



Parliament of Tasmania

JOINT STANDING COMMITTEE

ENVIRONMENT, RESOURCES AND DEVELOPMENT

REPORT

ALTERNATIVE FUELS

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INTRODUCTION

APPOINTMENT AND TERMS OF REFERENCE

The Joint Standing Committee on Environment, Resources and Development was established for a trial period from 7 April 2004 and was re-established on 30 May 2006 following the State Election on 18 March that year. The Committee as at the date of this Report was re-established by Order of the Legislative Council on 4 March 2008, agreed to by resolution of the House of Assembly on 5 March 2008.

The Committee adopted the following terms of reference at its meeting on 31 October 2006:

To inquire into and report upon the development and use of alternative vehicle fuels in Tasmania, with particular reference to :-

- 1. The relative merits of the use of diesel, compressed natural gas (CNG) and liquid natural gas (LNG), 100% bio-diesel and bio-diesel/diesel mixtures and other alternative fuels for vehicles under the control of state and local government, state owned companies, government businesses and the broader community; and*
- 2. Options in the agricultural and transport sectors for developing and processing alternative fuels.*

The membership of the Committee currently comprises four members of the Legislative Council – Mr Hall (Chairman), Mr Harriss, Mrs Rattray-Wagner and Ms Thorp; and four members of the House of Assembly – Mr Best, Mr Booth, Mr Green and Mr Gutwein.

The Committee has general jurisdiction over the following areas: Government Business Enterprises; regulation of business, commercial and industrial relations; economic and finance development; environment and land use planning; natural resources – forestry, mining and fisheries; energy; tourism; transport; and primary industry.

This is the final report in relation to Alternative Fuels and will address both terms of reference.

PROCEEDINGS

Advertisements were placed in the three regional daily newspapers calling for submissions and evidence regarding the Committee's full terms of reference on Alternative Fuels.

Seventeen witnesses gave verbal evidence to the Committee in Hobart and Launceston and are listed in Appendix 1. **Twenty-eight** written submissions were received and are listed in Appendix 2. Documents received into evidence are listed in Appendix 3.

The Committee held public hearings in Launceston on 9 October 2007 and in Hobart on 10 and 15 October 2007. Further hearings were held in Hobart on 20 November 2007. The Chairman represented the Committee at the Bioenergy Australia 2007 Conference 26-28 November in Queensland. The Committee also visited Macquarie Oil's bio-diesel plant at Cressy on 9 October 2007.

EXECUTIVE SUMMARY

As stated by the Manager of Veolia Environmental Services in a written submission to this Committee:

There is little doubt that to implement new technologies there will be potential logistical and financial challenges, especially in the short term. It is respectfully emphasised that any short term 'pain' associated with the uptake of alternate fuels is a price the community and business may have to pay in order for us to achieve our goal of not leaving a lower standard of living for future generations and safeguarding the biodiversity of the planet.¹

The Committee's inquiries reveal the widespread acceptance of the "peak oil" phenomena whereby, at some time prior to 2030, world petroleum production will begin an irreversible decline. Conventional fuel prices are currently at levels that were considered to be highly unlikely in the period prior to the taking of evidence reported in the following pages. It is apparent to the Committee that, while there is still time to prepare for a global conventional transport fuel shortage, given the long lead times required for the commercialisation of alternative fuel sources, the time to act is now.

Evidence presented to this Committee indicates that there are a range of emerging alternative fuels each with its various advantages and challenges, and none of which offers a single solution to the anticipated global fossil fuel shortage.

The Committee notes the valuable investigative work that has been done and which continues into the question of renewable transport fuel sources across the nation by parliaments, agencies of government, private industry, and the scientific community.

In addition, evidence presented to this Committee indicates that there are three interrelated constraints that ultimately determine Australia's transport fuel present and future in general and Tasmania in particular, namely:

- The price of conventional fuel;
- The presence or absence of State and Federal government assistance; and
- The unique environmental and economic infrastructure of the State.

Significantly, there is no national fuel strategy, and the issue was not directly addressed at the recent Australia 2020 summit.

¹ Veolia Environmental Services, *Written Submission*, Mr John Brennan, 31 January 2007, p. 1.

The Committee strongly recommends that the issue of a medium-to long-term national fuel strategy be placed on the agenda of the Ministerial Council on Energy as a matter of high importance. Any such strategy must have due regard for regional strengths and differences and have a focus on achieving a sustainable source of transport fuel to secure the nation's economic wellbeing beyond peak oil.

July 2008

**Greg Hall MLC
Chairman**

RECOMMENDATIONS

Having weighed the Evidence presented to it, the Committee makes the following recommendations :

RECOMMENDATION 1

The Committee **recommends** that the Government provide a detailed response to the recommendations in this report, as well as the recommendations in this Committee's 2003 report on *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*, within a six month time-frame.

RECOMMENDATION 2

The Committee **recommends** that section 5 of the Metro Tasmania Act 1997 be amended to read as follows:

The principal objective of the Company is to provide road passenger transport services in Tasmania in a manner that is socially, economically and environmentally responsible by reference to quantifiable international benchmarks for public transport systems.

RECOMMENDATION 3

The Committee **recommends** that the Minister for Energy and Resources immediately place the development of a national fuels strategy on the agenda of the Ministerial Council on Energy, with specific reference to the inclusion within such a strategy of sustainable regional-specific alternative fuels' strategies capable of securing Australia's transport fuel future.

The Committee notes the recent announcement by the State Government of a State fuels summit and **further recommends** that the development of a State fuels strategy be considered at that summit.

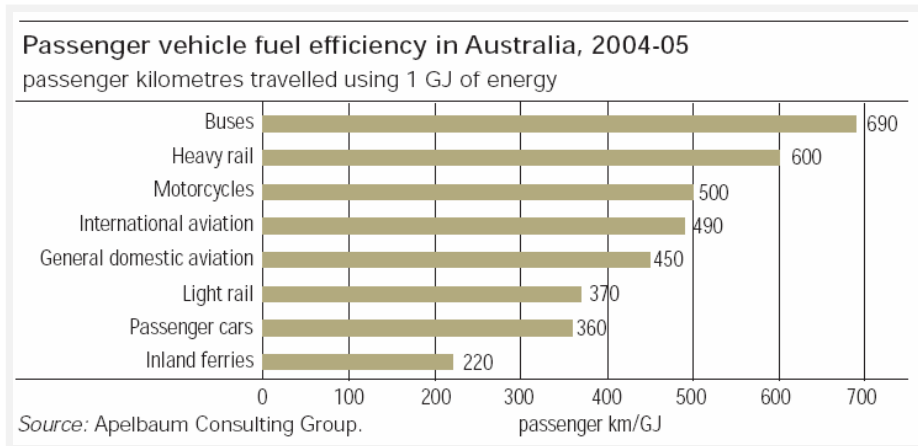
THE MERITS OF ALTERNATIVE FUEL OPTIONS

Fuel Demand Profile

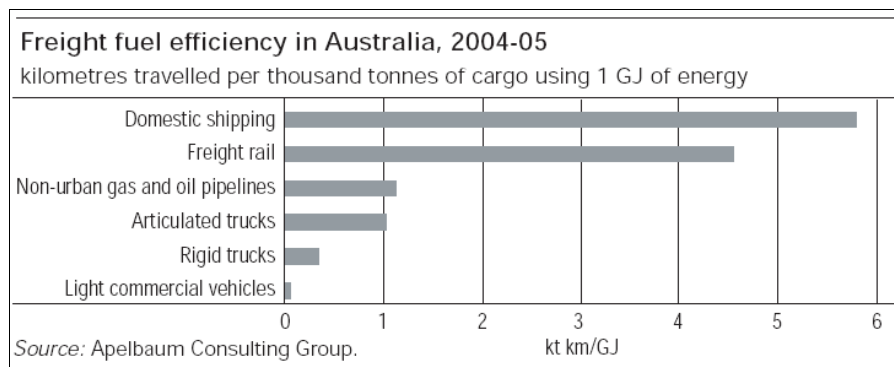
According to its recent “*Energy in Australia 2008*” report, the Australian Bureau of Agricultural and Resource Economics (“ABARE”) states that:²

The transport sector accounts for 35 per cent of final energy use and 70 per cent of liquid fuels used (including LPG) in Australia. Reflecting strong growth in road and air transport, energy use in the transport sector is projected to grow by around 1.4 per cent a year over the long term.

