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23 April 2009

Mr John Hawkins
The Secretary
Senate Select Committee on Climate Policy
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Parliament House
Canberra ACT 2600
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Dear Mr Hawkins

Caltex Australia Limited welcomes the opportunity to provide a submission to the Senate Select Committee on Climate Policy.

This submission focuses on those sections of the terms of reference of most relevance to Caltex which include:

b. the relative contributions to overall emission reductions from complementary measures

c. whether the Government's Carbon Pollution Reduction Scheme (CPRS) is environmentally effective

e. the design of the proposed scheme taking into account permit allocation

f. any other matters.

In addressing the above, this submission concentrates on the impact of the CPRS on international competiveness, the effectiveness of the CPRS in reducing greenhouse gas emissions in the transport sector and complementary measures that would assist emission abatement in the transport sector. The submission also discusses the timing of effective introduction of the CPRS.

Yours sincerely

Frank Topham
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Caltex Australia Limited submission to

Senate Select Committee on Climate Policy

April 2009

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Executive Summary

Summary of key points

- Caltex's submission makes the following key points, which are discussed in this executive summary and in the body of the submission:
  - the CPRS (or an alternative emissions trading scheme) should not start effective operation until properly designed and economic conditions return to normal
  - the international competitiveness of emissions-intensive, trade-exposed industries should be fully maintained (for example through a 100% free allocation of permits under the CPRS) until overseas competitors have equivalent carbon costs
  - the excise reduction for motorists and certain other fuel users under the CPRS has made their inclusion environmentally ineffective for many years yet will create massive churn in emission permits
  - as a consequence, private motorists and some commercial users should be excluded from the CPRS and simple, practical proposals are made to achieve this
  - various complementary measures should be implemented to help reduce emissions from transport.

The timing of emissions trading should allow for proper design and economic conditions

- The timing of introduction of an emissions trading scheme (ETS) such as the CPRS is less important than ensuring the scheme is properly designed. The two most important design criteria for Caltex are fully maintaining the international competitiveness of our two oil refineries and effectively reducing the impact of emissions from combustion of petroleum products while avoiding the financial risk and cost associated with having to purchase permits for our customers' emissions.
- While Caltex supports an emissions trading scheme as the primary tool for reducing point source greenhouse gas emissions, it does not have a view as to whether a cap and trade model is the best form of an ETS for Australia or alternatives such as a baseline and credit scheme could be superior. This would have to be judged against general ETS design criteria as well as Caltex's specific criteria discussed above.
- Regardless of the time taken to achieve a properly designed ETS, economic conditions currently make it difficult to absorb any costs that would be created by the CPRS. In particular, the global oil refining industry is under great pressure from reduction in demand for petroleum products and resultant excess capacity and this adversely affects the gross margins for refinery production in Australia. Most other industries are adversely affected by global and Australian economic conditions and Caltex suggests that the CPRS (or any alternative ETS) not be implemented until economic conditions return to normal ie economic growth is similar to historical levels and profitability in the oil refining industry reflects those conditions.
- Caltex does not suggest abandoning work on an ETS. On the contrary, we believe work should continue in order to fully investigate all key design issues prior to a complete and integrated package being put to the Parliament. The current process has not allowed sufficient time for development of the full package of legislation and supporting regulation, nor will it provide the Parliament with an opportunity to debate and amend the package. We are particularly concerned that certain key design elements such as regulation of emission-intensive trade-exposed (EITE) industries will be presented to Parliament on a "take it or leave it" basis in regulation rather than being embodied in legislation so subject to amendment.
- Caltex notes that the slowdown in economic activity will probably reduce emissions in the Kyoto Protocol first commitment period (2008-2012) so as to allow an ETS start date later than 2010 and/or a period in which the ETS can be trialled without creating adverse economic impacts ie no money would be required to purchase permits. Caltex would support a later start in order to allow for proper ETS design and Parliamentary

consideration and a trial period for business to test the scheme and business systems to administer it.

The competitiveness of emissions-intensive, trade-exposed industries must be maintained

- Caltex's two oil refineries will emit in total about 2.5 million tonnes of carbon dioxide equivalent ($MtCO_2e$) annually when the CPRS is in operation. At the CPRS-5 price scenario, this will result in a permit cost of about $25 million pa in the early years of the scheme, increasing to about $35 million pa (in $2005) by 2020. At the CPRS capped price, the permit costs would be $40 million pa and $60 million pa respectively. These figures assume a nominal rate of 60% free permits and 1.3% pa carbon productivity contribution reduction. These permit costs will not be recoverable because the prices of petroleum products from Caltex's refineries are based on import parity and none of the overseas refineries that are our direct competitors (eg in Singapore and Korea) seem likely to adopt equivalent carbon costs for the foreseeable future.
- In order to fully maintain international competitiveness, Caltex proposes that activities such as oil refining where prices are completely aligned with import parity should receive a free allocation of permits equal to 100% of Scope 1 and Scope 2 emissions, until such time as all significant import competitors face equivalent carbon costs. For oil refining these competitors would include Singapore, India, Korea, Japan and China. Failure to provide such permits would result in reduced investment in Australian refining and loss of competitiveness, potentially leading to refinery closures and replacement of Australian production of petroleum products with overseas production.

The CPRS is ineffective and creates massive permit churn due to the excise reduction

- All petroleum products supplied from Australian terminals, whether sourced from imports or local refineries, will be subject to a carbon permit liability. The point of carbon liability will be aligned with the point of excise liability. The CPRS proposes that suppliers from terminals will have an "upstream point of obligation" ie will be required to purchase permits for customers' emissions, which they will then recover by increasing the prices charged to customers. This CPRS design feature will make Caltex the largest single purchaser of permits in Australia at over 40 million tonnes pa or about 12% of the permits available at auction from the Australian Government. These permits will cost about $0.9 to $1.6 <u>billion</u> pa based on the CPRS-5 and price cap carbon price scenarios.
- The requirement to purchase such a large quantity of permits creates the risk of under-recovery of costs that could be significant relative to Caltex's profitability and imposes large working capital costs and debt-raising requirements. For example, if permits were purchased in 12 equal amounts, this would require an additional $80 to $130 million in capital, which is significant in relation to Caltex's total debt.
- The inclusion of liquid fuels in the CPRS, in particular fuels used in transport, is questionable on the grounds of environmental effectiveness. The elasticity of petrol demand with respect to price is low, about -0.15 in the short run and about -0.4 in the long run. In other words, a 1% increase in price would reduce petrol demand 0.15% to 0.4%. In addition, petrol prices are largely the result of world oil prices and Australian taxes so the effect of a carbon cost is very small. Caltex calculates that a carbon cost of A$40/tonne of carbon dioxide would increase prices only 10 cents per litre (cpl) and reduce demand by 3% in the long run, far short of the massive reductions required by 2050. On these grounds alone, the inclusion of transport in the CPRS is of marginal effectiveness and complementary measures will be required to achieve large emission reductions.
- The situation with the CPRS is actually far worse in terms of emission outcomes because of the introduction of excise reductions for various classes of petroleum product consumers. The CPRS will actually <u>increase</u> emissions from petrol for several years because the excise reduction is greater than the carbon price for the first three years and several years beyond that time. In fact, under the CPRS-5 price scenario there will be no overall (ie cumulative) reduction in emissions from petrol until 2025. At the same time, petrol suppliers will have purchased <u>$20 billion</u> in permits and charged these back to customers - financial churn for no environmental benefit. Another realistic

pricing scenario would result in no overall emissions reduction for at least the first 20 years of the scheme but would create billions of dollars more permit churn.

- In relation to diesel, the situation is not as bad (ie there is no emissions increase, unlike petrol). There would be no impact on emissions from private motorists and light commercial users for the first three years of the CPRS and reduced emissions after that time. While it is difficult to calculate the emissions impact, an indicative calculation assuming diesel has half the price elasticity of petrol suggests the excise reduction would stifle emission savings from diesel use by motorists, leading to only a 1% cumulative reduction by 2020 compared to an 8% cumulative reduction without the excise offset.

