December 9, 2011

Vehicle Emissions and Environment Section
Surface Transport Policy
Department of Infrastructure and Transport
GPO Box 594
Canberra AC 2601

Via email: CO2standards@infrastructure.gov.au

Subject: Light vehicle CO$_2$ emission standards for Australia discussion paper

To Whom It May Concern:

The International Council on Clean Transportation (ICCT) would like to thank the Department of Infrastructure and Transport (DIT) for the opportunity to provide comments on your “Light vehicle CO$_2$ emission standards for Australia” discussion paper. We commend DIT for the thoughtful work towards establishing Australia’s first light vehicle CO$_2$ standards. The range of options you are considering is consistent levels of stringency in other major vehicle markets, including the 5% annual improvement under consideration in scenario 6, and would be achievable with known and cost-effective technologies.

Please let us know of any questions regarding our comments or otherwise where we can be of any assistance to you.

Best regards,

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ICCT responses on selected key issues raised in:
Light vehicle CO₂ emission standards for Australia

1) Do you support the setting of staged short and medium term targets? 2) If yes, do you consider 2020 is the logical date for a firm second stage target? 3) Do you consider it appropriate to set a target beyond 2020 at this stage?

Short-term targets are important to ensure that automakers have an incentive for immediate action but medium and longer-term standards are critical to capture the real benefits of regulatory action. Therefore, the approach to set staged short and medium term targets is appropriate.

A short-term target, such as one in 2015, is important to capture the significant near-term improvements using technologies that are already available in the Australian light-vehicle market. Given the long-life of modern automobiles, even small near-term improvements will have a lasting impact on reducing both fuel consumption and greenhouse gas (GHG) emissions.

The medium and longer-term standards can help set a consistent and predictable regulatory environment for the automobile industry. The longer lead times associated with these standards provides the opportunity for the industry and their suppliers to synchronize investments with product retooling cycles. In this regard, 2020 would be a logical choice for a firm second stage target. Setting standards for 2020 now will provide an opportunity for manufacturers to create product plans beyond their existing product cycles with a full view of the regulatory targets with ample time to incorporate newer technologies across a range of product platforms. The relative costs and benefits of technologies applicable for any proposed 2020 standard are well understood.

The United States has already proposed a longer-term target for light vehicle GHG standard for year 2025. This proposal based on the most up to date understanding of the potential costs and benefits of technologies to reduce GHG emissions by 2020-2025 timeframe provides a sound basis for setting longer-term targets. The US proposal also includes a mid-term review so that the standards in the out years (2022-2025) can be strengthened or relaxed as the need may be based on the best available information at that time.

The European Commission has also stated its intent to propose a 2025 target for passenger car emissions, stating that, “… the Commission will assess the feasibility of the target suggested by the European Parliament of reaching 70 gCO₂/km by 2025” (European Commission 2010).

Thus, the DIT should consider setting longer-term target beyond 2020 at this stage, along with a comprehensive mid-term review.

4) Do you consider 2010 is the appropriate base year for determining the targets?

There is no prima facie evidence to doubt that 2010 is a reasonable base year for setting the standards. By the virtue of being the most recent, and likely most complete set of data representing the types of vehicles sold in Australia, the 2010 can be considered as the appropriate base year for determining the targets.
5) What rate of CO\(_2\) emissions reduction do you consider is achievable by 2015 and 2020 in Australia? 6) What do you think is a reasonable CO\(_2\) target for the Australian new light vehicle fleet in 2015 and 2020? 7) Are there any impediments to Australia achieving the more ambitious rates of reductions embodied in Scenarios 5 and 6 above?

Technical studies and standards adopted around the world contain a substantial amount of information that suggests that scenarios 5 and 6 represent reasonable emission reduction scenarios for light vehicles.

Both scenarios 5 and 6 provide a near-term reduction in CO\(_2\) emissions of 2.5 percent or 3 percent per year as compared with the business-as-usual (BAU) scenario of 1.8 percent reduction per year. This is consistent with the goal of the standard – to exceed the emission reductions beyond a BAU type situation – while at the same time moderating the expectations in terms of emission reductions in near-term due to obviously short lead-time involved.

In the longer term, scenarios 5 and 6 come up with a target of 141-145 g/km for 2020, with an average rate of reduction of around 4 percent per year for ten years. This is very much consistent with the longer-term targets being set in the EU and US as shown in Figure 1 below.

