

SUBMISSION

# Ministerial Forum on Vehicle Emissions

---

Fuel Efficiency Standard for Light Vehicles  
Proposed Model

August 2017



1

2

ClimateWorks Australia, in collaboration with Future Climate Australia, welcomes the opportunity to respond to the proposed model for an Australian fuel efficiency standard for light vehicles.

We congratulate the Ministerial Forum on Vehicle Emissions, the Department of Infrastructure and Regional Development, and the Department of the Environment and Energy for their work in addressing light vehicle emissions in Australia. We hope that this submission can assist the Forum and the Departments in designing standards which maximize benefits to the Australian economy and environment.

We welcome the opportunity to discuss any of the points raised in this submission further.

---

ClimateWorks Australia is a leading independent organisation acting as a bridge between research and action to identify, model and enable end-to-end solutions to climate change. Since our launch in 2009, ClimateWorks has made significant progress and earned a reputation as a genuine and impartial adviser to key decision makers from all sides of politics and business. Our collaborative approach to solutions that will deliver the greatest impact encompasses a thorough understanding of the constraints of governments and the practical needs of business. We do this by looking for innovative opportunities to reduce greenhouse gas emissions, analysing their potential, resolving obstacles and helping to facilitate conditions for our transition to a prosperous, net zero emissions future by 2050. ClimateWorks was co-founded by The Myer Foundation and Monash University and works within the Monash Sustainable Development Institute.

Future Climate Australia (FCA), a not-for-profit organisation established in 2007, has been integral in the development and implementation of a wide range of practical initiatives contributing to the improvement of fuel efficiency measures in passenger vehicles, and an active contributor in the development of policy in the automotive sector.

The submission has had input and draws on current evidence from The International Council on Clean Transportation (ICCT).

---

---

# 1. Introduction

---

Improving light vehicle fuel efficiency will help deliver Australia’s international climate commitments, improve air quality, reduce health impacts and deliver significant financial savings to the Australian economy.

The implementation of the proposed Target A (105 gCO<sub>2</sub>e/km) provides the opportunity to deliver over six per cent of Australia’s 2030 emissions reduction target, whilst delivering a net benefit of AUD\$13.9 billion to 2040. Target A provides both greater economic benefits and more emissions reductions than weaker targets modelled in the draft Regulation Impact Statement (RIS). It provides an additional 140 Mt CO<sub>2</sub> of abatement to 2040 over the weakest target, whilst delivering an additional \$8.1 billion in net benefit to 2040.

ClimateWorks and FCA commend the Government on taking a considerable step forward with the release of the proposed model for an Australian fuel efficiency standard for light vehicles. The proposed model ensures that Australia joins other markets such as the US, EU, Japan, Mexico and Saudi Arabia which have standards in place.

ClimateWorks and FCA strongly support the proposed Target A stringency and the following submission provides responses to the design of the proposed standard; including information for further consideration in response to the proposed implementation timeline, weight-based approach, and additional credits.

**TABLE 1: SUMMARY OF CLIMATEWORKS AND FCA RESPONSES TO THE FUEL EFFICIENCY STANDARD PROPOSED MODEL**

<b>Proposed Model</b>	<b>ClimateWorks and FCA Response</b>
<b>High level objective</b>	Supportive of Target A (105 gCO <sub>2</sub> e/km), and recommends a cost benefit analysis of a more ambitious target of 95 gCO <sub>2</sub> /km by 2025.
<b>High level timeline</b>	Proposed standard should be implemented in 2020 rather than delaying until 2022.
<b>What will the standard regulate?</b>	Supportive of the proposal to regulate through a CO <sub>2</sub> emissions-based standard, with the adoption of the Worldwide Harmonised Light Vehicles Test Procedure (WLTP).
<b>How will the standard be applied?</b>	Supportive of the proposal for a single attribute-based standard, however recommends a size-based approach rather than weight-based.
<b>Which entities are required to comply?</b>	Supportive of the application of the standard through a replacement Act to the Motor Vehicle Standards Act 1989 (MVSA).
<b>Compliance arrangements</b>	ClimateWorks and FCA supports the Government’s proposed compliance arrangements.
<b>Additional credits</b>	ClimateWorks and FCA support the proposed additional credits to encourage the supply of ultra-low emissions vehicles,

