
**Australian Transport Council
and the
Environment Protection and Heritage Council**

Vehicle Fuel Efficiency Working Group

Final Report

March 2009

(Amended April 2009)

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EXECUTIVE SUMMARY

This is the final report to the Australian Transport Council (ATC) and the Environment Protection and Heritage Council (EPHC) by the joint ATC/EPHC Vehicle Fuel Efficiency Working Group.

The report is in response to a request to ATC and the EPHC from the Council of Australian Governments (COAG) to:

“develop jointly a package of vehicle fuel efficiency measures designed to move Australia toward international best practice”.

The report provides an evaluation of a number of potential vehicle fuel efficiency measures, following consideration of the stakeholder comment to the Working Group’s discussion paper released in September 2008. The evaluation is based on the Working Group’s assessment of the effectiveness of measures in an international and local context and comment from key stakeholder organisations.

This final report facilitates the next step – consideration of potential measures by ATC and EPHC Ministers.

Note: The Working Group has defined vehicle fuel efficiency in terms of greenhouse gas emissions per kilometre travelled, rather than volume of fuel consumed. This enables effective comparisons between vehicles across fuel types.

Measures Evaluated

Consistent with its terms of reference, the Working Group agreed to focus on vehicle based measures which:

- are complementary to the Carbon Pollution Reduction Scheme (CPRS);
- improve the greenhouse emissions performance of new vehicle models relative to existing models;
- increase the overall proportion of lower greenhouse emission vehicles in the vehicle population;
- do not compromise the pollutant emission standards set out in the Australian Design Rules (ADR’s) for motor vehicles; and
- support delivery of improved transport greenhouse efficiency reductions over time.

The discussion paper outlined eight potential measures to improve vehicle fuel efficiency, *viz*:

- CO₂ emission targets for new light vehicles (voluntary or mandatory)
- Differential registration and stamp duty charges for new light vehicles based on CO₂ emissions
- Direct financial incentives for low emission vehicles
- Fleet purchasing frameworks that incorporate CO₂ reduction objectives
- Inclusion of fuel consumption and CO₂ data in vehicle advertisements

- International standards/labelling requirements for non-engine components which impact on CO₂ emissions
- An environmental rating scheme for heavy vehicles
- A technology demonstration scheme for Australian road transport fleets linked to CO₂ outcomes

Stakeholder Response

The Working Group received over sixty submissions, from a range of stakeholder organisations and individuals.

With a few notable exceptions, the submissions were broadly supportive of one or more of the measures outlined in the discussion paper, with most support for CO₂ emission standards for new vehicles. The least focus was on the heavy vehicle measures. Many submissions also suggested measures outside the scope of the paper.

The Federal Chamber of Automotive Industries (FCAI), representing vehicle manufacturers and importers, and the Motor Traders Associations were opposed to mandatory CO₂ emission standards, any vehicle based financial incentives / disincentives and the inclusion of fuel consumption in vehicle advertising. The FCAI argued that as transport is to be included in the CPRS, the proposed additional vehicle measures were not warranted.

Working Group Assessment and Recommendations

In considering potential measures to improve the fuel efficiency of the new vehicle fleet, a combination of measures is likely to achieve better results than any single measure. It is also worth noting that, while short term gains are possible in terms of influencing purchasing decisions, it takes a long time for new vehicles to become dominant in the vehicle fleet. Consequently, the introduction of new vehicle technologies and/or fuel systems, and revised regulatory arrangements for new vehicles, make only gradual (but accumulating) improvements to overall fleet emissions.¹

To facilitate the assessment, the report groups potential measures under one of three broad categories:

1. Measures to Increase Supply of Low Emission Vehicles
2. Measures to Increase Demand for Low Emission Vehicles
3. Measures to Improve Consumer Awareness.

Based on an evaluation of the international practice and stakeholder comment, the Working Group presents the following recommendations for consideration by ATC and EPHC.

¹ In 2007, a little over 1 million new light vehicles were sold in Australia, compared with a total light vehicle fleet estimated at 13.7 million vehicles.

Note: The numbering of the recommendations below is linked to the eight individual measures, together with the “next steps” process, discussed in the main body of this report.

Category 1 – Measures to Increase Supply of Low Emission Vehicles

The Working Group considers there is a *prima facie* case for introducing mandatory CO₂ standards for new light vehicles sold in Australia and adopting related international standards for non-engine components, and recommends that:

Recommendation 1.1

The Australian Government undertake a detailed Regulatory Impact Statement to assess the costs and benefits of introducing CO₂ emission standards for light vehicles;

Recommendation 1.2

The Australian Government continue to monitor national and international best practice for traditional and emerging fuels in order to support ambient air quality objectives and improve the fuel efficiency of Australia's motor vehicle fleet;

and

Recommendation 6.1

The Australian Government continue to monitor the development and implementation of international standards for non-engine components which impact on vehicle fuel efficiency, with a view to evaluating the merits of adopting those standards in Australia, when finalised.

Category 2 - Measures to Increase Demand for Low Emission Vehicles

The Working Group considers there is merit in examining the use of fiscal and purchasing measures to encourage demand for low emission vehicles, and recommends that:

Recommendation 2.1

State and Territory Governments give consideration to revising their stamp duty and/or registration regimes for new light vehicles to establish differential charges linked to environmental performance;

Recommendation 2.2

Any differential stamp duty and/or registration charges should utilise the environmental ratings published on the Australian Government's Green Vehicle Guide as the measure of environmental performance (the ACT stamp duty system provides one model of this approach);

Recommendation 2.3

Revenue neutrality be considered as a design feature for any differential charges, to assure the community that the objective is not higher public revenue;

Recommendation 3.1

Consideration be given to the introduction of a balanced set of financial incentives (rebates) and disincentives (surcharges) for the purchase of new vehicles based on the CO₂ emissions performance of a vehicle, sometimes referred to as a “feebate” – noting that this is a similar policy tool to Recommendation 2.1;

and

Recommendation 4.1

The Australian Government, in conjunction with the States and other stakeholders, co-ordinate the development and dissemination of on-line information resources, drawing on best practice frameworks and case studies, to assist fleet managers in incorporating objective environmental criteria into fleet purchasing decisions.

Category 3 – Measures to Increase Consumer Awareness

The Working Group considers there are a number of relatively low cost measures that can be taken to enhance the information currently provided to the public and industry regarding the environmental performance of vehicles, and recommends that:

Recommendation 5.1

The Australian Government initiate discussions with the Federal Chamber of Automotive Industries and relevant advertising bodies, with a view to developing a code of practice regarding the inclusion of fuel consumption and CO₂ data in vehicle advertisements and promotional materials;

Recommendation 5.2

In the event that a code of practice envisaged under Recommendation 5.1 is not achieved, the Australian Government should pursue the development of mandatory provisions regarding the inclusion of fuel consumption and CO₂ data in vehicle advertisements and promotional material;

Recommendation 7.1

The Australian Government work with the Victorian and New South Wales Governments to develop and deploy the “Truck Buyer’s Guide” on the *Green Vehicle Guide* website;

Recommendation 7.2

The Australian Government continue to monitor the development and implementation of international heavy vehicle emissions standards under the UN ECE framework, noting that the inclusion of fuel consumption and CO₂ emissions data in the *Euro 6* standards may assist the development of more robust rating tools for heavy vehicles;

and

Recommendation 8.1

The Australian Government, in consultation with the NSW Roads and Traffic Authority, other interested jurisdictions and industry, co-ordinate the development of on-line information resources regarding trials and evaluations of low emission technologies for commercial vehicles, to assist operators in assessing the effectiveness of various technologies.

Next Steps

The Working Group recommends that ATC and EPHC endorse this report and its recommendations and forward it to COAG for consideration at the next available meeting.

It is also recommended that ongoing monitoring of this package of measures take place within the context of the National Strategy on Energy Efficiency, which is currently oversighted by the Senior Officials Group on the National Strategy for Energy Efficiency (SOG-EE).

To provide a mechanism for monitoring and reporting progress on those recommendations endorsed by COAG, the Working Group recommends that:

Recommendation 9.1

The ATC monitor and report progress on COAG endorsed recommendations;

and

Recommendation 9.2

The ATC provide progress reports to the body managing the National Strategy on Energy Efficiency (with copies to the Environment Protection and Heritage Council).

A summary table listing all recommendations is at Appendix C.

MAIN REPORT

1. Background

This is the final report to the Australian Transport Council (ATC) and the Environment Protection and Heritage Council (EPHC) by the joint ATC/EPHC Vehicle Fuel Efficiency Working Group. The Working Group consists of Commonwealth and State/Territory transport, environment and industry representatives.

The report provides an evaluation of a number of potential vehicle fuel efficiency measures. The evaluation is based on the Working Group's assessment of the effectiveness of measures in an international and local context and comment from stakeholder organisations.

The Working Group's initial report was endorsed by the ATC and the EPHC, and transmitted to COAG in late 2006. COAG noted the report at its meeting on 13 April 2007. The then Prime Minister, as chair of COAG, subsequently wrote to the chairs of the ATC and the EPHC requesting the Councils to:

“develop jointly a package of vehicle fuel efficiency measures designed to move Australia toward international best practice”.

In response to that request, the ATC / EPHC Vehicle Fuel Efficiency Working Group prepared a public discussion paper, which was released on 12 September 2008, by the Minister for the Environment, Heritage and the Arts, the Hon Peter Garrett AM and the Minister for Infrastructure, Transport, Regional Development and Local Government, the Hon Anthony Albanese, as chairs of the EPHC and the ATC respectively.² The discussion paper outlined a number of potential measures to improve vehicle fuel efficiency. Its purpose was to inform discussion and evaluation by stakeholders.

This final report facilitates the next step – consideration of potential measures by ATC and EPHC Ministers.

The Working Group facilitated an eight week period for public comment on the discussion paper. Stakeholder forums were held in Canberra, Sydney, Melbourne and Perth. Videoconference and teleconference meetings were conducted for interested parties in Adelaide and Darwin.

² Australian Transport Council & the Environment Protection & Heritage Council (2008), *Vehicle Fuel Efficiency: Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles. – Public Discussion Paper.* (see <http://www.environment.gov.au/settlements/transport/vfe.html>)

The Working Group received 64 written submissions, from a range of stakeholder organisations and individuals. The submissions can broadly be categorised as follows:

- Concerned individuals (12)
- Conservation groups (Australian Conservation Foundation + 3 regional groups)
- Alternative fuels proponents, primarily gas and biofuels (Australian LPG Assoc, Renewable Fuels Australia, Natural Gas Vehicles Assoc + 7 others)
- Electric Vehicle proponents (2)
- Vehicle Manufacturers & Importers (Federal Chamber of Automotive Industries, Truck Industry Council, + 5 companies)
- Motoring Associations (Australian Automobile Assoc, NRMA, RACQ)
- Motor Traders Associations (4)
- Tertiary institutions (2)
- Advertising bodies (2)
- Transport associations/operators (Australian Trucking Assoc., Linfox, Australasian Railways Assoc., Australian Fleet Managers Assoc.)
- Government bodies (Tasmanian Premier, National Transport Commission, 4 local government bodies)

The submissions can be accessed at:

<http://www.environment.gov.au/settlements/transport/vfe.html>

2. Scope

While the Working Group was established to examine vehicle fuel efficiency, the Working Group concluded that the most effective way to consider fuel efficiency in a fuel neutral manner was to consider the objective of improved fuel efficiency in terms of reductions in CO₂ emissions. Consequently the discussion of measures in this report is often framed in terms of emission reductions, rather than fuel efficiency *per se*.