Based on research conducted in 2004-05, the same report illustrates the relative fuel efficiencies of passenger vehicles in the following chart:³



On the issue of freight transportation, ABARE summarises the comparative fuel efficiency of the major transportation options as follows:⁴



² Australian Bureau of Agricultural and Resource Economics, *Energy in Australia 2008*, Canberra ACT, Commonwealth of Australia, February 2008 at p 71.

³ *Id.*

⁴ *Id.*

It is apparent then, that within the entire transport sector, the least efficient user-group of transportation fuels is road transport. Within that user-group, ABARE indicates that:⁵

Road transport fuel consumption is projected to increase by an average 0.9 per cent a year over the next 23 years. Passenger cars and wagons have dominated road fuel consumption over the past 30 years, consistently using around 60 per cent of the sector's total.

On the question of future fuel consumption by the transport sector, ABARE summarises its projections for Australia in the following chart:⁶

47 Projected energy consumption in the transport sector a					
	2009-10	2014-15	2019-20	2024-25	2029-30
	PJ	PJ	PJ	PJ	PJ
Road transport	1 095	1 142	1 190	1 241	1 295
Railway transport	37	38	39	40	41
Water transport	60	62	63	65	66
Air transport	240	288	337	392	453
Other	34	36	39	41	44
Total	1 466	1 566	1 668	1 779	1 899

a Projections include only the impacts of policy measures in operation during 2007.
Source: ABARE, *Australian Energy: National and state Projections to 2029-30*.

Fuel Supply Outlook

In February 2007, the Australian Senate's Standing Committee on Rural and Regional Affairs and Transport published its final report on "*Australia's future oil supply and alternative transport fuels*". The Executive Summary refers to warnings by the International Energy Agency ("IEA") as follows:⁷

The IEA's World Energy Outlook 2006 (WEO 2006) gives serious new warnings about the energy future. It regards current trends as "neither secure nor sustainable".

The Senate Standing Committee inquiry was prompted in part by the growing concerns relating to the "peak oil theory". The Senate Standing Committee defined this theory as follows:⁸

This term refers to the theory that, for fundamental geological reasons, global conventional oil production will reach a peak and then start an irreversible decline soon enough to be of concern.

⁵ Australian Bureau of Agricultural and Resource Economics, *Energy in Australia 2008*, Canberra ACT, Commonwealth of Australia, February 2008 at p 73.

⁶ *Ibid* at p 72.

⁷ Commonwealth of Australia, *Australia's future oil supply and alternative transport fuels*, Canberra, ACT, Senate Standing Committee on Rural and Regional Affairs and Transport, February 2007 at p xi.

⁸ *Ibid* at p ix.

The period of time which “peak oil” will emerge is debated, however, as noted by the Senate Standing Committee:

“Peak oil” commentators commonly predict a peak of conventional oil production somewhere between now and 2030. They fear that declining production after the peak will cause serious hardship if mitigating action is not started soon enough.

Despite the lack of consensus about the exact timing of “peak oil”, there is an emerging acceptance of it as a pragmatic reality. As expressed by the Senate Standing Committee Report: *“the concept appears to be widely accepted, including by official agencies such as the IEA and the US Energy Information Administration, and some major oil companies.”*⁹

The Fuel Security Imperative

The economic and social consequences flowing from the emerging confrontation between the fuel demand profile and fuel supply outlook for Tasmania are a cause for immediate concern.¹⁰

The Committee notes that the disturbing picture painted by Chapter 4 of the Senate Select Committee on *“Australia’s future oil supply and alternative transport fuels”* was based on the IEA’s then conservative scenario; *“that the oil price will ease to 2010, then rise again to reach \$US55 per barrel by 2030”*.¹¹

At the time of this report, the price of oil is currently being quoted on international markets at more than double that figure.

The Senate Standing Committee Report highlights many of the obstacles to achieving a broad shift away from reliance on conventional fuel towards alternative fuel, including renewable energy sources.¹²

Such is the mainstream concern about the current transport fuel situation, that alternative fuel options are already being utilised in major fuel use situations. For example, the Hobart City Council currently incorporates into its fleet vehicles capable of running on diesel, ethanol and LPG powered vehicles in addition to traditional petrol powered vehicles.¹³

In addition, the Department of Treasury and Finance provided evidence to the Committee that the Tasmanian Government (excluding Government Business

⁹ *Ibid* at p 44.

¹⁰ Impression Bay Seafoods, *Written Submission*, Mr John Evans, 1 February 2007. Origin Asset Management, *Written Submission*, Mr John O’Brien, 30 January 2007.

¹¹ Commonwealth of Australia, *Australia’s future oil supply and alternative transport fuels*.

¹² *Ibid* at p 137-8.

¹³ VB Armstrong, Hobart City Council, *Written Submission*, 1 February 2007.

Enterprises and most State Owned Companies) has a leased fleet of 2,750 vehicles.¹⁴ While individual agencies choose their vehicles based on numerous factors including efficiency, safety, availability of fuel supply, only 3 models of vehicle capable of running on alternative fuels (one hybrid, one LPG and one dual fuel) are made available under the present contractual arrangements with leasing companies. Despite this restricted choice, just under 12% of the Government's total leased fleet are alternative-fuel vehicles. This proportion comprises 313 diesel, 5 dual fuel and 3 hybrid vehicles.¹⁵ The Committee further notes the announcement on 3 March 2008 by the former Premier Mr Paul Lennon MP of the Government's intention to achieve a carbon neutral vehicle fleet by 2010. That announcement detailed the following commitments:¹⁶

- *The Government will invest in Tasmanian-based offsets to ensure that the Government vehicle fleet achieves full carbon neutrality by July 2010.*
- *Minimum greenhouse ratings will be immediately introduced for new Government fleet vehicles. All passenger vehicles (including Ministerial vehicles) purchased from today forward must meet a minimum Australian Government Green Vehicle Guide greenhouse rating of 5.5, and all light commercial and 4WD vehicles must meet a minimum rating of 3.5. There will be some exceptions for special purpose vehicles.*
- *The Government will immediately begin ordering more hybrid and alternative-fuel vehicles for use in the Government fleet.*
- *All Government agencies will advise the Tasmanian Climate Change Office of what additional measures they will take immediately to reduce the carbon emissions from the vehicles they operate.*

The CSIRO advised the Committee that it has commissioned a scoping study within the Alternative Transport Fuels stream of its Energy Transformed National Research Flagship "to examine the requirements and potential for alternative fuels to address the current fuel security crisis."¹⁷ Preliminary results of that study "indicate that biofuels will definitely have a role to play in Australia's future transport fuel mix."¹⁸

It is against this background of concern regarding conventional fuel supplies, threats to economic growth and mainstream interest in alternative transport fuel utilisation, that this Committee has inquired into the relative merits of alternative fuel options.