	however recommend that further analysis is undertaken on the potential impact of additional credits on emission reductions.
<b>Concessional arrangements</b>	Supportive of the proposed concessional arrangements where distributors that supply less than 1,000 vehicles per annum may apply for an alternative target or exemption.
<b>Penalties for non-compliance</b>	Supportive of the proposed penalties for non-compliance of \$100 for each g/km debit not offset within the next three calendar years.

---

## 2. Detailed Response

---

### 2.1 High Level Objective

ClimateWorks and FCA support the implementation of Target A (105 gCO<sub>2</sub>/km) to be phased in from 2020 to 2025. Based on the Government's own cost benefit analysis, Target A provides greater benefits to Australian motorists than the weakest standard, Target C (135 gCO<sub>2</sub>/km); providing an additional 41 Mt CO<sub>2</sub> of abatement to 2030 and 140 Mt CO<sub>2</sub> to 2040, whilst delivering an additional \$8.1 billion in net benefit to 2040. Implementation of Target A would help Australia achieve its emissions reduction objectives at least cost, reduce expenses for Australian households and businesses and lessen the transport sector's health impacts.

The difference in abatement between the two targets has significant implications for other sectors of the Australian economy and the community more broadly. Any abatement not achieved in the light vehicle sector will need to be compensated for in other sectors and will come at a higher cost than abatement in the light vehicle sector.

**TABLE 2: ESTIMATED BENEFITS OF DRAFT RIS TARGET STRINGENCIES AND ADDITIONAL BENEFIT OF TARGET A OVER TARGET C (DRAFT RIS AND CLIMATEWORKS ANALYSIS)**

Target Stringency	Cumulative Abatement to 2030 (Mt CO <sub>2</sub> )	Cumulative Abatement to 2040 (Mt CO <sub>2</sub> )	Net benefit to 2040 (\$ billion)
Target A (proposed target by Government) (105 gCO <sub>2</sub> /km by 2025)	65	231	13.9
Target C (proposed target by industry) (135 gCO <sub>2</sub> /km by 2025)	25	91	5.8
Additional benefit of Target A vs C (Target A-C)	41	140	8.1

Fuel savings for consumers are also highest under the strongest standard. The draft RIS analysis shows that Target A delivers an additional \$16.7 billion in fuel savings in comparison to Target C. For an average performing petrol vehicle under Target A, this translates into an annual additional fuel saving of between \$328 to \$493 per year (\$6.30- \$9.50 per week) for a motorist driving 25,000 km per year. Target A delivers over 2.5 times more fuel savings than Target C to 2040.

**TABLE 3: COMPARISON OF TARGET STRINGENCY LEVELS ON FUEL SAVINGS FOR AVERAGE DRIVER DOING 25,000 KM/YR (DRAFT RIS AND CLIMATEWORKS ANALYSIS)**

Target Stringency	Annual additional fuel savings over BAU (\$)¹	Reduction in average low income household fuel spend (%)²	Reduction in average middle income household fuel spend (%)³
Target A	\$604-906	16.1-24.2%	12.1-18.1%
Target C	\$276-413	7.4-11.0%	5.5-8.3%
Lost opportunity (Target A-C)	\$328-493	8.8-13.2%	6.6-9.9%

To put this into context, in 2012 the average Australian middle income household spent \$96 per week on household energy, of which fuel for vehicles was \$59, or 61 per cent.<sup>4</sup> By adopting the most stringent target (Target A) compared to the most lenient (Target C), this could deliver an approximate further 4 per cent to 10 per cent reduction in total household energy cost.

### The introduction of CO<sub>2</sub> emissions standards can be achieved without immediately improving fuel quality

Arguments that CO<sub>2</sub> standards require better fuel quality are specious.

