



RACQ position on ethanol-blended petrol reaffirmed following Biofuels Taskforce report

With ongoing concerns being about the future supply and costs of fossil fuels, as well as their negative environmental impacts, greater emphasis is being placed around the world on developing alternative power sources for cars and other motor vehicles.

Vehicles powered by electric motors charged through fuel cell technology are increasingly seen as the answer within the next decade or so.

In the interim, hybrid vehicles featuring dual internal combustion and electric motors are starting to make a small contribution to reduction in world dependence on fossil fuels. At the same time, there is a growing push to introduce bio-fuels, e.g., ethanol, sourced primarily from renewable crops, into the total fuel supplies of various countries throughout the world.

Brazil (sugar-sourced ethanol) and parts of the United States (grain ethanol) are the most advanced in terms of the production and supply of ethanol for automotive fuel use, with environmental, health, economic, fuel supply security and vehicle performance benefits most commonly being promulgated in the promotion of this bio-fuel.

RACQ's Motoring Advocacy Principles include trying to ensure fair and justifiable costs on motorists as well as endeavouring to reduce environmental damage caused by the use of motor vehicles. These principles and their attendant policies – as well as a commitment to seeking the most up-to-date, expert and objective information available – have directed RACQ's approach to formulation of the Club's position on the issue of blending ethanol in petrol for automotive use.

That position currently is:

- retention of motorists' freedom of choice (no mandating of ethanol blend use);
- maximum 10 percent ethanol content;
- ethanol-blends appropriately labelled at the fuel pump; and
- no cost penalties to motorists in ethanol blend use.

Briefly, the RACQ position is based on the following facts.

- Blends of up to 10 percent ethanol in petrol (E10) have been declared suitable for use in most – but not all – post-1986 petrol-engine vehicles in Australia (source: Federal Chamber of Automotive Industries [web address]).
- E10 increases fuel consumption between 2.6 and 5 per cent relative to unblended petrol (according to a variety of research studies).

At the same time, RACQ's reading and analysis of a considerable amount of research literature reveals – that the mandatory supply and use of ethanol-blended petrol cannot be justified on environmental, health, security of supply or economic grounds, despite the claims of many ethanol proponents.

This position was further confirmed with the release on 22 September 2005 of the report of a Biofuels Taskforce, convened by the Prime Minister on 30 May 2005, to examine:

- the latest scientific evidence on the impacts of ethanol and other biofuel use on human health, environmental outcomes and automotive operations;
- the economic and scientific bases for decisions to support ethanol and other biofuel production in Europe, North America and elsewhere; and
- the findings of the Commonwealth Scientific and Industrial Research Organisation/Australian Bureau of Agriculture and Resource Economics/Bureau of Transport and Regional Economics study, *Appropriateness of a 350 Million Litre Biofuels Target*, which was completed in December 2003.

The key points in the taskforce report and RACQ's comments on them are outlined below.

Consumer Confidence

The taskforce reported there is little demand for ethanol/petrol blends. Lack of consumer confidence remains a fundamental obstacle to E10 sales following reports of sales of unlabelled, 20-30 per cent ethanol blends around Sydney in 2002-03 and widely publicised allegations of vehicle damage.

Biodiesel does not have the same consumer confidence problem, but the taskforce noted confidence could be fragile.

Fuel Consumption

The taskforce observed ethanol's 32 per cent lower energy density (MJ/kg) than petrol implies an increase in fuel consumption with E10 of 3.6 per cent in volumetric terms or 4.3 per cent in mass terms for post-1986 vehicles with electronic fuel injection systems. Recent testing by Orbital Engine Company of such vehicles indicated fuel consumption increases (in terms of litres /km) of 2.9 per cent and 2.7 per cent for city and highway cycles, respectively. Tests by APACE Research in 1998 indicated an increase in fuel consumption of 2.6 per cent with E10.

The taskforce commented that the increase in fuel consumption should translate into E10 pump prices that are 2-3 per cent (2.5-3.5 cents/litre) lower. However, E10 pump prices are typically the same as ULP prices. The Task Force suggested a pricing strategy reflecting higher fuel consumption with E10 would assist in encouraging uptake.

Comment

The taskforce did not refer to any overseas studies, some of which indicate higher fuel consumption with E10 than indicated by the Orbital and APACE studies. The RACQ agrees that E10 should be priced to reflect its fuel consumption relative to unblended petrol.

Engine Operability

The taskforce observed that there has been limited testing of the suitability of biodiesel for use in diesel engines.

The Biofuels Taskforce reported that almost all post-1986 vehicles can operate satisfactorily on E10. It claimed vehicle testing by researchers and E10 trials by fuel companies supported this.

But, E10 is “not optimal” for vehicles with carburettors or mechanical fuel injection, mainly pre-1986 models.

The taskforce argued that, because a higher percentage of cars can use E5 than E10, labelling should be required only if ethanol exceeds 5 per cent, rather than one per cent at present.

Comment

The taskforce did not offer any convincing arguments to refute the Federal Chamber of Automotive Industries’ argument that the increasing number of vehicles optimised to run on 95 RON petrol and a maximum of 5 percent ethanol (E5) may suffer driveability problems and have increased levels of exhaust and evaporative emissions if fuelled with E10. The main basis of the taskforce’s position, other than assertions including claims that manufacturers were over-cautious, appeared to be a 1998 study by APACE Research which tested only Australian-built vehicles.

The taskforce’s suggestion regarding labelling could be justified only if there were no consumer confidence issues with ethanol blends, there was no fuel consumption penalty and Reid Vapour Pressure – and hence evaporative emissions – were lower. But none of these conditions apply.

