Australian Government

Biofuels Taskforce

REPORT OF THE BIOFUELS TASKFORCE to the Prime Minister

August 2005

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ISBN 0646-45241-X

Web address of this report: www.pmc.gov.au/biofuels

Produced by the Biofuels Taskforce
Printed by Pirion (02) 6280 5410
Edited by WordsWorth Writing (02) 6232 7511

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Synopsis

- The Taskforce analysed consumer confidence in biofuels, and assessed that consumer confidence in ethanol, while having slightly improved, is still a significant problem for the ethanol industry. Biodiesel does not have the same consumer confidence issues associated with ethanol petrol blends. However, the Taskforce notes that confidence can be fragile and biofuel suppliers will need to ensure that consumers are properly advised on fuel blends and take care to meet fuel quality standards.

- Almost all post-1986 vehicles can operate satisfactorily on E10. As was known when setting the fuel standard in 2003, E10 is not optimal for vehicles that have carburettors or mechanical fuel injectors, mainly pre-1986 vehicles.

- As part of a broader campaign to assist in restoring confidence, and to assist vehicle manufacturers in determining the suitability of their vehicles for E10, further E10 vehicle operability testing is warranted.

- For post-1986 cars using E10 ULP, fuel consumption increases in the order of 2.6–2.8%. Discounted pricing strategies that reflected this would assist in encouraging uptake of ethanol-blended fuel.

- As part of an awareness campaign, the Federal Chamber of Automotive Industries (FCAI) vehicle list related to E10 suitability could be revised into a simplified format and confined to clear and accurate statements about the suitability of vehicles to use ethanol blend fuels.

- The Taskforce considers that there is no reason to reduce the maximum ethanol limit in petrol from 10% to 5%.

- Responsibility for consumer information about the fitness of fuel for its intended purpose rests mainly with fuel retailers and suppliers. In the light of that, the current fuel ethanol information standard could be simplified, primarily to require notification that the fuel contains ethanol at up to 10%.

- Given that an even higher percentage of cars can use E5 than E10, the information standard for fuel ethanol could be further modified so that labelling is required only above 5% ethanol in petrol, rather than 1% as at present. As in Europe, this would give fuel companies flexibility to use up to 5% ethanol as a fuel extender or octane enhancer, without the costs of dispensing E5 as a separate blend.

- A greater focus on industry-based information dissemination and marketing/promotional activity may improve consumer confidence in ethanol blend fuels.

- As B5 meets the diesel fuel standard, there is no justification for labelling B5 blends. Labelling higher biodiesel blends is a necessary piece of consumer information. Such labelling should be consistent with the proposed simplified ethanol label information standard.

- The government could work with the Australian fuels and transport industries to settle on B5, B20 and B100 as the standard forms of biodiesel, in part through developing a standard for blends above B5.

- There appears to be limited testing of the suitability of biodiesel for use in engines. The Taskforce notes, however, that there is no diesel engine manufacturing capacity in Australia and that, as a result, engine manufacturers will need to be guided by overseas testing and practice.

Ethanol

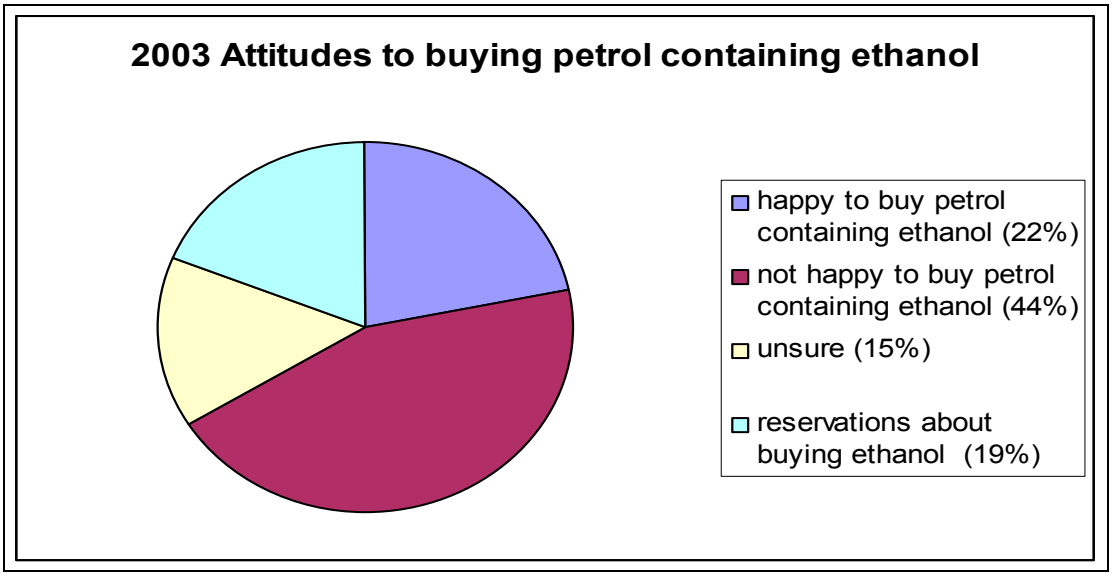
Consumer confidence remains a key barrier to the uptake of ethanol-blended fuels in Australia. Stakeholders, including representatives of the ethanol industry, oil companies and consumer groups, consider that consumer confidence needs to be addressed urgently if an Australian ethanol industry is to be further developed. A key aspect of consumer confidence is clear advice on which vehicles and engines can use ethanol blends.