¹⁴ DW Challen, Department of Treasury and Finance, *Written Submission*, 25 January 2007.

¹⁵ *Id.*

¹⁶ <http://www.dpac.tas.gov.au/divisions/policy/climate/> (Accessed 12 June 2008).

¹⁷ CSIRO, *Written Submission*, Mr Peter K. Campbell and Dr Tom Beer, 12 February 2007 at p 2.

¹⁸ *Id.*

Terms of Reference

Terms of Reference in the present inquiry is as follows:

1. *The relative merits of the use of diesel, compressed natural gas (CNG) and liquid natural gas (LNG), 100% bio-diesel and bio-diesel/diesel mixtures and other alternative fuels for vehicles under the control of state and local government, state owned companies, government businesses and the broader community; and*
2. *Options in the agricultural and transport sectors for developing and processing alternative fuels.*

The Committee received evidence from many witnesses in relation to the use of diesel, compressed natural gas and liquid natural gas, bio-diesel and other alternative fuels.

Alternative Fuels Compared

The evidence before the Committee has enabled it to compile the following overview of the major existing alternative fuel options within the context of Tasmania:

Diesel

Although strictly speaking a conventional fuel, diesel recommends itself as a fuel source worthy of far greater acceptance, due to its efficiency, lower particulate emissions, and lower greenhouse gas production, when compared with regular unleaded petrol, on a life-cycle basis.¹⁹ In addition, the uniform availability of diesel throughout the State together with its relative stability in transit further recommends it as an alternative fuel in this restricted sense.²⁰

The Committee was particularly interested to discover the extent of research and development into the production of cleaner conventional diesel fuels together with the utilisation of biomass either alone or in conjunction with conventional diesel fuel. Currently two synthetically produced diesel equivalent fuels are available to a limited extent; natural gas-to-liquid and biomass-to-liquid.

At present, it appears that while natural gas-to-liquid diesel production might address some supply concerns, the extensive processing procedures involved mean that, it is not a carbon-neutral alternative fuel source.²¹ Biomass-to-

¹⁹ Beer, T, *et al*, Life-Cycle Emissions Analysis of Fuels for Light Vehicles, *Report to the Australian Greenhouse Office*, 2004. www.environment.gov.au/settlements/transport/publications/pubs/lightvehicles.pdf (accessed on 30 April 2008). Ford Motor Company of Australia Ltd, *Written Submission* at p 1.

²⁰ Hobart City Council, *Written Submission*, Mr VB Armstrong, 1 February 2007 at p 6.

²¹ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission*, 29 January 2007; Beer, T *et al*, *Comparison of Transport Fuels, Final Report to the Australian Greenhouse Office on the Stage 2 study of Life-Cycle Emissions Analysis of Alternative Fuels for Heavy Vehicles*, 2001

liquid alternative diesel fuel, on the other hand, appears at present to have greater promise at present, with life-cycle greenhouse emissions reported to be far lower than for conventional fuels. The Committee notes in particular the recent construction of a biomass-to-liquid fuel processing facility in the German city of Freiberg, Saxony on 17 April 2008 by a Shell subsidiary, as an example of how this technology is becoming more mainstream.²² The Committee believes there may be benefits to Tasmania from the on-going development of such technology.²³

Biodiesel

According to research commissioned by the Australian Greenhouse Office:²⁴

Biodiesel is a generic name for fuels obtained by esterification of a vegetable oil. The esterification can be done either by methanol or by ethanol. Biodiesel can be used in a diesel engine without modification.

Given its essentially renewable nature, there is much to recommend biodiesel as a source of alternative fuel for Tasmania.²⁵ This is further suggested when considering its life-cycle greenhouse gas profile together with its negligible health-related emissions.²⁶ The Committee notes with interest the work done in Cressy by the Macquarie Oil Company to utilise waste poppy-seed oil as a feedstock for the production of biodiesel. This enterprise is highly commendable and the Committee expresses its thanks to Mr Rob Henry for facilitating an on-site Committee field trip to the Cressy facility on 9 October 2007.

Evidence was presented to the Committee indicating that an engine conversion would be required for a regular diesel engine to operate on 100% biodiesel (referred to as B100). In addition, the energy produced by the combustion of biodiesel is marginally lower than that produced in a conventional diesel engine. The Committee was also advised that owing to its chemical structure, B100 can only be safely stored for relatively short periods

www.environment.gov.au/settlements/transport/comparison/index.html (accessed on 30 April 2008) at p 292.

²² www.choren.com/en/choren_industries/information_press/press_releases/?nid=185 (website accessed 30 April 2008).

²³ John Gaylor, *Written Submission*, 13 January 2007 referring to J. Cadogan, *Eco-friendly diesel heralds clean, green future*. 4X4 Australia, December 2006.

²⁴ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission*, at p 27.

²⁵ Department of Economic Development, *Written Submission*, Mr Norm McIlfratrick, 10 September 2007 at p 11.

²⁶ RACT, *Written Submission*, Mr Doug Ling, 8 February 2007 at para 7.2. The Committee also notes with interest the proposed pilot biodiesel production facility at Cressy which was announced by the Macquarie Oil Company on 20 February 2008. <http://www.abc.net.au/rural/news/content/2007/s2167404.htm> (accessed 30 April 2008). Department of Economic Development, Resource and Infrastructure Industry Development Division, *Written Submission*, at p 11.

of time, being prone to water absorption and algal growth.²⁷ Evidence was also presented that there is a definite constraint on supply of biodiesel given the possible reliance of any production on the import of non-environmentally assured feedstock.²⁸

These facts, together with growing concerns about global food production security suggest to the Committee that biodiesel alone will not provide the solution to “peak oil” concerns.²⁹

No technical data was available to the Committee that would indicate what effect, if any, the use of biodiesel and conventional diesel blended fuel might have on vehicle warranties. While it was suggested to the Committee that blends of more than B5 might in fact void some warranties, it is nevertheless the case that blends of between B20 are commercially available in the United States.³⁰

Given that there are documented problems associated with B100 fuel, the Committee was persuaded by the view that its principal benefit in the short to medium-term would be as an additive to conventional diesel. The effect of this would be to lessen adverse greenhouse gas and noxious emissions associated with conventional diesel, which is already one of the most efficient available fuel options.

A word of caution was sounded by one submission to the Committee that must be carefully considered should any mandated minimum biodiesel fuel blend be proposed. That caution related to supply of suitable feedstock for biodiesel production. According to the CSIRO submission, there is reason to believe that existing sources of suitable biodiesel feedstock would struggle to match 10% of Tasmania’s current diesel fuel requirements.³¹

Against this background, the Committee was particularly interested in the views of Metro on the possibilities for the use of biodiesel in their bus fleet. Metro advised the Committee that, despite a Scania trial of B100 biodiesel showing no adverse effects on engines similar to those in use within the Metro fleet, the storage problems and supply constraints associated with B100 make it unsuitable for commercial use.

Biodiesel blended fuel was suggested to be the most practical proposal for a fleet such as Metro’s as it could be introduced to the entire fleet with no new

²⁷ Department of Tourism, Arts and the Environment, Environment Division, Written Submission, at p 31. Hydro Tasmania, *Written Submission*, Mr John Titchen, 9 February 2007 at para 4.3.2.

²⁸ CSIRO, *Written Submission* at p 3. Hobart City Council, *Written Submission* at p 6.

²⁹ CSIRO, *Written Submission*.

³⁰ RACT, *Written Submission* at para 7.2. Leon Joubert, *Written Submission*, 2 February 2007 at p 5.