![Figure 1: Annual Rate of Reduction for Fuel Economy Standards in Four Major Markets](image)

[1] China’s target reflects gasoline fleet scenario. If including other fuel types, the target will be lower.

As the work by National Transport Commission has shown, if all new vehicles in 2010 matched their emissions with best-in-class emissions of vehicles available in the market during 2010, the Australian NACE value would be 135 g/km or 36 percent lower than the 2010 average (NTC, 2011). In other words, if all that the CO\(_2\) standards demanded was to bring up the performance of
all vehicles to the best-in-class vehicle of 2010 by 2020, then the targets outlined by Scenarios 5 and 6 would be met.

The largest potential impediment to reaching a numerical target would be a major shift in consumer preference towards larger, heavier and more powerful vehicles than today.

8) Do stakeholders have any information on costs and benefits of standards which would assist the Department of Infrastructure and Transport in the preparation of the cost benefit analysis for the implementation RIS?

As of date, the supporting documents released by the U.S. EPA for the 2017-2025 Light-Duty Vehicle GHG Standards proposal are the most recent and up-to-date information on costs and benefits of standards that should be useful to DIT in preparation of RIS. In addition to the Draft Regulatory Impact Assessment and the Draft Technical Supporting Document (available at: http://www.epa.gov/otaq/climate/regulations.htm#1-1), supporting documents listed in the EPA docket (http://www.regulations.gov/ Docket ID: EPA-HQ-OAR-2010-0799 Agency: EPA RIN: 2060-AQ54) including Ricardo report on simulation of future vehicle technologies, and series of FEV reports on potential costs of these technologies by 2020-2025 timeframe should be helpful.

9) Should Australia set a single set of CO₂ targets for all light vehicles, or is there merit in establishing separate targets for passenger vehicles (cars and SUVs) and for LCVs (utes and vans)?

The best practice in setting light-vehicle CO₂ standards would likely be a single standard for all light vehicles (M1 and N1 combined). If M1 (Cars and SUVs) and N1 (utes and vans) standards are separated, there may be a tendency to reclassify some of the larger/heavier/less efficient Cars and SUVs as utes/vans through simple design changes without affecting the underlying engine/transmission or overall utility of the vehicle.

On the other hand, while many people use utes/vans as a personal transport vehicle just like a car or an SUV, there are several legitimate users of utes who need the fundamental load carrying/towing capacity provided by the utes, and which affects overall CO₂ emissions of those vehicles. Combining the standards into one may provide a disadvantage to some of these vehicles, especially if the standard is not attribute based (see Question 12). Under an attribute-based standard, however, consideration can be given to the larger size/mass of the utes while maintaining one set of standards for M1 and N1 vehicles.

At present, no country regulates all M1 and N1 vehicles under the same standard. At the same time, there is recognition that technologies available to reduce CO₂ emissions of light-vehicles are similar.

10) Do you support the idea of bonus credits for new technology vehicles (such as EVs), flex fuel vehicles and other technologies, or should the CO₂ standard be purely performance based, treating all vehicles on the same basis (using the CO₂ emissions result on the standard ADR test)? 11) If you support credits, what vehicle types do you consider qualify for a credit and why?
Performance based standards are the best practices in setting CO₂ emission standards. Some credits however, do help to incentivize technologies whose benefits are not fully captured in testing procedures. In general, credits fall into two categories: 1) actual reductions that are not reflected in the test cycle and 2) incentives for changes that do not result in real-world reductions or where the incentive is boosted beyond the actual reduction. Examples of the first category include air conditioning efficiency credits, and gearshift indicators, which can result in potential “off-cycle” credits, based on real world emission reductions, although verification and quantification are key challenges. Electric vehicle and flex-fuel credits are examples of credits that have been used to give a greater incentive than the actual real world emission reductions achieved in order to promote these technologies. Detailed comments below address each of these examples.

Electric Vehicles
Giving credits for Electric Vehicles (EV) beyond actual emission reduction impact within fleet average standards can reduce the overall benefits of the standards, create perverse incentives, and provide windfall credits to manufacturers who would be bringing these vehicles to market even in the absence of such credits. While it is unlikely that EV credits alone are sufficient to make a significant difference in near-term deployment, such creates risk greater erosion of program benefits over the long term.