The Working Group has focussed the review of potential vehicle fuel efficiency measures on measures relevant to road vehicles, in particular measures which:

- complement the Carbon Pollution Reduction Scheme (CPRS);
- improve the greenhouse emissions performance of new vehicle models relative to existing models;
- increase the overall proportion of lower greenhouse emission vehicles in the vehicle population;
- do not compromise the pollutant emission standards set out in the Australian Design Rules (ADR's) for motor vehicles; and
- support delivery of ongoing improvements in transport greenhouse efficiency.

The Working Group’s analysis does not include potential improvements in the *operational* efficiency of vehicles, such as more efficient driving behaviour, improved maintenance of vehicles or improved traffic management. Behavioural measures aimed at delivering emission reductions through travel demand management are also outside of scope. These matters are the subject of separate consideration by ATC and EPHC.

3. Context

3.1 Road Transport Sector

Road transportation is integral to the ongoing development of the Australian economy and enhances the mobility and quality of life of millions of Australians. There are about 15 million motor vehicles on the road in Australia. As Figure 1 illustrates, light passenger vehicles make up over 77% of the fleet, with the remainder comprising motorcycles, light commercial vehicles, trucks and buses.³

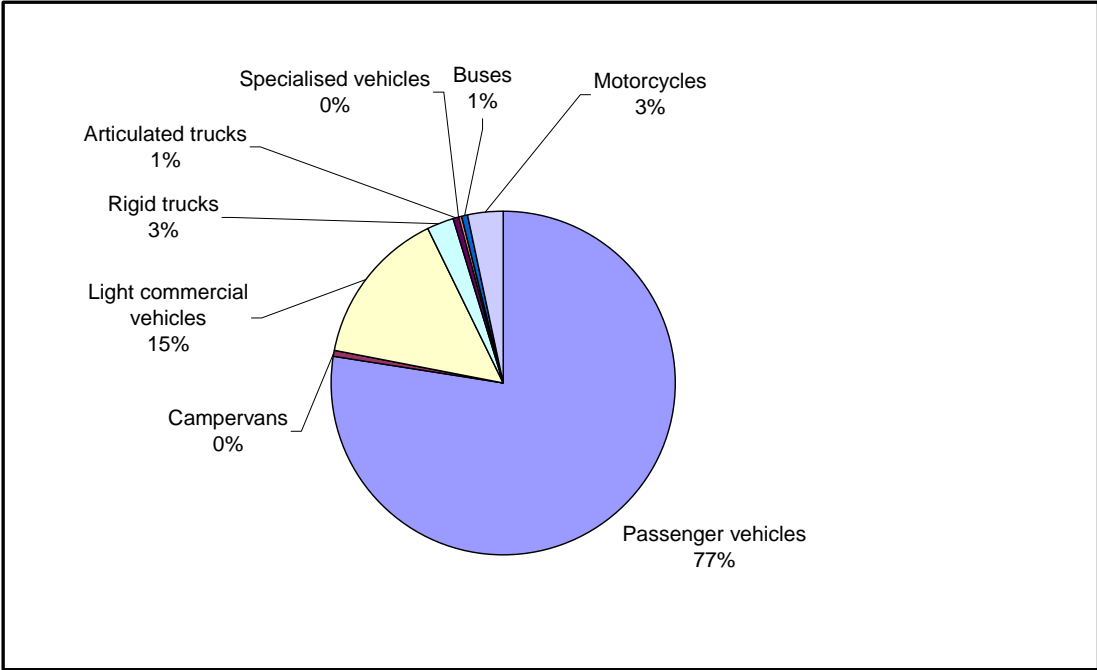


Figure 1: Proportion of vehicle types in Australian fleet – 2007

Source: ABS, 2007, Motor Vehicle Census 9309.0

Historically, Australian businesses and households have had access to relatively inexpensive transport fuel as a result of relatively low global oil prices and low fuel taxes (by international standards). Inexpensive fuels combined with prevalent patterns of urban development have been key factors behind the high level of car ownership and extensive use of trucks for the national freight task.

Population growth, combined with a strong economy, has driven growth in the Australian vehicle fleet in recent years. Since 2003, the number of vehicles in the

³ ABS Motor Vehicle Census 9309.0

Australian fleet has grown at an average rate of almost 3% per year.⁴ Growth in the vehicle fleet is predicted to moderate in the medium to long term as a result of the combined effects of forecast slower economic growth and a saturation of per-capita car ownership.⁵

The road transport sector depends on petroleum based fuels. Growth in the Australian road transport task has led to a corresponding increase in fuel consumption, which in turn, has led to an increase in greenhouse gas emissions from the sector. In 2006, road transport accounted for 12% of Australia's total greenhouse gas emissions. Greenhouse emissions from road transport have been increasing at an average rate of 1.7% per annum since 1990. Figure 2 shows emissions growth between 2010 and 2020 is forecast to slow to 1.6% per year, owing to reduced growth in the number of vehicles in the fleet and ongoing improvements in vehicle fuel efficiency.⁶

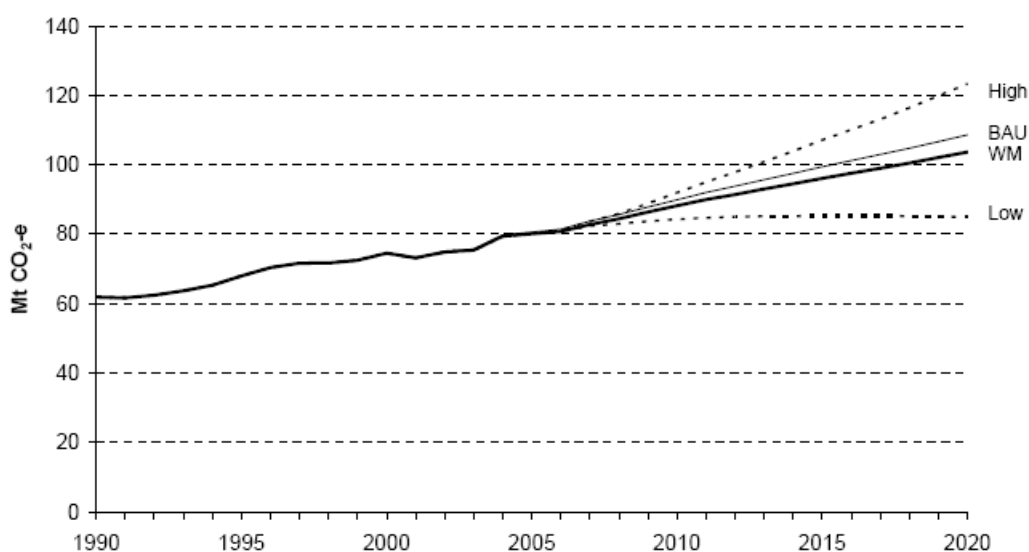


Figure 2: Greenhouse gas emissions from the transport sector

Note 1 WM = 'With measures' best estimate. BAU = "Business as Usual"

Note 2 High and low scenarios are variations on the 'with measures' scenario which provide an indication of how emissions may be affected by uncertainty in forecasting key drivers including economic growth, population, fuel efficiency improvements and oil prices.

Sources: ACG 2007, BTRE 2007, DCC analysis.

3.2 Fuel Consumption

In 2007, the national average carbon emission rating for new light vehicles⁷ sold in Australia was 226 g CO₂/km. This represents an average annual improvement of around 2 percent since 2002.⁸ This has been influenced by improvements in vehicle technology combined with changing buyer preferences in favour of smaller cars and to a lesser degree a growth in sales of diesel powered vehicles.

⁴ ABS Motor Vehicle Census 9309.0

⁵ Department of Climate Change (2008), *Transport Sector Greenhouse Gas Emissions Projections – 2007*.

⁶ Department of Climate Change (2008), *National Greenhouse Gas Inventory (2006)*.

⁷ Light vehicles include passenger cars, sports utility vehicles and light commercial vehicles (under 3.5 tonne GVM).

⁸ Federal Chamber of Automotive Industries (FCAI) submission.

Direct comparison of the fuel efficiency of the Australian fleet with that of overseas countries is made difficult by differences in testing standards, vehicle classifications and inherent differences in the historical and current road transport task between countries. Nevertheless, based on its understanding of the current Australian light vehicle fleet, and consideration of current and emerging low emission vehicle technologies, the Working Group considers there is considerable scope to improve the fuel efficiency of road vehicles, particularly light vehicles, at a rate greater than current “business as usual” improvements.

3.3 Capacity for Improvement in Vehicle Fuel Efficiency

Opportunities to improve vehicle fuel efficiency are available through making changes to:

- engine and vehicle technology; and
- transport fuel mix.

3.3.1 Engine and Vehicle Technology

International research suggests there is considerable scope for fuel consumption improvements in road vehicles operating on conventional internal combustion engines. Improvements can occur through more widespread adoption of proven fuel saving engine and transmission technologies as well as improved vehicle design and materials.

The recent *King Review*⁹, commissioned by the UK Government, concluded that 30% fuel consumption savings are achievable for the average new light passenger vehicle in the short term (5-10 years). This conclusion does not rely on downsizing or major fuel shifts, but simply “adopting a small selection of the most cost-effective technologies”. Other reports have reached similar conclusions.^{10,11,12,13}

These reports also conclude that the additional costs of delivering these improvements were moderate, and likely to be fully offset in 3-5 years of vehicle ownership because of lower fuel costs. A recent study of the costs associated with a range of greenhouse abatement strategies in Australia found that, in general, efforts to improve vehicle fuel efficiency carry a ‘negative’ cost of abatement (i.e. provide a

⁹ King, J (2007), *The King Review of low carbon cars – Part 1: the potential for CO2 reduction*.

¹⁰ Plotkin, S (2007) *Examining Fuel Economy and Carbon Standards for Light Vehicles* Discussion Paper No. 2007-1, December 2007, OECD/ITF Joint Transport Research Centre at [http://www.internationaltransportforum.org/jtrc/Discussion Papers/DiscussionPaper1.pdf](http://www.internationaltransportforum.org/jtrc/Discussion%20Papers/DiscussionPaper1.pdf)

¹¹ US National Research Council (2002) *Effectiveness and Impact of Corporate Average Fuel Economy (CAFÉ) Standards*, National Academies Press at http://www.nap.edu/catalog.php?record_id=10172

¹² Cheah et al (2007) *Factor of two: Halving the Fuel Consumption of New U.S. Automobiles by 2035* MIT, at: <http://on-line.wsj.com/public/resources/documents/eyes-1119-2007.pdf>

¹³ E4tech (2007), *A review of the UK innovation system for low carbon road transport technologies: A report for the Department of Transport*. <http://www.dft.gov.uk/pgr/scienceresearch/technology/lctis/e4techlc.pdf>

net economic gain).¹⁴ In the light vehicle sector, shifting to more fuel efficient engines, particularly diesels, and vehicle or engine downsizing offer additional capacity for significant improvements.