Background

Consumer confidence was damaged significantly in 2002–2003 after reports of the distribution of high-concentration (20–30%) ethanol blends around Sydney, and widely publicised allegations of vehicle damage. At the time, the Australian Automobile Association (AAA) and other consumer advocates became concerned about the potential operability and additional motoring costs associated with ethanol-blended fuels.

In 2003, ANOP, on behalf of the AAA, conducted research on consumer sentiment. The research found that 22% of motorists were happy to buy petrol containing ethanol, while 44% were not, 19% had reservations and 15% were unsure (Figure 9). Of those who were not happy to buy ethanol or had reservations, 55% cited concerns about vehicle damage.

Figure 9 Attitudes to buying petrol containing ethanol, 2003



Source: ANOP (2003)

During 2003, evidence of low consumer confidence could also be seen in the suspension of petroleum company trials in Queensland. The 'no ethanol' signs, which appeared at many retail petroleum sites, reinforced low consumer confidence.

In 2002, BP received a grant under the Greenhouse Gas Abatement Programme (GGAP) for the production and marketing of E10 in the Brisbane region. Phase one, which commenced in May 2002, was a marketing trial at six Brisbane service stations testing E10 as 91 RON and 95 RON, with most volume sold as 91 RON. BP advised that phase one of the trial was technically very successful, with about 10 ML of E10 sold. However, in early 2003, BP suspended its trials in the wake of loss of confidence associated with public concerns that ethanol blends were causing vehicle damage in the Sydney region.

A 10% ethanol limit was announced by the government on 11 April 2003 and came into force on 1 July 2003 as an amendment to the fuel quality standard for petrol. This followed testing by the Orbital Engine Company (Orbital 2004a,b) of 20% ethanol in petrol (E20) blends on passenger vehicles and marine outboards. Orbital also tested outboards and other small non-automotive engines on E10.

Vehicle testing

APACE 1998 Report

The APACE report *Intensive field trial of ethanol/petrol blend in vehicles* (APACE 1998) compared E10 and regular unleaded petrol in terms of: greenhouse gas and noxious emissions; fuel consumption; vehicle driveability; fuel system component material compatibility; engine wear; and water tolerance.

In terms of hot and cold driveability, the research found that E10 blends reduced the tendency for engine knock under both hot and cold conditions, and observed no other significant differences. In terms of materials compatibility, APACE found no

discernible effect on any plastic or elastomer materials, and no discernible corrosion in fuel-wetted metal parts such as fuel tanks, lines, or pressure regulators. In terms of engine wear, the research found no additional increase in wear metals or decrease in the total base number of the lubricating oil, and no additional or unusual wear than would normally be expected.

The APACE study confirmed that most cars in the fleet can operate satisfactorily on E10. The only adverse APACE findings for E10 related to water tolerance. The research found that pre-1986 vehicles are more prone to phase separation when first fuelled with E10. The research also found that subsequent E10 fuelling prevents water accumulation and thus separation is not a concern, provided that good housekeeping is adopted. The research concluded that: the quality of ethanol produced and stored in its neat form must be of a high standard and the water content maintained below 1.25% w/w; and an ethanol compatible water detecting paste must be used to establish the water content of underground storage tanks.

The NSW EPA provided figures to the Taskforce indicating that pre-1986 models represent about 4.09% of the number of cars in the 2005 Sydney fleet and 1.98% of the kilometres travelled (because of older cars driving fewer kilometres).

Orbital's 2004 E20 Report

Orbital's passenger vehicle study (Orbital 2004b) focused on the impact of E20 on vehicle performance in terms of emissions and operability, and on the durability impacts on post-1986 vehicles. Overall, impacts on post-1986 vehicles were found to be small.

Orbital's testing concluded that E20 could cause problems (including hesitation and problems with starting) in very cold conditions, and deterioration of metal, plastic and rubber components, particularly in pre-1986 vehicles. Over mileage, the testing subsequently found increased tailpipe emissions and greater levels of engine wear in vehicles operating with E20 compared with those operating with petrol.

The fuel system assessments highlighted some small differences in durability performance between the two fuels; the most significant finding related to the 'fuel filter pressure drop' assessment. While no changes were identified as significant in absolute terms (that is, there were no blockages or failures), Orbital found that the filter systems operating with E20 were relatively less restrictive after the mileage accumulation cycle than those systems operating on gasoline. This suggested that E20 might affect the filter element. The fuel pumps running on E20 generally had a slightly higher relative increase in electrical current draw after the mileage accumulation cycle. The trend was for current draw to increase as the pumps wore. Orbital argued that the relative increase in the E20 fuel pumps could suggest an increased level of wear.

The vehicles that completed the 80,000-kilometre durability assessment did so without major incidents related to the fuel type used. However, there was some evidence suggesting differences in both wear and deposits. Two of the vehicles tested also showed problems with their catalytic converters, evidenced by increasing emissions. Greater levels of wear were observed for engines run on E20 compared with those run on gasoline. Even though wear levels were small in absolute terms, differences could be seen in the piston skirt wear, cylinder bore wear, valve seat recession and piston ring gaps.

