

21 February 2005

Energy Efficiency Inquiry
Productivity Commission
Locked Bag 2
Collins Street East
MELBOURNE VIC 8003

Dear Sir/Madam

RE: ENERGY EFFICIENCY INQUIRY

I am writing to forward to you a copy of a paper prepared by FCAI and presented to the 6th APEC Automotive Dialogue by Mr Russell Scoular (Vice President of FCAI), Beijing, China in June 2004.

The paper contains a number of observations about the development and implementation of voluntary fuel consumption targets by the Australian automotive industry over the period since 1978, which may be of relevance to the Commission's inquiry.

As a key point it is worth noting that the regulation of measurement of fuel consumption and emissions is linked to international technical regulations, as adopted by the United Nations Economic Commission for Europe. The link with these international standards recognises the global nature of the automotive industry and ensures that vehicle importers and manufacturers do not face the added cost and complexity of an entirely unique system of Australian regulations.

Beyond this the industry has sought to cooperate with successive Australian governments to adopt voluntary targets to achieve improvements in the energy efficiency and environmental performance of vehicles, thereby avoiding unnecessary resort to more draconian mandatory regulation which would otherwise increase compliance costs and undermine the competitiveness of the Australian industry.

I trust you will find this paper to be of interest and value to the current inquiry.

Kind regards

ANDREW McKELLAR
Director (Government Policy)

Voluntary Fuel Consumption and CO₂ Emission Targets for New Light Vehicles: The Australian Experience¹

Introduction

The automotive industry in most developed economies has long been conscious of pressure to improve the fuel efficiency of vehicles.

In the early 1970s the impact of the first 'oil shock' led to pressure for measures to improve fuel efficiency and fuel economy as consumers reacted to increased personal transportation costs and the flow-on economic impacts.

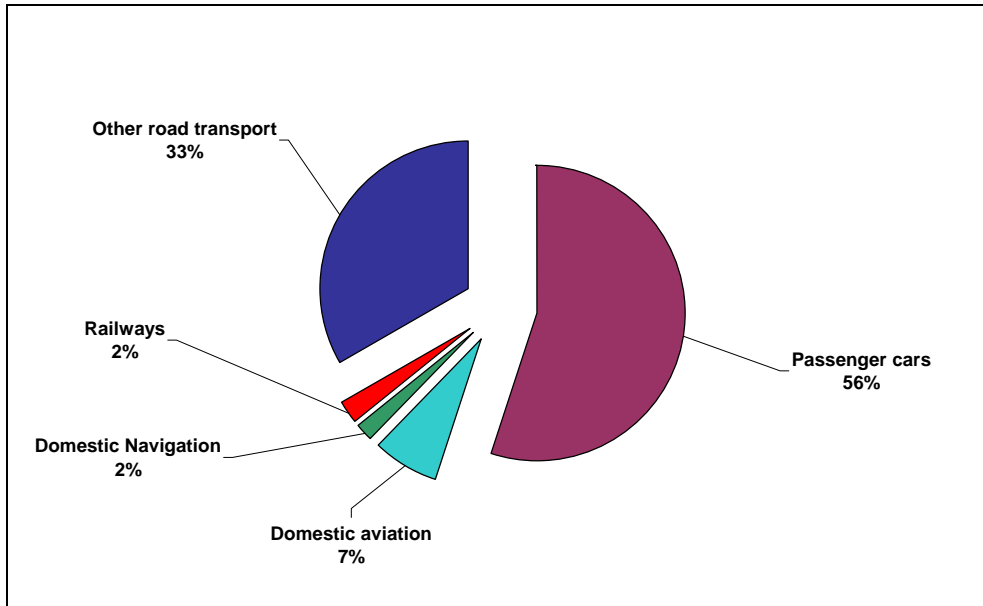
In more recent times, environmental imperatives have assumed increased recognition and importance. The contribution of the transport sector to greenhouse gas emissions around the world is significant. Road vehicles are a major source of transport emissions, so it not surprising, that governments and industry around the world have targeted improved average fuel economy as a means of limiting the impact of growing vehicle fleets on net national emissions.