³¹ CSIRO, *Written Submission* at p 7-8. Mike Scott, *Written Submission*, 1 October 2007 at p 3. This point was raised in a positive context by Fox Design Pty Ltd, *Written Submission*, Mr James Fox, 5 February 2007 at p 7.

investment requirements. The entire TransAdelaide fleet currently operates on a B5 fuel blend and have been trialling a B20 fuel blend. Metro has also closely monitored a B100 trial by Croydon Bus Services in Victoria. That trial was showing promising results until supply problems caused by drought conditions resulted in the early termination of the trial.

Trials to date appear to suggest that there may be a slight loss of power associated with biodiesel blends, a slight increase in NOx smog-causing gas, and an occasionally unpleasant odour, depending on the type of oils used in the production of the biodiesel being tested. None of these problems appear to outweigh the perceived benefits of biodiesel blended fuel as Metro has management strategies in place for each one. Metro also advised the Committee that they are ready and able to commence their own trials with biodiesel as soon as a dependable and economically sustainable source of supply can be secured.³² At the date of this report, there was no indication that Metro has proceeded with further trials of biodiesel.

Ethanol

There are two types of fuel ethanol, namely; hydrated and anhydrous ethanol. The difference between the two is that hydrated ethanol is the product of a once-only distillation of a standard fermentation process and contains a small proportion of water. Anhydrous ethanol is the product of a further process whereby the water is extracted from hydrated ethanol. The additional process stage in the production of anhydrous ethanol typically makes it between 10%-20% more expensive, and increases its greenhouse gas profile.³³

Both Hydrated and anhydrous ethanol can be used as pure fuels (so called E100 fuel) or as additives to either conventional diesel or petrol (for example E5, E10 or, in a common US blend, E85).³⁴ However, the emulsifiers required to blend ethanol with diesel produce such toxic emissions on combustion that "diesohol" as it is termed does not recommend itself to the Committee.³⁵ In addition, all ethanol fuels have higher aldehyde emission levels on combustion than either conventional diesel or petrol.³⁶ This together with the low vaporisation temperature of ethanol, means that there are significant emission issues associated with the use of both types of ethanol as alternative fuel sources.³⁷

³² Metro Tasmania Pty Ltd, *Written Submission*, Mr Jack Lane, 6 February 2007.

³³ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission Part 1 Chapter 13 Anhydrous Ethanol*.

³⁴ *Ibid* Part 1 Chapter 14 *Petrohol*. Mike Scott, *Written Submission* at p 4.

³⁵ *Ibid* Part 1 Chapter 7 *Diesohol*.

³⁶ *Ibid* Part 1 Chapters 6 *Hydrated Ethanol* and 13 *Anhydrous Ethanol*.

³⁷ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission*, Part 2, Chapters 6 *Hydrated Ethanol*, 13 *Anhydrous Ethanol*, and 14 *Petrohol*.

Hydrated ethanol adversely affects the stability of conventional petrol and may increase the corrosion profiles of certain vehicles, and so does not recommend itself to the Committee as a sustainable alternative fuel source in the short to medium term.³⁸ Anhydrous ethanol, owing to its superior burn over conventional petrol offers lower power output and a harsher combustion within the cylinder. In some vehicles designed to run purely on conventional petrol, where the ethanol component of the fuel exceeds 5%, this has been observed to cause engine “knock”.³⁹ Some of the other cautionary submissions to the Committee regarding ethanol fuel blends referred to its potential to damage older vehicles,⁴⁰ uncertainty about the lifecycle greenhouse emissions of the ethanol to be used⁴¹ and competition over arable land usage.⁴²

The Committee notes evidence suggesting that new vehicle warranties may provide for ethanol fuel blends of E10 or less.⁴³ The Committee further notes that the suggestion of an E10 blend was supported in more than one submission and on a number of grounds, including availability of Australian feedstock, commercial availability of the E10 blend, and the potential utilisation of poppy industry waste ethanol.⁴⁴ In addition, there was evidence to suggest that Tasmania might be well placed to source its own cellulosic ethanol from agricultural and forestry wastes.⁴⁵ This option has significant greenhouse advantages over the more traditional lingocellulosic ethanol produced from food crops such as beet, corn, soybean and sugar.⁴⁶

³⁸ *Ibid* Part 1 Chapter 6 *Hydrated Ethanol*, and Part 2 Chapter 14 *Petrohol*.

³⁹ *Ibid* Part 1 Chapter 14 *Petrohol*.

⁴⁰ Hobart City Council, *Written Submission* at p 8. RACT, *Written Submission* at para 4.2.2. Also note the comments of Mr Malcolm Little, General Manager, Tasmanian Automotive Chamber of Commerce as reported by David Killick in “RACT calls for car controls” *Mercury* 4 January 2008 at p 3 “We have the oldest fleet of cars in the country ... The last figures I saw was an average age of 11.9 years”.

⁴¹ Hydro Tasmania, *Written Submission*, Mr Mark Rayner, 9 February 2007 at para 4.2.2. This point was not addressed in the submission from RACT which advocated the import of cheap ethanol from Brazil: RACT, *Written Submission* at para 8.6.

⁴² RACT, *Written Submission*, at paras 7.1 and 8.3. Leon Joubert, *Written Submission* at p 5. Mike Scott, *Written Submission* at p 3.

⁴³ Hobart City Council, *Written Submission*, at p 8. Ford Motor Company of Australia Ltd, *Written Submission* at p 1.

⁴⁴ Department of Economic Development, *Written Submission*, Mr Norm McIlfratrick, 24 January 2007 at p 10. Hydro Tasmania, *Written Submission*, at para 4.2.2. CSIRO, *Written Submission* at p 8.

⁴⁵ Fox Design Pty Ltd, *Written Submission* at p 7. CSIRO, at p 8. Department of Economic Development, *Written Submission* at p 10.

⁴⁶ Department of Economic Development, *Written Submission*, at p 10-11. A slightly contrary view was put in favour of lingocellulosic ethanol production by Bioenergy Australia, *Written Submission*, Dr Stephen Schuck, 2 February 2007 and Mike Scott, *Written Submission*, September 2007 at p 14-15.

LPG

Given the prevalent view that LPG is primarily a by-product of petroleum production, it could be argued to sit somewhat precariously within a consideration of “alternative” fuels. Nevertheless, because the sources of Australian LPG are in fact predominantly a by-product of natural gas extraction, the Committee has chosen to consider it as an alternative to conventional petroleum fuels in its inquiry.

According to research commissioned by the Australian Greenhouse Office:⁴⁷

Most LPG used on the East Coast of Australia is Autogas. Propane as a vehicle fuel is limited to Western Australia. There is very little usage of LPG in Australian heavy vehicles. LPG has particularly low particulate levels, which make it an attractive fuel for urban buses and delivery vehicles. However, as diesel particulate emissions reduce to Euro4 levels this advantage may be lost.

The CSIRO submission to the Committee states that:⁴⁸

LPG is an attractive short-term alternative because Australia has the world's most extensive LPG distribution system and has reserves that can sustain likely demand for some years. Despite claims that a large proportion of Australia's petrol use could be replaced with LPG, this is very unlikely because about 20% of the LPG supply comes from petroleum refining and the other 80% comes from the excess propane found in natural gas basins. Australian reserves of LPG are one-tenth those of the natural gas reserves, and would be exhausted in a very short time if a large portion of Australian domestic transport used LPG.

The characteristics of LPG were summarised for the Committee in one submission as follows:⁴⁹

It has lower peak pressure during combustion, which generally reduces noise and improves durability; noise levels can be less than 50% of equivalent diesel engines.