A range of engine technologies that offer the potential to improve fuel efficiency and reduce noxious exhaust emissions are most effective when used in conjunction with high quality fuels. The Australian Government's fuel standards policy, via the *Fuel Quality Standards Act 2000*, has been to largely align Australian fuel quality with international standards (particularly with Europe, as European fuel standards are matched to the UN ECE vehicle emissions standards). This has ensured that fuel quality is able to facilitate the introduction of vehicles with improved engine and emissions control technology.

The greater use of hybrid vehicle technologies can offer significant emission reductions of 25-30% for mild hybrids, and 25-50% for full hybrids, and potentially greater than 50% for "plug-in" hybrids (King Review).¹⁵ The Working Group considers these technologies will become much more widespread in the medium term (10-20 years).

Mitsubishi, General Motors Toyota and Nissan have all recently announced that they will introduce plug in hybrid / electric models from 2009-2010 into the international market¹⁶. Project Better Place has proposed an electric vehicle network powered by renewable energy in Australia from 2012¹⁷.

The potential for plug-in hybrid and electric vehicle technology to deliver substantial reductions in CO₂ emissions will depend upon a corresponding change in the carbon intensity of the electricity grid, through an expanded use of renewable and other energy sources.¹⁸

3.3.2 Transport Fuel Mix

The Australian road transport fleet is heavily reliant on petroleum based fuels (petrol and diesel). Petrol remains the dominant fuel in the light vehicle sector, although there is also a growing use of diesel and liquefied petroleum gas (LPG). Diesel is the dominant fuel in the heavy vehicle sector.

The work of the *Future Fuels Forum*¹⁹ suggests that the increasing cost of oil and the need to reduce greenhouse emissions will drive diversification in the transport fuel mix.

¹⁴ McKinsey & Co (2008), *The Australian Cost Curve for Greenhouse Reduction*.

<http://www.greenfleet.com.au/uploads/pdfs/McKinsey%20Report%20-%20greenhouse%20-%202015Feb08.pdf>

¹⁵ Mild hybrids use a subset of available electrical technologies in conjunction with a conventional engine, full hybrids utilise all available hybrid technologies, plug-in hybrids include the capacity for external charging of the vehicle battery.

¹⁶ Australian Electric Vehicle Association (AEVA) submission

¹⁷ Better Place Australia submission.

¹⁸ Garnaut, R. (2009), *The Garnaut Climate Change Review*, p 519, <http://www.garnautreview.org.au>

¹⁹ CSIRO, 2008, *Fuel for Thought - The future of transport fuels: challenges and opportunities*.

Liquefied Petroleum Gas (LPG) has a lower carbon to hydrogen ratio and higher octane rating compared with petrol and diesel. This offers the potential for LPG fuelled vehicles to deliver CO₂ emission reductions. However, at present in Australia, this potential has largely not been realised. The engines and fuel delivery technologies historically utilised in LPG vehicles (both mono and bi-fuel) have been less than optimal. Adoption of emerging LPG engine and fuel delivery technologies (e.g. liquid injection) offers the potential to improve the CO₂ emissions performance of LPG in the future.

Biofuels and biofuel blends promise to provide a less greenhouse intensive alternative to petroleum fuels, but this depends on feedstock and production method. Biofuels are produced using a range of biological feedstock and include ethanol and biodiesel. At current rates of production, these fuels are only likely to replace a small proportion of the traditional fuel market.

Natural gas, which is mainly methane (CH₄), can be used as a transport fuel either as Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG). Depending upon engine technology, CNG and LNG can offer potential greenhouse benefits over petrol and diesel. However, the potential emission of methane in the form of unburnt gas in the exhaust can mean that these fuels can be considerably worse from a greenhouse perspective than conventional petrol or diesel, as methane has a greenhouse warming potential 21 times higher than carbon dioxide. The full fuel cycle emissions from natural gas will also vary from state to state due to indirect emissions from the extraction, production and transportation (and liquefaction in the case of LNG) of the gas.

Hydrogen has the potential to be a lower emission fuel with a number of trials of hydrogen fuel cell vehicles now occurring around the world. Significant technical and infrastructure challenges would need to be overcome before it would be commercially feasible. Full fuel cycle emissions will vary with the method used to produce hydrogen.

3.4 Policy Measures to Improve Vehicle Fuel Efficiency

The Working Group considered a range of policy measures that are being utilised around the world to address the challenges of improving vehicle fuel efficiency and reducing CO₂ emissions from road vehicles. Measures can be broadly categorised according to whether they target the supply of, or demand for, new low emission vehicles.

The efficacy of measures was found to vary widely, and in many cases there was little or no evaluation of the impact of particular measures. International experience to date suggests that the measures most likely to deliver better fuel efficiency and lower greenhouse emissions include:

- Vehicle taxation and charges linked to emissions performance;
- Road use charges linked to emissions performance;

- Purchase incentives for low emission vehicles to encourage investment in appropriate emission reduction technologies; and
- Performance based emission targets for the vehicle industry (whether voluntary or regulatory).

Of these measures, all but the road use charging are within the scope of the Working Group. There is also general agreement that consumer awareness measures can have a complementary role and are low cost.

3.5 Current Measures

Australia has a range of measures in place which have a key objective of reducing vehicle CO₂ emissions or improving fuel efficiency. These are briefly summarised below.

3.5.1 National Average Fuel Consumption Target

The Australian Government and the Federal Chamber of Automotive Industries (FCAI) agreed a voluntary national average fuel consumption (NAFC) target for new passenger cars in 2003. That target is 6.8 L/100km for petrol passenger cars by 2010 (for a petrol vehicle, this target is approximately 162 g CO₂/km).

In 2004, the Australian Government and the FCAI commenced negotiations to align the target with the revised fuel consumption test procedures and to set an updated equivalent CO₂ based target covering all light vehicles. The parties were unable to reach an agreement on a revised target.

The FCAI has proposed a target of 222 g CO₂/km for all light vehicles, up to 3.5 tonnes, by 2010. The FCAI reports a 10 percent improvement in the national average CO₂ emissions for all new light vehicles sold in Australia since 2002 (to approximately 226 g CO₂/km in 2007).²⁰

3.5.2 Fuel Consumption Labelling

Since January 2004, the Australian Government has mandated fuel consumption labelling of all new vehicles up to 3.5 tonnes, to assist consumers in comparing the relative performance of individual models. From 1 April 2009, the label will display the fuel consumption and greenhouse gas emissions over urban and non-urban test conditions, as well as the “combined” result.

²⁰ FCAI submission

3.5.3 Green Vehicle Guide

The *Green Vehicle Guide* (GVG) website provides model specific information to consumers on the emissions performance of all light vehicles produced since mid-2004. The GVG ratings provide an overall assessment as well as separate ratings based on CO₂ emissions and air pollutant emissions and fuel consumption values. The fuel consumption and CO₂ data match the information provided on the fuel consumption label.

3.6 Related Policy Areas

The Working Group recognises that vehicle fuel efficiency measures operate in a complex policy environment which includes measures covering transport systems efficiency, taxation, energy, vehicle manufacturing and climate change.

This section outlines current issues in related policy areas and seeks to identify possible linkages with potential vehicle fuel efficiency measures.

3.6.1 National Transport Policy

The ATC is developing the *National Transport Policy*. This seeks to deliver improvements in the productivity, sustainability and safety of the transport sector. Within this process the ATC Climate Change, Energy & Environment Working Group is developing strategies to reduce energy use and climate change impacts of the transport sector. The *National Transport Policy* may provide a suitable overarching transport policy framework within which to incorporate and report progress toward potential vehicle fuel efficiency measures.

3.6.2 National Strategy for Energy Efficiency (NSEE)

COAG is developing a National Strategy for Energy Efficiency, to accelerate energy efficiency efforts across all governments and to assist households and businesses prepare for the introduction of the Australian Government's Carbon Pollution Reduction Scheme. The strategy is expected to be finalised by mid 2009. The NSEE is expected to include transport and there is scope to incorporate vehicle fuel efficiency measures within the NSEE framework.

3.6.3 Carbon Pollution Reduction Scheme

On 15 December 2008, the Australian Government released a white paper outlining the Carbon Pollution Reduction Scheme (CPRS).

The CPRS will be the primary mechanism to reduce greenhouse gas emissions on an economy-wide basis. The CPRS will be a broadly based “cap and trade” emissions trading scheme and is expected to commence on 1 July 2010. The transport sector will be included within the CPRS, with Scheme obligations to apply to upstream suppliers of transport fuels.

The Australian Government has acknowledged there will be a need for additional, “complementary” measures to work in parallel with the CPRS to assist the transition to a low carbon economy. COAG has agreed a set of principles to inform the assessment of potential “complementary” measures in order to ensure climate change policy is coherent and efficient.

According to the principles, each abatement-related complementary measure should target a market failure that is not expected to be adequately addressed by the CPRS or that impinges on its effectiveness in driving emission reductions. It is widely held that the road transport sector has a number of market failures that may impede the efficient operation of the CPRS. Non-price barriers relating to consumer access to information are key market failures which impact on the uptake of low emission vehicle technologies. Lack of access to objective information on fuel consumption can be a barrier to the uptake of low emission vehicle technology.

Complementary measures should also adhere to principles of efficiency, effectiveness, equity and administrative simplicity and be kept under review. Where measures are regulatory they should meet best practice regulatory practice, including that the benefits of any government intervention should outweigh the costs.

3.6.4 Green Car Innovation Fund

On 10 November 2008, the Australian Government announced *A New Car Plan for a Greener Future*. The strategies announced in the Plan will provide transitional assistance to the local car manufacturing industry (and component suppliers) to adjust to a more open trade environment and shift to producing vehicles and components with lower fuel consumption and greenhouse emissions. The Plan was developed in response to the recent Review of Australia's Automotive Industry.

The Plan includes an expanded Green Car Innovation Fund (GCIF) to support research, development and commercialisation of Australian technologies that reduce fuel consumption and greenhouse gas emissions. The Fund amounts to \$1.3 billion, brought forward to 2009, and will operate for ten years. In general the Fund will commit one dollar for every three dollars committed by industry participants.

The Australian Government's Green Car Challenge will also provide support for the purchase of Australian manufactured vehicles that meet certain environmental standards and provide good value for money for the Commonwealth vehicle fleet.

Many of the potential vehicle fuel efficiency measures considered by the Working Group have the capacity to support the GCIF objectives by increasing demand for low emission vehicles and by raising consumer awareness.

3.6.5 Taxation Review

On 13 May 2008 the Australian Government announced the review of Australia's taxation system. The review is looking at the current tax system and will make recommendations to respond to demographic, social, economic and environmental challenges of the 21st century. The review will encompass Australian Government and State taxes, with the exception of the Goods and Services Tax (GST), and will consider interactions with the transfer system.