Recent data for Australian transport emissions accounted for around 14 per cent of net national greenhouse gas emissions (79 Mt out of a total 550 Mt). Of this, around 88 per cent (70 Mt) was accounted for by road transport emissions, with passenger cars (mostly petrol-fuelled) accounting for 54.9 per cent (43.5 Mt).

Chart 1 shows a breakdown of overall transport emissions in Australia in 2002, highlighting the dominant share of passenger cars and other forms of road transport.

¹ Presented by Russell Scoular, Vice President, Federal Chamber of Automotive Industries (Australia), to the 6th APEC Automotive Dialogue, Beijing, China, 10-12 June 2004.

Chart 1: Australian Transport Emissions in 2002 (Total 79.2 Mt CO₂-e)



Source: National Greenhouse Inventory, 2002.

International Perspectives

Around the world, a variety of different approaches have been adopted in an effort to address the objective for reduced fuel consumption and increased fuel efficiency.

The common scenario faced by the industry has been the introduction of incrementally stricter regulations for individual vehicle emissions and the progressive introduction and uptake of standards for improved fuel quality.

In some cases, the automotive industry has also had to take account of prescriptive requirements for corporate average fleet performance. In other cases, partnerships between industry and government have been forged on the basis of voluntary commitments to contribute to improved environmental outcomes.

It is worth briefly considering some examples of the approaches in the world's largest automotive markets.

European Union

The EU has adopted a strategy to cut the average CO₂ emissions of new cars sold in the EU by around one third over the period from 1998 to 2010. The strategy has three elements:

- Agreements with car manufacturers to reduce new car CO₂ emissions mainly by technological innovation. The three commitments with the European (ACEA), Japanese (JAMA) and Korean (KAMA) car manufacturers associations to achieve an average CO₂ emission target for new passenger car of 140 g CO₂/km by 2008-09.
- A fiscal framework for measures to reduce CO₂ emissions from new cars.
- Improved consumer information on the energy efficiency of new cars, through fuel consumption and emission labelling.

Table 1: EU Agreed CO₂ Emission Targets for New Passenger Cars

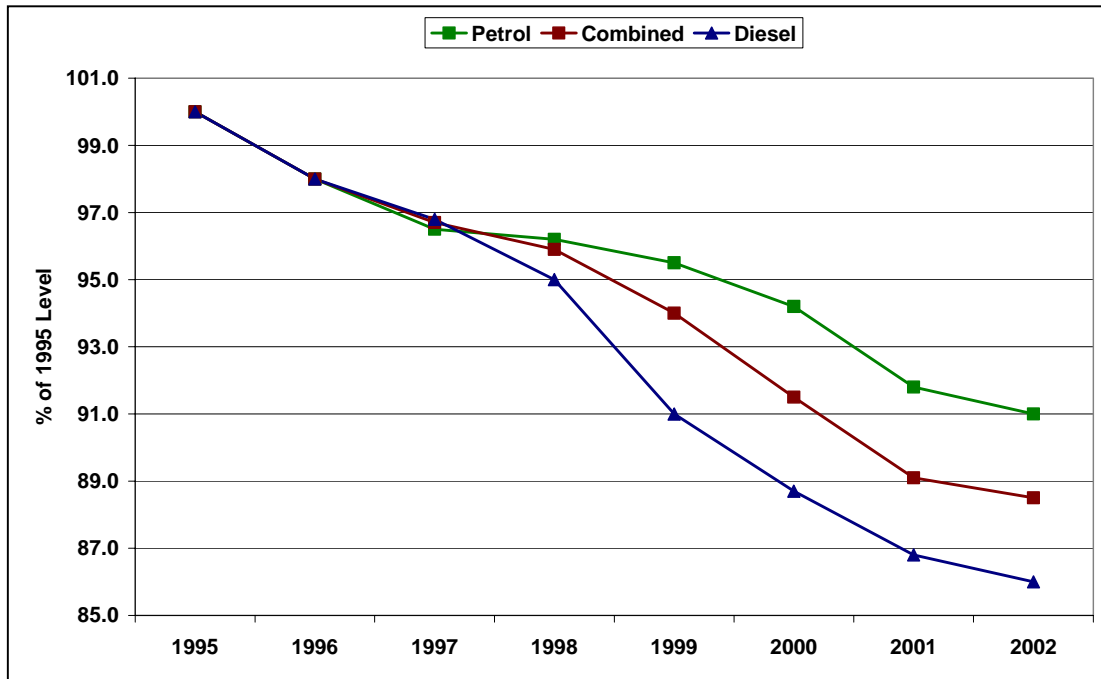
Year	ACEA		KAMA		JAMA	
	Emissions (gm/km)	% Change (cf. 1995)	Emissions (gm/km)	% Change (cf. 1995)	Emissions (gm/km)	% Change (cf. 1995)
1995	185		197		196	
2001	165	-10.8	187	-5.1	178	-9.2
2002	163	-11.9	183	-7.1	174	-11.2
2008	140	-24.7	140	-28.9	140	-28.6
2010	120	-35.5	120	-39.1	120	-38.8