LPG fuel systems are sealed and evaporative losses are negligible.

It is easily transportable and offers 'stand-alone' storage capability with simple and self-contained LPG dispensing facilities, with minimum support infrastructure.

LPG vehicles do not require special catalysts.

It contains negligible toxic components.

LPG has lower particulate emissions and lower noise levels relative to diesel, making it more attractive for urban areas.

Its low emissions have low greenhouse gas effects and low NOx precursors.

⁴⁷ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p 65.

⁴⁸ CSIRO, *Written Submission* at p 2.

⁴⁹ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p 63-4.

Relative to other fuels, any increases in future demand for LPG can be easily satisfied from both natural gas fields and oil refinery sources.

Emissions of PAH and aldehydes are much lower than those of diesel-fuelled vehicles.

Although LPG has a relatively high energy content per unit mass, its energy content per unit volume is low which explains why LPG tanks take more space than diesel fuel tanks. [Committee Comment: This also means that, as more LPG must be used for the same energy output, its greenhouse gas impact is on par with diesel].

The LPG tanks are pressure vessels and therefore weigh more than diesel tanks.

Its vapour flammability limits in air are wider than those of petrol, which makes LPG ignite more easily.

It has a high expansion coefficient so that tanks can only be filled to 80% of capacity.

The Committee was particularly interested to note that, despite the popularity of LPG with the owners of passenger vehicles,⁵⁰ there has been lack of market penetration with respect to dedicated heavy vehicles.⁵¹ This is despite the Federal Government's Alternative Fuels Conversion Program which:⁵²

... will generally fund up to 50% of the Eligible Costs, which are:

for gas conversions - the direct cost of converting the conventionally fuelled vehicle to operate on gas fuel, including the cost of on-vehicle gas fuel storage tanks; or,

for new (original equipment manufacture - OEM) gas or hybrid diesel/electric vehicles - the amount by which the price of the gas vehicle exceeds that of its conventionally fuelled equivalent, but only to the extent that the price difference is attributable to the different fuel system.

Grants under this programme are available where it can be shown that the conversion will result in a minimum 5% reduction in greenhouse gas emissions and lower stated noxious emissions. The lack of market penetration may be explained (in part) by the fact that the average price for LPG in Tasmania is significantly higher than on the mainland, by the time delays in obtaining LPG conversions and by the lower power/higher fuel consumption constraint.⁵³

Natural Gas and its Variants

Natural gas is an alternative fuel that the Committee believes has much to recommend it in the Tasmanian context. While it is true that most of

⁵⁰ Ford Motor Company of Australia Ltd, *Written Submission* at p 1.

⁵¹ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p xx. Hobart City Council, *Written Submission* at p 7.

⁵² <http://www.environment.gov.au/settlements/transport/afcp/pubs/afcp-guidelines.pdf> at p 3 (accessed 30 April 2008).

⁵³ RACT, *Written Submission* at paras 4.1.1 and 4.2.1.

Australia's known natural gas reserves are primarily located off the north west of Western Australia, around 10% are located in Bass Strait. Since the completion of the Tasmanian Gas Pipeline and its associated terminals across the State, there has been the potential for utilisation of natural gas to fuel heavy transport.⁵⁴

The relatively low energy content of natural gas means that it can only serve as a transport fuel if it is either compressed (CNG) or liquefied (LNG). In order for such a fuel to provide a commercial range of movement to a vehicle, the tanks are both heavy and bulky, limiting its usefulness to heavy transport vehicles.⁵⁵ It is this factor that makes it unsuitable for use in commercial transport vehicles and passenger vehicles.⁵⁶ However, one of the great advantages of natural gas powered vehicles is that they run significantly quieter than conventional fuel powered vehicles. This recommends them for use in less industrialised workspaces together with residential and central city environments.⁵⁷

The lifecycle greenhouse gas⁵⁸ and noxious emission levels associated with CNG are a fraction of those associated with conventional transport fuels.⁵⁹ As

⁵⁴ CSIRO, *Written Submission* at p 3. RACT, *Written Submission*, at para 7.3.3. Option One Pty Ltd, *Written Submission*, Mr Russell Reid, January 2007 at p 2. This submission also makes the point that "Natural gas also has the advantage, compared with bio-fuels, that it does not place additional pressure on the limited water resources available in Australia." *Written Submission*, Mr Fraser Kirkpatrick, 31 January 2007 at p 2. Department of Economic Development, *Written Submission* at p 4. Alinta DTH Pty Ltd, *Written Submission*, Mr Simon Himson, 9 January 2007.

⁵⁵ CSIRO, *Written Submission* at p 3. Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p 52 "CNG on board a vehicle takes 3 to 4.5 times more volume for storage than diesel." Option One Pty Ltd, *Written Submission* at p 1. Ford Motor Company of Australia Ltd, *Written Submission* at p 2.

⁵⁶ RACT, *Written Submission* at para 7.2. Option One Pty Ltd, *Written Submission*, at p 2. Mr Leon Joubert, *Written Submission* at p 6. Origin Asset Management, *Written Submission*, Mr John O'Brien, 30 January 2006 which incorporates Child, N et al, *Transport Fuels in Australia*, Submission to the Australian Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels, February 2006 at p 18.

⁵⁷ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission*, at pp 52 and 57. Powerco Tasmania Pty Ltd, *Written Submission*, Mr Fraser Kirkpatrick, 31 January 2007 at p 2. Fox Design Pty Ltd, *Written Submission* at p 8. Hobart City Council, *Written Submission* at p 7.

⁵⁸ The high payload requirements of on-board storage tanks mitigates this by significantly increasing the mass of the vehicle being powered. In addition, methane (which is itself a greenhouse gas) is a relatively high proportion of total exhaust emissions of CNG. Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p 52. Hobart City Council, *Written Submission* at p 7. Origin Asset Management, *Written Submission* at p 2.

⁵⁹ The Asia Pacific Natural Gas Vehicles Association claims that "replacing one diesel powered garbage truck with a natural gas powered one is equal to taking 325 cars off(f) (sic) the road in terms of pollution reduction." RACT, *Written Submission* at para 7.3. Option One Pty Ltd, *Written Submission*, at p 1. Powerco Tasmania Pty Ltd, *Written Submission* at p 2.

a compound, it is one of the safest of all alternative fuels.⁶⁰ The lifecycle greenhouse gas profile of LNG is significantly poorer than CNG given the energy required to render it into a liquid form. In addition, the ultra-cold nature of LNG increases the potential problems associated with its handling and refuelling. “*Tasmania currently does not have LNG liquefaction facilities.*”⁶¹ *However, the import cost profile of LNG into the State is ameliorated somewhat by the fact that globally, “LNG is the cheapest available heavy-duty truck fuel.”*⁶² Vehicular conversion costs, the availability of refuelling stations and, in the case of LNG, the relatively time consuming re-fuelling process, appear to be currently the most significant obstacles to the widespread uptake of natural gas transport fuel.⁶³ It is important to note that the private sector is currently exploring LNG processing and distribution systems within Tasmania. The Committee applauds these efforts and encourages heavy vehicle fleet operators in this State to maximise the opportunities presented by this far-sighted endeavour.

Despite these challenges, the Committee was encouraged to discover that a trial of CNG as a fleet transport fuel had been undertaken by Cripps Nubake on its delivery vehicles. This trial returned a 49 percent fuel cost saving in its six weeks of operation.⁶⁴

Given this Committee’s 2003 report on; *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*, this Committee was concerned to discover that Metro Tasmania is still to implement significant local research and development strategies with respect to alternative fuels including CNG.⁶⁵ The Committee respectfully requests that the responsible Minister provide the relevant House with a detailed update on the Government’s response to recommendations made by this Committee in its 2003 report on; *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*.