Orbital also found that the vehicles tested on E20 had greater levels of deposit on the intake and exhaust port, piston rings, skirt and crown and exhaust and/or intake valves. The effects of the mileage accumulation cycle on the fuel system in terms of deposits and durability were small, with no major failures or changes observed that would compromise the vehicle system's performance. There were no significant fuel specific trends observed in this area.

The APACE 1998 report and the Orbital E20 study compared

The method used for the Orbital testing was different from the 1998 APACE report. While the Orbital study tested five vehicle pairs run over the scheduled 80,000-kilometre accumulation for all assessment categories, the APACE report tested four vehicles in some assessment categories, and assessed only one catalytic converter for example. It is unclear how accurately the assessed vehicles represented the Australian vehicle fleet and there was no formal drive cycle. For the 2004 Orbital study, new cars were selected on the basis of sales volume in the Australian market for 2001. While the Orbital study undertook testing on both imported and domestically manufactured vehicles, the APACE study tested domestically built vehicles only.

The Taskforce, however, notes that there is limited recent testing on the suitability of the current Australian vehicle fleet for E10 blend fuels. While the APACE report was a valuable study, it was done seven years ago and was not representative of the Australian vehicle fleet, and the Orbital work tested E20, which is now not a legal fuel blend.

The AAA has indicated its willingness to undertake in-service testing on the suitability of E10 for the Australian vehicle fleet with government support. The AAA believes that a testing programme would cost about $1 million.

Conclusion 32: *Almost all post-1986 vehicles can operate satisfactorily on E10. As was known when setting the fuel standard in 2003, E10 is not optimal for vehicles that have carburettors or mechanical fuel injectors—mainly pre-1986 vehicles. Drivers should seek advice from manufactures about the suitability of fuel types if they are not certain about their particular model.*

Conclusion 33: *As part of a broader campaign to assist in restoring confidence, further testing could usefully validate the suitability of vehicles in the current fleet to operate on E10.*

Marine outboard and other small non-automotive engine testing

Orbital also tested a sample of two-stroke outboard marine engines with petrol containing both E10 and E20 (Orbital 2003). For E20, Orbital found that, during wide-open throttle acceleration, the two-stroke outboard marine engines would stall. Orbital also found that engine misfire frequency increased and that it was hard to maintain a constant engine operating speed during the in-gear motoring test. Orbital argued that this engine stall characteristic potentially adversely affects engine operation.

In general, Orbital detected little performance difference when comparing two-stroke outboard marine engines run on E10 versus regular unleaded petrol. However, Orbital did find during the demand of wide-open throttle acceleration following the in-gear low-speed test at the lowest tested speed, that one of the ten tested engines stalled. For both E10 and E20, Orbital found that those engines that had stalled could be restarted immediately. As ethanol blends are prone to phase separation if there is water in the tank, use of ethanol blends in marine environments requires care.

Victa Lawncare, a major supplier of lawnmowers in Australia, in 2003 reported experiencing problems related to ethanol blends with its two-stroke engines. Victa has argued that the high percentage blends of ethanol in circulation at the time affected many components, especially plastic and rubber parts. Victa saw an increase in warranty claims, and reported a higher incidence of concerns about engine performance.

Conclusion 34: *The Taskforce notes that, while the 2003 E20 Orbital study was important in determining the ethanol limit and the suitability of certain engines for using ethanol, it is now of limited relevance to an assessment of vehicle operability at 10% ethanol blends. The E10 study of two-stroke outboard and other small engines suggests that E10 may not be suitable for two-stroke engines. The risk of phase separation in ethanol blends, and the resulting risk of these smaller engines stalling, means that use of ethanol blends requires care in a marine environment.*

Fuel consumption

Fuel consumption is another factor that may impede consumers purchasing ethanol blend fuels if they are sold at equivalent prices to petrol. The ANOP surveys in both 2003 and 2005 identified consumer concern about vehicle performance as a specific reason for their lack of interest in ethanol fuel.

More E10 fuel is required than petrol to do the same amount of work, because ethanol has a lower energy density (68% compared with petrol in terms of MJ/kg). Therefore, fuel consumption should theoretically increase when ethanol is blended with petrol due to the lower energy content of ethanol. Post-1986 vehicles that operate with E10 in closed loop control should see a theoretical increase in fuel consumption of approximately 3.6% in volumetric terms, or 4.3% in mass terms.

The Orbital Engine Company examined the fuel consumption (petrol and E10) of vehicles then representative of the Australian fleet. Five post-1986 vehicles and four pre-1986 vehicles were evaluated for the experimental study. The study found fuel consumption (in terms of L/100 km) to increase for *post-1986 vehicles* using E10 over both the city and highway drive cycles by 2.9% and 2.7%, respectively. The variation between theoretical and actual fuel consumption may be the result of subtle differences in both the calibration strategies and the engine management system adaptation process. Any improvement in combustion efficiency is of a second order compared to the relative change in energy content of the two fuels. Oxygen entrained with the fuel mixture may well improve the flame propagation, and hence the thermal efficiency, but its relative magnitude would appear to be small (Orbital Engine Company, personal communication 2005).