The review is considering the various forms of taxation associated with motor vehicles and transport fuels administered by the Australian Government, including:

- Fuel taxes and tax credits;
- Fringe benefits tax;
- Luxury car tax; and
- Tariffs.

In addition, the review is considering State/Territory taxes and charges, including stamp duty on motor vehicles and registration charges.

4. Assessment of Potential Measures

As already noted, the discussion paper released for public comment in September 2008 presented a package of eight potential measures which the Working Group considered had the capacity to deliver improvements in vehicle fuel efficiency and lower CO₂ emissions from vehicles. These were:

- CO₂ emission targets for new light vehicles (voluntary or mandatory)
- Differential registration and stamp duty charges for new light vehicles based on CO₂ emissions
- Direct financial incentives for low emission vehicles
- Fleet purchasing frameworks that incorporate CO₂ reduction objectives
- Inclusion of fuel consumption and CO₂ data in vehicle advertisements
- International standards/labelling requirements for non-engine components which impact on CO₂ emissions
- An environmental rating scheme for heavy vehicles
- A technology demonstration scheme for Australian road transport fleets linked to CO₂ outcomes.

This section of the report considers the broad stakeholder response to the package of measures and then considers each measure individually. A more detailed description of the measures, and the international and domestic context, can be found in the discussion paper.

4.1 Summary of Stakeholder Comment & Working Group Response

In response to the discussion paper, a broad cross-section of stakeholders supported the development of a package of vehicle fuel efficiency measures, in addition to the measures already in place. The exceptions included the Federal Chamber of Automotive Industries, the Motor Trades Association and a number of other companies and organisations from the motor vehicle industry. These respondents considered that, with the inclusion of the transport sector in the CPRS, additional measures would not be required. Further, the FCAI and some car manufacturers argued that additional measures would place an inequitable burden on the road transport sector and may impact adversely on the effectiveness of the CPRS.²¹

The Working Group recognises the CPRS as the primary mechanism for the reduction of greenhouse gas emissions on an economy wide basis and that measures aimed at placing an additional cost on transport emissions would replicate the intent of the CPRS, rather than complement it. However, measures aimed at other outcomes could be considered complementary to the CPRS.

In the context of this report, complementary actions could include measures that are aimed at overcoming:

- a lack of information about the potential savings from lower emission vehicles or which vehicles/components deliver improved fuel economy and lower emissions;
- the tendency of those purchasing vehicles to undervalue potential savings in future operating expenses provided by more fuel efficient vehicles, and to focus on other factors at the time they are choosing a vehicle to purchase; and
- limits on the incentives for vehicle manufacturers and suppliers to provide low emission vehicles to the Australian market when they may be able to maximise sales and revenues by focussing on other features.

In order to meet the criteria identified by COAG for measures that will complement the CPRS, measures must be cost effective.

The Working Group's evaluation has identified potential market failures within the road transport sector, relating primarily to consumer choice and access to information. The potential complementary measures considered in this report seek to address these market failures.

Several submissions suggested that certain potential measures may disproportionately affect some people within lower socio-economic groups through the introduction of financial penalties on vehicles with poor fuel efficiency. It was also suggested that people in these groups may be less likely to benefit from some potential measures as the measures are limited to the purchase of new vehicles.

²¹ FCAI, Mitsubishi, Ford, GM Holden submissions

A number of submissions highlighted the specific vehicle needs of individuals and organisations in rural and remote regions. In such cases, larger, heavy duty four wheel drive vehicles are sometimes required to satisfy the transport task. Concern was expressed that several measures could disadvantage these groups.

The Working Group acknowledges these concerns and recommends that potential impacts on these groups be considered within the design and implementation of measures.

The Australian Conservation Foundation (ACF) argued that poor design and implementation of vehicle fuel efficiency measures could potentially lead to perverse outcomes through a “rebound” effect, where improved fuel efficiency encourages people to increase vehicle use.²² The ACF submission highlighted the need to implement vehicle fuel efficiency measures within a comprehensive policy framework in order to counter possible perverse effects.

Several submissions expressed concern about the potential for negative impacts of fuel efficiency measures on the local vehicle manufacturing industry. The Working Group suggests that appropriately designed measures have the potential to support the local industry as it shifts toward production of low emission vehicles in line with the Australian Government’s *A New Car Plan for a Greener Future*.

A table summarising the key elements of significant submissions is at Appendix A.

²² Australian Conservation Foundation (ACF) submission.

4.2 Individual Assessment of Potential Measures

This section of the report provides the Working Group's final assessment and conclusions regarding the potential measures as proposed in the discussion paper, taking into account the stakeholder comment.

Measure 1 CO₂ emission standard for new light vehicles

Proposal

Establish revised sales weighted average CO₂ emission standards for new light vehicles, which aim to significantly reduce the average level of CO₂ emissions from the Australian light vehicle fleet. This has the effect of improving the average fuel efficiency for new vehicles.

Current Situation

As explained in section 3.5.1 of this report, a voluntary national average fuel consumption (NAFC) target is in place, but no agreement has been reached between government and industry on a new target which reflects changes in test procedures and the scope of vehicles covered by the new procedures. The Working Group is not aware of any data or information that demonstrates that the voluntary NAFC target has had any influence on the modest reductions in fuel consumption achieved to date.

Discussion

Consumer demand should be the prime determinant of which vehicles are successful in the market. Market driven economies assume that consumer preference for smaller vehicles will mean that manufacturers will need to adjust or continue to lose market share. However, in an environment where there is a policy objective to improve the efficiency of the Australian vehicle fleet, and consumer purchasing patterns are not leading to an increase in the supply of more efficient vehicles, consideration of measures to increase the supply of these vehicles may be warranted.

A market signal for vehicle manufacturers to adopt fuel efficient technologies and supply low emission vehicles to the market, may be muted in the short to medium term, as a result of the combined effects of market failures around vehicle purchasing decisions and the delayed impact of the CPRS on the price of fuel. A cost efficient pathway may be achievable in the short to medium term through specific measures to increase the supply of low emission vehicles. In this context, the introduction of CO₂ emission standards is receiving considerable international focus as a supply based measure.

Several countries are utilising, or are planning to introduce, sales weighted average CO₂ emission standards to deliver improvements in the fuel efficiency of new vehicle models. The United States, Japan, China, Taiwan and South Korea all have mandatory fuel efficiency standards for new cars. The European Union currently has a voluntary agreement linked to CO₂ emissions with vehicle manufacturers, although there has been a decision to establish a mandatory CO₂ target for passenger cars which will take effect from 2012. Only the United States and Japan have applied standards to the fuel efficiency of commercial vehicles.

Over the long term, the improvement in the CO₂ emission performance of the light vehicle fleet from CO₂ emission standards could be significant as the proportion of lower emission vehicles increases. Figure 6 provides an indication of potential impacts on vehicle CO₂ emissions for a range of CO₂ emission standard levels and timing scenarios. This is based on preliminary modelling undertaken for the Working Group by the Bureau of Infrastructure, Transport and Regional Economics (BITRE). Notes and underlying assumptions for these scenarios are at Appendix B to this paper.

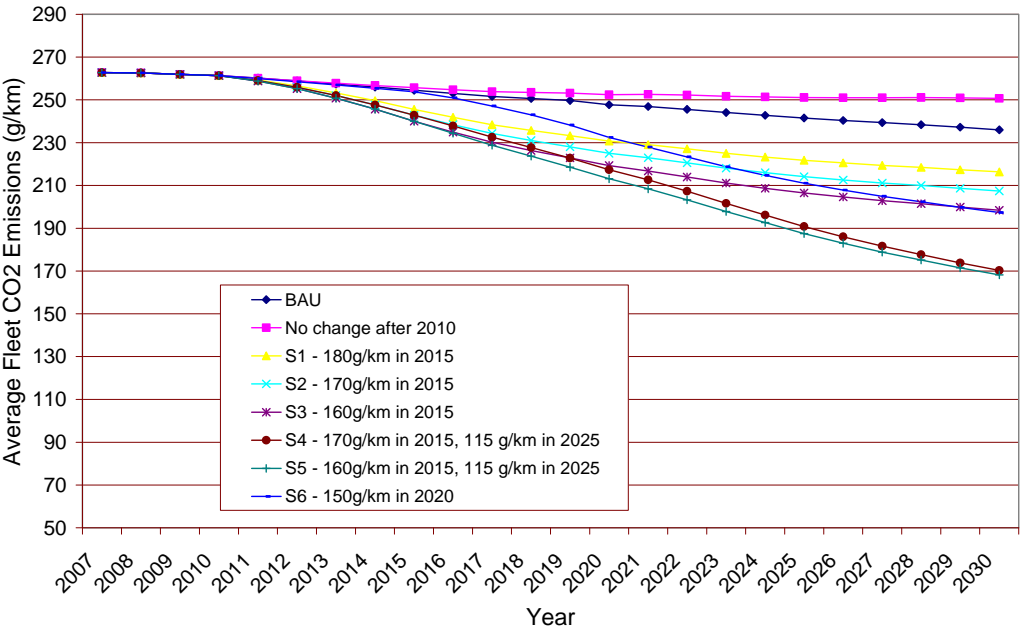


Figure 6: Projected average CO₂ emissions of the whole light vehicle fleet under a range of CO₂ emission targets for new vehicles

Source: BITRE (unpublished) 2008

A broad cross section of stakeholder groups support a tightening of CO₂ emission standards for the light vehicle fleet. Opposition to the measure was primarily raised by groups within the motor vehicle manufacturing sector. The FCAI argued that a CPRS, inclusive of transport, represents the most efficient and equitable mechanism to achieve carbon emission reductions and improve fuel efficiency on an economy wide basis.

The FCAI and some car manufacturers argued that mandatory CO₂ emissions targets introduced in Japan, the US and the EU are a second best measure to address fuel efficiency and emissions, and have only been introduced in the absence of a more efficient market based measure such as a CPRS. They also argue that a mandatory CO₂ emissions standard would place an inequitable burden on the road transport sector.

A few submissions argued that the combination of changes in consumer demand, higher fuel prices and technical innovation were already driving sufficient improvements in vehicle fuel efficiency.²³ The 'business as usual' projections reported above, suggests that average light vehicle emissions (across the fleet) would remain in excess of 230 g CO₂/km by 2020.

Sales weighted average CO₂ standards could be implemented by means of either a voluntary or a mandatory approach.

A voluntary agreement could be implemented via a formal written agreement between the Australian Government and the vehicle industry, represented by the Federal Chamber of Automotive Industries (FCAI). Submissions from sections of the motor vehicle industry (manufacturers and dealers) and some motoring associations expressed a preference for the Australian Government to pursue a new voluntary agreement with the industry.

However, international and Australian experience suggests that voluntary schemes have generally not achieved their targets. A recent International Energy Agency (IEA) review of international vehicle fuel efficiency policy measures²⁴ concluded that voluntary programs have generally "fallen short of their targets" and pointed to a general trend away from implementing voluntary programs.