⁶⁰ Powerco Tasmania Pty Ltd, *Written Submission* at p 2.

⁶¹ Department of Economic Development, *Written Submission* at p 5.

⁶² *Id.* Fox Design Pty Ltd, *Written Submission* at p 7. Origin Asset Management, *Written Submission*, Mr John O’Brien, 30 January 2006 which incorporates Child, N et al, *Transport Fuels in Australia*, Submission to the Australian Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia’s Future Oil Supply and Alternative Transport Fuels, February 2006 at p 15.

⁶³ Hobart City Council, *Written Submission* at p 7. Option One Pty Ltd, *Written Submission* at p 1. Powerco Tasmania Pty Ltd, *Written Submission* at p 2. Department of Economic Development, *Written Submission*, at p 5. Advanced Fuels technology Pty Ltd, *Written Submission*, Mr Bruce Thompson, 15 January 2007. Metro Tasmania Pty Ltd, *Written Submission* at p 5. RACT, *Written Submission* at paras 4.1.1-4.1.2.

⁶⁴ Department of Economic Development, Resource and Infrastructure Industry development Division, *Written Submission*, at p 11. Compare (Australasia) Ltd, *Written Submission*, Mr Crispin Cannon, 31 January 2007 at p 4.

⁶⁵ Powerco Tasmania Pty Ltd, *Written Submission* at p 3.

Hydrogen

The characteristics of Hydrogen as a potential transport fuel were summarised for the Committee in one submission as follows:⁶⁶

Cars, trucks and buses can burn pure hydrogen in an internal combustion engine, or use it in a fuel cell to drive an electric motor. The fuel cell option is generally considered preferable for the long term, because although it requires more changes to existing vehicle design, it allows for higher efficiency and hence a longer range on the same amount of fuel. This section will thus consider the upstream emissions associated with producing hydrogen of the purity required for fuel cells.

Hydrogen is the chemical element with the smallest molecular mass. Hydrogen is not found as a free element on earth. Because of its high reactivity, it is always bonded to other molecules. As a result hydrogen for automotive use has to be man made. The hydrogen energy content per unit mass is high. Compared to petrol for example, it is three times as high. On a volume basis, the energy content of hydrogen is relatively small.

Hydrogen fuel-cell technology is not yet mature; however, research into its potential transport fuel usage is well advanced.⁶⁷ The largest environmental issue associated with the production of transport hydrogen lies in the huge quantities of electricity required by the process. The effect of this is to negate completely the greenhouse gas benefits of switching from conventional fuels to hydrogen transport fuel. However, a real opportunity exists for advancement in the research and development of this transport fuel in Tasmania given our current renewable energy profile.⁶⁸

Oil from Coal

Tasmania's coalfields prompted two submissions to include reference to existing coal to oil technology.⁶⁹ This technology was developed in Germany between the two world wars of the last century. That technology enjoyed something of a renaissance in apartheid South Africa during its economic isolation.

The fuel produced by these processes is effectively a highly refined version of conventional transport fuels. As such it contains fewer of the noxious emissions but all of the greenhouse gas emissions of conventional fuel. Because of the synthetic processing of this fuel, unless it is produced using

⁶⁶ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission* at p 357.

⁶⁷ RACT, *Written Submission* at paras 7.7-7.8. CSIRO, *Written Submission* at p 4 "The International Energy Agency tells us that the only means of achieving 90% or better reduction in vehicle emissions is to use hydrogen or electricity produced from renewable resources. Based on current technologies it could take thirty or forty years to get there."

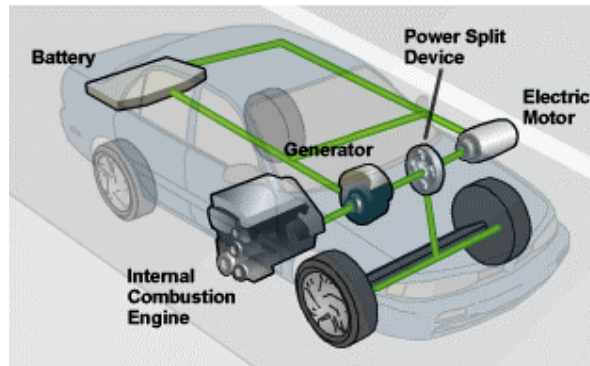
⁶⁸ CSIRO, *Written Submission* at pp 4-5. Hydro Tasmania at para 4.5. Fox Design Pty Ltd, *Written Submission* at p 10. Hobart City Council, *Written Submission* at p 8.

⁶⁹ RACT, *Written Submission*, at para 7.4. CSIRO, *Written Submission* at pp 4.

renewable energy, its greenhouse gas profile is far higher than conventional fuel.⁷⁰ However, history has shown that it can be a viable response to conventional fuel supply constraints.

Electric / Hybrid

Two submissions to the Inquiry referred favourably to the potential of “electric/hybrid” vehicles.⁷¹ According to the United States Department of Energy,⁷² hybrid-electric vehicles (HEV’s): “combine the benefits of gasoline engines and electric motors and can be configured to obtain different objectives, such as improved fuel economy, increased power, or additional auxiliary power for electronic devices and power tools.”



Some of the advanced technologies typically used by hybrids include

Regenerative Braking. *The electric motor applies resistance to the drivetrain causing the wheels to slow down. In return, the energy from the wheels turns the motor, which functions as a generator, converting energy normally wasted during coasting and braking into electricity, which is stored in a battery until needed by the electric motor.*

Electric Motor Drive/Assist. *The electric motor provides additional power to assist the engine in accelerating, passing, or hill climbing. This allows a smaller, more efficient engine to be used. In some vehicles, the motor alone provides power for low-speed driving conditions where internal combustion engines are least efficient.*

Automatic Start/Shutdown. *Automatically shuts off the engine when the vehicle comes to a stop and restarts it when the accelerator is pressed. This prevents wasted energy from idling.*

An emerging variant of Hybrid Electric technology that interested the Committee was the so-called “Plug-in Hybrid Electric Vehicle” (PHEV).

⁷⁰ Department of Tourism, Arts and the Environment, Environment Division, *Written Submission Part 1 Chapter 3 Fischer-Tropsch Diesel* and Part 2 Chapter 3 *Fischer-Tropsch Diesel*.

⁷¹ RACT, *Written Submission* at para 7.6. Hydro Tasmania, *Written Submission* at para 4.4.

⁷² “How Hybrids Work.” <http://www.fueleconomy.gov/feg/hybridtech.shtml> (accessed 30 April 2008).

According to an article in "Popular Mechanics" magazine published in May 2007:⁷³

The PHEV's main selling point is big fuel economy, using technology that's almost ready now. While hydrogen, in particular, would demand new infrastructure on a grand scale, plug-ins rely on ... home powerlines and pump gasoline.

...

General Motors says both an E-Flex car and a Saturn-branded plug-in, called the Vue Green Line, will be ready by 2010. The Vue, like models on the roads now, will follow a "parallel" design, in which both an electric motor and a gasoline engine drive the wheels, often working in concert. In contrast, the E-Flex cars will be "series" hybrids. Only the electric motor will turn the wheels. Then, once the battery runs low, a small engine - could be gas or diesel, or it could someday be replaced by a hydrogen fuel cell - fires to turn a generator that produces more electricity. That's potentially less efficient than making a direct mechanical linkage between the engine and the wheels, as in a parallel design. However, it allows for great flexibility in design and manufacturing.