It is noted that one of the key influences on recent average fuel consumption and emissions performance in Europe has been the significant increase in the share of diesel passenger cars. As Chart 2 shows, over the period 1995-2002 ACEA members (who account for more than 85 per cent of European market) achieved an overall reduction in CO₂ emissions of 12.1 per cent (ACEA/EC 2003). During this period petrol car emissions were down 9 per cent, while diesel car emissions were down by 13.6 per cent.

The extent of the uptake of diesel in passenger cars has been facilitated by a combination of technological advances (such as common rail) and a supportive policy environment.

The extent to which this trend continues is likely to have a determining impact on whether or not the ambitious targets for reduced average CO₂ emissions are achieved in Europe.

Chart 2: Reduced CO₂ Emissions in Europe – ACEA Members



Source: ACEA

United States

Corporate Average Fuel Economy (CAFE) requirements were first introduced in the United States in 1975 with the aim of improving average fuel economy for cars and light trucks.

CAFE is the sales weighted average fuel economy, expressed in miles per gallon (mpg), of a manufacturer's fleet of passenger cars or light trucks with a gross vehicle mass of 8,500 lbs. or less, manufactured for sale in the United States, for any given model year.

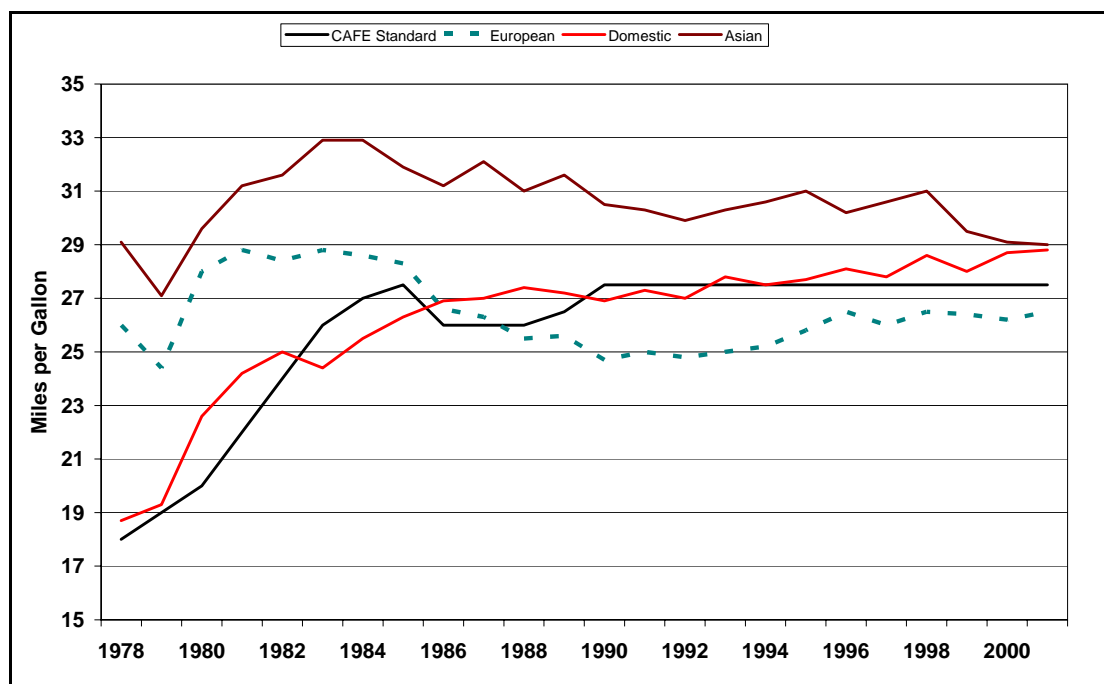
CAFE standards are required by law to be set at the 'maximum feasible level', taking into account the following four factors:

- Technological feasibility;
- Economic practicability;

- The effect of other standards on fuel economy; and
- National energy conservation objectives.

For cars, the initial target was to double average fuel economy (to 27.5 mpg) by 1985. Chart 3, shows the record of changes in the fuel economy standard and measured passenger car performance over the period since CAFE was introduced.

Chart 3: US CAFE Passenger Car Standards and Performance



Source: NHTSA

There can be significant financial penalties for manufacturers who do not meet CAFE requirements. Since 1983, manufacturers have paid more than \$500 million in civil penalties. Most European manufacturers regularly pay CAFE civil penalties ranging from less than \$1 million to more than \$20 million annually. Asian and domestic manufacturers have never paid a civil penalty.

Japan

In Japan, fuel-efficiency targets have been given a regulatory basis under the 1998 changes to its Law Regarding the Rationalisation of Energy Use.

Under a 'top-runners approach' Japan's targets are set higher than the most efficient vehicle in each class. Fuel-efficiency targets (based on 1995 levels) to be achieved by 2010, are:

- a 22.8 per cent improvement in fuel efficiency for petrol cars by 2010 (to 6.68 litres/100km);
- a 13.2 per cent improvement for petrol light- and medium-duty trucks by 2010 (to 6.13 litres/100km);
- a 14.9 per cent improvement for diesel cars by 2005 (to 8.62 litres/100km); and,
- a 6.5 per cent improvement for diesel light- and medium-duty trucks by 2005 (to 6.80 litres/100km).

It is understood Japan is also studying other measures to reduce the growing consumer demand for larger vehicles. This could include financial incentives to purchase high-efficiency vehicles and/or a tax on less efficient vehicles.

As mentioned previously, JAMA has also undertaken a voluntary commitment with the EU to reduce the average CO₂ emissions of Japanese vehicles sold in the EU.

The Australian Experience

The Australian Automotive Industry in Context

An appreciation of Australia's automotive market structure is important in gaining an understanding of the industry's strong preference for voluntary fuel consumption and CO₂ targets.

Australia's automotive market is small by world standards. However, it ranks as one of the most competitive. There are more than 50 different brands and 350 different models from nearly 20 different source countries competing for less than one million annual sales. Imported vehicles account for around 70 per cent of the total market.

The four domestic manufacturers largely focus on the production of medium- to large passenger cars. They complement their locally produced vehicles with a variety of imported models.

In recent years, new vehicles have been selling at record levels in Australia, the result of strong economic conditions, comprehensive taxation reform and the launch of a variety of highly regarded new models.

However, the complexity of the market, the reliance of domestic manufacturers on largely overseas technology breakthroughs and the fact there are no 'full-line' producers in Australia would make it impossible to equitably pursue a CAFE type program in the Australian context.

Fuel Consumption Targets

In Australia, the automotive industry (through its representative association – FCAI) has put in place a series of voluntary agreements with successive governments, establishing targets for reduced average fuel consumption for new passenger cars.

