emission standards Australia needs to move towards international harmonisation of fuel quality standards. This will become increasingly important from around 2017/18 as vehicle brands will import vehicles with engines that are designed to achieve Euro 6 level emissions. If Australia does not align to higher world fuel quality standards Australia will be at risk that future vehicle models will shift Australia's vehicle fleet towards lower grade offerings. This potentially degrades Australia's progress towards more technologically advanced and efficient vehicles.

6.0 CONCLUSION

The FCAI is supportive of moves by Government to improve air quality and fuel efficiency of motor vehicles. The FCAI believes that this can and should be done through the consistent application of measures at technological, behavioral and regulatory levels. Indeed, reducing emissions through one area (e.g. a sole focus on vehicle technology) can be more expensive than measures such as the increasing use of alternative fuels, improved fuel quality, better infrastructure, traffic management, and adopting an eco-driving style.

Motor vehicle brands are reducing both CO₂ emissions and pollutant emissions year on year with the introduction of new technology in response to new regulations, market competition and consumer

⁸ Australian Bureau of Statistics, 9309.0 Motor Vehicle Census, Australia, 31 Jan 2014. <http://www.abs.gov.au/ausstats/abs%40.nsf/mf/9309.0> [accessed 17 April 2015]

demand. An important component of being able to deliver new vehicle technology to continue to achieve improvements in vehicle emissions is improved fuel quality standards.

The FCAI and member companies consider that a whole of Government approach is required that incorporates all associated issues, including fuel quality standards, which have a significant impact on vehicles' ability to meet both CO₂ targets and air pollution emission standards. This approach is recognised as necessary globally by industry and regulators alike.

The FCAI trusts that the information contained in this submission assists the Department's work and the Chamber would be happy to participate further with the Inquiry.

APPENDIX A THE AUSTRALIAN AUTOMOTIVE INDUSTRY

The FCAI is the peak industry organisation representing vehicle manufacturers and importers of passenger vehicles, light commercial vehicles and motor cycles in Australia.

The automotive industry is a major contributor to Australia's lifestyle, economy and community and is Australia's largest manufacturing industry. The industry is wide-ranging and incorporates importers, manufacturers, component manufacture and distribution, retailers, servicing, logistics and transport, including activity through Australian ports and transport hubs.

There are over 67 brands in the Australian market, with just over 1.1 million new vehicle sales per year. That is a lot of brands to service a market of our size equating to only around 16,000 new vehicles sold per brand. The following table provides a comparison of the competitiveness of global markets with double the number of new vehicles sold per brand in Canada, almost three times as many in the UK and more the 255,000 new vehicles sold per brand in the USA.

Table A.1 Competitiveness of Global Vehicle Markets⁹

	Australia	Canada	UK	USA
No. of brands in market	67	49	53	51
Sales	1,112,032	1,620,221	2,249,483	13,040,632
Market size per brand	16,597	33,066	42,443	255,699

In 2014, only 9 per cent of new vehicles sold were manufactured locally with the remaining 91 per cent of new vehicles imported from many countries and regions of the world including Asia (65 per cent), Europe (17 per cent), North and South America (6 per cent) and other countries including South Africa (3 per cent) (see Table A.2).

Table A.2 Country/Region of Origin for New Vehicle Sales in 2014¹⁰

Country/Region of Origin	% of New Vehicle Sales
Japan	30%
Thailand	20%
Europe	17%
Korea	12%
Australia	9%
Americas	6%
Other Asia (incl China and India)	3%
Other (incl South Africa)	3%

⁹ Australian government, Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, March 2013 Automotive Update.

¹⁰ FCAI, VFACTS National Report, New Vehicle Sales, December 2014.

The motor vehicle is increasingly a global product and one of the most comprehensively regulated products. In considering regulations, the government’s role is to balance social and economic benefits with safety and environmental performance.

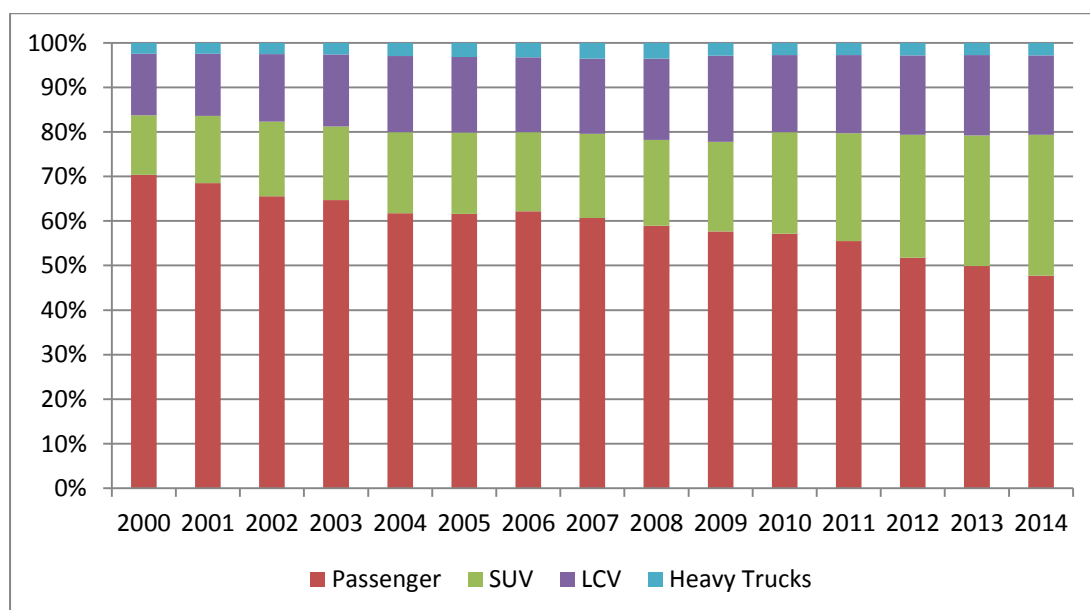
As economies of scale are critical in the automotive industry all manufacturers have tended to limit the number of locations any one model is produced and that model is then cross-shipped to markets where there is demand. This approach initially benefits the manufacturer through reducing costs and ultimately benefits the consumer by improving affordability and increasing product choice.