On the other hand, fuel consumption was found to be unchanged for pre-1986 vehicles, operating open loop, probably because of the leaner air/fuel mixture. This finding agrees with Orbital's E20 literature review (Orbital, 2002).

In summary, the Orbital study suggests that the impact of E10 on the fuel consumption of pre-1986 vehicles (with open-loop fuel systems) may be negligible, but that there will be an increase in consumption of typically 2.8% for post-1986 vehicles, because of their closed-loop fuel control. APACE Research found that E10 increases fuel consumption by 2.6% for both the city and highway cycles.

The Taskforce also considered the findings of the 2004 AEA Technology Report[46] but found that, in relation to fuel consumption, there were no overall statistically significant results from this study. Six cars were tested, two of which showed statistically significant results, one for increased fuel consumption and one for decreased fuel consumption.

The Manildra Group's submission noted that the use of ethanol blend fuel increases the combustion efficiency of the fuel and argued that consumers do not detect a difference in their fuel economy. While it is likely that a consumer would find it difficult to detect a 2–3% difference in fuel economy, available test data suggests these increases are real for post-1986 vehicles. The Taskforce notes that the actual increases in fuel consumption are lower than what would have been theoretically expected.

From a consumer perspective, on a pure energy content it is reasonable to expect that this increase in fuel consumption should translate into ethanol blend fuels costing 2–3% less at the pump. The Taskforce notes that ethanol fuels are, in some cases, being marketed at an equivalent price to traditional fuels. While this is a commercial decision on the part of fuel suppliers, a pricing strategy reflecting increased fuel consumption with E10 could assist in encouraging uptake.

Conclusion 35: *For post-1986 fuel-injected cars using E10 ULP, fuel consumption increases in the order of 2–3%. Pricing strategies reflecting this would assist in encouraging uptake of ethanol blend fuel.*

FCAI vehicle list

As part of the work of the Ethanol Confidence Working Group, established in May 2003 to assist in building consumer confidence, the Federal Chamber of Automotive Industries (FCAI) released detailed advice as to which vehicles could operate satisfactorily on E10 blends. This advice is available at Appendix 5.

The list provides advice from individual vehicle manufacturers and importers on which vehicle models will, may not or do not operate satisfactorily on E10. The list was meant to be an authoritative statement of manufacturers' advice on the suitability of E10 for their vehicles. The FCAI endorsed the statement that 'most new and many' pre-1986 vehicles can run on E10 blend petrol. Local manufacturers Holden, Ford,

[46] Ethanol Emissions Testing for the UK Department for Transport, Local Government and the Regions by AEA Technology, March 2002, revised in September 2004

Toyota and Mitsubishi indicated that their petrol engine vehicles since 1986 will operate satisfactorily on E10, with the exception of some specific models. The list also gives technical reasons as to why the manufacturer does not consider certain models suitable for E10.

The biofuels industry has argued that the advice provided by manufacturers in Australia differs from the position taken by those same manufacturers in the United States, where all cars are warranted to run on E10. In response, vehicle manufacturers have indicated that components are tailored to particular markets and that even cars which appear identical to the casual observer, use different components in different markets.

Renewable Fuels Australia has argued that manufacturers are not prepared to endorse the use of E10 in pre-1986 vehicles, because of liability concerns. In consultations with the Taskforce, manufacturers' representatives acknowledged that, at least in some cases, vehicle manufacturer statements concerning the suitability of particular vehicle models to satisfactorily use E10 were limited to what could be said on the basis of European testing on E5 blends. In the absence of testing, which they asserted could not be justified commercially for non-current models, manufacturers adopted a cautious approach to statements about E10 suitability for their models.

On this basis, the Taskforce notes that much of the caution evident in the information contained in the FCAI vehicle list is not supported by vehicle testing.

The Taskforce notes the concern of vehicle manufacturers about the E10 vehicle list being used by consumers as a statement about whether or not vehicle manufacturers warrant vehicles to use ethanol blend fuels or even recommend these fuels. While the position of vehicle manufacturers is understandable, the E10 list was meant to be a statement of the suitability of ethanol blend fuels for certain vehicles, not a statement representing warranty positions or fuel recommendations.

The Taskforce also notes the complexity of the vehicle list could be undermining consumer confidence and that information advising consumers of the suitability of a particular vehicle to use ethanol blend fuels could be provided in a less confusing manner, for example in automotive handbooks or somewhere on the vehicle. This could include information on fuel filler caps or in pamphlets available at the service station.

Conclusion 36: *As part of an awareness campaign, the FCAI vehicle list could be revised into a simplified format and confined to clear and accurate statements about the suitability of vehicles to use ethanol blend fuels. Automotive manufacturers should present fuel suitability information to consumers in a less confusing manner.*

PULP E5 versus E10

During consultations with the Taskforce and in its submission, the FCAI argued that the limit for ethanol in premium unleaded petrol (PULP) in Australia should be 5%, rather than 10%.

The FCAI noted that many imported vehicles, particularly high-performance vehicles, increasingly use advanced emission control technologies and therefore have more

stringent fuel quality requirements, and will increasingly need PULP 95 RON fuel. According to the FCAI, if vehicles with engines optimised to run on 95 RON and a maximum of E5 use petrol blends with greater than 5% ethanol, they may suffer driveability problems and have increased levels of exhaust and evaporative emissions.