The first of these voluntary agreements was put in place from 1978, establishing targets for a 15 per cent reduction in average fuel consumption by 1983 and by 20 per cent by 1987.

A second voluntary agreement was endorsed by the then Ministers for Transport and Primary Industries and Energy in January 1996. Under this agreement, FCAI members declared their intention (subject to certain conditions) to achieve further reductions in new passenger car fuel consumption to an average 8.2 litres per 100 kilometres by 2000. This amounted to a reduction of just under 12 per cent on the 1990 level of 9.16 litres per 100 kilometres.

More recently, in 2003, a third agreement was finalised, establishing a target of 6.8 litres per 100 kilometres for 2010, a target that was established with a view to achieving the Australian Government's stated objective of achieving a 15 per cent improvement '*over business as usual*' in fuel efficiency by 2010². In addition this agreement, undertook to implement two additional measures as follows:

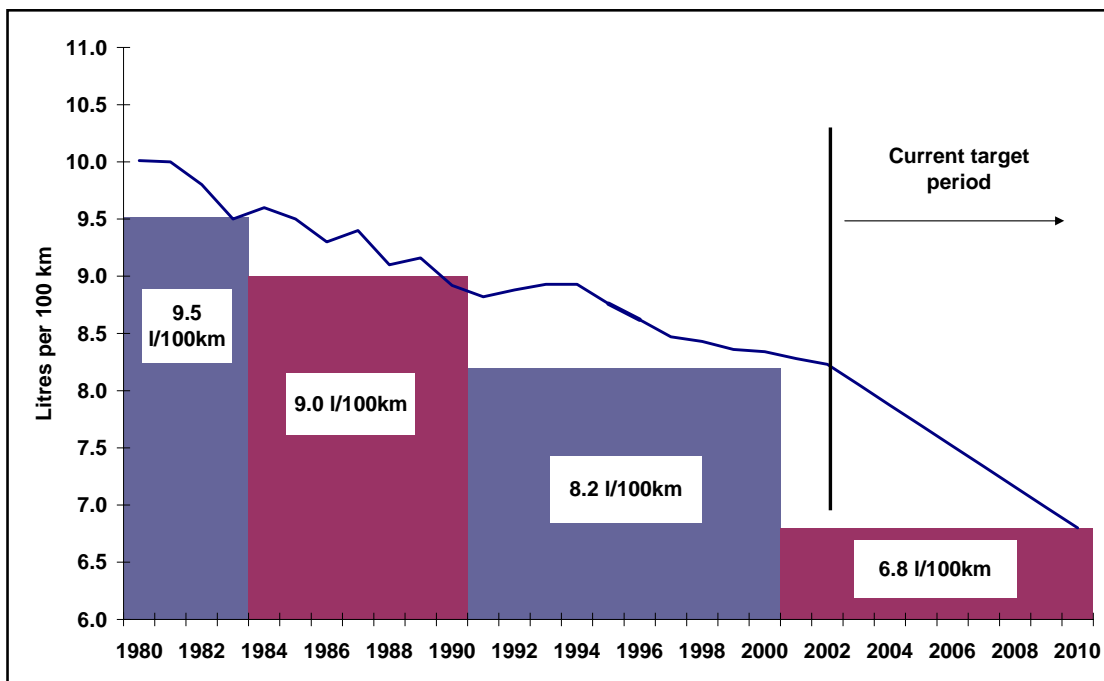
- Update the basis of measurement for fuel consumption testing to reflect the introduction of new standards.
- Establish a new target for 2010 based on inclusion of a broader range of light vehicles and alternative fuels.

² This objective was outlined as part of package of measures announced by the Australian Prime Minister in a statement entitled '*Safeguarding the Future: Australia's Response to Climate Change*', December 1997.

In practice, this meant that FCAI would need to convert the basis for the existing target from a measure of fuel consumption, expressed in litres per 100 kilometres, to a measure of carbon dioxide emissions, expressed in grams per kilometre. This is consistent with the basis for the European commitments made by ACEA, JAMA and KAMA, discussed previously.