Australia’s fuel quality standards do not present any impediment to immediately implementing CO<sub>2</sub> emissions standards in line with Target A as proposed by the Government. Claims to the contrary appear to conflate or confuse fuel quality requirements to meet Euro 5/6 standards, which aim to limit noxious emissions (NO<sub>x</sub>, HC, CO and particulates), with fuel requirements to meet CO<sub>2</sub> emissions standards. Largely, these two objectives can be considered independently, except in the specific circumstance where fuel efficient ‘lean-burn’ engine technology could be used to improve efficiency, requiring low-sulfur fuel. The evidence shows that vehicle manufacturers are not turning to lean-burn technologies even in markets where low-sulfur fuel is available.<sup>5</sup>

ClimateWorks and FCA have previously supplied evidence from the ICCT which concludes that the present quality of fuel available for road transport across Australia does not present any impediment to reducing vehicle CO<sub>2</sub> emissions in line with levels outlined in the draft RIS.<sup>6</sup>

### While discrepancies exist between on-road and in-lab performance, a standard will still provide significant savings to consumers and the environment

ClimateWorks and FCA support efforts to improve the correlation of vehicle emissions test results to real world experience. The Government’s selection of the WLTP procedure will help to address the disparity between emissions recorded under test conditions and so-called ‘real world’ emissions.

<sup>1</sup> Range based on petrol price range of \$1.00/L to \$1.50/L

<sup>2</sup> Based on ABS 2012 Household energy consumption

<sup>3</sup> Based on ABS 2012 Household energy consumption

<sup>4</sup> Australian Bureau of Statistics (2012)

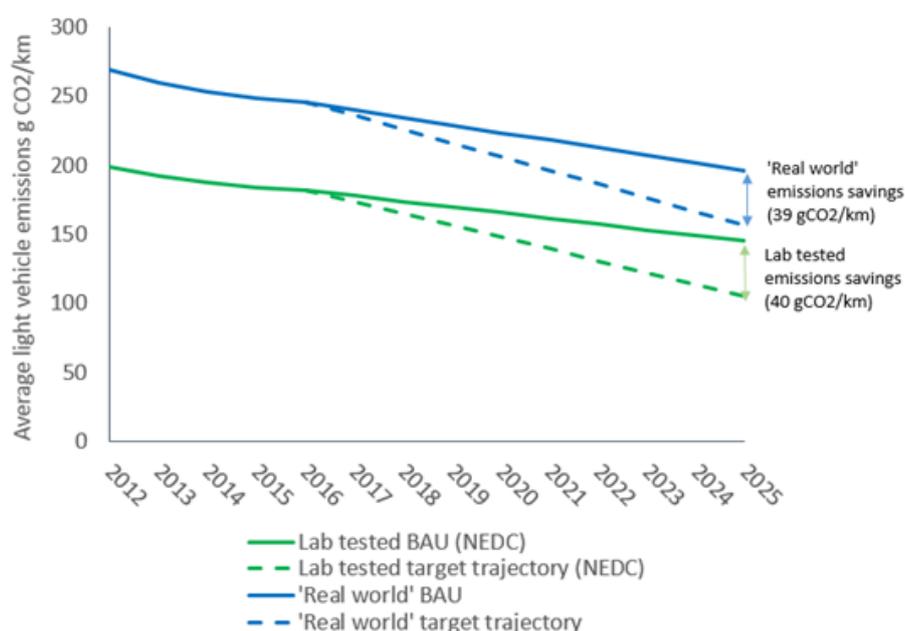
<sup>5</sup> McMahon, K., Selecman, C., Botzem, F., and Stablein, B. (2011)

<sup>6</sup> International Council on Clean Transportation (2014)

While some submissions to the draft RIS have argued that the discrepancy between lab-tested and 'real world' emissions may negate any benefits of a CO<sub>2</sub> standard, this is not correct. The benefits obtained in the real world can be expected to equal and perhaps exceed the notional benefits calculated using test results.