The FCAI notes that Australian fuel and vehicle emission standards are being broadly harmonised with UNECE (United Nations Economic Commission for Europe) standards, although the unlabelled ethanol limit in petrol under the UNECE standard is 5%, while Australia allows 10% labelled. This alignment with European fuel standards is facilitating the use in Australia of the latest engine technologies to reduce both emissions and fuel consumption.

Given that there is an E5 limit in Europe and that about 70% of post-1986 vehicles are imported, the FCAI advocates an E5 cap on PULP.

The FCAI also noted that post-1986 vehicles have been tested and certified in Europe for E5 fuel. On this basis, the FCAI considered that a reduction in the ethanol limit from 10% to 5% could provide the basis for a clearer statement from vehicle manufacturers about vehicle suitability for ethanol-blended fuel. The FCAI indicated that all post-1986 vehicles could operate satisfactorily on E5.

The Australian Government set an ethanol limit of 10%, with a consumer label, in response to concerns about the impact of ethanol blends above 10% on vehicle operability. While the limit of ethanol in PULP to 5% may result in fewer (especially European) manufacturers advising against ethanol blends, vehicle studies and experience with the Australian fleet do not identify operability problems that would justify revising the ethanol limit downwards. The Taskforce considers that there no reason for a reduction in the limit and in consumer choice. The Taskforce notes that the UNECE fuel standard does allow for higher than 5% ethanol blends, subject to them being labelled.

The 1998 APACE study indicates that most cars in the fleet can operate satisfactorily on E10. The FCAI has also endorsed the statement that ‘most new and many pre-1986 vehicles can run satisfactorily on E10 blend petrol’. In consultations with the Taskforce, the FCAI was unable to identify a single incident of vehicle operability concern associated with E10 since the 10% ethanol in petrol limit came into force.

Further, BP, Caltex, Manildra Park and a number of independents have been marketing ethanol-blended fuels at 10% for over two years without a single technical problem reported. BP has sold a total of 13 ML of E10 and fully endorses E10 as part of its brand. E10 has been sold under Caltex’s Bogas brand since 1996, with about 40 ML of ethanol (or about 400 ML of E10) sold over that period, and Manildra has consistently noted a similar view.

On the whole, testing and trials show that E10 does not cause operability problems in post-1986 vehicles (that is, those vehicles with electronic fuel injection systems).

There are also other drawbacks with a reduction in the ethanol limit including:

- given that almost all new cars can use E10, such a step could be seen as going backwards, potentially being perceived as the government having less confidence in ethanol fuels and further undermining consumer confidence

- an E5 limit would reduce marketing flexibility by not allowing E10 to be blended in both unleaded petrol and premium unleaded petrol.

Conclusion 37: *The Taskforce considers that there is no reason for a reduction in the maximum ethanol limit in petrol from 10% to 5%.*

Ethanol labelling

With the intent of ensuring consumers are advised if a fuel contains ethanol, an ethanol fuel quality information standard took effect on 1 March 2004. The *Fuel Quality Information Standard (Ethanol) Determination 2003* specifies the labelling requirements for the ethanol–petrol blends sold in Australia.

The ethanol label in its current form (Figure 10) is regarded by the fuel ethanol industry as having, unnecessarily in its view, the character of a warning label.

Figure 10 The mandatory label in its current form

The Taskforce sought legal advice on government labelling regulations. In light of that legal advice, which draws attention to the fact that retailers already have trade practices and commercial law obligations regarding the fitness of the fuel for its intended purpose, the Taskforce considers that the government's current labelling requirements can be simplified. For E10, the label would simply identify the fuel as a blend of ULP or PULP (octane specified) with up to 10% ethanol.

Advice to the Taskforce has confirmed that labelling of ethanol in petrol in Europe is required only when ethanol blends are greater than E5. This is because up to 5% ethanol is permitted as an oxygenate in the European fuel standard for petrol (European directive 98/70EC), and the Worldwide Fuel Charter also nominates a maximum of 5% ethanol in petrol. Therefore, ethanol can be present in petrol in Europe up to 5% without a requirement to separately advise consumers. This is because European vehicles are designed, tested and certified for use of E5.

Conclusion 38: *Responsibility for consumer information about the fitness of fuel for its intended purpose rests mainly with fuel retailers and suppliers. In the light of that, the current fuel ethanol information standard could be simplified primarily to require notification that the fuel contains ethanol at up to 10%.*