Most of the stakeholders supporting CO₂ targets favoured the adoption of mandatory standards. A mandatory standard would require suitable legislation. The *Motor Vehicle Standards Act 1989*, the current legislative mechanism for setting vehicle emission standards, would not appear to be suitable for a standard linked to the sales mix. However, *ADR 81/02 Fuel Consumption Labelling for Light Vehicles* does provide an accepted methodology for measuring CO₂ emissions for all light vehicles supplied to the Australian market.

The IEA Review indicated that, while mandatory schemes can produce good results, the effectiveness of such schemes is highly dependent upon their design. The paper identifies several key attributes for effective standards, including broad coverage of all light vehicle categories, robust testing procedures, a focus on efficiency outcomes (not technology) and providing regulatory flexibility for manufacturers in achieving the outcomes.

Determining an appropriate CO₂ standard will need to consider the range of technology options that are available in the Australian context. Australia would

²³ Motor Traders Assoc. Australia, Mitsubishi Motors submission.

²⁴ International Energy Agency (2008), *Review of International Policies for Vehicle Fuel Efficiency*.

appear to have considerable scope for improvement in the short to medium term – at least 30 percent – without markedly affecting the vehicle mix.

Stringency and timing are also critical factors in the design and implementation of any standards, and a number of submissions noted that the target values need to reflect the Australian vehicle fleet, not simply adopt a target from other international schemes. The Working Group recognised that vehicle design and production planning is a lengthy process, and recommends that transition periods be considered as part of a regulatory impact assessment. In their submission, Mitsubishi Australia indicated that typical automotive product sales cycles range between five and ten years. To provide adequate time for the vehicle industry to respond, a two-step standard could be considered. An initial target date of 2015, with a longer term target for 2020 could be adopted, for example.

Several submissions indicated that changes to Australian fuel quality standards should be considered in conjunction with this measure, arguing that the introduction of “zero” sulfur petrol (<10 ppm) would enable manufacturers to introduce new engine technologies with improved CO₂ emissions performance.²⁵

Conclusions

On the basis of the available evidence, the Working Group concludes there is a *prima facie* case for mandatory fuel consumption/CO₂ standards for new light vehicles sold in Australia. A Regulatory Impact Statement (RIS) would be required to assess the costs and benefits associated with such an approach, before implementation of appropriate legislation could be considered. As well as meeting the minimum requirements for a RIS, the analysis should:

- Evaluate potential design options for the standard, but assume the adoption of sales weighted averaging as a core principle;
- Use CO₂ emissions in g/km as the “metric” for any target;
- Reflect the nature of the Australian light vehicle fleet;
- Assess the technological options to achieve various CO₂ emission targets;
- Address the timing of a standard, including the merits of initial and longer term targets;
- Consider how such a target could be used to support the fuel efficiency outcomes sought through the Australian Government’s Green Car Innovation Fund and Green Car Challenge; and
- Consider how the standard might take account of emerging technologies such as plug in electric hybrid vehicles, fully electric vehicles and vehicles specifically designed to operate on emerging low carbon fuels.

²⁵ FCAI, BMW submissions.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 1.1

The Australian Government undertake a detailed Regulatory Impact Statement to assess the costs and benefits of introducing CO₂ emission standards for light vehicles; and

Recommendation 1.2

The Australian Government continue to monitor national and international best practice for traditional and emerging fuels in order to support ambient air quality objectives and improve the fuel efficiency of Australia's motor vehicle fleet.

Responsibility for Future Action

Australian Government (Department of Infrastructure, Transport, Regional Development and Local Government and Department of Environment, Water, Heritage and the Arts)

Measure 2 Restructure State and Territory registration and stamp duty charges for light vehicles

Proposal

Realign existing State and Territory stamp duty and/or registration charges for light motor vehicles on a differential scale based on CO₂ emissions.

Current Situation

Each State and Territory currently uses different criteria to set light vehicle registration charges, including vehicle mass, number of cylinders and engine capacity. None of these parameters relate directly to fuel consumption or CO₂ emissions.

Stamp duty systems also differ across jurisdictions, with rates varying from two to six percent of purchase price depending on the jurisdiction and vehicle price. Apart from the ACT, the schemes make limited use of environmental parameters.

In September 2008, the ACT Government introduced a “green vehicle” stamp duty scheme which links stamp duty payable on new vehicles to vehicle environmental performance. The scheme includes assessment of both CO₂ and air pollutant emissions, as set out in the *Green Vehicle Guide*. The ACT scheme is intended to be revenue neutral, with higher polluting vehicles paying slightly higher duty rates to offset concessions provided to lower emission vehicles. At this stage it is too early to assess the overall impact of this scheme.

A number of states offer concessions or benefits to drivers of hybrid vehicles (Queensland, Victoria and South Australia), however these concessions are not adaptive to changes in the vehicle market, and do not provide support for conventional vehicles which offer equivalent emissions performance.

Discussion

The aim of differential motor vehicle registration and stamp duty charges is to influence consumer choice in favour of vehicles with improved fuel efficiency or lower CO₂ emissions through a system of modest financial incentives.

Many developed countries have taken steps to realign motor vehicle taxation policy to support environmental objectives, through direct linkages to CO₂ emissions performance or fuel efficiency. Some 15 European Union member states, for example, have implemented a diverse range of CO₂-related vehicle charges, including sales tax incentives, company car taxes, and registration taxes.

In Japan, reductions on both purchase tax and the annual circulation tax (equivalent to registration) are provided for the best performing vehicles in each vehicle class. This measure complements the mandatory fuel efficiency standard.

Studies undertaken in the European Union have sought to quantify the costs and benefits of CO₂ differentiated vehicle taxation. A 2002 study for the European Commission Directorate-General for the Environment found that, for an average new car emissions level of 172 g CO₂/km in the year 2000, implementation of a CO₂ differentiated vehicle taxation scheme would result in an average 5% reduction in new car emissions by 2008.²⁶

Experience in Europe suggests that strong fiscal signals around the purchase and ongoing registration costs of vehicles can be an effective tool in influencing behaviour change in both consumers (encouraging the purchase of more fuel efficient vehicles) and manufacturers (supporting the supply of more fuel efficient vehicles to the market).

There was broad stakeholder support for the introduction of differential stamp duty and registration regimes, apart from the vehicle manufacturing and retailing sectors.

Several submissions expressed concern that those consumers who have a genuine need for larger vehicles (such as consumers in rural and remote areas and those with large families) may be unduly disadvantaged by the measure. The Working Group notes that existing vehicle stamp duty and registration charges utilise differential scale of charges, which in many cases, relate to the size of vehicles.

The scope of differential registration / stamp duty schemes is a key consideration. Schemes could be limited to new vehicles or alternatively, extended to include vehicles which are already in-service. Limiting the scheme to new vehicles is easier to implement and potentially raises fewer equity issues.

It is also desirable for differential schemes to be designed to ensure revenue neutrality. This would avoid the complexity of seeking to defend net increases in public revenue (if the differential is created by simply increasing charges for particular vehicle categories) or the potential need to fund offsetting revenue increases or expenditure reductions (if the differential is created by simply decreasing charges for particular vehicle categories). Scheme parameters would need to be adjusted periodically to maintain overall revenue neutrality as the emissions profile of vehicles changes over time.

Conclusions

Based on the international experience, the Working Group considers there is a case for State and Territory Governments to consider introducing differential light vehicle registration and stamp duty regimes based on objective measures of vehicle environmental performance. The Working Group considers that the ACT stamp duty scheme, which is linked to the Green Vehicle Guide overall ratings, is a good model.

²⁶ COWI A/S, (2002), *Fiscal Measures to Reduce CO₂ Emissions from New Passenger Cars*.

Specific thresholds and other features may need to vary between jurisdictions due to revenue implications and the character of the existing legislative and administrative frameworks. In particular, the selection of particular ratings from the Green Vehicle Guide (e.g. overall rating or greenhouse alone) may vary in line with specific policy objectives, including ambient air quality. However, in developing new arrangements, there is a need for jurisdictions to work together to ensure consistency through the application of technology neutral, performance based, emissions criteria. Such an approach is important in providing a nationally consistent signal to both vehicle manufacturers and vehicle buyers, as evidenced by the international trend towards harmonisation between many countries pursuing schemes of this type.

The Working Group recognises that the differential stamp duty measure is a similar policy tool to the “direct financial incentives” measure (Measure 3).

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 2.1

State and Territory Governments give consideration to revising their stamp duty and/or registration regimes for new light vehicles to establish differential charges linked to environmental performance;

Recommendation 2.2

Any differential stamp duty and/or registration charges should utilise the environmental ratings published on the Australian Government’s Green Vehicle Guide as the measure of environmental performance (the ACT stamp duty system provides one model of this approach); and

Recommendation 2.3

Revenue neutrality be considered as a design feature for any differential charges, to assure the community that the objective is not higher public revenue.

Responsibility for Future Action

Individual States and Territories

Measure 3 Provision of direct financial incentives and disincentives based on vehicle CO₂ emissions

Proposal

Encourage consumer uptake of low emission vehicles by establishing a balanced set of direct financial incentives and disincentives based on the CO₂ emission performance of a vehicle.

Such offsetting incentives are frequently described as “feebates”. A feebate scheme would provide a direct financial incentive toward the purchase of new vehicles with low CO₂ emissions, and also impose a financial penalty on the purchase of new vehicles with high CO₂ emissions.

Current Situation

There are currently no schemes in Australia that provide a direct financial payment to vehicle purchasers based on a vehicle’s emission performance.

There are a number of vehicle based financial incentives measures in place for LPG vehicles, but these are designed to reduce operating costs for motorists, rather than achieving an environmental outcome.

Discussion

As with Measure 2, the aim of a feebate scheme is to use financial incentives to influence consumer choice in favour of vehicles with improved fuel efficiency and lower CO₂ emissions.

The basic model for a feebate scheme involves a single sliding scale of surcharges and rebates, based on vehicle CO₂ emission ratings. The key design parameters are: the rate at which the rebate or surcharge increases relative to emission performance (\$ / g CO₂/km) and the division (pivot point) between those who pay a surcharge and those who are paid a rebate.

This model can be modified by replacing the pivot point with a range of emission ratings that are not subject to either a rebate or a surcharge. Under this arrangement, only those consumers purchasing vehicles defined as high or low emitters would be affected by the program. Caps on feebate values for vehicles at either end of the scale may also be applied to avoid onerous surcharges or over generous rebates.

An alternative approach relies on the use of a series of pivot points based on “vehicle class”. Such a scheme would seek fuel efficiency improvements across the full range of vehicles by encouraging “best in class” performance across vehicle categories.

A feebate approach could be designed to ensure the scheme is revenue neutral, with the value of rebates paid for low emission vehicles being offset by the fees on high emission vehicles. As the average emissions of new vehicles falls over time, the scheme parameters would need to be adjusted periodically to maintain overall revenue neutrality.

The Working Group is aware of “feebate” style schemes operating in France and Canada.