Figure 1 below depicts the NEDC lab-tested emissions savings from the Government's proposed standard (Target A of 105g CO<sub>2</sub>/km in 2025) and compares this to the same target, adjusted for the discrepancy between the lab and the 'real world'. Despite the discrepancy in the level of emissions, the savings remain very similar. The discrepancy in the level of emissions would be reduced through the Government's proposed implementation of the WLTP procedure.

**FIGURE 1. COMPARISON OF EMISSIONS SAVINGS FOR TARGET A UNDER 'REAL WORLD' AND NEDC LAB TESTING**



Sources: discrepancy between lab and real world emissions savings was calculated using the ICCT's adjustment factors for the NEDC test procedure. BAU emissions were based on the Government's Regulation Impact Statement and historical emissions were based on National Transport Commission data.<sup>7</sup>

## A more stringent standard beyond Target A is achievable and likely to provide greater net benefit

As discussed above, the most stringent target modelled by the Government (Target A, 105 gCO<sub>2</sub>/km) also provided the strongest environmental, economic and fuel saving benefits. In comparison to Target C, Target A provides an additional 140 Mt CO<sub>2</sub> in emissions savings, \$16.7 billion in fuel savings and \$8.1 billion in net economic benefit. Given the substantial size of these savings, ClimateWorks and FCA recommends that the Ministerial Forum conduct a cost benefit analysis of an even more ambitious target of 95 gCO<sub>2</sub>/km by 2025, as we believe it will deliver greater net benefits and is technically feasible based on achievements in other markets.

## Complementary measures are important to drive consumer uptake

Light vehicle CO<sub>2</sub> emissions standards are more effective when implemented alongside supporting complementary measures. Best practice light vehicle CO<sub>2</sub> emission standards and relevant complementary measures must be designed with a focus on maximising a range of positive outcomes - financial savings for vehicle owners, addressing technical and

<sup>7</sup> National Transport Commission (2017)

infrastructure issues, improved energy security, and achieving least cost emissions reductions. They must also be designed to support the marketing of low emissions vehicles, to assist consumer choice.

As outlined in ClimateWorks' and FCA's submission to the draft RIS, a range of complementary measures should be considered:

- The Government should provide education and awareness activities to promote the purchase of more efficient vehicles. This could include providing information on fuel savings and total cost of ownership at dealerships, consumer labels, or websites.
- Government should implement policy to encourage the uptake of low and zero emissions vehicles in its own fleet and corporate fleets. This will provide the community with exposure to low or zero emissions vehicles and will provide flow-on benefits for the second-hand market.
- Government should consider financial incentives to promote the uptake of low or zero emissions vehicles, through changes to the Luxury Car Tax or Fringe Benefit Tax.
- Government should support the advancement of emerging technologies, such as intelligent transport systems, which can also improve the efficiency and emissions of the vehicle fleet.

## 2.2 High Level Timeline

ClimateWorks and FCA encourage the Government to phase in the proposed fuel efficiency standard by 2020, at the latest. The Government's proposal states that due to the use of the WLTP as the basis for measuring vehicle efficiency, an additional two years will be required to translate the proposed Target A of 105 gCO<sub>2</sub>/km on the current test cycle to WLTP.