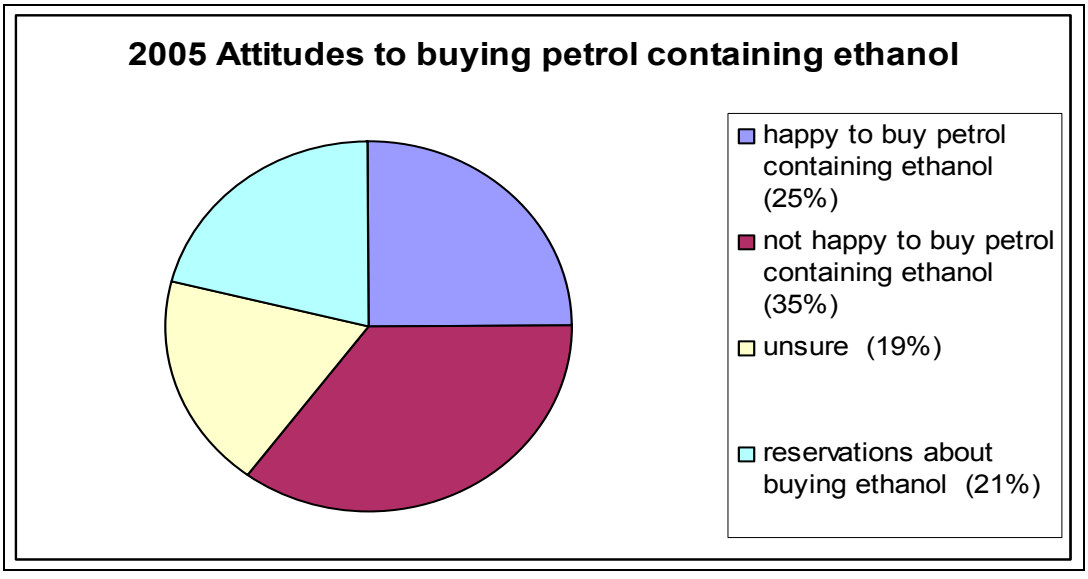
Conclusion 39: *Given that an even higher percentage of cars can use E5 than E10, the fuel ethanol information standard could be further modified so that labelling is required only above 5% ethanol in petrol, rather than 1% as at present. As in Europe, this would give fuel companies flexibility to use up to 5% ethanol as a fuel extender or octane enhancer, without the costs of dispensing E5 as a separate blend.*

Recent trends in confidence

There are some signs that consumer confidence has recovered slightly since 2003. These include the results of the 2005 ANOP motorist survey, the recommencement of trials by BP and Caltex, and recent indications from Shell and some independents that they are intending to become involved in marketing E10.

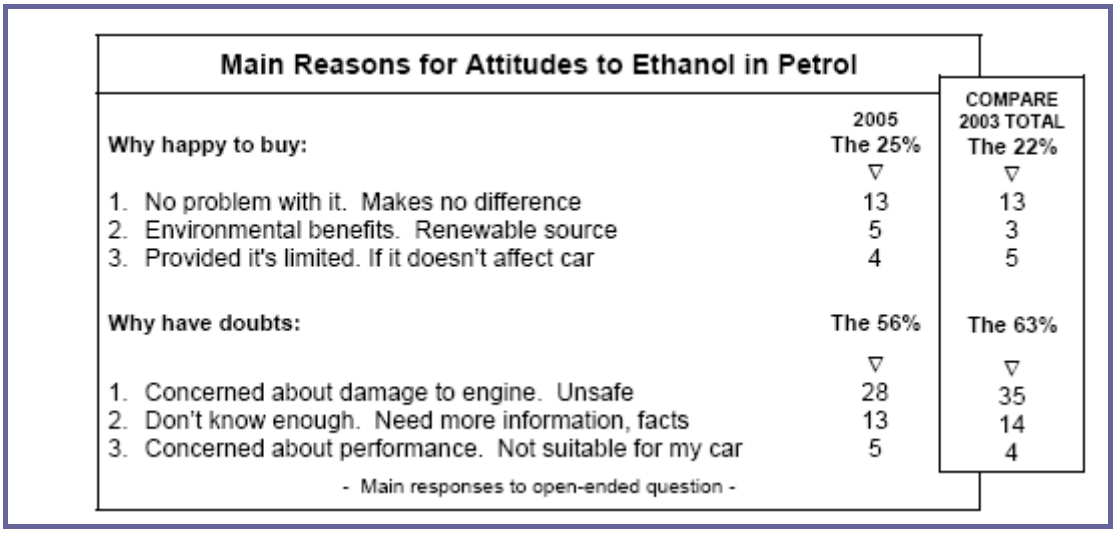
The 2003 ANOP research was repeated in 2005, showing small improvements in consumer confidence. Key findings were that 25% of motorists were happy to buy petrol containing ethanol, 35% were not, 21% had reservations and 19% were unsure (Figure 11). Of motorists who were not happy to buy ethanol or had reservations, 50% still had concerns about vehicle damage and 23% wanted more information.

Figure 11 Attitudes to buying petrol containing ethanol, 2005



Source: ANOP (2005:14).

Figure 12 Attitudes to buying ethanol in petrol, 2003 versus 2005



Main Reasons for Attitudes to Ethanol in Petrol

	2005	COMPARE 2003 TOTAL
Why happy to buy:	**The 25%**	**The 22%**
	▽	▽
1. No problem with it. Makes no difference	13	13
2. Environmental benefits. Renewable source	5	3
3. Provided it's limited. If it doesn't affect car	4	5
Why have doubts:	**The 56%**	**The 63%**
	▽	▽
1. Concerned about damage to engine. Unsafe	28	35
2. Don't know enough. Need more information, facts	13	14
3. Concerned about performance. Not suitable for my car	5	4

- Main responses to open-ended question -

Source: ANOP (2005:14).