The Canadian rebate scheme was funded for a two year period and provides a sliding scale of rebates between \$1000 and \$2000 for the purchase of low emission light vehicles. Eligibility criteria are based on the greenhouse emission performance of vehicles rather than specific technologies. The rebate scheme ends in March 2009. The Canadian Green Levy applies to new vehicles with a combined fuel consumption rating in excess of 13.0 L/100km. The levy varies from \$1000 to a maximum of \$4000 depending upon the fuel consumption, and will continue beyond the life of the rebate scheme.²⁷

In France, the *bonus / malus* scheme was announced in December 2007. Under the scheme a sliding scale *bonus* (rebate) is available to purchasers of new vehicles emitting a maximum of 130 g CO₂/km. Rebates of between €200 and €5000 are payable, depending upon vehicle emission rating. A *malus* (surcharge) is payable by purchasers of new vehicles with emissions in excess of 160 g CO₂/km. Surcharges of between €200 and €2600 are payable, depending upon the vehicle emission rating.²⁸ Early results suggest the French scheme has been effective, with a 45 percent growth in sales of cars under 130g/km in the first year of operation, and a similar reduction in the sale of less fuel efficient vehicles.²⁹

There was broad stakeholder support for the provision of rebates for the purchase new low emission light vehicles based on vehicle CO₂ emissions. There was also broad (but reduced) support for the cost of rebates to be offset with fees on high emitting vehicles, through a “feebate” scheme.

A small number of vehicle industry stakeholders suggested rebates would not be effective.³⁰ It was argued that many low emission vehicles are already competitively priced in the market, as demonstrated by high sales growth in the small car sector. As a result, there is potential for inefficiency within the scheme, where rebates are paid to consumers who would have purchased a low emission vehicle anyway.

Groups such as the Motor Trades Association, Australian Automobile Association and Australian Fleet Managers Association opposed fees being applied to vehicles with high emissions. There was concern that those consumers who have a genuine need for larger vehicles (such as consumers in rural and remote areas and those with large families) may be unduly disadvantaged by the measure.

²⁷ <http://www.budget.gc.ca/2007/plan/bpc3-eng.html> accessed in February 2009

²⁸ <http://www.ambafrance-uk.org/Bonus-Malus-France-encourages.html> accessed in February 2009.

²⁹ <http://www.r744.com/article.view.php?Id=689> accessed in February 2009.

³⁰ Including Ford Australia and Motor Traders Assoc. Australia submissions.

Acknowledging an ongoing need for a diversity of vehicle sizes and types to meet the needs of Australian motorists, a number of stakeholders argued that a class based approach to feebates would encourage improvements across all market segments and would assist a greater number of people to make fuel efficiency improvements while also fulfilling the transport task. A class based approach would need to be carefully evaluated, as it has the potential to create anomalies across and between classes. It is possible such a scheme would promote the purchase of a higher emitting vehicle in one class, at the expense of a lower emitting vehicle in another class. The implementation and administration of a class based scheme is also likely to be more complex than the single pivot point approach.

There was also broad support for any feebate scheme to be based on CO₂ emissions and not linked to particular vehicle or fuel technologies. A number of submissions indicated a scheme should also consider emissions which impact on air quality.³¹

In their submission, the Australian Conservation Foundation (ACF) proposed the replacement of the existing luxury car tax with an emissions-based tax system for passenger motor vehicles. The ACF also suggested the possible incorporation of a rebate scheme to complement the tax, creating a “feebate” scheme.

The Henry Review into Australia’s taxation system has also explored the possibility of reforming the luxury car tax into a tax linked to environmental performance.³²

Conclusions

The Working Group concluded that the available evidence, although limited, suggests that financial incentives, including feebates, can be effective in increasing demand for low emission vehicles. They operate through distorting the (pre-intervention) relative prices in favour of low emission vehicles.

The Working Group recognises this measure is a substantially similar policy tool to differential stamp duty, and that implementing both measures could be seen as duplicative and unnecessary. In a comparative sense, implementation of an effective and well designed differential stamp duty scheme would appear preferable as it only requires the adjustment of an existing charges system, whereas direct incentives would require new legislation.

If the incentives are applied as a “feebate” which aims for revenue neutrality - there may be greater sensitivity, as Governments may have less enthusiasm for effectively introducing a penalty (tax) on some higher emitting vehicles which some consumers may argue as essential to their needs.

³¹ Australian Fleet Managers Assoc. (AfMA), Better Place, CompAir (Australasia) Ltd submissions

³² Australian Government, (2008), *Australia’s Future Taxation System – Consultation Paper December 2008*, p 231.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 3.1

Consideration be given to the introduction of a balanced set of financial incentives (rebates) and disincentives (surcharges) for the purchase of new vehicles, based on the CO₂ emissions performance of a vehicle, referred to as a “feebate” – noting that it is a similar policy tool to Recommendation 2.1.

Responsibility for Future Action

Noting that this measure takes a similar policy approach to the differential stamp duty measure (Measure 2), if ATC/EPHC nevertheless concluded this measure merited further consideration, the Councils may propose to COAG that it refer the matter to the current review of Australia’s tax system (Henry review).

Measure 4 Fleet purchasing frameworks that incorporate greenhouse reduction objectives

Proposal

A voluntary scheme that supports the adoption of best practice fuel efficiency strategies in government and business light vehicle fleets. The measure could include:

1. Provision of comprehensive information and advice on greenhouse abatement strategies to government and business fleet operators.
2. A national fleet accreditation process which supports government and business fleet operators to set and achieve voluntary, enterprise-level fleet greenhouse emission targets. This process would relate to all aspects of fleet procurement and management.

The benefits of a national scheme to improve the fuel efficiency of government and business fleets would assist in underpinning future investment decisions by vehicle manufacturers surrounding the *Green Car Challenge* and the *Green Car Innovation Fund*.

Current Situation

All jurisdictions have adopted policies aimed at reducing government fleet greenhouse emissions over time. While in general terms, each jurisdiction is moving toward an improvement in the overall fuel efficiency of their vehicle fleets, there is considerable variability in the arrangements in both the level of improvement sought and the mechanisms for achieving improvements in fuel efficiency. Some jurisdictions also have additional policy objectives associated with the choice of fleet vehicles, such as vehicle safety and domestic industry support.

In New South Wales, Queensland, Tasmania and the Australian Capital Territory, government fleet purchasing policies are directly linked to Green Vehicle Guide ratings.

The New South Wales Government will implement the FleetWise program from mid 2009. The program aims to reduce emissions from business fleet vehicles in NSW. Participants in FleetWise commit to try to reduce their fleet emissions over a period of two years. In exchange, participants will receive free assistance from the NSW Department of Environment and Climate Change in measuring their fleet emissions (to establish an initial emissions baseline), and advice and training on how they can be progressively reduced.

The Victorian Government, within the Victorian Transport Plan, has committed to support commercial fleet operators to purchase low emission vehicles and meet voluntary emission targets.³³

Discussion

An analysis of sales of passenger cars shows that government and business purchasers are more likely to purchase large cars than private buyers, who are increasingly favouring small and medium vehicles. The Department of Environment, Water, Heritage & the Arts (DEWHA), estimates that in 2007 the average fuel consumption of new government and business fleet vehicles was 11 percent higher than private buyers (10.5 L/100km and 9.6 L/100km, respectively)³⁴ In 2007, new vehicles for the government and business markets represented 45% of new vehicle sales (excluding heavy commercial vehicles).³⁵

The difference in buying patterns can be partly explained by procurement preferences for Australian-made vehicles which are currently only available in the large and medium car segments.

The Working Group identified a number of fleet programs operating in Europe and North America, aimed at improving fleet fuel efficiency.

While there was broad support for a voluntary national fleet accreditation scheme, many submissions considered that the benefits (especially financial) of participation would need to be clear to attract interest from industry players.

The Working Group notes that several State Governments are undertaking measures which support the uptake of low emission vehicles within Government and business fleets. As a result, the Working Group considers the focus of this measure should be on ensuring fleet operators have access to reliable and objective information, rather than establishing a national fleet accreditation process. This simpler approach may achieve similar outcomes to a national fleet accreditation scheme at lower cost.

Conclusions

The Working Group considers there is a case for developing on-line information resources and self-help tools to support government and business fleet operators in making best practice fleet purchasing decisions from an environmental perspective.

The Working Group does not consider there is a strong case to develop a national fleet accreditation program as it does not appear to offer significant public benefit above the current state and locally based activities.

³³ <http://www4.transport.vic.gov.au/vtp/projects/lowemission.html> (Accessed: February 2009)

³⁴ Australian Transport Council & the Environment Protection & Heritage Council (2008), *Vehicle Fuel Efficiency: Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles.* – Public Discussion Paper. p 16.

³⁵ VFACTS data, December 2007.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 4.1

The Australian Government, in conjunction with the States and other stakeholders, co-ordinate the development and dissemination of on-line information resources, drawing on best practice frameworks and case studies, to assist fleet managers in incorporating objective environmental criteria into fleet purchasing decisions.

Responsibility for Future Action

Australian Government (Department of Infrastructure, Transport, Regional Development and Local Government)

States and Territories

Industry

Measure 5 Including fuel consumption data in vehicle advertisements

Proposal

Require standard fuel consumption and CO₂ data to be provided in vehicle advertisements to reinforce the current fuel consumption and greenhouse information provided to consumers via the current fuel consumption label and the *Green Vehicle Guide*. The measure is aimed at improving fuel efficiency by providing consumers with a capacity to choose better performing models from among those models that meet their needs.

Current Situation

There are no measures of this type currently operating in Australia. Manufacturers voluntarily include fuel consumption and/or CO₂ information in some advertisements where they perceive this to be a marketing advantage for the advertised vehicle. In such circumstances, there is usually a footnote linking the data to the Australian Design Rule (ADR) for fuel consumption labelling (ADR 81/02).

Discussion

Current international experience of such a measure is limited to the European Union, where a directive requires manufacturers to ensure that fuel consumption and CO₂ emissions data is provided in all “promotional literature” produced by the manufacturers to market specific models of new cars. In 2001, the United Kingdom adopted this directive into legislation. The Working Group is not aware of any other non-EU countries mandating such information in vehicle advertising.

There was broad stakeholder support for the inclusion of fuel consumption and CO₂ data in vehicle advertising.

However, submissions from several members of the motor vehicle industry (both manufacturers and retailers) were not supportive, arguing that the measure would be unlikely to add value to existing sources of consumer information.³⁶ As an alternative strategy, they suggested that further effort could be devoted to promoting the Green Vehicle Guide.

Representatives of the advertising industry, while questioning the merits of the measure, indicated a willingness to work with Government on developing suitable approaches.³⁷ The Working Group also recognised that it would be necessary to clarify the scope of any requirements to provide maximum practical coverage of both manufacturers and dealers, without placing unreasonable demands on certain

³⁶ Mitsubishi Motors, MTAA submissions

³⁷ Australian Publishers Bureau, Australian Assoc. of National Advertisers submissions.

advertising formats used by motor vehicle dealers. This could be implemented via a code of practice, agreed between Government and industry or, alternatively, via regulation.