Chart 3, below shows the changes in measured average fuel consumption for new passenger cars in Australia, over the period since 1980. It can be seen, that over this period significant reductions have been achieved but in each case the industry fell a little short of its intended target.

Chart 3: Average Fuel Consumption for New Passenger Cars - Australia



Source: FCAI

Future Directions

FCAI, in partnership with the Australian Greenhouse Office, has initiated a program of research to implement the additional requirements of the 2003 voluntary agreement.

Under this program two main tasks are envisaged:

- First, the existing target for reduced average fuel consumption for new passenger cars of 6.8 litres per 100 kilometres is to be re-calibrated to an

equivalent measure, based on an updated drive-cycle. This is then to be converted to a figure, based on an equivalent measure of carbon dioxide emissions.

- Second, an analysis of current and projected future fuel consumption and emissions performance of other light vehicles (including off road vehicles and light commercial vehicles up to a gross weight of 3.5 tonnes) is to be undertaken to facilitate and expansion in the coverage of the target for reduced CO₂ emissions for 2010.

It had been hoped that this research would have been completed by now and that the final results would have been available to be reported in this paper. Unfortunately that is not the case, so we are restricted to a more limited discussion of some of the issues being explored.

In particular, the proposed approach for the determination of a new target, based on CO₂ emissions, for all new light vehicles must take into account three main factors:

- Changes in market segmentation;
- Level of uptake of diesel and alternative fuels; and
- Impact of new technology and changes in vehicle specification.

In each case the extent and the direction of the impact on future average CO₂ emissions is likely to be different. These influences are examined and summarised below.

Market Segmentation

Over the past six years there have been several discernable shifts in the segmentation of new light vehicle sales in the Australian market:

- There has been a general decline in the market share of sales of passenger cars. This has been most discernable for light cars, and large cars. Small cars are the only passenger segment which has exhibited significant growth.
- In contrast, the market share of sports utilities (SUVs) has burgeoned, underpinned by strong growth in sales of compact SUVs.

Looking ahead one might expect a similar broad trend in the market, although few would predict that SUVs could maintain the stellar rates of increased market penetration achieved in the recent past.

The net impact of continued shift from passenger cars to SUVs on projected future emissions performance is difficult to discern. The fuel consumption and emission properties of compact SUVs and large passenger cars are not greatly different. However, initial modelling indicates that on balance the changes in market segmentation will place upward pressure on future level of average CO₂ emissions.

Uptake of Diesel and Alternative Fuels

In contrast to the European experience, Australia has a very low level of penetration of diesel among passenger and most other categories of light vehicles.

To be sure, with the advent of new diesel technologies an increased variety of diesels have been appearing, particularly from Europe. However, preliminary results from the research undertaken on behalf of Australian industry indicate that despite potential emissions advantages, it would require a substantial increase in the proportion of new vehicles operating on diesel to generate a meaningful reduction in average emissions.

In the absence of policies which provide a stronger incentive for consumers to make use of diesel, in preference to petrol, it is our assessment that uptake of diesel can only account for a limited contribution to any eventual voluntary target agreed to by industry.

Equally, it has to be said that LPG and other alternative fuels hold only a very small share of new vehicle sales. Accordingly, even with a two or three-fold increase in the proportion of new vehicles fitted with LPG or other alternative fuel systems there would be little overall impact on average CO₂ emissions for new light vehicles.

Technology and Vehicle Specification

In a very real sense the future uptake of a range of emerging technologies and trends in vehicle specification are likely to hold the key to the Australian automotive industry's efforts to reduce greenhouse gas emissions.

The collective impact of a range of technologies and design improvements must inevitably account for the majority of the burden in achieving any agreed voluntary target. These include:

- continuous variable transmissions
- variable valve timing;

- high pressure direct injection for diesels;
- hybrid drives;
- low-rolling resistance; and
- more widespread use of light metals and low-weight advanced materials.