EV credits have fallen into two categories: fuel-cycle credits and credit multipliers or “bonus” credits. The US, Europe and Canada have all allowed EVs to be given an emissions rating of 0 gCO₂/km, discounting upstream emissions from electricity production. The credit multiplier approach, which allows each EV to be counted as more than one vehicle in the fleet, reduces the need for manufacturers to improve the energy efficiency of a part of their fleet.

In the near term the exemption of upstream EV emissions from the standard is not likely to have a significant environmental impact due to limited deployment rates. In the long term, however, such an exemption could affect the emission reduction potential of standards unless the standards are also tightened by the amount of the exemption. Several key factors are relevant if Australian policy-makers wish to consider an exemption in the upcoming benefit-costs assessment:

- Regulatory incentives: Is the credit sufficient to actually bring greater numbers of EVs to the market than would otherwise be expected?
- Regulatory costs: What is the resulting increase in CO₂ emissions or fuel consumption from the rest of the fleet?

Under the recently proposed Japan 2020 fuel economy standards, plug-in hybrid and battery electric hybrid vehicles will receive a credit in proportion to the energy efficiency as measured on the standard test cycle. Complete accounting for electric vehicle upstream emissions can be accomplished based on vehicle efficiency, fuel type carbon intensity, and vehicle activity rates.

Flex-fuel vehicle credits (E85)
Experience in the US has shown that it is important to base credits for E85 or “flex-fuel” vehicles on actual verified emission reductions for two reasons. First, these vehicles have rarely been fueled with E85. In the US only about 2 percent of vehicle fueling stations offer E85 and in
the state of California there are only 44 public E85 stations (NREL, 2011). Providing credits in the based on the vehicle’s theoretical capability to accept E85 gave an incentive for automakers to produce many more of these cars than would actually use the fuel, undercutting the overall fuel consumption and CO$_2$ emissions benefits of the program. Secondly, the actual carbon profile of E85 varies widely and is not necessarily a net benefit over conventional fuels once land-use changes are taken into consideration.

Default credits for flex-fuel vehicles have now been phased out in the US, where these vehicles are now assigned the same emissions as conventionally fueled vehicles. Additional credit is only provided for demonstrated reductions in CO$_2$ emissions, i.e. the manufacturer must demonstrate that each vehicle receiving credit is fueling with a lower carbon fuel. As noted in the discussion paper, the EU also provides zero credit for E85 unless the fuel is available at 30% of fuel outlets and is produced sustainably, and even this potential credit sunsets in 2015.

12) Do you support an attribute-based standard? 13) If so, do you have a preference for mass or footprint?

A flat standard i.e. single numerical target that all manufacturers have to meet on a corporate average basis would be a simpler design choice. A flat standard fully incentivizes a range of technology options including vehicle lightweighting as well as vehicle downsizing to meet the CO$_2$ standard.

An attribute-based standard is preferred by many as a means to a more equitable distribution of responsibility. Some manufacturers, typically those who specialize in producing vehicles of larger size, view flat standards as a competitive disadvantage, and can see their burden lessened by use of an attribute-based standard. In addition, attribute based standards ensure that vehicles across all fleet have to deploy newer technology since the standards cannot be met alone simply by selling more smaller cars.

Footprint indexed standards, which are used in the United States, have several important advantages over mass indexed standards for encouraging the significant benefits of mass reduction. Vehicle efficiency can be increased by powertrain efficiency improvement or reducing the loads on vehicles. Most of the reduction of energy consuming due to vehicle loads (such as inertia losses from starts and stops and tire rolling resistance losses) is realized through lightweighting vehicles (mass reduction). Lightweighting vehicles will therefore reduce vehicle CO$_2$ emissions. Powertrain efficiency gains are equally incentivized under either size- or mass-based standards, but load reduction is not (German and Lutsey, 2011).

A standard with stringency indexed for size rewards manufacturers that apply lightweighting technology. Under this scenario, manufacturers can keep the benefit of the CO$_2$ reductions from improving powertrain technology and vehicle mass. On the other hand, mass-indexed standards reduce or eliminate the incentive for automakers to lightweight vehicles. Manufacturers would keep the benefits of improving powertrain efficiency but lose most or all CO$_2$ reduction benefits of lightweighting by triggering a stricter standard. As a result, a mass-indexed standard would discourage this important technology pathway to improve vehicle efficiency (German and Lutsey, 2011).
Furthermore, a size-based target system is less prone to gaming and correlates better with vehicle utility than mass. Manufacturers can, at relatively low cost, increase the curb weight of a vehicle (within certain boundaries) without the customer noticing it, resulting in a higher target for this now heavier vehicle. On the other hand, changing the wheelbase affects the vehicle performance and cannot easily be altered without a vehicle redesign\(^1\).