Motorists and certain other fuel users should be excluded from CPRS

- The excise reduction means that certain consumers - primarily private motorists and commercial users not eligible for a fuel tax credit - have been effectively removed from the CPRS for many years. Caltex therefore proposes the CPRS be amended to remove private motorists and other small consumers from the CPRS and to address the issue of emission reduction from these consumers through complementary measures.
- There are various legislative options to achieve this but Caltex advocates either: permit liability for emissions for permits to apply only to emissions above the CPRS liability threshold eg 25,000 tpa for a facility; or a carbon cost to apply to all consumers eligible for a fuel tax credit, which in practice would include all emitters above the CPRS threshold and some smaller but still significant business emitters. In the former case, the liability would be to surrender permits, as for emissions from other sources. In the latter case, the fuel tax credit would be reduced by an amount calculated from historical carbon prices, in exactly the same way as proposed under the CPRS for the "CPRS fuel credit". These options retain larger emitters from petroleum products within the CPRS and are administratively simple and consistent with current CPRS design details.

Complementary measures are required to reduce transport emissions

- Complementary measures will be required to help reduce emissions from vehicles regardless of whether vehicles are inside or outside the CPRS. Caltex believes that changes in vehicle technology will be the key to reducing emissions, together with greater reliance on alternative fuels.
- Caltex proposes the following package of complementary measures:
    - Monitor carbon efficiency (in grams/kilometre) against a set of voluntary targets that are comparable to other countries.
    - Provide incentives to consumers to purchase the most fuel efficient vehicles available from manufacturers in Australia, Europe, the US and other regions through a "feebate" scheme that provides "cashbacks" for low emission vehicles, funded by fees on higher emission vehicles.
    - Provide grants for research, development and demonstration of low emission vehicles and low carbon fuels, including biofuels, tailored to developing Australian manufacturing capability and fuel distribution infrastructure.
    - Other policies including consumer education, improved public transport and road management, and better urban planning to reduce transport emissions.

1. Introduction

Caltex welcomes the opportunity to make a submission to the Senate Select Committee on Climate Policy. This submission focuses on those sections of the terms of reference of most relevance to Caltex which include:

b. the relative contributions to overall emission reductions from complementary measures

c. whether the Government's Carbon Pollution Reduction Scheme (CPRS) is environmentally effective

e. the design of the proposed scheme taking into account permit allocation

f. any other matters.

In addressing the above, this submission will concentrate on the impact of the CPRS on international competiveness, the effectiveness of the CPRS in reducing greenhouse gas emissions in the transport sector and complementary measures that would assist emission abatement in the transport sector. The submission will also discuss the timing of effective introduction of the CPRS.

2. Background

Australia's annual greenhouse gas emissions were 576 million tonnes (Mt) in 2006, the most recent year for which data has been published. Of this total, 46 Mt was from petrol, 44 Mt from diesel, 25 Mt from jet fuel/other petroleum products, a total of 115 Mt or 20% of total Australian emissions. Of this total, transport (road, rail and sea) accounted for 79 Mt or 14% of Australian emissions.

In percentage terms, about 8% of Australian emissions were from use of petrol, 8% from diesel and 4% cent from jet fuel and other fuels. To manufacture these fuels, Australia's seven operating oil refineries emitted directly about 6 Mt or 1% of Australia's emissions.

Caltex estimates that without the CPRS emissions from combustion of liquid fuels will reach 150 Mt by 2020 comprising approximately 41 Mt from petrol, 73 Mt from diesel, 37 Mt from jet fuel/other petroleum products. Refinery emissions will be similar to 2006.

As a company, Caltex emits about 2.1 million tonnes directly (about 2 million tonnes from refining and 0.1 Mt from marketing and distribution activities) and about 0.4 million tonnes indirectly, from purchased electricity. Our products, once used by our customers, emitted another 35 million tonnes in 2005, mainly from vehicles. Customers' emissions will increase, particularly from growth in diesel and jet fuel. Caltex estimates these emissions will reach 42 Mt in the first year of the CPRS, approaching 10% of the permit market of about 480 Mt when refinery emissions are included. Caltex's customer emissions will be almost 20 times Caltex's own emissions.

Because Caltex must purchase permits for its customers' emissions as well as its own emissions, it will be Australia's largest single purchaser of emission permits so has a vital interest in the effectiveness of climate change policies. Assuming 75% of permits are auctioned, Caltex's permit requirements will be about 12% of the 360 Mt of permits available at auction.

Caltex is the largest refiner and marketer of petroleum products in Australia with operations in all states and territories. Caltex has achieved the leading market share for supply of transport fuels and is the number one convenience store operator through its branded retail network. It has an estimated market share of more than 30 per cent of the major transport fuels (petrol, diesel and jet fuel) supplied nationally.

Caltex accounts for around 35 per cent of Australia's oil refining capacity. It owns and operates two of Australia's seven oil refineries – at Kurnell in Sydney and Lytton in Brisbane. Between them, the Caltex refineries have the capacity to process 244,000 barrels (about 39 million litres) of crude oil per day.

Caltex produces mostly high-value transport fuels which contribute to the growth of the economy and provide significant employment. The two refineries directly employ 874 Caltex employees and around 550 contractors. For major maintenance and other projects the numbers can escalate by an extra 1,200 workers, bringing the total number of workers to about 2,600.

Caltex refineries will spend an average of $100 million per year over the next three years on capital expenditure and approximately $60 million per year on the major maintenance projects that are required regularly in all oil refineries.

The CPRS as currently proposed will significantly reduce our international competitiveness and the purchasing of permits on behalf of our customers will place an inequitable and disproportionate financial risk and cost on the business.

3. The outlook for oil refining and CPRS timing (term of reference f)

Economic conditions currently make it difficult to absorb any costs that would be created by the CPRS. In particular, the global oil refining industry is under great pressure from reduction in demand for petroleum products and resultant excess capacity and this adversely affects the gross margins for refinery production in Australia.

Most other industries are adversely affected by global and Australian economic conditions and Caltex suggests that the CPRS (or any alternative ETS) not be implemented until economic conditions return to normal ie economic growth is similar to historical levels and profitability in the oil refining industry reflects those conditions.

The petroleum product market in the Asian region, including Australia, will continue to be adversely affected by the global economic slowdown throughout 2009. Significant new refining capacity is expected to be commissioned over the next 2 years, expanding regional petroleum product supply, while demand contracts due to declining industrial activity and consumer confidence.

The International Energy Agency (IEA) projects global oil demand in 2009 at 84.4 million barrels per day (MBD), down 1.5% or 1.3 MBD on 2008. (A barrel is 159 litres.) 2009 will be the first year since 1982 that global oil demand has dropped. The IEA says the global recession has delayed spending on 2 MBD of planned oil production capacity worldwide and almost as much refining capacity, creating a potential supply crunch when demand recovers.

Petroleum consultants Wood Mackenzie predict that Asia Pacific demand will fall 1 MBD in 2009. This is in contrast to strong growth in earlier years.

The IEA projects Chinese oil consumption to grow just 0.7% in 2009 to 7.9 MBD, compared with 4.3% in 2008, 4.6% in 2007 and 7.8% in 2006. The average growth projection masks a significant drop in Chinese demand. For example, Energy Security Analysis, Inc. data shows year on year drop in diesel sales of 11% in the period from November 2008 – January 2009 vs the period from November 2007 – January 2008. This fall reflects the rapidly escalating impact of the global economy on China.

Against this backdrop of decelerating demand, the region is entering a phase of increased supply of refined products. Several key refining projects in Asia are now set to either commence operations or ramp up capacity. The bulk of this capacity will stem from China's Huizhou (240,000 barrels/day) and Quanzhou (160,000 barrels/day) refineries, Vietnam's Dung Quat refinery (140,000 barrels/day) and India's Reliance plant (580,000 barrels/day). Consultants ESAI forecast that Asia's petrol surplus will average 120,000 barrels/day for the year while diesel surplus is projected to increase to a massive 600,000 barrels/day by the third quarter of 2009.

With falling demand, particularly for diesel, and increasing refining capacity, ESAI says Asian refiners have responded by aggressively slashing refinery production. Despite this, the rapidly changing situation has meant that supply continues to overshoot regional demand and inventories are at very high levels.