Despite the small improvements in consumer attitudes to ethanol identified by the 2005 ANOP survey, it is clear that consumer confidence in ethanol blends is still low and remains a key barrier to their further uptake in Australia.

Confidential research conducted by oil majors also identified consumer confidence as still being a major barrier. Consumers indicated that they need more information about E10 and the effect of the fuel on car engines.

Some fuel retailers in Queensland and New South Wales display 'no ethanol' signs either on price billboards or at the pump. These signs were first displayed in 2003 after the controversy about reportedly high-percentage ethanol blends and vehicle damage, and have reduced consumer confidence even further. Some effort has been made to encourage relevant players to remove the signs.

Queensland Government response on consumer confidence

As part of its boarder ethanol industry development policies, the Queensland Government has implemented a range of initiatives during the past two years designed to assist the development of consumer confidence in ethanol blends. The V-8 Ethanol Blueprint announced on 21 June 2004 included a commitment that the government's vehicle fleet (approximately 13,000 vehicles) would run on E10 where possible and would also display pro-ethanol stickers. While the blueprint focused heavily on the promotion of ethanol and the provision of information to consumers, it contained no significant financial support. Consumer confidence elements of the blueprint include: the inclusion of information about the suitability of E10 (consistent with manufacturers' advice) in all motor vehicle registration renewal notices; the launch of an ethanol website providing the latest information to consumers and industry[47]; working with vehicle manufacturers to ensure that fuel and engine technologies are optimally compatible; and encouraging service stations in Queensland to sell E10.

[47] http://www.ethanol.qld.gov.au

The Queensland Ethanol Industry Action Plan announced in April 2005 has also sought to: raise public awareness of and confidence in ethanol-blended fuels; increase domestic demand and export capacity; create links between industry and the Queensland Government to promote a market for ethanol; and assist the development of retail and distribution networks.

On 9 May 2005, Premier Peter Beattie announced the Ethanol Conversion Initiative, a programme designed to assist the Queensland ethanol industry to improve its capacity to market ethanol-blended fuels and to assist diesel-based fleet operators with technical conversions to allow the use of diesel–ethanol blends. The conversion initiative falls under the previously announced Queensland Ethanol Industry Action Plan. Targeted projects under the conversion initiative include: conversion of existing fuel storage tanks to support E10; establishment of E10 storage and blending facilities; signing and rebadging of fuel distribution facilities; and conversion of fleet vehicles for the use of diesel–ethanol blends.

Effectiveness of the Queensland policies

Reports suggest that the Queensland Government's use of E10 in its fleet uptake has been low but is improving. Sales of fuel ethanol by the two Queensland-based fuel ethanol producers have increased to 2.55 ML in 2004–05, or by 146% compared with 2003–04. Fuel purchasing data indicates that in the six-month period January–June 2005 E10 purchases by volume for QFleet increased from 31,486 litres to 171,302 litres.

There are 51 service stations that currently retail E10 in Queensland, more than half of them located in major regional centres including Cairns, Townsville, Mackay, Rockhampton, and Toowoomba. The remainder are in the Brisbane and Gold Coast regions.

In February 2005, in conjunction with assistance provided by the Queensland Government, BP launched a promotional campaign in the Mackay region which included an E10 logo, a mail-out including a $10 voucher for the fourth E10 fill, and radio, television, and billboard advertising.

The 2005 ANOP research also found that motorists in Queensland are more favourably disposed to buying petrol with ethanol (35% of Queensland motorists—versus a national average of 25%—were found to be 'happy to buy' ethanol), indicating that targeted efforts have had some impact.

Discussion

The Taskforce considers that consumer confidence is a key issue impeding market uptake. Almost all submissions identified this:

- ExxonMobil noted it will take time and the concerted efforts of all parties to restore consumer confidence in ethanol-blended fuels.
- CSR suggested that the Australian Government should find ways to positively assist the industry to build confidence in fuel ethanol.

- The Australian Institute of Petroleum suggested that a sophisticated communications strategy is needed to address consumer confidence issues and that the government's role could be strengthened in this area.
- The Independent Petroleum Group called for the government to be proactive in promoting ethanol and biodiesel blends to the automotive industries.

In the light of the positive results possible from targeted promotional activity (as noted in discussions with fuel suppliers and the Queensland Government), the Taskforce considers that greater focus on industry-based information dissemination and marketing/promotional activity can assist in building consumer confidence and, in turn, encourage greater consumer uptake of ethanol-blended fuels. The Taskforce notes that confidence-building measures are likely to work only if they have the support and involvement of vehicle manufacturers and automobile associations and if the messages to consumers are accurate and complementary. The Taskforce believes that some of the findings of this report could form the basis of accurate and positive consumer information about biofuels.

Conclusion 40: *Greater focus on industry-based information dissemination and marketing /promotional activity may improve consumer confidence in ethanol blend fuels.*

Biodiesel

Consumer confidence

Biodiesel does not have the same consumer confidence problems as ethanol blends. However, the Taskforce notes that confidence can be fragile, and that the biodiesel industry will need to ensure that consumers are properly advised on fuel blends.

Vehicle operability

Advice from engine manufacturers is that the maximum biodiesel blend for the current fleet should be no greater than 5% (B5). Manufacturers have indicated that higher blends raise significant issues involving engine performance, efficiency, emissions and warranties. The Trucking Industry Council and the Australian Trucking Association support the manufacturers' advice.