It would be preferable to avoid regulation if an effective non-regulatory mechanism can deliver the desired outcomes. There was some stakeholder support for a regulatory approach, but several stakeholder groups with a specific interest in the measure indicated that a voluntary approach would be preferred.³⁸

Amendment of the existing FCAI Advertising Code of Practice would be a potential mechanism to implement this measure. However, the FCAI argued that the current code is primarily focused on the portrayal of safe driving behaviours in vehicle advertising and did not support amendments to include environmental information.³⁹

If a regulatory approach was considered necessary, the Working Group is not aware of any national legislation currently in place that could be used as the basis for the necessary regulations.

Submissions did not express a clear view on the range of media (i.e. print, electronic etc.) to be included within the measure. The United Kingdom's print-based approach appears sensible, as there would be little or no value in a rapid visual or verbal delivery of fuel consumption data in a television or radio advertisement.

Conclusions

The Working Group considers there is a case for the inclusion of fuel consumption data in vehicle advertising, based on the potential for the measure to build consumer awareness of vehicle fuel consumption and CO₂ emissions at minimal cost.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 5.1

The Australian Government initiate discussions with the Federal Chamber of Automotive Industries and relevant advertising bodies, with a view to developing a code of practice regarding the inclusion of fuel consumption and CO₂ data in vehicle advertisements and promotional materials; and

Recommendation 5.2

In the event that a code of practice is not achieved, the Australian Government should pursue the development of mandatory provisions regarding the inclusion of fuel consumption and CO₂ data in vehicle advertisements and promotional material.

³⁸ APB, AANA, RACQ submissions.

³⁹ FCAI submission

Responsibility for Future Action

Australian Government (Department of Infrastructure, Transport, Regional Development & Local Government).

Measure 6 Standards/labelling requirements for non-engine components which impact on fuel consumption

Proposal

Introduce standards or labelling requirements for non-engine components – such as tyres, tyre pressure monitors and vehicle air conditioning units – which impact on vehicle fuel consumption and CO₂ emissions.

Current Situation

None of these measures are in place in Australia.

Discussion

There was broad stakeholder support for the various elements of this measure.

The Working Group notes the work underway to develop international standards for tyres and other non-engine components aimed at reducing the overall fuel consumption of vehicles.

The most well developed international measures are in relation to tyres. A 2006 IEA paper indicates that work is progressing on standards for tyres in Europe and the United States, including the development of an ISO standard to measure rolling resistance of tyres. On 23 May 2008, the European Commission (EC) announced its intention to introduce mandatory standards for low rolling resistance tyres and tyre pressure monitoring systems from 2012.

The IEA and the EC are also working on standards for vehicle air conditioning systems and proposals to include air conditioner operation within the standard fuel consumption test procedure.

The manufacture of vehicles and vehicle components is an international activity and Australia is a relatively small consumer in the international context. As such, there would be no clear benefit – and indeed potentially significant costs – if Australia were to act unilaterally.

Once suitable standards are finalised by the EC or UN ECE, consideration could be given to the merits of applying those standards in Australia. Stakeholders were broadly supportive of this approach.

Conclusions

The Working Group notes that improvements in non-engine components offer the potential for modest improvements in vehicle fuel efficiency at relatively low cost. A range of international standards are being developed to address the performance of such components.

The Working Group considers it appropriate to monitor the development of those standards, and when finalised, consider the merits of adopting them in Australia.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 6.1

The Australian Government continue to monitor the development and implementation of international standards for non-engine components which impact on vehicle fuel efficiency, with a view to evaluating the merits of adopting those standards in Australia, when finalised.

Responsibility for Future Action

Australian Government (Department of Infrastructure, Transport, Regional Development & Local Government).

Measure 7 Heavy vehicle environmental rating scheme

Proposal

Provide guidance for heavy-vehicle buyers in relation to fuel efficiency.

Three delivery mechanisms could potentially be used to deliver fuel efficiency information on heavy vehicles:

1. Develop web-based qualitative information about heavy vehicle fuel efficiency, incorporating a printable guide, printable checklist and an on-line step through purchasing guide;
2. Develop web-based tools to assist fleet operators to benchmark their fleets and to monitor and improve fuel consumption performance through operational changes;
3. Establish – when feasible – a Heavy Vehicle Environmental Rating Scheme similar to the light vehicle model delivered by the Green Vehicle Guide.

Current Situation

Environmental rating of light vehicles is well established in Australia through the use of emission standards and data from the Australian Design Rules to develop and publish ratings in the Green Vehicle Guide website. There are no equivalent independent sources of quantitative data and information for the heavy vehicle sector.

The NSW Government runs the *Clean Fleet* and *Fleet Wise* programs to assist fleet managers improve the environmental performance of their fleets. These programs primarily target urban air pollution.

The Victorian and New South Wales Governments are jointly developing a “Truck Buyer’s Guide” to provide qualitative information on issues associated with the fuel efficiency and environmental performance of heavy vehicles. It is intended that the buyers guide will also be made available on-line via the existing Green Vehicle Guide.

On 8 December 2008, the Victorian Government announced the Freight Futures Sustainability Partnership. This scheme is modelled on the United States *Smart Way* program, and will see government partnering with freight operators toward the achievement of improved environmental outcomes, including reduced CO₂ emissions. This will provide a framework, through which information can be provided to industry stakeholders on emission reduction technologies for heavy vehicles.

Discussion

Heavy vehicles are primarily used in a business context. Consequently, there is a strong commercial imperative to consider fuel consumption as a key factor in heavy vehicle purchasing decisions.

Unpublished analysis commissioned by the NSW Department of Environment and Climate Change suggests that, in the Australian context, obtaining objective and comparable information prior to vehicle purchase can be difficult, particularly for small fleet operators. Larger fleet operators are able to obtain test vehicles to conduct in-service trials of the fuel efficiency and other performance aspects of new models. Smaller operators often have to rely upon limited and subjective information from industry contacts or vehicle sellers. This asymmetry in information could be reducing the potential emission reductions that arise in a better informed market.

Submissions identified three inter-related barriers to the availability of objective fuel efficiency information on heavy vehicles. These were:

1. Absence of fuel efficiency data which encompasses the diversity of heavy vehicle activity and configurations;
2. No “real world” standards to assess the fuel efficiency of heavy vehicles; and
3. No certification level heavy vehicle emissions test facilities in Australia.

There are currently no international standards in place to measure and report the fuel consumption of heavy vehicles. The UN ECE World Forum for Harmonisation of Vehicle Regulations is working on an international harmonised heavy duty vehicle certification procedure (WHDC) for pollutant emissions. This procedure will be adopted in future *Euro 6* emission standards and include methodology to also calculate fuel consumption and CO₂ emissions, but Euro 6 is not likely to take effect for at least five years.

There was stakeholder support for the development of a qualitative fuel efficiency guide for heavy vehicles, including web-based fleet information tools - particularly those that can be integrated with existing business systems. It was suggested that these resources focus on small-midsize trucks and target smaller operators.

While there was also support for the concept of a heavy vehicle environmental rating scheme, the available evidence suggests that such a scheme is not currently viable given the diversity of the heavy vehicle fleet and a lack of standardised data on CO₂ emissions or fuel consumption.

A small number of submissions indicated that a suitable heavy vehicle test facility would be required in order to implement any future heavy vehicle environmental rating system.⁴⁰ The submission by Linfox included a detailed proposal for the construction of a test facility at an existing vehicle proving facility in Anglesea, Victoria. The Working Group notes that the Australian Government has committed funding (\$2.8 million) toward the development of an engine emissions test facility in Perth for heavy vehicles and the facility is expected to commence operation in 2009. It is also noted that a full transient-capable heavy-duty chassis dynamometer test facility is operational at Vipac Engineers and Scientists in Port Melbourne, Victoria.

⁴⁰ Linfox and AfMA submissions.

Conclusions

The Working Group concluded that a heavy vehicle rating scheme - similar to that for light vehicles under the Green Vehicle Guide - was not practical ahead of the finalisation and implementation of new *Euro 6* heavy vehicle emission standards.

In the interim, the Working Group considers there is merit in developing on-line information resources to assist consumers in the purchase of commercial vehicles, noting the work already underway with the Truck Buyer's Guide.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 7.1

The Australian Government work with the Victorian and New South Wales Governments to develop and deploy the "Truck Buyers Guide" on the *Green Vehicle Guide* website; and

Recommendation 7.2

The Australian Government continue to monitor the development and implementation of international heavy vehicle emissions standards under the UN ECE framework, noting that the inclusion of fuel consumption and CO₂ emissions data in the *Euro 6* standards may assist the development of more robust rating tools for heavy vehicles.

Responsibility for Future Action

NSW Government (Department of Environment and Climate Change)

Victorian Government (Department of Sustainability and Environment)

Australian Government (Department of Infrastructure, Transport, Regional Development & Local Government.)

Measure 8 Technology demonstration scheme for Australian road transport fleets linked to achievement of greenhouse outcomes

Proposal

Establish a scheme aimed at assisting road transport operators to evaluate new low emission transport technologies applicable to light commercial vehicles, heavy trucks and buses. This would provide the transport industry with independent information on options to reduce fuel consumption.

Current Situation

There are currently no programs aimed at supporting the demonstration of low emission technologies in the heavy vehicle sector.

In 1999 the Alternative Fuels Conversion Program (AFCP) was established to provide assistance to heavy vehicle operators to convert to natural gas and LPG. This program ended in June 2008.

Discussion

In most cases, commercial vehicles, including heavy vehicles, are used within a business context. As noted in Measure 7, there is a strong commercial motivation to reduce costs by minimising fuel consumption. In this sense, commercial vehicles in Australia may already have a high level of fuel efficiency as both manufacturers and operators have taken steps to reduce fuel consumption. This raises the question as to whether the Government has any role to play.

Nevertheless, the adoption of new and emerging low emission technologies presents a level of risk for potential investors, particularly if the costs and benefits of the technology are not clearly demonstrated in an Australian context.

There was some limited support for this measure, primarily from stakeholders with a direct interest in the heavy vehicle sector. The Working Group also recognised that it is very difficult for Governments to justify up-front provision of general funds unrelated to specific projects.

The New South Wales Roads and Traffic Authority is undertaking preliminary work toward the development of a protocol for the design, implementation and reporting of low emission technology trials in the heavy vehicle sector. As noted in Measure 7, the Australian Government has also provided funding towards the development of an engine emissions test facility for heavy vehicles, and this may assist industry and other stakeholders in assessing some new technologies.

Internationally, the Working Group is aware of joint government/industry programs in the US which support the development and demonstration and dissemination of commercially viable technologies that will reduce fuel consumption and improve air quality.

Conclusions

The Working Group was not able to reach a definitive view regarding the merits of Government involvement in funding of technology evaluation and trial programs envisaged under this measure.

The Working Group agreed that it would be useful to provide on-line information regarding the results of heavy vehicle technology trials (now and in the future) and the NSW protocols (when developed). There was some discussion about suitable websites to host the information, including National Transport Commission (NTC), the ARRB Group (formerly the Australian Road Research Board) and Austroads, but further discussion with these organisations would be required. Co-location with the Truck Buyers Guide (Measure 7) may also be an option.

Recommendations

In consideration of this Measure, the Working Group recommends that:

Recommendation 8.1

The Australian Government, in consultation with the NSW Roads and Traffic Authority, other interested jurisdictions and industry, co-ordinate the development of on-line information resources regarding trials and evaluations of low emission technologies for commercial vehicles, to assist operators in assessing the effectiveness of various technologies.