This inundation of supply in the bearish market will exert downward pressure on gross refining margins (the difference between product prices and crude oil prices). Asian diesel margins fell to a five year low in February and are expected by ESAI to remain depressed: gasoline (petrol) margins are projected to be lower than for most of the past four years and diesel margins are projected to be about a third of those experienced in the past four years and far below the record levels experienced in 2008. The significance of the past four years is this was the period in which Chinese economic growth boosted demand for materials of all kinds, including petrol and diesel, and drove the regional refining industry to a cyclical high point.

As Australia is a net importer of refined petroleum products, predominantly from Singapore, Australian petrol and diesel prices reflect import parity based on Singapore benchmark prices.

As a result, the profitability of Australian refineries will be adversely impacted by the fall in refining margins in the Asian region.

In 2008, the Caltex Refiner Margin (CRM) averaged $10.27 US/barrel (7.88 Acpl), up from $9.26 US/barrel in 2007 on the back of robust diesel and jet margins. While the CRM was stronger on average in 2008, there was significant volatility with the monthly average. Margins are now lower, particularly for diesel, and the CRM was about $6 US/barrel in March 2009 (about 5.8 Acpl).

Macroeconomic factors are expected to make 2009 a challenging year for Caltex along with most of the Australian business community. Slowing GDP growth with the potential for rising unemployment may put pressure on transport fuel volume growth and continue to impact both refining and marketing margins in the coming year.

This is already noticeable in a decline in demand for petroleum products in Australia. Data from the Department of Resources, Energy and Tourism (DRET) shows that sales of petroleum products in February 2009 were 5.3% lower than in February 2008. Diesel sales dropped 4.2% and petrol sales fell 5.6% in the same comparison period. This is a key indicator of economic growth in Australia, particularly the decline in diesel demand, which has not been seen since before 2001.

With the petroleum product market facing a protracted period of weak refiner margins, the additional cost of the CPRS will pose a significant challenge for Caltex to maintain competitiveness against regional refiners and profitability in the Australian market. There is no way a cost impost of $25 to $40 million pa could be absorbed without doing long term damage to the viability of Caltex's refineries.

Caltex notes that the slowdown in economic activity will probably reduce emissions in the Kyoto Protocol first commitment period (2008-2012) so as to allow an ETS start date later than 2010 and/or a period in which the ETS can be trialled without creating adverse economic impacts ie no money would be required to purchase permits. Caltex would support a later start in order to allow for proper ETS design and Parliamentary consideration and a trial period for business to test the scheme and business systems to administer it.

4. Full maintenance of international competitiveness (term of reference e)

Caltex's two oil refineries will emit in total about 2.5 million tonnes of carbon dioxide equivalent ($MtCO_2e$) annually when the CPRS is in operation. At the CPRS-5 price scenario, this will result in a permit cost of about $25 million pa in the early years of the scheme, increasing to about $35 million (in $2005) by 2020. At the CPRS capped price, the permit costs would be $40 million pa and $60 million respectively. These figures assume a nominal rate of 60% free permits and 1.3% pa carbon productivity contribution reduction.

These permit costs will not be recoverable because the prices of petroleum products from Caltex's refineries are based on import parity and none of the overseas refineries that are our direct competitors (eg in Singapore and Korea) seem likely to adopt equivalent carbon costs for the foreseeable future.

Caltex believes international competitiveness must be fully maintained, which means 100 per cent free allocation of permits must be provided for in the scheme. Until overseas refineries such as those in Singapore which supply product to Australia bear equivalent carbon costs the free allocation of 60 per cent or even 90 per cent of permits exposes the industry to additional costs that cannot be passed on to customers. Failure to implement such a policy (100 per cent free allocation of permits) threatens to destroy Australian investment and jobs without reducing global emissions.

The outlook for oil refining as described in the previous section of this submission is adding to our concerns. Australia imports 30 per cent of the petroleum products it needs and this figure will increase over time. Large, low-cost Asian refineries have competitive advantages over Australian refineries including being closer to growing markets. This means no new refineries will be built in Australia and imports will accordingly increase.

In the near term, lower demand growth in Asia because of the global economic crisis combined with new refining capacity in countries like India will reduce refining profitability. Despite this, Australian refineries can be competitive but not if they are loaded up with extra costs that tilt the playing field against them. Once competitors have the same carbon costs, then emissions trading should work as intended to help reduce emissions.

At this stage it is expected that only 60% of the permits required to cover these emissions will be free. Having to purchase 40 per cent of permits would seriously reduce the funds needed to keep Caltex's refineries running reliably and efficiently. In the bottom half of a business cycle, such as now, carbon permit costs for refining could consume a significant percentage of our earnings as the costs are not recoverable from customers.

Refineries already consume large amounts of energy so focus closely on energy efficiency. As a result, there is not much scope to reduce greenhouse gas emissions through better efficiency. This makes the CPRS just a tax on competitiveness instead of an incentive for emission reduction.

The Australian Institute of Petroleum says the CPRS could place significant pressure on the viability of a number of Australian refineries over the period to 2020 and may lead to closures. Caltex agrees with this assessment. Yet Australian refineries offer the critical supply diversity that underpins security of fuel supply to Australian industry, businesses and consumers. We believe it will be difficult and more costly to maintain our historical high level of fuel supply security if the vast majority of fuel supply is imported. A supply chain is not strengthened by removing some of the links.

5. The CPRS is ineffective and creates massive permit churn (term of reference c)

5.1 CPRS excise reduction arrangements and impact on emissions

The CPRS requires liquid fuel suppliers to purchase permits for their customers' greenhouse gas emissions then pass on the cost to customers through fuel prices.

At the prices estimated in the CPRS, purchasing approximately 40 million tonnes of customers' permits would cost Caltex $0.9 to $1.6 billion dollars annually. In contrast, Caltex's after tax profit for 2008 was $186 million on a replacement cost of sales operating profit basis. Caltex recorded an after tax profit of $34 million on a historical cost profit basis.

Under the CPRS, the Government will cut fuel excise to offset the carbon price impact on fuel prices for many users. The Government will adjust the excise reduction every six months for the first three years based on the average permit price in the preceding six months. After July 2013, the Government will make a final assessment and, if needed, a final fuel tax cut will take effect from 1 August 2013. The final assessment will be made permanent.

The excise reduction will reduce the price of petrol for several years because it is based on the carbon intensity of diesel (2.7 kg CO_2/litre of diesel) rather than petrol. This means that emissions from petrol under the CPRS will increase relative to emissions without the CPRS before decreasing as carbon prices exceed the excise reduction.

In relation to diesel, the situation is not as bad (ie there is no emissions increase, unlike petrol). There would be no impact on emissions from private motorists and light commercial users for the first three years of the CPRS because the excise reduction will exactly offset the carbon cost. Emissions from diesel will then be reduced more slowly than would be case for the CPRS without an excise reduction. While it is difficult to calculate the emissions impact, an indicative calculation assuming diesel has half the price elasticity of petrol suggests the excise reduction would stifle emission savings from diesel use by motorists, leading to only a 1% cumulative reduction by 2020 compared to an 8% cumulative reduction without the excise offset.

Applying the excise offset effectively removes petrol emissions from the CPRS for many years and greatly reduces the impact of the CPRS on diesel emissions yet places a significant burden on Caltex and other suppliers to purchase permits on behalf of our petroleum customers.

For the CPRS-5 price scenario, Caltex calculates that by 2025, cumulative emissions from petrol will be the same as without the CPRS yet fuel suppliers will have purchased $20 billion in permits and charged them back to customers. This is financial churn with associated financial risk and cost for no effect other than to create fees for financial intermediaries.

Under a scenario in which there is substantial price volatility in an initial 6 month period such that the carbon price reaches the price cap, the increase in petrol emissions is very substantial. This is because the excise reduction can only increase, not decrease. In this scenario, there is no overall reduction in emissions from petrol until well beyond 2030.

5.2 Fuel price changes under the CPRS

Petrol

The following table shows the effect of the excise reduction on petrol price for the CPRS-5 price scenario.