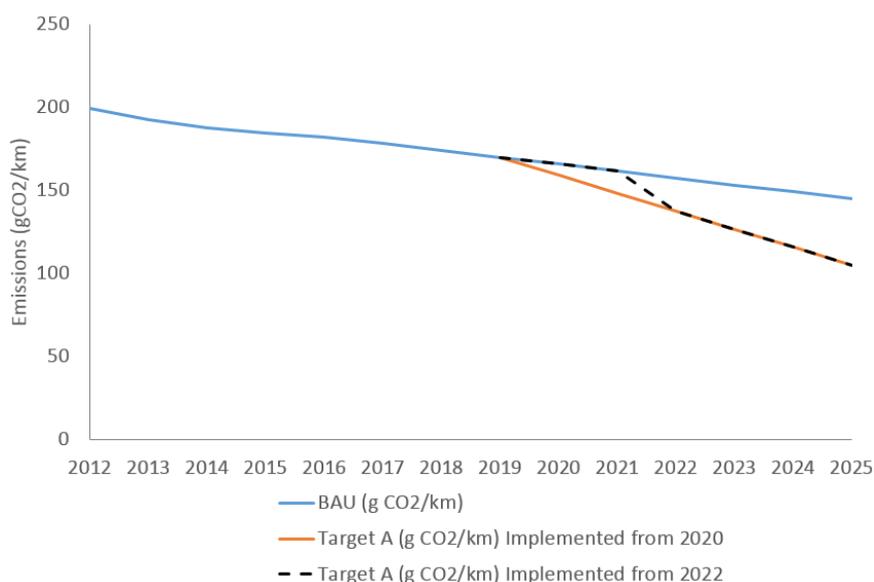
ClimateWorks suggests that while this work is necessary, a faster turnaround time is achievable, given that other countries with standards have already developed a tool to carry out this analysis.<sup>8</sup> Europe will be switching to the WLTP methodology in 2021 with targets for 2025 to 2030 expected to be released in November this year.<sup>9</sup> Maintaining the faster implementation timeline would ensure that Australia does not miss out on the economic and environmental benefits of a vehicle emissions standard for vehicles sold in 2020 and 2021 (approximately 2.5 million vehicles in total).

Given the 10 year average age of the Australian light vehicle fleet, any delay in implementing a standard will result in emissions and fuel use lock-in, where a larger proportion of vehicles on our roads will be less efficient than they would be with a standard in place. This reduces the contribution of vehicle emissions standards to Australia's 2030 emissions reduction target, and reduces the potential fuel savings these vehicles will have over their lifetime.

<sup>8</sup> European Commission Joint Research Centre (2017)

<sup>9</sup> European Commission (2017)

**FIGURE 2: COMPARISON OF EMISSIONS REDUCTIONS BASED ON PHASE IN OF TARGET A FROM 2020 VS 2022 (DRAFT RIS AND CLIMATEWORKS ANALYSIS)**



Source: BAU and target emissions for 2025 were based on the Government’s Regulation Impact Statement and historical emissions were based on National Transport Commission data.<sup>10</sup>

This indicative analysis completed by ClimateWorks, revealed that delaying implementation by two years from 2020 to 2022 would result in an additional 2.5 million vehicles being sold without a standard in place and the loss of 3.5 Mt CO<sub>2</sub> of emissions reductions to 2030, or 5 to 14 per cent of the total savings estimated for Target A in the draft RIS.<sup>11</sup>

## 2.3 What will the standard regulate?

ClimateWorks and FCA support the Government’s proposal to regulate fuel efficiency for vehicles through a CO<sub>2</sub> emissions-based standard, combined with the adoption of the new Worldwide Harmonised Light Vehicles Test Procedure (WLTP).

## 2.4 How will the standard be applied?

ClimateWorks and FCA support the Government’s proposal for an attribute based standard, however recommends a size-based approach rather than weight-based.

A size-based or footprint-indexed standard more directly and efficiently encourage mass reduction (lightweighting), which is the primary means for reducing vehicle load, rather than weight-based or mass-indexed standards. Since lightweighting promises to be one of the most cost effective ways to increase efficiency<sup>12</sup> and thereby comply with the standards, size-based standards reduce compliance costs. As pointed out by the ICCT in their submission to the draft RIS, in 2014, Ricardo-AEA completed a study for the European Commission comparing footprint- and mass-based standards.<sup>13</sup> It was found that overall compliance costs are 16% lower under a footprint standard than a mass standard.