In Europe, vehicles are designed for diesel fuel containing a maximum biodiesel content of 5%. This limit is a requirement of the fuel injection equipment manufacturers. As the diesel fuel specification permits up to 5% biodiesel, its presence does not require labelling (as for E5) in Europe. The Taskforce understands that there are proposals to increase the maximum level of biodiesel in European fuel standards to 10%.

Several local governments in Australia have undertaken trials of biodiesel at higher percentages.

Camden (NSW) Council trial

In 2003–04, Camden Council conducted a six-month trial comparing the performance of 100% biodiesel (B100) to that of ultra-low sulphur diesel (ULSD) in two of the council's waste collection vehicles under normal operating conditions. In particular, the council sought to reduce tailpipe emissions from its diesel-powered waste collection fleet. The vehicles' engines were not modified for the trials.

The trial showed no increase in biodiesel fuel consumption measured in litres per hour and a slight increase (3%) measured in litres per kilometre. A power loss of 17% at 80 kph was recorded under test conditions on the dynamometer. The drivers did not readily observe the loss of performance attributed to the reported power loss from the biodiesel during the operational trial.

Before the trial, the biodiesel truck engine was dismantled and assessed for condition. Two independent mechanical assessments undertaken at the completion of the trial showed no evidence of abnormal mechanical wear and tear for biodiesel compared with petroleum diesel. The engine oil in the biodiesel vehicle was tested after each service to monitor potential dilution. The results showed no difference in oil dilution.

Newcastle (NSW) City Council trial

The Newcastle City Council has also undertaken a biodiesel trial, which involved 12 vehicles using diesel, filtered diesel and biodiesel (B20). The vehicles' engines were not modified for the trials. The vehicles used included light-duty four-wheel drives, light- and medium-duty trucks, and garbage collection vehicles. While the trials largely sought to measure emissions from the vehicles using the various fuels, the council also conducted a maintenance testing regime. The engines were disassembled and inspected before and after the trials.

While the maintenance testing is still being undertaken (the final report is due by the end of 2005), at this stage there is no evidence of vehicle damage or operability problems in the vehicles operating on B20. The council reports that B20 biodiesel fuel had no significant affect on fuel consumption and power at 80 kph.

South Australian biodiesel trial

A trial of a bus run on B20 was conducted in South Australia from June 2002 to February 2003. At the conclusion of the trial, the vehicle had travelled over 25,000 kilometres. Vehicle performance using B20 was found to be comparable to performance using petroleum diesel.

Peugeot biodiesel passenger vehicle testing

Peugeot Automobiles Australia provided the Taskforce with the results from extensive testing of passenger vehicles run on up to B30 in Europe since 1991. Peugeot tested B30 on: 800 vehicles driving under normal conditions and seven vehicles on endurance testing covering a total of 614,000 kilometres; Peugeot passenger cars since 1991 in the Paris area; and over 4000 vehicles covering a total of 200 million kilometres.

Peugeot reported no vehicle operability problems from any of its testing. The company considers that biodiesel provides good lubricity of the injection system and requires no major modification of the engine or vehicle. Peugeot considers that B100 is unsuitable for engines because of its low stability, low cetane and high viscosity, causing oxidation, deposits and fouling. The company considers that B100 would require the adaptation of materials, particularly elastomers, in the engine. In Europe, Peugeot and Citroën diesel cars are guaranteed to run on B30, as long as the biodiesel blends conform to quality norms.

A number of oil companies, including majors and independents, have indicated to the Taskforce their intention to become involved in the marketing of biodiesel blends.

While there have to date been no serious consumer confidence issues associated with biodiesel, and it is important that this circumstance be maintained. Currently, biodiesel is being marketed in Australia at a range of different blends, with consumers not always aware of the percentage of biodiesel in the blend. It is important for consumers to be told what they are buying, ie pure biodiesel or a blend and, if a blend, the concentration of biodiesel in the blend. It is also important that information be available to assist consumers in making appropriate fuel choices. The Taskforce considers that there is a gap in this information.

Standard international practice is for the marketing of B5, B20 and B100 biodiesel blends, with the dominant blends being B5 and B20. There appears to be little or no original engine manufacturer acceptance of blends other than B5 or B20. Warranty acceptance is a key factor in growing the biodiesel industry domestically, and these two standard blends offer the best prospects for market growth. The Taskforce notes advice from fuel companies and others that biodiesel blends of up to 5% meet the Australian fuel standards for diesel.

Conclusion 41: *As B5 meets the diesel fuel standard, there is no need to label B5 blends. Labelling at higher biodiesel blends is a necessary piece of consumer information but could be relatively straightforward with the simplified ethanol label suggested previously.*

Conclusion 42: *The government could work with the Australian biodiesel industry to suggest B5, B20, and B100 as the standard forms of biodiesel, in part through fuel standards for biodiesel blends.*

Conclusion 43: *As for E10, there appears to be limited testing of the suitability of biodiesel for use in engines. The Taskforce notes, however, that there is no diesel engine manufacturing capacity in Australia and, as a result, engine manufacturers will need to be guided by overseas testing and practice.*