Financial year	Carbon price A$/t($2005)	Carbon cost incl GST (Acpl)	Excise reduction incl GST (Acpl)	Net petrol price change (Acpl)
2010-11	23.00	5.8	6.8	-1.0
2011-12	23.92	6.0	7.1	-1.1
2012-13	24.88	6.3	7.4	-1.1
2013-14	25.88	6.5	7.4	-1.1
2014-15	26.91	6.8	7.4	-0.9
2015-16	27.99	7.0	7.4	-0.6
2016-17	29.11	7.3	7.4	-0.4
2017-18	30.27	7.6	7.4	0.2
2018-19	31.48	7.9	7.4	0.5
2019-20	32.74	8.2	7.4	0.8

The following table shows the effect of the excise reduction on petrol price if the price of carbon rises to the cap price in the third year, which will then be fixed as the measure for the excise reduction.

Financial year	Carbon price A$/t($2005)	Carbon cost incl GST (Acpl)	Excise reduction incl GST (Acpl)	Net petrol price change (Acpl)
2010-11	23.00	5.8	6.8	-1.0
2011-12	23.92	6.0	7.1	-1.1
2012-13	44.10	12.1	13.1	-1.0
2013-14	25.88	6.5	13.1	-6.6
2014-15	26.91	6.8	13.1	-6.3
2015-16	27.99	7.0	13.1	-6.1
2016-17	29.11	7.3	13.1	-5.8
2017-18	30.27	7.6	13.1	-5.5
2018-19	31.48	7.9	13.1	-5.2
2019-20	32.74	8.2	13.1	-4.9

Diesel

The following table shows the effect of the excise reduction on diesel prices for the CPRS-5 price scenario.

Financial year	Carbon price A$/t ($2005)	Carbon cost incl GST (Acpl)	Net diesel price change for private motorists (Acpl)	Net diesel price change for heavy road transport (Acpl)	Net diesel price change for agriculture and fishing* (Acpl)	Net diesel price change for other diesel users (Acpl)
2010-11	23.00	6.8	0	0	0	6.8
2011-12	23.92	7.1	0	7.1	0	7.1
2012-13	24.88	7.4	0	7.4	0	7.4
2013-14	25.87	7.7	0.3	7.7	7.7	7.7
2014-15	26.91	8.0	0.6	8.0	8.0	8.0
2015-16	27.98	8.3	0.9	8.3	8.3	8.3
2016-17	29.10	8.6	1.2	8.6	8.6	8.6
2017-18	30.27	9.0	1.6	9.0	9.0	9.0
2018-19	31.48	9.3	1.9	9.3	9.3	9.3
2019-20	32.74	9.7	2.3	9.7	9.7	9.7

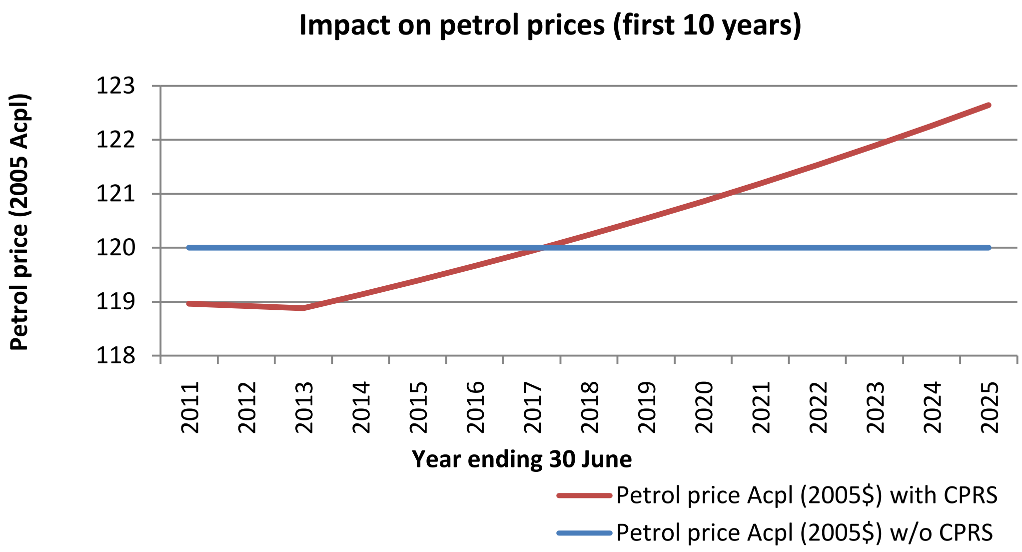
* Subject to review in 2013

5.3 Emissions from petrol

The White Paper recognises that "people have limited flexibility to respond quickly to changes in fuel prices." This can be expressed as price elasticity of demand, which measures the percentage decrease in demand for a 1% increase in price.

Petrol is an inelastic good, with historical evidence suggesting that for every 1% increase in price there is only 0.15% reduction in demand in the short run (say 1 year) and 0.4% reduction in demand in the long run (say 10 years). The Bureau of Infrastructure, Transport and Regional Economics (BITRE) estimates the price elasticity of fuel demand to be between -0.15 and -0.4 for passenger vehicles (Green Paper p.101). Caltex modelling uses these estimates as the basis of its modelling. These elasticities are consistent with the recent Treasury Working Paper: *An Exploration of Australian Petrol Demand: Unobservable Habits, Irreversibility, and Some Updated Estimates*.

In order to calculate the impact of carbon price on demand and emissions, fuel price scenarios are required. In this submission, the petrol price is assumed constant at 120 Acpl (without the CPRS) and the CPRS-5 case carbon price changes discussed in Section 5.2 are applied to this base case. The following chart illustrates the impact of the CPRS (with excise reduction) on petrol prices.



The following table shows the effect the CPRS has on annual and cumulative carbon dioxide emissions based on the above price scenario.

Financial year	Carbon price A$/t CO_2 ($2005)	Net petrol price Acpl (2005$)	Annual emission impact kt CO_2	Cumulative emission impact kt CO_2
2010-11	23.00	119.0	56	56
2011-12	23.92	118.9	77	133
2012-13	24.88	118.9	89	223
2013-14	25.87	119.1	86	308
2014-15	26.91	119.4	77	385
2015-16	27.98	119.7	65	450
2016-17	29.10	119.9	50	501
2017-18	30.27	120.2	33	533
2018-19	31.48	120.5	11	545
2019-20	32.74	120.9	-13	532
2020-21	34.05	121.2	-50	482
2021-22	35.41	121.5	-90	392
2022-23	36.82	121.9	-135	257
2023-24	38.30	122.3	-180	77
2024-25	39.83	122.6	-227	-150

The cause of the increase in annual emissions until 2019 is the decision to offset the price impact of the CPRS by providing an excise reduction which is greater than ‘cent-for-cent’. By using the mass of greenhouse gases emitted by a litre of diesel to calculate the offset (which is greater than petrol emissions), the CPRS will result in a reduction in petrol prices compared to prices without a CPRS. This will lead to an increase in demand for petrol and a consequent increase in emissions.

The short term decrease in price due to the more than cent-for-cent excise reduction affects purchasing behaviour of consumers in a way that has long term effects. Lower prices create demand for less fuel efficient vehicles that remain in the fleet for many years. This why the long term elasticity of demand for petrol is greater than the short term elasticity and means the effect of a decrease in petrol price in a particular year has an effect for many years, regardless of the petrol price in subsequent years.

The Department of Climate Change's 2007 paper *Transport Sector Greenhouse Gas Emissions Projections* details the impact that high petrol prices have had on influencing the pattern of new vehicle purchases by Australian motorists. With the rise in petrol prices, sales of new large passenger cars fell almost 20 per cent in 2006, while sales of small passenger cars increased by about 20 per cent. The impact of lower petrol prices under the CPRS is likely to reduce this purchasing trend towards lower emission vehicles, with purchasing decisions made in one year having impacts for many years until vehicles purchased in that year are replaced.

Longer term, the CPRS is projected to increase petrol and diesel prices in the order of 10 cents per litre but this will reduce emissions by only 3%. The CPRS will not deliver the solution Australia needs to greatly reduce emissions from vehicles and other mobile equipment by 2050.