Responsibility for Future Action

Australian Government (Department of Infrastructure, Transport, Regional Development & Local Government)

NSW Roads and Traffic Authority

5. Next Steps

The Working Group recommends that ATC and EPHC endorse this report and its recommendations and forward it to COAG for consideration at the next available meeting.

Chapter 4 has provided the Working Group views on which agencies may be best placed to progress future action on measures endorsed by COAG, however this will be guided by the advice from EPHC and ATC.

It is also recommended that ongoing monitoring of this package of measures take place within the context of the National Strategy on Energy Efficiency, which is currently oversighted by the Senior Officials Group on National Strategy for Energy Efficiency (SOG-EE).

Recommendations

To provide a mechanism for monitoring and reporting progress on those recommendations endorsed by COAG, the Working Group recommends that:

Recommendation 9.1

The ATC monitor and report progress on COAG endorsed recommendations; and

Recommendation 9.2

The ATC provide progress reports to the body managing the National Strategy on Energy Efficiency (with copies to the Environment Protection and Heritage Council).

A summary table listing all recommendations is at Appendix C.

Appendix A

Summary of Significant Submissions

Organisation	Outline of Submission
Future Climate	<p>Argues that a package of integrated supply and demand measures required, but as a minimum mandatory CO₂ standards essential to address market failure. Greenhouse emissions should be the policy focus (ADRs take care of noxious emissions) and CO₂ in g/km should be the metric.</p> <p>Supports differential registration & stamp duty as provides both up front and ongoing price signal. Feebates may not be necessary if differential stamp duty & registration in place. Fleet purchasing frameworks may also be unnecessary. Supports information in advertisements.</p>
Australasian Fleet Managers Assoc	<p>Notes inconsistencies in fleet purchasing policies across 3 levels of government and considers these are not conducive to emission reductions. Supports mandatory CO₂ standards and fiscal measures to support low emission vehicles (but not penalties for high emitters). Claims AfMA's Greener Motoring fleet framework was successful (relied on Government funding). Supports information in advertisements (but prefer "real world" figures).</p>
Motor Traders Assoc (National & 3 states)	<p>General opposition to any changes – happy to leave it to the market to drive consumer preference. Opposed to any further regulation of the vehicle industry (including imposts on dealers). Qualified support for differential registration/stamp duty – at least in support of low emission vehicles (unfair to penalise high emitters as some consumers need these vehicles).</p>
FCAI, Mitsubishi, Ford, Mercedes-Benz, GMH,	<p>FCAI, Ford, GMH and Mitsubishi all argue that with CPRS in place, no additional measures required – "unfair burden" argument. Major focus is opposition to mandatory CO₂ standards for vehicles and rejection of suggestion that voluntary targets have not worked. Mitsubishi and GMH open to renegotiation of voluntary targets. M-Benz suggest that if targets introduced, should be weight based and not before 2015. FCAI, Mitsubishi, Ford, also argue that fiscal and other measures also unnecessary, and should focus on urban planning, congestion, eco-driving etc. GMH opposes differential stamp duty, but more open to consideration of direct financial incentives to consumers and information in advertisements.</p>
Australian Conservation Foundation	<p>Broad support for most measures, but considers need to also target vehicle use (lists a wide range of potential measures outside the scope of the report). Supports mandatory CO₂ standards for vehicles, but notes risk of improved fuel</p>

	consumption increasing vehicle use. Supports fiscal measures (stamp duty, registration, incentives), but considers incentives best directed at low income earners. Supports replacing luxury car tax with emissions based feebate.
RACQ, AAA	Essentially identical submissions. General support for most measures. Favour voluntary CO ₂ targets. Varied messages on stamp duty– RACQ favours stamp duty abolition (to promote new vehicle purchases), AAA no comment. Qualified support for registration changes and fiscal incentives for low emission vehicles (opposed penalties for high emitters). Support fleet frameworks, but only beneficial if participants get commercial/market advantage and recognition. Support information in advertisements and non-engine component measures.
NRMA	General support for most measures. Unlike AAA and RACQ, favours mandatory CO ₂ standards for vehicles, fiscal measures (stamp duty, registration, and direct incentives) for low emitters (but considers difficult to “sell” penalties for high emitters). Support information in advertisements and non-engine component measures.
Society of Automotive Engineers	Supports voluntary CO ₂ targets for vehicles based on annual % reductions in emissions. Qualified support for registration/stamp duty differentials, but appear to not support direct financial incentives. Supports information in advertising and non-engine component measures. Supports heavy vehicle measures.
NTC	Favours mandatory CO ₂ standards for vehicles. General support for demand side measures, but did not specifically comment on measures in paper.

Appendix B

Notes on CO₂ Emission Target Scenarios for Measure 1

Scenarios

- 1 - NACE for new vehicles sold in 2015 is 180g CO₂ / km
- 2 - NACE for new vehicles sold in 2015 is 170g CO₂ / km
- 3 - NACE for new vehicles sold in 2015 is 160g CO₂ / km
- 4 - Scenario 2 + NACE for new vehicles sold in 2025 is 115g CO₂ / km
- 5 - Scenario 3 + NACE for new vehicles sold in 2025 is 115g CO₂ / km
- 6 - NACE for new vehicles sold in 2020 is 150g CO₂ / km

Assumptions

- Targets are sales weighted average as per FCAI National Average Carbon Emissions (NACE) methodology - see <http://www.fcai.com.au/files/nace.pdf>
- Includes all light vehicles up to 3.5 tonnes GVM
- Base year is 2007
- End year is 2030
- NACE for new vehicles sold in base year is 226g CO₂ / km (FCAI reported figure)
- Business as usual until 2014 (until 2019 for Scenario 6)
- Under Scenarios 1-3, NACE target is met for new vehicles sold in 2015 and every year thereafter
- Under Scenarios 4&5, NACE target is met for new vehicles sold in 2015 and every year until 2024, new NACE target applies from 2025 and every year thereafter
- Under Scenario 6, NACE target is met for new vehicles sold in 2020 and every year thereafter
- Impacts of the Carbon Pollution Reduction Scheme are not included within the model.

BITRE Comments

The estimates are approximate, since so many future unknowns require assumed values to be assigned to them (e.g. the effects of future levels of urban traffic congestion, future petrol prices and their impacts on travel - including the take-up of alternative fuels, durability of new technology etc.)

Even the settings for a 'BAU' scenario are somewhat arbitrary, since even if exact macroeconomic assumptions are specified, it is still uncertain what particular vehicle mix would result from the different manufacturers' and consumers' decisions. To partially address this, the projections include a second 'reference' scenario where average new vehicle efficiency is held constant after 2010.

All the scenarios use the same fleet projections for stock and VKT – i.e. possible rebound effects (where reductions in travel costs, from vehicle efficiency improvements, can result in some extra levels of discretionary travel) are disregarded to simplify the modelling and its evaluation. This means that 'actual' fleet CO₂ reductions (from the specified NACE settings) are likely to be slightly lower than for these simplified scenario runs.

Appendix C

Summary Table of Recommendations

No.	Text of Recommendation	Responsibility for Future Action
	Measures to Increase Supply of Low Emission Vehicles	
1.1	The Australian Government undertake a detailed Regulatory Impact Statement to assess the costs and benefits of introducing CO ₂ emission standards for light vehicles	Australian Government (DITRDLG)
1.2	The Australian Government continue to monitor national and international best practice for traditional and emerging fuels in order to support ambient air quality objectives and improve the fuel efficiency of Australia's motor vehicle fleet	Australian Government (DEWHA)
6.1	The Australian Government continue to monitor the development and implementation of international standards for non-engine components which impact on vehicle fuel efficiency, with a view to evaluating the merits of adopting those standards in Australia, when finalised	Australian Government (DITRDLG)
	Measures to Increase Demand for Low Emission Vehicles	
2.1	State and Territory Governments give consideration to revising their stamp duty and/or registration regimes for new light vehicles to establish differential charges linked to environmental performance	Individual States and Territories
2.2	Any differential stamp duty and/or registration charges should utilise the environmental ratings published on the Australian Government's Green Vehicle Guide as the measure of environmental performance (the ACT stamp duty system provides one model of this approach)	As for 2.1
2.3	Revenue neutrality be considered as a design feature for any differential charges, to assure the community that the objective is not higher public revenue	As for 2.1

3.1	Consideration be given to the introduction of a balanced set of financial incentives (rebates) and disincentives (surcharges) for the purchase of new vehicles, based on the CO ₂ emissions performance of a vehicle – sometimes referred to as a “feebate” - noting that it is a similar policy tool to Recommendation 2.1	ATC/EPHC may propose to COAG that it refer the measure to the current review of Australia’s future tax system (Henry review)
4.1	The Australian Government, in conjunction with the States and other stakeholders, co-ordinate the development and dissemination of on-line information resources, drawing on best practice frameworks and case studies, to assist fleet managers in incorporating objective environmental criteria into fleet purchasing decisions	Australian Government (DITRDLG)
	Measures to Increase Consumer Awareness	
5.1	The Australian Government initiate discussions with the Federal Chamber of Automotive Industries and relevant advertising bodies, with a view to developing a code of practice regarding the inclusion of fuel consumption and CO ₂ data in vehicle advertisements and promotional materials	Australian Government (DITRDLG)
5.2	In the event that a code of practice is not achieved, the Australian Government should pursue the development of mandatory provisions regarding the inclusion of fuel consumption and CO ₂ data in vehicle advertisements and promotional material	As for 5.2
7.1	The Australian Government work with the Victorian and New South Wales Governments to develop and deploy the “Truck Buyers Guide” on the <i>Green Vehicle Guide</i> website	NSW Government (DECC) Victorian Government (DSE) Australian Government (DITRDLG)
7.2	The Australian Government continue to monitor the development and implementation of international heavy vehicle emissions standards under the UN ECE framework, noting that the inclusion of fuel consumption and CO ₂ emissions data in the <i>Euro 6</i> standards may assist the development of more robust rating tools for heavy vehicles	As for 7.1
8.1	The Australian Government, in consultation with the NSW Roads and Traffic Authority, other interested jurisdictions and industry, co-ordinate the development of on-line information resources regarding trials and evaluations of low emission technologies for commercial vehicles, to assist operators in assessing the effectiveness of various technologies	Australian Government (DITRDLG) NSW RTA

	Monitoring and Reporting on Endorsed Measures	
9.1	The ATC monitor and report progress on COAG endorsed recommendations;	ATC
9.2	The ATC provide progress reports to the body managing the National Strategy on Energy Efficiency (with copies to the Environment Protection and Heritage Council)	ATC

Departmental Acronyms:

DITRDLG - Department of Infrastructure, Transport, Regional Development and Local Government (Commonwealth)
 DEWHA – Department of the Environment, Water, Heritage and the Arts (Commonwealth)
 DECC – Department of Environment and Climate Change (NSW)
 DSE – Department of Sustainability and the Environment (Vic)
 RTA – Roads and Traffic Authority (NSW)