Viability of Biofuels Production

The taskforce report explained that biofuel production everywhere has required government assistance to be viable. Governments typically cite a range of reasons for subsidising ethanol production, but support for agriculture was or became the real primary driver of government assistance for biofuel production in most countries.

The taskforce pointed out that Australian biofuels production would generally remain uncompetitive with conventional fuels without continuing government assistance in the long term. For ethanol producers to be competitive without assistance, oil prices would need to remain above US\$47 per barrel with an exchange rate under US\$0.65 = \$A1.00 or above US\$54 with an exchange rate below US\$0.75 = \$A1.00, which is close to the current exchange rate. For biodiesel production to be viable without assistance, oil prices would need to remain above US\$62 at an exchange rate below US\$0.65.

ABARE and the taskforce consider that long term price and exchange rate scenarios obviating government assistance for biofuels were unlikely. Those views have subsequently been backed by forecasts from the Reserve Bank.

Australian ethanol producers are likely to struggle from 2011 when changes in subsidy/protection arrangements allow import competition from Brazilian and United States producers with costs only 60 to 75 per cent of those in Australian plants.

Economic Issues

The cost to GDP of meeting the Commonwealth Government’s biofuels target of 350

million litres per year is expected to be about \$90 million per year (2005 prices) in 2010 and \$72 million per year (2005 prices) post-2015.

The economic cost (GDP loss) of each direct biofuel related job in 2010 is estimated to be about \$417,000. The cost in government expenditure is estimated to be about \$545,000.

The taskforce rebutted balance of payments arguments for subsidising biofuels.

Comment

The economic costs of supporting ethanol production are extremely high.

The federal government's biofuels target is only about ten per cent of the production required if the government mandated 10/90 per cent ethanol/petrol blends. The economic costs would be much more than 10 times those involved in meeting the 350 million litre target (much more than \$900 million) because of rising marginal costs of production as the 10 per cent ethanol figure is approached.

Energy Security/Self Sufficiency Issues

The Task Force rebutted energy security/self sufficiency arguments for subsidising biofuels.

Environmental and Health Issues

Life cycle analysis of emissions from E10 production and use indicate that, compared with straight petrol:

- emissions of carbon monoxide fall significantly,
- emissions of oxides of nitrogen (NO_x) increase significantly,
- there is little change in emissions of volatile organic compounds,
- carbon dioxide emissions fall slightly, and
- emissions of some air toxics fall while others rise.

In summary, there is a small reduction in emissions of greenhouse gases, a significant increase NO_x emissions, which could increase smog formation with attendant respiratory health issues, and uncertainty regarding the overall effect on air toxic emissions. This is consistent with the findings of the 2003 CSIRO/ABARE/BTRE report.

Although particulate matter (PM) is not a regulated pollutant for petrol vehicles in Australia, it has become a matter of concern because of recent studies indicating adverse health effects from fine PM.

The taskforce's discussion of PM emissions differs from the earlier CSIRO/ABARE/BTRE report. It considers that the assumption of negligible impact of E10 on PM *tailpipe* emissions in the 2003 report needs to be revisited because of results of three small studies in USA and UK, indicating *tailpipe* PM emissions could fall significantly with E10. However, the taskforce pointed out that two of the three studies were conducted at near zero temperatures and three small studies do not provide a basis for a robust result. The taskforce proposed that comprehensive experimental work be undertaken on PM emissions under Australian conditions.

The Task Force report explained that agricultural and processing activities to produce ethanol significantly increase PM emissions on a life-cycle basis, unless energy for processing is provided by co-generation.

Secondary particles make up about 30 per cent total PM in Australian cities. Research in California indicates secondary particles may rise with E10 use because E10 yields higher emissions of NO_x. Once again research is required in Australian conditions.

On a life-cycle basis, pure biodiesel (B100) yields significantly lower carbon monoxide, volatile organic compounds and PM emissions than extra lower sulphur diesel (XLSD) to be introduced in 2009, especially with waste cooking oil as the feedstock for biodiesel. But NO_x emissions increase by between 16 and 30 per cent.

The benefits of the 5 per cent biodiesel blend (B5) diminish against increasingly lower sulphur diesel, with PM emissions even increasing slightly over XLSD.

Life-cycle analysis indicates B100 from waste cooking oil produces 90 per cent less greenhouse gas emissions than XLSD. Biodiesel from tallow or canola reduces emissions by less than 30 per cent. There are negligible benefits for canola and tallow-derived B5 against XLSD, though waste cooking oil derived B5 achieves a 3 per cent reduction.

There is insufficient data at the present time to assess the air toxic emissions from biodiesel.

The taskforce pointed out that any air quality benefits from using biofuels needed to be evaluated side by side with the costs and benefits of other approaches to reducing emissions, such as tightening emission standards.

The taskforce explained that changes in fuel standards alone, including those to apply from 1 January 2006, are expected to reduce key pollutants to 20-40 per cent of their year 2000 levels by 2020. For example, fine PM and carbon monoxide emissions are expected to fall to around 20 per cent of 2000 emission levels by 2020 as a result of tightening fuel standards.

The taskforce said reductions in greenhouse gas emissions from meeting the 350 million litre biofuels target would cost \$204 per tonne of carbon dioxide in terms of reduced GDP and \$267 per tonne in terms of cost to government, compared to the \$15 per tonne capped abatement cost under NSW and Australian Government abatement schemes.

The taskforce noted that studies have shown that E10 increases the risk of groundwater contamination compared with straight petrol.

Comment

It is clear that an environmental case for E10 has not been made, notwithstanding the claims of politicians and the ethanol lobbies. Reductions in emissions from using E10 would be bought at a very high cost relative to other methods of abatement.