The following table illustrates calculation of the long term impact on emissions of a carbon price. Substitution of various prices and elasticities would generate the same general conclusion, that carbon prices have only a small impact on greenhouse gas emissions from transport.

Petrol price (Acpl)	120
Carbon price @ $40/ t CO_2 (Acpl)	10.0
% increase in price	8.4%
% reduction in emissions (long run elasticity of -0.4)	3.2%
Emissions from petrol (2008)	46Mt CO_2
Reduction in emissions by 2050 (assuming petrol emissions without carbon price equal 2008 emissions)	1.3Mt CO_2
Note: impact on diesel would be less because of the reliance on diesel by heavy vehicle transport and lesser ability to switch fuel types.	

5.4 Impacts on diesel emissions

Diesel is the dominant fuel for all kinds of commercial and industrial on-road and off-road vehicles. With economic growth, demand for diesel has increased markedly in recent years and Caltex projects that this growth will continue by around 4% per annum on trend.

Under the White Paper proposals, a "CPRS fuel credit" will be made available to agriculture and fishing businesses for three years and heavy on-road transport businesses for one year. Once this CPRS fuel credit payment ceases (it is subject to review in 2013), these businesses will be liable for a carbon cost even though there is limited capacity for a reduction in diesel use as heavy vehicles have little ability to downsize or improve their efficiency. This is because commercial users of diesel already focus on fuel efficiency to reduce operating costs and commercial vehicles must carry loads that can't be downsized. In contrast, motorists using petrol can downsize without affecting passenger capacity or switch to more fuel efficient models.

While it is difficult to calculate the emissions impact, an indicative calculation assuming diesel has half the price elasticity of petrol suggests the excise reduction would stifle emission savings from diesel use by motorists, leading to only a 1% cumulative reduction by 2020 compared to a 8% cumulative reduction without the excise offset. This assumption has been used to demonstrate the impact of the excise reduction on diesel emissions in the table below.

Financial year	Carbon price A$/t CO_2	Diesel carbon price component Acpl (2005$)	Excise reduction based on diesel factor Acpl (2005$)	Net diesel price Acpl (2005$)	Annual emission impact kt CO_2	Cumulative emission impact kt CO_2
2010-11	23.00	6.8	6.8	124.6	0	0
2011-12	23.92	7.1	7.1	124.7	0	0
2012-13	24.88	7.4	7.4	124.7	0	0
2013-14	25.87	7.7	7.4	125.2	-1	-1
2014-15	26.91	8.0	7.4	125.8	-2	-3
2015-16	27.98	8.3	7.4	126.4	-3	-6
2016-17	29.10	8.6	7.4	127.0	-5	-12
2017-18	30.27	9.0	7.4	127.6	-7	-19
2018-19	31.48	9.3	7.4	128.4	-10	-28
2019-20	32.74	9.7	7.4	129.1	-12	-40

NB: Assumes diesel price of 124 Acpl without the CPRS. This is an arbitrary assumption for the purpose of illustration, not a forecast. Calculation applies only to diesel motorists receiving the excise reduction after 2013.

The following table demonstrates the reduction in emissions from diesel used by motorists when the excise reduction is not applied.

Financial year	Carbon price A$/t CO2	Diesel carbon price component Acpl (2005$)	Excise reduction based on diesel factor Acpl (2005$)	Net diesel price Acpl (2005$)	Annual emission impact kt CO2	Cumulative emission impact kt CO2
2010-11	23.00	6.8	0	130.83	-17	-17
2011-12	23.92	7.1	0	131.10	-27	-44
2012-13	24.88	7.4	0	131.38	-34	-78
2013-14	25.87	7.7	0	131.68	-40	-117
2014-15	26.91	8.0	0	131.99	-46	-164
2015-16	27.98	8.3	0	132.30	-53	-217
2016-17	29.10	8.6	0	132.64	-60	-277
2017-18	30.27	9.0	0	132.98	-67	-345
2018-19	31.48	9.3	0	133.34	-75	-420
2019-20	32.74	9.7	0	133.72	-83	-502

6. Motorists and certain other fuel users should be excluded from CPRS

The excise reduction means that certain consumers - primarily private motorists and commercial users not eligible for a fuel tax credit - have been effectively removed from the CPRS for many years. The clear policy intention of the White Paper is that these consumers be effectively excluded from CPRS coverage. Caltex therefore proposes the CPRS be amended to remove private motorists and other small consumers from the CPRS and to address the issue of emission reduction from these consumers through complementary measures.

There are various legislative options to achieve this but Caltex advocates either:

- permit liability for emissions for permits to apply only to emissions above the CPRS liability thresholds eg 25,000 tpa for a facility; or
- a carbon cost liability to apply to all consumers receiving a fuel tax credit, which in practice would include all emitters above the CPRS threshold.

In the former case, the liability would be to surrender permits, as for emissions from other sources. In the latter case, the fuel tax credit would be reduced by an amount calculated from historical carbon prices, in exactly the same way as proposed under the CPRS for the "CPRS fuel credit"; this would impose no additional administrative burden on consumers relative to the CPRS.

These options retain the largest or relatively large emitters from petroleum products within the CPRS and are administratively simple and consistent with current CPRS design.

Option 1: include fuel users above CPRS threshold

Activities that emit greenhouse gas emissions above the CPRS threshold (eg 25,000 tpa carbon dioxide equivalent for a facility) are required to report these emissions under NGERS, including emissions from petroleum products. Under the CPRS, there is an upstream point of obligation that requires fuel suppliers to purchase permits on behalf of customers. However, the CPRS provides an Obligation Transfer Number (OTN) mechanism to allow consumers of petroleum products to take on the permit liability for emissions from these fuels.

Over time, the Government contemplates moving from a voluntary liability for large emitters (via the OTN) to a mandatory liability, subject to business systems being developed by suppliers to differentiate between large users (with their own liability) and other users (for which suppliers would retain an upstream point of obligation.) It would be consistent with the philosophy of the CPRS that large end users take on liability for petroleum product emissions, as for other emissions. Under Caltex's proposal, this could occur immediately as there would be no upstream point of obligation for fuel suppliers so no requirement for the development of business systems by fuel suppliers.

Under this option, petroleum product users below the CPRS threshold would not have any permit liability nor would product suppliers. Emission reduction for these emitters would be managed through complementary measures.

One criticism of such a proposal could be the potential for businesses above the threshold to restructure their operations so as to avoid permit liability. This could be tackled in various ways: through rules relating to the emissions of related entities; by extension of the carbon liability to smaller emitters through option 2 below; or through the anti-avoidance provisions in the CPRS legislation.

Option 2: include all fuel users eligible for a fuel tax credit

The fuel tax credit scheme provides credits of up to 38.143 cpl for various types of fuel users. The maximum rate of 38.143 cpl applies to all taxable fuels including petrol and diesel used in agriculture, fishing, forestry, mining, marine transport, rail transport, nursing and medical businesses and electricity generation. A fuel tax credit of 19.07 cpl applies to construction, manufacturing, wholesale/retail, property management and landscaping until 1

July 2012, when the full 38.143 cpl credit applies. A credit of 17.143 cpl applies to vehicles above 4.5 tonnes gross vehicle mass travelling on public roads and using any taxable fuel including petrol and diesel.

Under Option 2, there would be no general increase in fuel costs as there would be no liability for fuel suppliers to purchase permits for customers' emissions. However, fuel tax credits would be reduced by an amount equal to the cost of carbon, thereby imposing a carbon cost on all fuel users eligible for a fuel tax credit.

Under the CPRS, a "CPRS fuel credit" will be paid to certain users in the above categories for one to three years to offset the impact of carbon prices on fuel costs (see CPRS White Paper p17-17). The reduction in fuel tax credits proposed above would be calculated and adjusted periodically in exactly the same way as the CPRS fuel credits ie on the average of auction prices over the previous six month period. This demonstrates the administrative practicality of Option 2.

The following table illustrates how the Caltex proposal would work for private motorists and heavy vehicles. The illustration is for diesel but would apply in the same way to petrol.