Furthermore, size-based standards encourage better safety design than weight-based standards. Weight-based standards can encourage smaller vehicles, which can have negative safety impacts for the vehicle fleet. Size-based standards encourage lighter vehicles while

<sup>10</sup> National Transport Commission (2017)

<sup>11</sup> Calculation based on vehicle sales data from ABMARC (2017), emissions intensity from the Government’s Regulation Impact Statement and average kilometres travelled from ABS (2017)

<sup>12</sup> Environmental Protection Agency (EPA) (2016) and International Council for Clean Transportation (2017)

<sup>13</sup> Kollamthodi (2014)

maintaining vehicle size. As long as size is maintained, safety impacts are negligible, or even positive.<sup>14</sup>

We agree that the attribute based standard should be applied as a single limit curve for all light passenger (M category) and commercial (N category) vehicles with a gross vehicle mass up to 3.5 tonnes. While no other country currently regulates all vehicles (M and N category) together under the same target curve, it is best practice. The majority of light commercial vehicle distributors in Australia sell both passenger and light commercial vehicles, so having separate standards for commercial and passenger vehicles would increase administrative costs for distributors. The use of separate standards can also encourage distributors to market light commercial vehicles, for which higher emissions are allowed, as passenger vehicles, eroding the emissions reductions achieved by the policy. Australia would be a pioneer as the first country to implement best practice through regulating all light duty vehicles together.

## 2.5 Which entities are required to comply?

ClimateWorks and FCA support the Government's proposed application of the standard through a replacement Act to the Motor Vehicle Standards Act 1989 (MVSA).

## 2.6 Compliance arrangements

ClimateWorks and FCA support the Government's proposed compliance arrangements, but recommends that distributors should be required to report all light vehicle sales by vehicle category, mass and WLTP efficiency levels in a single annual report from 2020.

In addition, we support flexibility arrangements that allow distributors to bank carry-forward credits between compliance periods. This encourages over-compliance, which improves the energy security and emission reduction benefits of the standards and establishes a more efficient baseline, effectively allowing more stringent standards to be set in the next phase.

However, allowing underperforming distributors to borrow credits from future compliance periods could compromise the standard's effectiveness in reducing emissions. As such, ClimateWorks and FCA support the application of a three year expiration date for banked credits.

## 2.7 Additional credits

ClimateWorks and FCA support the Government's proposal for additional credits to encourage the supply of ultra-low emissions vehicles, and recommend the establishment of a strong review mechanism and sunset clause for these credits.

Additional credits are important to encourage model availability and supply in a relatively low volume market. Given the current absence of a specific electric vehicle policy in Australia, additional credits will incentivise automotive manufacturers to introduce low emissions vehicle models to Australia.

However, unless careful limits are imposed on their use, super credits can have a negative impact on overall fleet emissions in comparison to a scenario where the standard does not include additional credits.

We recommend that the Ministerial Forum undertake further analysis of the impacts of additional credits on the emission reductions that the proposed standard will deliver. Further consultation with industry is required to set these credits at an appropriate level which will encourage manufacturers to bring low emission vehicles to market and deliver emission reductions.

<sup>14</sup> ICCT (2009)

## 2.8 Concessional arrangements

ClimateWorks and FCA support the Government's proposed concessional arrangements where distributors that supply less than 1,000 vehicles per annum may apply for an alternative target or exemption. The proposal is largely consistent with ClimateWorks' and FCA's view that any small volume manufacturer provisions should be limited to manufacturers with limited engineering capacity, i.e. manufacturers with worldwide sales of less than 3,000 vehicles per year.

## 2.9 Penalties for non-compliance

The Government's proposed penalties for non-compliance are appropriate, as a penalty of \$100 per gCO<sub>2</sub>/km higher than the cost of technology required to reduce CO<sub>2</sub> emissions. This means that it will be more cost-effective for distributors to comply with the standard rather than simply pay the penalty, which is the purpose of such a penalty. We would discourage the Government from taking a voluntary approach to standard compliance, as based on previous experience in the Australian market we have seen this is ineffective.