Australia is a small player with less than 1.5 per cent of the global build sold in this market. Consequently, Australia’s ability to influence global design and investment is limited and as individual states are even a smaller proportion of the market their ability to influence multi-national companies is correspondingly very limited.

The expansion of new and global brands and models into the market has led to the introduction of advanced security, safety and environmental features in motor vehicles. The introduction of these features is in response to increasingly strict environmental regulations and growing demands from consumers for advanced security and safety features.

The consumer preferences in the new Australian light vehicle market have changed significantly from 2000 to 2014 (see figure A.1). Over this time the share of passenger cars has decreased from around 70% to less than 50% of the market. The growth in the market has been in the SUV and light commercial vehicle segments. In 2014 SUVs were 31% and light commercial vehicles were (approx.) 18% of the new vehicle market.

Figure A1 – Australian New Vehicle Market; 2000-2014¹¹



¹¹ FCAI, VFACTS National Report, New Vehicle Sales, December 2000 to 2014

The FCAI's longstanding position that fuel quality standards, Green House Gas emission standards (i.e. CO₂ standards) and pollutant emission standards (i.e. ADR 79/0x or Euro 5/6) all need to be considered together, as they are all interrelated, is not a unique one. It is shared by the global automotive industry, regulators and research organisations alike.

US EPA: For example the US EPA stated in their Tier 3 Motor Vehicle Emission and Fuel Standards,¹²

"This program includes new standards for both vehicle emissions and the sulfur content of gasoline, considering the vehicle and its fuel as an integrated system."

and

"The systems approach enables emission reductions that are both technologically feasible and cost-effective beyond what would be possible looking at vehicle and fuel standards in isolation."

and

"EPA is not the first regulatory agency to recognize the need for lower-sulfur gasoline. Agencies in Europe and Japan have already imposed gasoline sulfur caps of 10 ppm, and the State of California is already averaging 10 ppm sulfur with a per gallon cap of 20 ppm."

European Commission: The European Commission (EC) also recognises fuel quality standards are linked to both pollutant and CO₂ standards. On their website page, "Road transport: Reducing CO₂ emission from vehicles¹³" the EC state;

"Fuel quality is an important element in reducing greenhouse gas emissions from transport."

International Council on Clean Transportation: The non-profit research organisation, the International Council on Clean Transportation (ICCT), also recognises the importance of fuel quality standards. In their inaugural *State of Clean Transport Policy*¹⁴ report, released in 2014, the ICCT states;

¹² US Federal Register Vol. 79 No. 81, 28 April 2014, Part II Environmental Protection Agency 40 CFR Parts 79, 80, 85, et al. Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards: Final Rule

¹³ European Commission (EC), Climate Action, Road transport: Reducing CO₂ emissions from vehicles, http://ec.europa.eu/clima/policies/transport/vehicles/index_en.htm [accessed 21 November 2014]

¹⁴ Miller, Joshua D., Facanha, Cristiano, The International Council on Clean Transportation (ICCT), the State of Clean Transport Policy: A 2014 synthesis of vehicle and fuel policy development, 2014.

“A key requirement to world-class vehicle standards, and thus cleaner vehicles, is the availability of ultralow-sulfur fuels.” (Page 4)

and

“Fuel quality, most notably the sulfur content of gasoline and diesel, is key to the implementation of advanced emission controls. For optimal function of emission controls, ... Euro 6/VI-equivalent vehicles require fuel as low as 10 ppm sulphur.” (Page 18)

World Wide Fuel Charter: The global auto industry position is based on the World Wide Fuel Charter¹⁵ (WWFC) which is an extensive and comprehensive compilation of research and testing of engine, fuel and control systems by a wide group of expert contributors. The objective of the WWFC is to promote global harmonisation of fuel to:

- Reduce the impact of motor vehicles on the environment by enabling reduced vehicle fleet emissions;
- Facilitate the delivery of optimised fuels for each emission control category, which will minimize vehicle equipment complexities and help reduce customer costs (purchase and operation); and,
- Increase customer satisfaction by maintaining vehicle performance for a longer period of time.