(All figures are cpl)	Private motorists without CPRS	Private motorists under CPRS	Private motorists under Caltex proposal	Heavy vehicles without CPRS	Heavy vehicles under CPRS	Heavy vehicles under Caltex proposal
Fuel price	120	120	120	120	120	120
plus carbon cost	0	10	0	0	10	0
Subtotal	120	130	120	120	130	120
less excise reduction	0	10	0	0	10	0
Subtotal	120	120	120	120	120	120
less fuel tax credit	0	0	0	17	7	7
Net price	120	120	120	103	113	113

All figures are in cents per litre, example is for diesel (ie excise reduction equals carbon price)

7. Complementary measures are required to reduce transport emissions

7.1 Summary of proposals

The operation of the market should remain the preferred option to help reduce emissions from vehicles, including the use of price mechanisms such as the CPRS. Complementary measures will be required regardless of whether all vehicles are inside or outside the CPRS. Caltex believes that changes in vehicle technology will be the key to reducing emissions, together with greater reliance on alternative fuels. Caltex proposes the following package of complementary measures:

- Monitor carbon efficiency (in grams/kilometre) against a set of voluntary targets that are comparable to other countries.
- Provide incentives to consumers to purchase the most fuel efficient vehicles available from manufacturers in Australia, Europe, the US and other regions through a “feebate” scheme that provides “cashbacks” for low emission vehicles, funded by fees on higher emission vehicles.
- Provide grants for research, development and demonstration of low emission vehicles and low carbon fuels, including biofuels, tailored to developing Australian manufacturing capability and fuel distribution infrastructure.
- Other policies including consumer education, improved public transport and road management, and better urban planning to reduce transport emissions.

7.2 Background to proposals

Carbon prices would do little to change motorists’ consumption behaviour. The necessary changes to reduce greenhouse gas emissions will come mainly from new vehicle technologies, with carbon prices having little impact on this technological change. Once new vehicle technology becomes economic drivers will switch from fossil fuels to electric vehicles and vehicles using other renewable non-fossil fuels, including biofuels. The focus of policy has to be on reducing emissions from consumption of liquid fuels, not their production, as emissions from use of liquid fuels are about 20 times emissions from production in Australian refineries.

Significantly higher future oil prices will have a greater impact than carbon prices as drivers seek to reduce the costs of running their cars and seek ways to achieve greater energy efficiency. For example, an increase in oil prices of US$50 per barrel is equivalent to a carbon price of about A$170 per tonne of carbon dioxide[1] and such an oil price increase seems quite plausible once the global economy resumes reasonable growth. Taxes also play a part in driving vehicle efficiency as evidenced by the significantly greater fuel efficiency of European vs US vehicles due at least in part to much higher fuel prices.

While the CPRS will play a role in addressing climate change, carbon prices will have very little impact on fuel demand because it is fairly inelastic with respect to price and taxes are already high. In order to reduce the emissions from vehicle use in Australia, it is necessary to examine vehicle technology, new fuel sources and non-price measures such as improved public transport, infrastructure and urban design. Australia can benefit from the experience of other countries, with the European Union an example of achieving reductions through complementary measures. Transport is not part of the EU emissions trading scheme.

The 12 million passenger vehicles in Australia constitute 77% of the fleet.[2] The average age of the passenger vehicle fleet in 2007 was 9.7 years, with about 20% more than 15 years old. In recent years, the composition of new passenger vehicle sales has changed significantly, with a marked increase in the sale of smaller cars.

[1] At exchange rate of 0.80 US$/AU$
[2] Australian Bureau of Statistics, *Motor Vehicle Census*, 2008

It is widely accepted that the elasticity of fuel use with respect to petrol prices is very low in the short term, as vehicle owners often have limited opportunity to change travel patterns or switch to more fuel efficient vehicles. The demand for road transport tends to respond slowly to changes in the price of fuel.

The CPRS is expected to provide a cost effective approach to reducing CO_2 emissions on an economy wide basis but will not have a significant impact on emissions from transport. Governments in Australia have implemented a range of measures aimed at reducing CO_2 emissions from transport including National Average Fuel Consumption targets, the Alternative Fuels Conversion Program and government biofuels measures.[3] The impact of these measures is estimated to be 1.8 Mt CO_2-e per annum over the Kyoto period and 5.0 Mt CO_2-e in 2020.[4] As a percentage of total road transport emissions these projected savings are small, representing 2% in 2010 and 4% in 2020.

Modelling for the Future Fuels Forum projected that a greater shift toward public transport, rail and sea freight and lighter vehicles could, by 2050, reduce kilometres travelled by 30 per cent and greenhouse gas emissions by 17 per cent.[5]

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, the 10 to 15 years it takes for new vehicles to become dominant in the vehicle fleet means that it will take considerable time to achieve significant change to the greenhouse gas emissions of the vehicle fleet from the introduction of new vehicle technologies and/or some fuels.

7.3 Increase the supply of low emission vehicles

7.3.1 Vehicle fuel efficiency

Vehicle technology plays a key role in reducing vehicle CO_2 emissions. The European Commission has noted that "improvements in car technology have delivered the bulk of the CO_2 reductions" to date.[6] A 2006 report prepared for European transport ministers also noted that "most future CO_2 emission reductions are expected to come from new technologies, and improvements of currently available technologies".[7]

The *King Review*, a report commissioned by the UK Government, concludes that 30% fuel consumption savings are achievable for the average new vehicle in the short (5–10 years) time frame.[8] This is consistent with other reports, including a recent analysis prepared for the OECD's International Transport Forum (ITF) which indicated that efficiency gains of around 25% should be possible for petrol vehicles from engine improvements alone.[9]

A 2007 US report examined the feasibility of achieving a 50% reduction in fuel consumption in US cars by 2035, and concluded that such an objective was possible using a combination of incremental improvements in engines and transmissions, reductions in drag, rolling resistance, weight and size, and deployment of more efficient alternative power trains.[10]

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[3] Department of Climate Change, *Transport Sector Greenhouse Gas Emissions Projections 2007*, pg iv
[4] Department of Climate Change, *Transport Sector Greenhouse Gas Emissions Projections 2007*, pg iii
[5] CSIRO, "Fuel for thought: The future of transport fuels", June 2008, pg 33
[6] European Commission, *Results of the review of the Community Strategy to reduce CO_2 emissions from passenger cars and light commercial vehicles*, 2007.
[7] European Conference of Ministers of Transport, *Cost Effectiveness of CO_2 Mitigation in Transport, prepared by CE Netherlands for ECMT*, 2006
[8] King, *The King Review of low carbon cars – Part 1: the potential for CO_2 reduction*, 2007.
[9] Plotkin, *Examining Fuel Economy and Carbon Standards for Light Vehicles,* Discussion Paper No. 2007-1, December 2007, OECD/ITF Joint Transport Research Centre, 2007.
[10] Cheah et al, *Factor of two: Halving the Fuel Consumption of New U.S. Automobiles by 2035* MIT, 2007.

Vehicle manufacturers have been responding to the challenge of more efficient vehicles, as evidenced by the "green" offerings at recent motor shows and lower emission vehicles entering new car showrooms.

7.3.2 CO_2 emissions standards for new light vehicles

The International Energy Agency (IEA), in its 2007 advice to the G8 summit, agreed that mandatory fuel efficiency standards for light vehicles is a "necessary condition" for delivering significant energy savings in the transport sector.[11,12] A recent international forum also concluded that "a fuel economy standard is a key component of a policy package that stimulates the use of technology to improve fuel economy".[13] However, Australia is largely a technology taker, which gives us the opportunity to benefit from the outcomes of overseas regulation without the risk of ineffective or distortionary regulation.

A voluntary National Average Carbon Emission (NACE) target for new cars and light commercial vehicles has been in place in Australia, in various forms, since the late 1970s. While there have been improvements in the new car fleet over time, the previous targets have not been achieved. The COAG Vehicle Fuel Efficiency Working Group reported in 2008 that though the NACE saw a 10% improvement from 2002 to 2007, the voluntary target was less responsible than changing buyer preferences to smaller cars.[14] However, it could be argued that changing consumer preferences are the means of achieving voluntary targets as manufacturers and importers can't dictate what vehicles consumers should purchase.