To complete the picture, there are also some pure electric vehicles (EVs) on the market. The \$92,000 Tesla Roadster, for instance, sucks electricity from an outlet, then rockets from 0 to 60 mph in under 4 seconds. And it can run up to 250 miles before needing a recharge. That's a huge advance over earlier EVs - but it still doesn't make an ideal road trip vehicle. As GM vice chairman Bob Lutz points out, "You can't take a gas can and walk down the highway to pick up five bucks' worth of electricity."

Other companies are working on their own designs. In March, Toyota announced it was developing a plug-in technology, which could be available in 2009. Nissan is working on a PHEV that may be introduced within five years. Ford introduced a PHEV concept vehicle, the Airstream, this winter, and some of its engineers are tooling around ... in a plug-in version of a Ford Edge - though the company pointedly denies any plans for a production vehicle. DaimlerChrysler is testing a fleet of plug-in Dodge Sprinter commercial vans; the electric motor is paired with either a gasoline or a small diesel engine.

There are two major factors pointing to the particular benefits of "electric/hybrid plug-in" vehicles within the Tasmanian context. One is the high degree of renewable electricity generated within the State. The other is the fact that peak recharging time is likely to be overnight, at a time of minimal power load demand on the electricity grid. However there are many challenges to be overcome by this technology, primarily in the economically sustainable and greenhouse-gas-friendly production of suitable battery systems.⁷⁴

⁷³ "Plug-in Hybrid Electric Cars: How They'll Solve the Fuel Crunch" http://www.popularmechanics.com/automotive/new_cars/4215489.html?page=1 (accessed 30 April 2008).

⁷⁴ Hydro Tasmania, *Written Submission* at para 4.4.2. Hobart City Council, *Written Submission* at p 8.

Excise Considerations

The Committee notes that the previous Federal Government proposed in 2006 to introduce the following range of fuel excises on alternative fuels based on the approximate energy profile of each:

Table 2: Proposed effective excise rate on alternative fuels (cents per litre)

Fuel type	1 July 2011	1 July 2012	1 July 2013	1 July 2014	1 July 2015
Biodiesel	3.8	7.6	11.4	15.3	19.1
LPG, LNG, ethanol	2.5	5.0	7.5	10.0	12.5
Methanol	1.7	3.4	5.1	6.8	8.5
CNG	3.8	7.6	11.4	15.2	19.0

Source: Fuel Tax Bill 2006, *Explanatory Memorandum*, p.15.

It is clear that such a proposed excise regime will have implications for the development of alternative fuel options throughout the nation.

Alternative Fuel Comparison Findings

FINDING 1

On the basis of evidence before it, the Committee finds that there are indeed:

... merits in the use of diesel, compressed natural gas (CNG) and liquid natural gas (LNG), 100% bio-diesel and bio-diesel/diesel mixtures and other alternative fuels for vehicles under the control of state and local government, state owned companies, government businesses and the broader community.

The Committee further finds that three major constraints act in concert to determine Tasmania's transport fuel supply in the present and into the future, namely:⁷⁵

- The price of conventional fuel;
- The presence or absence of State and Federal government assistance; and
- The unique environmental and economic infrastructure of the State.

RECOMMENDATION 1

The Committee **recommends** that the Government provide a detailed response to the recommendations in this report, as well as the recommendations in this Committee's 2003 report on *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*, within a six month time-frame.

⁷⁵ RACT, *Written Submission* at para 8. Veolia Environmental Services, *Written Submission* at p. 2. Bioenergy Australia, *Written Submission* provides context specific examples of the interrelationship of these variables.

Given this Committee's 2003 report on, *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*, this Committee was concerned to discover that Metro Tasmania provided little evidence of actual resort to alternative fuels including biodiesel, LPG CNG, ethanol, hydrogen. This is despite the increasing trend of equivalent public transport service providers moving towards alternative fuel usage. It was made clear to the Committee in its written submission that Metro remains unconvinced that the economic case has been made out for it to convert any of its fleet to utilise alternative fuels. It is of interest to the Committee to note that Metro's written submission concludes with the following sentence:

Metro has to operate within the scope of matters it can control, and in response to the incentives and disincentives it faces as a State Owned Company.

FINDING 2

At present, the corporate objectives of Metro Tasmania are found at section 5 of the Metro Tasmania Act 1997 and reads as follows:

5. Principal objective of Company

The principal objective of the Company is to provide road passenger transport services in Tasmania and to operate those services in a manner consistent with sound commercial practice.

The Committee finds that the present drafting of the *Metro Tasmania Act 1997* does not provide sufficient balance between commercial, social and environmental outcomes in its corporate objectives. This unduly restricts management of the corporation to a short-term focus on commercial outcomes to the exclusion of all other valid measures of performance.

RECOMMENDATION 2

The Committee **recommends** that section 5 of the Metro Tasmania Act 1997 be amended to read as follows:

The principal objective of the Company is to provide road passenger transport services in Tasmania in a manner that is socially, economically and environmentally responsible by reference to quantifiable international benchmarks for public transport systems.

General Observation

The Committee notes the work of other Parliamentary Committees and Government Agencies across Australia that seek to address the interrelated issues of sustainable fuel security and alternative fuel production.⁷⁶ The

⁷⁶ Eg: Note the current Legislative Council of South Australia Select Committee on the *Impact of Peak Oil on South Australia*, reporting on or before 23 July 2008. Parliament of Tasmania, Joint Standing Committee on Environment, Resources and Development, *The Use Of Compressed Natural Gas As A Vehicle Fuel In Tasmania*,

Committee notes the general comments of the Senate Rural and Regional Affairs and Transport Committee concerning the obstacles to securing National fuel security as follows:⁷⁷

- 7.90 *If alternative transport fuels are to successfully replace or supplement conventional oil to any significant degree, massive investment in large scale production will be essential, regardless of whether these fuels are to be derived from biomass or fossil sources.*
- 7.91 *This investment is seen as risky by corporations contemplating development of alternative fuel industries, for a number of reasons. All are more expensive than conventional oil, and thus the long term oil price constitutes a source of risk. Some technologies face uncertainties about the price of feedstocks and the price of carbon. (This will affect the economics of processes such as CTL that create significant emissions in the conversion process) Some such as fuel ethanol face difficulties associated with consumer acceptance and marketing the product. In the absence of mandatory targets, there is little incentive for the oil companies to sell these fuels, even if available in quantity.*
- 7.92 *Additionally, all large scale projects involve long lead times before they attain production. In the case of some projects which the committee has discussed in the preceding chapters, these lead times can be ten years or more. This adds to the risk profile for prospective investment.*
- 7.93 *Unless companies can control or quantify the nature of the investment risks they face, investment will not be forthcoming. As has been seen in the case of failed GTL projects in Western Australia, it is difficult to get projects to a point where they are judged sufficiently commercially viable. Equally, there are anecdotal reports of investment in ethanol production being held up because of difficulties in finding a market.*
- 7.94 *The committee considers that there is a need for the Government to develop strategies for addressing the risks that prospective investors in new fuel technologies face, to ensure that timely investment occurs. As noted at paragraph 6.136, there are serious questions about whether market forces will operate in a way that will ensure the timely development of such projects.*
- 7.95 *The committee further considers that the issues of long term sustainability of alternative fuels must be addressed, particularly from the perspective of climate change.*

20 March 2003. Parliament of Victoria, Joint Committee on Economic Development and Infrastructure, *Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria*, February 2008. Parliament of Australia, Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels, February 2006.