Of course, the determination of any final target will be crucially dependent on the assumptions made about the willingness of consumers to embrace (and pay for) fuel saving technologies. Against this, it is also necessary to take into account consumer preferences for other specification features, which may detract from improved fuel economy and emissions performance, including additional safety features, increased comfort features, cargo-space and towing capacity.

Policy Implications

Given the nature of the Australian market, as a relatively small price- and technology-taker, both industry and government have been conscious of the desirability of adopting market-based and voluntary approach to efforts to reduce the environmental impact of vehicle CO₂ emissions.

Australia's use of effective voluntary agreements is not limited to the automotive industry, although they were pioneered in part in our sector.

Since 1995, a major component of Australia's initiatives to reduce greenhouse gas emissions has been a program known as the Greenhouse Challenge.

The Greenhouse Challenge is a joint voluntary initiative between government and industry. Participating organisations sign agreements with the Australian Government that provide a framework for undertaking cost effective actions and reporting on those actions to abate emissions. Participants also agree to undergo an independent evaluation of their initiatives and abatement claims.

Effectively, organisations are responsible for setting their own targets for emission reductions.

Hundreds of organisations, large and small, private and public, across many different industries and commercial sectors have joined this voluntary program. The program has wide coverage of key industry sectors with more than 90 per cent of Australia's aluminium, cement, coal mining, oil and gas and automotive industries represented.

In the case of the automotive companies, the direct and indirect greenhouse gas emissions – largely electricity and gas use – are covered by the Greenhouse Challenge while the new FCAI voluntary agreement will cover vehicle greenhouse gas emissions. Ford, Holden, Toyota and Mitsubishi have all sought under the umbrella of this program to reduce the energy consumption involved in the manufacture of their vehicles. Those initiatives are not only good for the environment but they can deliver good economic advantages.

From our perspective, the Greenhouse Challenge is a second major example of a flexible and innovative voluntary agreement that can deliver significant environmental benefits.

A further program that has been introduced in Australia is an initiative called Greenhouse Friendly. This initiative allows consumers who wish to do so to purchase products and services for which greenhouse gas emissions from production, use and disposal are offset through verified abatement initiatives.

The Australian focus to date has been largely directed toward the fuel efficiency of new vehicles. There has been little focus, from a nationally-coordinated perspective, on initiatives that can be taken to enhance the in-use energy of the wider national fleet.

One obvious area here, over time, will be the great use of intelligent transport systems. However, there are also other initiatives that may be worthy of closer examination and which may be complementary to the existing cooperative agreement approach with industry. These should include a focus on the environmental benefits of eco-driving type programs and in-service vehicle maintenance programs. For example, eco-driving programs in Europe have shown drivers can reduce fuel consumption by up to 25 per cent simply by adopting some straight forward driving and maintenance procedures.

Conclusions

The automotive industry, as a global industry, understands and accepts its responsibility to contribute to international efforts for the abatement of greenhouse gas emissions. While there may remain some scientific uncertainties, we support the implementation of appropriate actions now.

As would be expected, around the world, the industry operates with a range of differing policy approaches responding to this imperative. In some cases a

prescriptive approach has been adopted, underpinned by specific regulatory requirements or benchmarks. In other cases, industry and governments have sought to pursue sought to reach agreement on voluntary efforts to reduce average fuel consumption and emissions.

A central purpose in this paper has been to highlight the Australian experience in the development by government and industry of series of cooperative targets over the past 25 years or so.

In the past, Australian targets have focussed only on achieving reduced average fuel consumption for (petrol only) passenger cars.

Currently, however the industry is working with Australian government agencies to expand the coverage of existing targets to a broader range of vehicles, including off-road vehicles and light commercial vehicles.

It is expected that these efforts will result in new agreement for a challenging but realistic target for reduced average CO₂ emissions for light vehicles for 2010, within the next few months.

The key to this flexible and market-oriented approach has been an emphasis on energy efficiency and conservation and a clear recognition that given Australia's position in the global market, as a small player with an open market, a voluntary approach offers the best means to secure the support of industry, while minimising the risk that more draconian regulation will result in unnecessary costs which would adversely impact the competitiveness of industry.