The European Union has had its own voluntary target for emissions standards in place since 1995. The EU recently concluded that their voluntary agreement had not succeeded[15] and has proposed a legislative approach. The EU has agreed to setting a five year mandatory target for passenger cars of 130gCO_2/km by 2012, the toughest standard so far proposed internationally.[16] From 2012, 65% of each manufacturer's newly registered cars must comply on average with the target. This will rise to 75% in 2013, 80% in 2014, and 100% from 2015 onwards. A target of 95g/km is set for the year 2020. Manufacturers will be charged an excess emissions premium if the average emissions of their vehicles are above the permitted limits.

This 130gCO_2/km target represents a 25% reduction from 2007 levels. A target for a rate of improvement for Australia similar to the EU should be achievable. An independent assessment in 2004 recommended an Australian target of 214gCO_2/km for all light vehicles by 2010.[17] The NACE of Australian cars was 226.1g CO_2/km in 2007,[18] so a 25% reduction would mean an Australian target of 170gCO_2/km.

The Vehicle Fuel Efficiency Working Group reported in 2008 that "at face value Australia would appear to have considerable scope for improvement in the short-medium term – at least 30% – without markedly affecting model mix.[19]"

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[11] Plotkin, *Examining Fuel Economy and Carbon Standards for Light Vehicles,* Discussion Paper No. 2007-1, December 2007, OECD/ITF Joint Transport Research Centre, 2007.
[12] U.S. Government Accountability Office, *Passenger Vehicle Fuel Economy – Preliminary Observations on Corporate Average Fuel Economy Standards*, 2007.
[13] International Transport Forum, *Transport and Energy – The Challenge of Climate Change, Research Findings*, Leipzig, May 2008.
[14] Vehicle Fuel Efficiency Working Group, *Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles,* pg 39
[15] European Commission, *Results of the review of the Community Strategy to reduce CO_2 emissions from passenger cars and light commercial vehicles*, 2007.
[16] Vehicle Fuel Efficiency Working Group, *Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles,* pg 41
[17] Tasman, *National Average Carbon Dioxide Emissions by Light Vehicles – A possible target for new light vehicles for 2010*, 2004.
[18] Federal Chamber of Automotive Industries, "Garnaut Climate Change Review 2008", pg
[19] Vehicle Fuel Efficiency Working Group, *Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles,* pg 44

The European Commission (EC) estimates that compliance with its proposed 130g/km target by 2012 may increase vehicle purchase prices by up to 6%, while noting that this level of increase will be compensated by lifetime fuel savings.[20] A recent presentation by the EC[21] noted that on average, consumers would pay an additional €1100–1300[22] per vehicle, but on average €2700 less for fuel over the vehicle's life.

In the US, the new 2015 fuel economy standards are expected to cost on average US$650[23] per car and US$979 per light truck. The US Department of Transport also estimates that (based on prices of US$2.26 per gallon in 2016) that the increased prices on passenger cars would be recovered from fuel savings in 56 months (50 months for light trucks).[24]

Caltex proposes the current voluntary approach should be continued but with a target NACE of 170gCO_2/km by 2015 and 125g/km by 2020. The 2015 target would represent a 25% reduction over the reported 2007 NACE of 226gCO_2/km. An alternative 2020 target could be proposed after stakeholder consultation.

The percentage reductions for 2015 and 2020 are about the same as for European manufacturers. The targets would allow for vehicle carbon efficiency improvements to be tracked and for policy adjustments to be made in order to achieve the targets.

7.3.3 Transitional policies for vehicle manufacturing

The car manufacturing industry in Australia produced 19.4% of the new passenger cars sold in Australia, down from 36.1% in 1998.

Australia can benefit from technological advances occurring internationally, particularly in Japan which has a NACE-equivalent target of 171gCO_2/km for 2015[25], has committed to providing cars to meet the European standard and is an important contributor to Australia's car sales.[26] Even utilising this change in technology, Australian manufacturers may bear some additional cost to transition to greener vehicles that meet the proposed NACE targets.

The Australian Government has already proposed the 5 year, $1.3 billion Green Car Innovation Fund, as part of the 10 year, $6.2 billion New Car Plan for a Greener Future. A portion of this has already been directed to Toyota to develop the hybrid Camry[27] and to GMH to develop its E85 vehicles.

Caltex proposes that the government should provide support to manufacturers to assist transition towards low emission light vehicles, together with support for the provision of fuelling infrastructure if required.

7.4 Increase demand for low emission vehicles

The risks that manufacturers take in producing lower emission vehicles for the market are reduced if there are additional incentives for consumers to purchase these vehicles (in addition to fuel savings). As noted in the 2007 International Transport Forum report,

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[20] European Commission, *Questions and answers on the proposed regulation to reduce CO_2 emissions from cars*, December 2007.
[21] European Commission, *The EU Policy on CO_2 and Cars presentation by Gunter Hormandinger (EC) to FIA Symposium Towards a Global Approach to Automotive Fuel Economy, Paris.* May, 2008.
[22] The AU$ is worth approximately EU€0.53.
[23] The AU$ is worth approximately US$0.72.
[24] National Highway Traffic Safety Administration, *Average Fuel Economy Standards Passenger Cars and Light Trucks Model Years 2001-2015,* 2008.
[25] Japanese Ministry of Land, Infrastructure and Transport, *Japan's Fuel Efficiency Regulation for Vehicles*, November 2007.
[26] Department of Industry, Tourism and Resources, *Key Automotive Statistics 2003*, p12
[27] Vehicle Fuel Efficiency Working Group, *Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles,* pg 84

"economic incentives that align consumer interests with the vehicle manufacturer's responsibilities under standards make ambitious standards politically feasible.[28]"

Economic incentives fall into two categories: at time of new vehicle purchase (eg stamp duty and feebates) and annual (eg registration fees and annual carbon charges.)

7.4.1 Direct financial incentives/disincentives based on vehicle CO_2 emissions

A 2002 study for the European Commission Directorate-General for the Environment found that from an average new car emissions level of 172gCO_2/km in the year 2000, implementation of a CO_2 differentiated vehicle taxation scheme would result in an average 5% reduction in new car emissions by 2008.[29]

A number of reports suggest that policies which lead to a better informed consumer, combined with incentives to encourage manufacturers to supply improved technology vehicles, can deliver significant emissions and fuel consumption improvements. The IEA adds that even modest incentives can send strong signals to both consumers and vehicle manufacturers.[30]

Analogous schemes which encourage behavioural change towards the purchase of vehicles that emit lower levels of air pollutants have been found to be effective. Under the annual vehicle tax incentive scheme introduced in Germany in mid-1997, the proportion of low emission passenger cars in the fleet increased from less than 1% to 70% of new vehicle sales within one year.[31]

The State of California suggests that a feebate scheme could lead to significant improvement, over time, in the overall fuel efficiency of the light vehicle fleet. Their modelling suggests that a hypothetical feebate scheme could deliver as much as a 26% improvement on 2002 figures in the overall fuel efficiency of the light vehicle by 2016.[32]

The Belgian government provides a tax reduction of up to 15% of the vehicle price (maximum €4350) to individuals who purchase cars with emissions of less than 105gCO_2/km and up to 3% of the vehicle price (maximum €810) for cars with emissions of between 105 and 115gCO_2/km.

The US addresses the penalty end of the spectrum through the application of a "gas guzzler" tax to vehicles which fail to meet their minimum fuel efficiency standard.