⁷⁷ Parliament of Australia, Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels, February 2006 Chapter 7 - Supply side responses - Alternative fuels - Biofuels

The same scientific community that has been working to bring alternative fuels on line and improve overall energy efficiency has also been clear about what needs to be done to address this long term problem. One of the CSIRO's leading researchers stated as far back as January 2006 that:⁷⁸

We have to ask what alternatives to oil might be realistic and then look at the role of alternative technologies in meeting the challenges.

...

We build our defence policies on the basis of possible threats to our national security. Our health policies recognise prevention is better than cure. Yet we don't seem to have any national plan for dealing with what could have a devastating effect on our economy and lifestyle.

...

It's time we pulled together for a national fuels strategy.

This call was echoed in evidence to the Committee from the Manager of Government Affairs for Ford Australia, Mr Russell Scoular:⁷⁹

In summary, we believe it important that a national approach is taken in Australia towards the development of an appropriate alternative fuel strategy.

It is therefore surprising to note that, at the date of this Report, a national fuels strategy (conventional or alternative) has not been placed on the agenda of either the Ministerial Council on Energy, or its working group the National Oil Supplies Emergency Committee.⁸⁰ In addition, the Committee notes with some concern that the specific issue of a national fuels strategy did not arise out of the recent Australia 2020 conference. Precisely this point was made by the Centre for International Economics in the context of biofuel production:⁸¹

Coordination among the various funding agencies and between the federal and state governments in the area of biofuel policy is hard to discern.

It is apparent to the Committee that the time has come to address the issue of a national fuels strategy that encompasses a sustainable mix of conventional and alternative fuels to secure Australia's future fuel requirements into the medium-to-long term.

⁷⁸ Lamb, D, "Pulling together a national fuel strategy" Wednesday, 25 January 2006, <http://www.csiro.au/science/ps16k.html> (accessed 30 April 2008).

⁷⁹ Scoular, R, Government Affairs Manager, Ford (Australia) Ltd, *Transcript of Evidence*, 15 October 2007 at p 42.

⁸⁰ The Committee notes that the Parliament of Victoria, Joint Committee on Economic Development and Infrastructure, *Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria*, February 2008 does not identify this issue specifically, but nevertheless recommends at p 171 that a national approach be developed in relation to biodiesel.

⁸¹ Centre of International Economics, "Biofuels – At What Cost?" International Institute for Sustainable Development, April 2008. http://www.iisd.org/pdf/2008/biofuels_subsidies_australia.pdf (accessed 30 April 2008).

FINDING 3

The Committee finds that Australia has no coordinated national fuels strategy.

Accordingly, the Committee recommends as follows:

RECOMMENDATION 3

The Committee **recommends** that the Minister for Energy and Resources immediately place the development of a national fuels strategy on the agenda of the Ministerial Council on Energy, with specific reference to the inclusion within such a strategy of sustainable regional-specific alternative fuels' strategies capable of securing Australia's transport fuel future. The Committee notes the recent announcement by the State Government of a State fuels summit and **further recommends** that the development of a State fuels strategy be considered at that summit.

APPENDIX 1

List of Witnesses

Name of Witness	Representing
Mr Mike Street & Mr Greg Fannan	Hobart City Council
Mr Russell Scoular	Ford Motor Company of Australia Ltd
Mr John Brennan & Mr Ron Ward	Veolia Environmental Services
Mr John Isaac	Department of Tourism Arts and the Environment
Mr David Hurburgh	Department of Economic Development
Mr John Evans	Impression Bay Seafoods
Mr Toby Meredith	Chelsea Gas
Mr Phil Westlake	Australian Liquid Petroleum Gas Association
Mr Crispin Cannon & Mr Gary Woodhead	CompAir (Australasia) Ltd
Mr Fraser Kirkpatrick	Powerco Tasmania Pty Ltd
Mr James Fox	Fox Design Pty Ltd
Mr Bruce Thompson	Advanced Fuels Technology Pty Ltd
Mr Russell Reid	Option One Pty Ltd
Mr Tony Sim & Mr Geoff Dallas	Metro Tasmania Pty Ltd
Mr Doug Ling	RACT
Mr Lyndon O'Neil	Independent Energy Fuel Systems Components
Private Witness	
Mr Michael Scott	

APPENDIX 2

Written Submissions Taken into Evidence

Performance Automobiles Group

Crantock, Paul

Hobart City Council

Firepower

Gaylor, John

Alinta

Ford Motor Company of Australia Ltd

Department of Treasury and Finance

Veolia Environmental Services

Department of Tourism, Arts and the Environment

Department of Economic Development

Impression Bay Seafoods

Chelsea Gas

CompAir (Australasia) Ltd

Joubert, Leon

Powerco Tasmania Pty Ltd

AJG Agencies Pty Ltd

Fox Design Pty Ltd

Origin Energy Asset Management Services

Advanced Fuels Technology Pty Ltd

Option One Pty Ltd

Metro Tasmania Pty Ltd

Bioenergy Australia

RACT

CSIRO

Hydro Tasmania

Private Witness

Mr Michael Scott

APPENDIX 3

Documents Taken into Evidence

1. Doornbosch, R and Steenblik, R, "Biofuels: Is the Cure Worse than the Disease?" *OECD Roundtable on Sustainable Development*, Paris 11-12 September 2007.
2. Stewart, K and Webster, P "Solution or stopgap?" *The Chemical Engineer*, September 2007 at p 40.
3. OECD-FAO "Agricultural Outlook 2007-2016" Organisation for Economic Co-operation and Development, and Food and Agriculture Organisation of the United Nations, 2007.
4. Department of Sustainability and Environment, "Biodiesel in Australia: Benefits Issues and Opportunities for Local Government Uptake." Victorian Government, June 2007.
5. Anyon P, "*Liquefied Petroleum Gas as an Automotive Fuel: An environmental and technical Perspective.*" The Australian Liquefied Petroleum Gas Association Ltd, Sydney, 2002.
6. World LP Gas Association, "Health Effects and Costs of Vehicle Emissions: The Invisible Challenge." Paris, 2005.
7. Anyon P, "*LPG- The Clean Transport Alternative.*" The Australian Liquefied Petroleum Gas Association Ltd, Sydney, September 2003.
8. ALPAGA Information Paper 1, "*Australian Liquefied Petroleum Gas Supply Research Study 2000-2020.*" The Australian Liquefied Petroleum Gas Association Ltd, Sydney, May 2003.
9. Mr Phil Westlake, Tasmanian LPG Gas Information Pack, Australian Liquid Petroleum Gas Association.
10. Mr Phil Westlake, "Fleet Impact on Environment: LPG Autogas." AFMA Seminar Presentation Slides, Australian Liquid Petroleum Gas Association, 18 September 2007.
11. IGU, "Report on Study Group 5.3 'Natural Gas for Vehicles (NGV)' Global Opportunities for Natural Gas as a Transportation Fuel for Today and Tomorrow." Final Report, International Gas Union, December 2005.
12. CompAir (Australasia) Ltd, "Proposal for Compressed Natural Gas CNG Public Refueling Infrastructure For Tasmania." Presentation slides, October 2007.
13. "Appendix 6 – Cost Comparison of Natural Gas and Diesel as a Vehicle Fuel."
14. Advanced Fuels Technology Pty Ltd, "CNG & LNG – A Viable Alternative for Australia." Presentation slides, October 2007.
15. Reid, R, "Submission by Option One Pty Ltd."
16. Metro Tasmania Pty Ltd, "Inquiry into the Potential of Compressed Natural Gas and Bio-Diesel." Presentation slides.