---

## References

---

- ABMARC. 2017. Analysis of the Australian 2015 New Light Vehicle Fleet and Review of Technology to Improve Light Vehicle Efficiency. [https://infrastructure.gov.au/roads/environment/forum/files/ABMARC\\_2016\\_Study.pdf](https://infrastructure.gov.au/roads/environment/forum/files/ABMARC_2016_Study.pdf)
- Australian Bureau of Statistics. 2012. Household Energy Consumption Survey, Australia: Summary of Results, 2012. <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4670.0main+features100032012>
- Australian Bureau of Statistics. 2017. Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2016. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9208.0>
- Environmental Protection Agency (EPA). 2016. Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation. <https://www.epa.gov/regulationsemissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhousegas-ghg#proposed=determination>
- European Commission. 2017. Commission delegated regulation (EU) of 2.6.2017 amending Annexes I and II to Regulation (EC) No 443/2009 of the European Parliament and of the Council for the purpose of adapting them to the change in the regulatory test procedure for the measurement of CO<sub>2</sub> from light duty vehicles. <http://ec.europa.eu/transparency/regdoc/rep/3/2017/EN/C-2017-3492-F1-EN-MAIN-PART-1.PDF>
- European Commission Joint Research Centre. 2017. CO<sub>2</sub>MPAS: Vehicle simulator predicting NEDC CO<sub>2</sub> emissions from WLTP. <https://co2mpas.io/>
- International Council on Clean Transportation. 2009. ICCT Comments In Response To the Proposed Rulemaking Issued By the National Highway Traffic Safety Administration And the Environmental Protection Agency to Establish Light Duty Vehicle Greenhouse Gas Emissions And Corporate Average Fuel Economy Standards for Model Years 2012-2016, <https://www.regulations.gov/document?D=EPA-HQ-OAR-2009-0472-7156>
- International Council on Clean Transportation. 2014. Fuel Quality and Light vehicle CO<sub>2</sub> emission standards for Australia.
- International Council on Clean Transportation. 2017. Comments on the draft Regulation Impact Statement for improving the efficiency of new light vehicles.
- Kollamthodi, S. (Ricardo-AEA). 2014. Improving the understanding of the potential for weight reduction in cars and vans, European Commission, [https://ec.europa.eu/clima/sites/clima/files/docs/0103/downweighting\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/0103/downweighting_en.pdf). [https://ec.europa.eu/clima/sites/clima/files/docs/0089/study\\_downweighting\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/0089/study_downweighting_en.pdf)
- McMahon, K., Seleckman, C., Botzem, F., and Stablein, B. 2011. Lean GDI Technology Cost and Adoption Forecast: The Impact of Ultra-Low Sulfur Gasoline Standards. SAE Technical Paper 2011-01-1226. Doi: 10.4271/2011-01-1226.
- National Transport Commission. 2017. Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2016. [https://www.ntc.gov.au/Media/Reports/\(35220AEE-C4EA-9AC6-1BB6-88D8C66D80F5\).pdf](https://www.ntc.gov.au/Media/Reports/(35220AEE-C4EA-9AC6-1BB6-88D8C66D80F5).pdf)

# Contact us

For further information  
about this project, contact:

Scott Ferraro

Head of Implementation

[scott.ferraro@climateworksaustralia.org](mailto:scott.ferraro@climateworksaustralia.org)

ClimateWorks Australia  
Level 16, 41 Exhibition Street  
Melbourne Victoria 3000  
+61 3 9902 0741  
[info@climateworksaustralia.org](mailto:info@climateworksaustralia.org)

Published by  
ClimateWorks Australia  
Melbourne, Victoria  
August 2017  
© ClimateWorks Australia 2016  
ISBN 978-0-9871341-5-8

This work is subject to copyright.  
Apart from any use permitted under  
the Copyright Act 1968, no part may be  
reproduced by any process without  
written permission from the publisher.

This report may be downloaded at  
[www.climateworksaustralia.org](http://www.climateworksaustralia.org)



**MONASH**  
University

MONASH  
SUSTAINABLE  
DEVELOPMENT  
INSTITUTE



THE MYER  
FOUNDATION

ClimateWorks Australia is an expert, independent adviser, committed to helping Australia transition to net zero emissions by 2050. It was co-founded through a partnership between Monash University and The Myer Foundation and works within the Monash Sustainable Development Institute.