The available analyses suggest that a feebate scheme has the potential to improve fuel economy and lower emissions by addressing consumer undervaluation of fuel savings, raising consumer awareness of the link between fuel consumption and CO_2 emissions and providing direct incentives for manufacturers to produce lower emission vehicles.[33] A feebate scheme, directly linked to CO_2 emissions performance, also has the advantage of transparency and a clear relationship between the rebate and the outcome. A feebate would also have an effect on manufacturers moving to improve vehicle fuel economy.[34]

By incentivising the purchase of a low emission vehicle and disincentivising the purchase of a high emission vehicle through a "feebate" as a once off transaction at the time of vehicle

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[28] Plotkin, *Examining Fuel Economy and Carbon Standards for Light Vehicles Discussion Paper No. 2007–1*, December 2007.
[29] European Commission's Directorate-General for Environment, "Fiscal Measures to Reduce CO2 Emissions from New Passenger Cars", January 2002.
[30] International Energy Agency, *Saving Oil and Reducing CO_2 Emissions in Transport – Options and Strategies*, International Energy Agency/OECD, Paris, 2001.
[31] European Conference of Ministers of Transport Group on Transport and Environment, *Variabilisation and Differentiation Strategies in Road Taxation – Theoretical and Empirical Analysis*, June 2000.
[32] McManus, *Economic analysis of feebates to reduce greenhouse gas emissions from light vehicles for California*, University of Michigan Transportation Research Institute, 2007.
[33] Langer, *Vehicle Efficiency Incentives: An Update of Feebates for States*, 2005.
[34] Langer, *Vehicle Efficiency Incentives: An Update of Feebates for States*, 2005.

purchase, consumer purchasing behaviour could be driven towards lower emission vehicles. Purchasers of low emission vehicles would receive a “cashback” but purchasers of high emission vehicles (typically more expensive vehicles) would pay an additional fee. The current luxury car tax contains elements of such a scheme albeit without the “cashback” component. This scheme would operate nationally through the Australian government.

Caltex proposes that consumer uptake of low emission vehicles should be encouraged by the establishment of a balanced set of financial incentives and disincentives based on the CO_2 emissions performance of a vehicle, in the form of “feebates”. The scheme should be phased in to allow consumers time to adjust vehicle choices and allow adjustment time for local manufacturers of larger vehicles.

In addition, existing State and Territory stamp duty and/or registration charges for light motor vehicles (purchased from the date of the scheme’s introduction) should be realigned on a sliding scale based on CO_2 emissions. These schemes would operate at the state level although they should be nationally coordinated and complement the national scheme.

7.4.2 Improve consumer awareness

Australia’s current key consumer awareness mechanisms are mandatory labelling for all new vehicles irrespective of fuel source and the Green Vehicle Guide website which provides specific information on all light vehicles under 3.5 tonnes produced since mid-2004.Consumer information and education programs are useful in providing accurate comparative information on vehicle carbon efficiencies.

Caltex proposes such programs should be maintained and extended to complement the feebate scheme.

7.5 Increase use of renewable fuels

7.5.1 Overview

Transport in Australia, as in much of the world, is highly dependent on petroleum-based fuels, with alternatives accounting for only three per cent of total fuel consumption. Road travel contributes 89 per cent of total transport greenhouse gas emissions.[35] Fluctuating oil prices, and higher prices associated with tightening oil supply, should see a move towards the greater uptake of biofuels and synthetic fuels with lower life cycle emissions.[36]

The introduction of emissions trading alone is unlikely to significantly change the transport sector. Even a A\$100/tCO_2e permit price would only increase the cost of fuel by around A\$0.25/L, which is significantly less than the impact of oil price movements in the four years to 2008. Nevertheless, modelling indicates there will be a steady shift toward low emission fuels and vehicles.[37]

In the next ten years it is projected that electricity, diesel, liquefied petroleum gas (LPG) and compressed natural gas (particularly in freight) will be the first fuels to expand their use, particularly if there is an abrupt decline in the availability of international oil supplies. Only these among the non-conventional fuels have the capacity to expand their availability into the transport market in a relatively short time frame due to existing production and distribution infrastructure. However, even these fuels will take considerable time to be fully commercialised.

Longer term, beyond 2020, advanced biofuels that limit competition with food production, hydrogen and synthetic fuels derived from gas and coal (using carbon capture and storage) are also expected to come into use once production infrastructure has had sufficient time to

[35] Department of Climate Change, *Transport Sector Greenhouse Gas Emissions Projections*, 2007.
[36] CSIRO, “Fuel for thought: The future of transport fuels”, June 2008
[37] CSIRO, “Fuel for thought: The future of transport fuels”, June 2008

scale up. The extent of their use will depend on primary fuel prices and government emission targets.

7.5.2 Electric vehicles

Vehicles relying on electricity as the main or partial source of fuel could be on the market within five years as built-for-purpose models. This could present near-zero emission transport fuels when combined with renewable electricity generation.

Petrol/electric hybrid vehicles represented 0.6% of sales in the combined passenger car and SUV market in 2007.[38] Hybrids are still a niche market, but announcements by vehicle manufacturers worldwide indicate that new fully electric and plug-in models are due to become available between 2010 and 2012.[39] Modelling for the Future Fuels Forum indicates plug-in electric vehicles (with or without an internal combustion engine for longer range driving) could account for up to two thirds of kilometres travelled in Australia by 2050.[40]

The King Review suggests that greater utilisation of hybrid technologies could reduce emissions by 20–35% for mild hybrids, 25–50% for full hybrids, and potentially greater than 50% for plug in hybrids.[41]

7.5.3 Biofuels

Biofuels and biofuel blends promise to provide less greenhouse intensive alternatives to petroleum fuels, depending on feedstock and production methods.

A 10% ethanol blend in petrol could reduce full life cycle ("well to wheel") greenhouse gas emissions by 2 to 6% relative to petrol, depending on the technology and feedstock. Second generation biofuels present further opportunities, with feedstocks such as algae and the lignocellulosic parts of biomass potentially available, which will avoid pressure on food crops for use as biofuels feedstocks. Algae based biodiesel has significantly lower life cycle emissions and so if this scenario were to occur it would lead to significantly more CO_2 emissions abatement in the transport sector – approximately $10MtCO_2e$.[42] Other biodiesel feedstocks also offer substantial emissions savings. Australia is an attractive environment for biofuels production, due to the availability of land other than prime agricultural land.

In 2007 California adopted a Low Carbon Fuel Standard (LCFS). The LCFS requires fuel providers to ensure that the mix of fuel they sell in the California market meets, on average, a declining target for carbon emissions. By 2020, the LCFS intends to produce a 10 percent reduction in greenhouse gas emissions from the production and use of fuel in passenger vehicles in California.[43] The LCFS uses market measures which allow fuel suppliers to respond to consumer demand in producing the fuel mix, with penalties for non-compliance. However, Caltex does not support such schemes for Australia's very different market.

Production of biofuels in Australia is currently supported by production incentives from the Australian Government which effectively negate the excise costs of ethanol and biodiesel, providing competitive pricing for the product, the intention of which is to incentivise consumer uptake. Current legislation proposes a phasing out of this tax concession, which in practice is likely to disincentivise further investment in the industry and reduce the price competitiveness of biofuels, which is currently the primary mechanism for consumer takeup.

The NSW Government has a mandate for ethanol sales in place and the Queensland Government is considering implementing a similar mandate although with a target rate of 5% of petrol volume compared with an E10 mandate (for regular unleaded petrol) in NSW. These

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[38] Australian Bureau of Statistics, *Motor Vehicle Census,* 2008
[39] CSIRO, "Fuel for thought: The future of transport fuels", June 2008
[40] CSIRO, "Fuel for thought: The future of transport fuels", June 2008
[41] King, *The King Review of low carbon cars – Part 1: the potential for CO_2 reduction*, 2007.
[42] CSIRO, "Fuel for thought: The future of transport fuels", June 2008
[43] California White Paper, "The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy"

policies place the onus on fuel suppliers and currently do not include demand side incentives for consumers.

Ethanol supply in NSW and Queensland faces ongoing challenges, with producers currently unable to meet the supply side mandates imposed on fuel suppliers. New plants and increased production or imports are necessary to enable Australia to embrace biofuels to the extent which will see a marked reduction in emissions.

Caltex proposes that the government should incentivise the development of the biofuels industry by providing favourable tax treatment to biofuels compared with other liquid fuels. For example, the concessional excise of 12.5cpl for ethanol would be phased in over the period 2011-15. In addition, consideration should be given by the Australian government to the provision of capital grants or loan guarantees for biofuels production facilities and distribution infrastructure. Funds for marketing to improve consumer awareness should be provided for the biofuels industry nationwide.