The WWFC contains both minimum specifications of necessary fuel quality parameters and a summary of the impact of the various fuel parameters on vehicle operation. In the “Technical Background” section there is an excellent overview of the research conducted on the effects of octane and sulphur and includes the following statements on octane and sulphur;

“Increasing the minimum octane rating available in the marketplace has the potential to help vehicles significantly improve fuel economy and, consequently, reduce vehicle CO2 emissions.” (Page 17)

and

“Sulphur removal requires prolonged rich operating conditions...” (Page 19)

Relevant to the consideration of a relevant octane rating and level of sulphur for Australia, the WWFC outlines the required parameters for various fuel categories. The ones of specific relevance to Australia considering the current emission standards (i.e. ADR 79/04 or Euro 5) and proposed emission (ADR 79/05 or Euro 6) and fuel consumption standards are (Page 1):

Category 4:

Markets with advanced requirements for emission control, for example, markets requiring US Tier 2, US Tier 3 (pending), US 2007 / 2010 Heavy Duty On-Highway, US Non-Road Tier 4,

¹⁵ ACEA, Auto Alliance, EMA and JAMA, World Wide Fuel Charter, September 2013, 5th Edition, www.acea.be [accessed 9 October 2010]

California LEV II, EURO 4/IV, EURO 5/V, EURO 6/VI, JP 2009 or equivalent emission standards. Category 4 fuels enable sophisticated NOx and particulate matter after-treatment technologies.

Category 5:

Markets with highly advanced requirements for emission control and fuel efficiency, for example, those markets that require US 2017 light duty fuel economy, US heavy duty fuel economy, California LEV III or equivalent emission

The maximum sulphur level for both Category 4 and Category 5 gasoline is 10 ppm and Category 5 gasoline specifies a minimum of 95 RON (refer pages 6 and 7).

Australian Fuel Quality Standards: The current Australian market fuel quality standards are lower than the WWFC recommendations. The Australian fuel quality standards, set under the authority of the Commonwealth Fuel Quality Standards Act and consequential Fuel Standard determinations, specify the following grades of petrol (gasoline);

- Unleaded petrol (ULP) - 91 RON (min) and 150 ppm sulphur (max)
- Premium unleaded petrol (PULP) – 95 RON (min) and 50 ppm sulphur (max).

Department of Environment: In addition to the research contributing to the WWFC, FCAI are also aware of and supports the findings of a yet to be released report prepared for the Australian Commonwealth Department of the Environment in 2013 which reviewed existing standards and research on the impacts of sulphur levels in petrol and reached similar conclusions to the WWFC extracts above, i.e.;

- Fuel standards work in partnership with vehicle emission standards to reduce emissions.
- Exhaust emissions will be higher with existing Australia market fuels (150 ppm or 50 ppm sulphur) than if low sulphur (10 ppm) petrol is introduced.
- Reducing sulphur levels (to 10 ppm) would allow use of some specific technologies and also reduce fuel consumption through the reduction of frequency of catalyst regeneration.

This report also acknowledges the potential for degraded performance, operability and durability of some vehicle technologies due to low quality market fuel. As a result of the potential for technical problems associated with the vehicle's operation, the FCAI is concerned that the resultant degraded vehicle performance, operation or component durability could lead to owner dissatisfaction and subsequent reputational brand damage if the vehicle does not operate as expected. To protect against such damage, some brands may instead choose to restrict from Australia the introduction of new technologies that require higher fuel standards.

Climate Change Authority: The FCAI considers that the analysis undertaken by the Climate Change Authority when developing their cost/benefit analysis of mandatory CO₂ targets¹⁶ did not consider the implications of in-service fuel and subsequent in-field vehicle performance. In particular, the Climate Change Authority paper uses certification results to develop their benefit analysis. The certification fuel is 95 RON 10 ppm sulphur petrol.

If this fuel is not available in the market, it cannot be guaranteed that the same result will be delivered in service, especially if a vehicle owner is likely to use ULP which, in Australia, is currently regulated to be 91 RON 150ppm (max) sulphur. Therefore, the FCAI questions whether the full benefit as calculated will be delivered and considers that this cost/benefit analysis cannot form the basis for any regulatory analysis without additional testing to confirm in-service operation on market fuel will deliver the same result. Otherwise, to deliver the estimated benefits, the market fuel would have to be consistent with the certification fuel (i.e. 10 ppm sulphur, 95RON) to fully deliver a continued reduction in CO₂ emissions.

FCAI Position: The FCAI has been consistent in its call for concomitant market fuel. This was highlighted in the FCAI's submission to the 2010 Regulatory Impact Statement (RIS) considering the introduction of Euro 5/6 emission standards. The regulation for Euro 5/6 (i.e. UN R83) specifies 95 RON 10 ppm sulphur petrol as the test fuel and the benefits estimated in the 2010 RIS for the introduction of Euro 5 and Euro 6 used the results of the regulation certification laboratory testing.

¹⁶ Australian Government Climate Change Authority (CCA), Light Vehicle Emission Standards for Australia: Research Report, June 2014