Evaluation of mass and size among other possible attributes for design of standards revealed that similar competitive impacts across manufacturers can be expected whether mass or size is chosen as the attribute, except size benefits from the advantages listed above (Mock, 2011). Therefore, if an attribute based standard design is preferred, then selection of size as an attribute is more appropriate.

16) Do you agree that the current VFACTS database (supplemented and audited as necessary) is suitable as the primary data source for assessing and reporting compliance with the standards? 17) Do you also agree that data collected for the purposes of the standards should be made publicly available on an annual basis?

The VFACTS database appears to be an appropriate starting point, but as the discussion paper points out it would need to be supplemented with additional data items and improved monitoring and verification of testing and data reporting.

Maintaining a public version of the data collected for the purpose of the standards is not only in the interest of greater transparency, but it will also foster more critical evaluation of data and changing technology and market characteristics of Australian vehicle fleet. Future policy can be adapted based on analyses of this data.

21) Do you consider there is merit in allowing manufacturers to pool, or is it an approach that manufactures are unlikely to pursue? 22) Do you think there is sufficient merit to warrant the inclusion of banking and trading systems as a feature of Australia’s CO\(_2\) standards? 23) Do you agree such systems are only possible where annual targets are set?

*Averaging, banking and trading, coupled with annual targets, can improve the cost-effectiveness of a given target.* These flexibility mechanisms facilitate the implementation of the most cost-effective technologies, provide a greater incentive to improve emissions over the full spectrum of vehicles sold, and allow for more rapid progress towards emissions reduction goals. If not coupled with annual targets, banking of credits can severely erode the overall program benefits. In other words, banking makes sense only in the context of providing flexibility to meet annual targets.

Both the US and EU have annual targets, although of a different form. In the US, where the actual curve changes each year, the full suite of market-based flexibility mechanisms is offered. In the EU, the standard curve remains constant but the portion of the fleet that must meet the standard changes over time. In general, annual targets combined with flexibility mechanisms are

\(^1\) To the extent that increasing track width and wheelbase would be possible, it would have relatively little impact on vehicle safety within the footprint range that varies fuel economy standard. Increasing footprint can help reduce fatalities caused by vehicle rollovers. (NHTSA 2005).
a preferable approach because they provide some incentive for over compliance in early years, thus locking in early emissions reductions from vehicles that will be on the road for many years to come.

Trading is allowed between manufacturers within the US (Federal Register 2010 Page 25414), but not commonly utilized. Thus, it is unclear whether the additional complexity of trading rules would provide significant benefit.

The European regulations provide for an opportunity for certain manufacturers or a group of connected manufacturers to pool their fleets together in order to comply. To the extent that such an approach reduces the compliance burden on small/niche manufacturers, pooling provisions can be allowed subject to pre-declaration of intention of pooling and verification that manufacturers would otherwise be subject to derogation due to their status as low volume manufacturer.

24) Do you agree that financial penalties are the most effective way to address non-compliance?

Penalties for non-compliance are an important part of ensuring that the CO2 reduction goals of the regulation are eventually met. It is important to set financial penalties at a level high enough to provide a strong incentive to comply with the standard rather than simply pay the penalty. In other words, the penalties should be higher than the cost of technology required to reduce CO2 emissions in order to make compliance the more cost-effective option. We expect that penalties issued by the European Commission of 95 euros per gram per km to be sufficient to ensure widespread compliance, although it should be noted that through the year 2018, the EU penalties are reduced for the first 3 gCO2/km of under compliance, which may increase the incentive for under-compliance on the margins.

United States manufacturers are subject to both automatic Corporate Average Fuel Economy (CAFE) penalties noted in the discussion document and also much higher Clean Air Act Section 205 liability up to $37,500 per vehicle including inflation adjustment (Federal Register 2010). Such fines would be levied on the highest emitting vehicles in the fleet, which when removed from the manufacturer’s fleet would allow for compliance with standards. EPA is allowed to consider several factors on a case-by-case basis, which for instance could include consideration for payment of penalties imposed under CAFE. With the inclusion of EPA penalty provisions, the US system does provide adequate enforcement authority, however the EU system is more straightforward.
References:


