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Tuesday September 12, 2006

Hon Jenny Lindell MP
Chair, Environment and Natural Resources Committee
Level 8, 35 Spring Street
MELBOURNE VIC 3000

Dear Ms Lindell

INQUIRY INTO THE PRODUCTION AND/OR USE OF BIOFUELS IN VICTORIA

Thank you for your letter of 8 August 2006 to Geoff Mabbett regarding the Environment and Natural Resources Committee's inquiry into the production and/or use of biofuels in Victoria.

I am pleased to respond to your request for a written submission from Sustainability Victoria which is attached with this letter.

If you have any questions or seek any additional information, please contact Vikas Ahuja, Renewables, on telephone (03) 9655 3262.

Yours sincerely

Geoff Mabbett
Chief Executive Officer
Sustainability Victoria
215 Spring Street,
Melbourne VIC 3000

Sustainability victoria

Victoria
The Place To Be

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Inquiry into the Production and/or Use of Biofuels in Victoria

Submission to the Environment and Natural Resources Committee

September 2006

Sustainability victoria

Victoria
The Place To Be

Contents

1 Executive Summary

Environmental impact

- The transport sector is the second largest emitter of greenhouse gas emissions in Victoria.
- In the short to medium term **biofuels are an effective way of reducing greenhouse emissions from the transport sector** because biofuels are renewable and can be grown, manufactured and used locally.
- **Biofuels help reduce air pollution and related public health risks** by reducing emissions of many air pollutants, especially those in urban areas. These include particulate matter (PM), carbon monoxide (CO), hydrocarbons (HC), sulfur oxides (SOx), and nitrogen oxides (NOx). Blending biodiesel may help reduce emissions from normal diesel.
- **Biodiesel is more relevant for Victoria** than ethanol, because the local feedstocks of tallow and oilseed crops are more suited to biodiesel. Ethanol from whey should be explored as an option.
- Each litre of biodiesel provides the same environmental benefits whether it is used neat (100%) or blended as say B20 (which is 20% biodiesel with 80% diesel fuel). Therefore the greenhouse benefit depends primarily on the total number of litres consumed in the State rather than the blend proportion.

Economic impact

- **Biofuels are economically viable** under current market conditions and so the environmental benefits of biofuels are available at no additional cost to the Victorian consumer or economy.
- In the existing market, **most environmental and social costs associated with petroleum derived fuels are not accounted for in their pricing**. As a result, the price of biodiesel (and to a lesser extent ethanol) appears high relative to the price of diesel (and petrol). There is no feasible way to reflect the environmental benefits of using biofuels, especially biodiesel (other than via a carbon cost on petroleum).
- Even if biofuel producers import feedstock (such as palm oil) to supplement or substitute locally grown feedstock, and export their biofuel production, the local investment in production plant, employment in construction and operation, and diversification of the market for primary producers will be **beneficial for the Victorian economy**.
- Petroleum imports are at record levels, and continue to rise. Our transportation sector relies almost exclusively on petroleum for energy. Biofuels can be produced domestically from energy crops, oilseeds, tallow and from waste fats and oils. Biofuels offer the immediate potential to **reduce our demand for petroleum**. This would benefit our economy by shifting the spending on imports to domestically produced energy, and offer new energy-related markets to local farmers.

Key barriers

- Sustainability Victoria has been approached by 19 parties interested in manufacturing or distributing biofuels or biofuel blends in Victoria. These proposals would amount to in excess of 400 million litres per annum of forecast production in Victoria alone, if realised. This exceeds the Australian Government's 350 million litres by 2010 target.
- The **key barrier** to investment in the Victorian biofuel industry for local production and distribution is the **uncertainty in demand** for biofuels.

Recommendations for the role of Government

Government's role in addressing the market's failure in supporting the production and use of biofuels in Victoria should be to:

> create certainty of demand; and
> address consumer confidence in biofuels.

Potential Government initiatives

1. Government leadership in **requiring the use of E10 and B20 for Government vehicles** where possible. This will help give the message that biofuels are safe and easy to use.
2. Government initiative to provide a **biofuel 'fuel card'**, perhaps in partnership with organisations like Greenfleet, which serves as a promotion and incentive, and removes one barrier (taking the first step) to fuelling Government vehicles on biofuels.
3. **Requiring a mandatory percentage of the Government's own consumption** (at least 20% to be meaningful) to be met with biofuels should be considered. There are a number of ways in which this may be done to address logistical and distribution issues such as requiring all depot based vehicles with access to their own refuelling facilities, to use biofuels.
4. **Build market confidence** around biofuels in particular B20 and E10. The main issue is the perception that these fuels will affect the warranties offered by the car manufacturers. The Government could facilitate clear statements regarding the effect of biofuels on vehicles to consumers in partnership with vehicle manufacturers, and work to establish the appropriate fuel quality standards.
5. **Facilitate local distribution** of biofuels to enable easy availability of these fuels.
6. Work with Local Government and large users to **form 'demand' groups** which can drive supply of biofuels. Local Councils are also responsible for planning permits for refuelling facilities.

Preferred option for public policy: mandatory sales targets

A sales target would require that a certain percentage of fuel sales from each company importing or distributing petroleum transport fuels be biofuels.

The preferred option at this stage of analysis is a sales target for biofuels across the board (as opposed to a target for ethanol and a separate target for biodiesel). In practice this would mean:

> For each company importing or distributing petroleum transport fuels, a set percentage of the total annual combined petrol and diesel sales volume would be required to be replaced with biofuels which meet the appropriate fuel quality specifications;
> The company would be able to decide which biofuels to use, when, where and at what percentage blend;
> Companies would need to report on annual sales of petroleum fuels (as at present) and biofuels sales.

2 Introduction

Sustainability Victoria is leading the State's activities to meet the sustainability challenge by focusing on changing the way Victorians supply and use resources. We are dedicated to showing the way to a sustainable future through the delivery of effective education and behaviour change initiatives and the development of innovative technologies and practices.

The environmental challenges that we face are enormous. The challenge is clear.

> We need to reduce our greenhouse emissions by reducing our demand for energy and increasing our uptake of renewable energy.

> We need to reduce the amount of waste we generate and continue to increase recycling.

> We need to increase water efficiency to ensure that we don't run out of this precious resource.

> And this all needs to be done in a way that supports a high quality of life and a growing economy.

While the challenge is great, the opportunities are also significant. Using resources more productively is good for business and good for the economy.

Sustainability Victoria is focused on delivering sustainable outcomes across:

> **Energy** - by reducing our consumption through energy efficiency improvements and accelerating the uptake of renewable energy, leading to reduced greenhouse emissions

> **Materials** - by reducing the amount of waste we generate, reducing litter and increasing recycling

> **Water** - by reducing consumption and improving water use efficiency.

Sustainability Victoria is working to accelerate progress towards a sustainable energy future and to ensure that Victoria's future energy needs are met in way that is more efficient, cleaner and more secure.

This submission on the Production and/or Use of Biofuels in Victoria is focused on sustainable energy, and addresses the following Terms of Reference for the Environment and Natural Resources Committee Inquiry (ENRC) inquiry in this context.

The Committee is asked to inquire into, consider and report to Parliament on:

> *current manufacture, availability and use of biofuels for transport in Australia and Victoria;*

> *potential environmental, economic and social impacts of increased manufacture and use of biofuel for transport application;*

> *the impact of reducing reliance on oil imports as a result of increased use of biofuels for transport;*

> *barriers to and incentives for the increased use of biofuel for transport; and*

> *the role of Government in the manufacture and use of biofuels for transport.*

In particular this Submission looks at:

> the sustainable energy challenge facing Victoria;

- the potential greenhouse gas emissions reductions that can be made in the agriculture and transport sector;
- the barriers to realising these increased production and use of biofuels in Victoria;
- current policies and initiatives that support the manufacture and use of biofuels; and
- the opportunities for increasing production and use of renewable fuels in Victorian communities.

The impact of reducing reliance on oil imports as a result of increased use of biofuels for transport is not addressed in detail in this submission.

What is a biofuel?

Biofuels are fuels produced from renewable organic sources. Biofuels with commercial prospects in Australia are ethanol and biodiesel.

Ethanol
Ethanol is an alcohol, most commonly made using a process similar to brewing beer where starch crops are converted into sugars, the sugars are fermented into ethanol, and then the ethanol is extracted into its final form by distillation.

At present there are two renewable sources of ethanol used commercially in Australia: from the fermentation of sugar from wheat starch and from C-grade molasses (a by-product from sugar cane operations).

The grain ethanol production process can use seconds or sub-standard grain, which may be affected by frost, hail, disease, contamination or physical damage.

Biodiesel
Biodiesel can be made from new or used vegetable oils (such as canola, soy and palm oil) and animal fats. Biodiesel is typically produced by a reaction of vegetable oil or animal fat with an alcohol, such as ethanol or methanol, in the presence of a catalyst.

Current potential feedstocks for biodiesel include vegetable/grain oils (new or used), tallow, lard and yellow grease. Biodiesel is biodegradable, requires minimal engine modification when used either as a blending component or undiluted, and is cleaner burning than the diesel it replaces.

Naming of petrol or diesel blended with biofuel
Ethanol is typically blended with petrol and biodiesel with diesel. The proportion of blend is reflected in the name of the blended fuel.

So E10 is petrol with 10% ethanol and E85 is petrol with 85% ethanol.

B5 is diesel with 5% biodiesel and B100 is 100% or neat biodiesel.

3 Current manufacture, availability and use of biofuels for transport in Australia and Victoria

3.1 National production

3.1.1 Ethanol

There are currently three main producers of fuel-grade ethanol in Australia:

- Manildra, Nowra, New South Wales
- CSR, Sarina, Queensland
- Rocky Point Distillery, Queensland.

Current fuel ethanol production capacity (but not production levels) is an estimated 75 million litres per annum. Manildra, Australia's largest fuel ethanol producer has some 90% of industry capacity.

Three major plants are in the planning and development stages and these include:

- BP's recently announced a joint venture with Primary Energy Pty Ltd to establish Australia's first wheat-based ethanol plant at Kwinana in Western Australia (WA). The $100 million project will result in the production of 80 million litres of ethanol a year which is enough to potentially blend 10 percent ethanol to all the petrol used by WA motorists each year.
- Lemon Tree Ethanol Pty Ltd, an ethanol plant at Millmerran, Queensland.
- Australian Biofuels Pty Ltd, Woorinen South, near Swan Hill, Victoria, with a capacity of 90 million litres per annum.

3.1.2 Biodiesel

Biodiesel production plants, operating and under development in Australia are shown in *Table 3-1* and *Table 3-2*.

Table 3-1 Biodiesel plants - operating

Organisation	Location	Annual Capacity
Australian Biodiesel Group	Berkley Vale, NSW	40 million litres
Australian Biodiesel Group	Narangba, QLD	160 million litres
Australian Renewable Fuels	Largs Bay, SA	45 million litres
Australian Renewable Fuels	Picton, WA	45 million litres
Biodiesel Industries Australia	Rutherford, NSW	12 million litres
Eco Tech Bio Diesel	Narangba, QLD	30 million litres
Evergreen Fuels	Mossman, QLD	
Future Fuels	Moama, NSW	

Table 3-2 Biodiesel plants - under construction, or in development

Organisation	Location	Annual Capacity	Estimated Operational Date
Axiom Energy	Geelong, VIC	150 million litres	June 2007
Biodiesel Producers	Barnawartha, VIC	60 million litres	
Biosel	Sydney, NSW	4 million litres	2007
Natural Fuels Australia	Darwin, NT	147 million litres	October 2006
Riverina Biofuels	Deniliquin, NSW	40 million litres	July 2007

3.2 Proposed biofuels plants for Victoria

Sustainability Victoria is aware of three key (large-scale) proposals for biofuel production facilities in Victoria. These are:

- Australian Ethanol (Australian Biofuels) plant near Swan Hill with an estimated capacity of 90 million litres per annum;
- Australian Biodiesel Producers plant in Barnawatha with a planned capacity 60 million litres per annum; and
- Axiom's recently announced plant in Geelong with a planned capacity of 150 million litres per annum.

Sustainability Victoria has been approached by 19 parties interested in manufacturing or distributing biofuels or biofuel blends in Victoria. These proposals amount to in excess of 400 million litres per annum of forecast production in Victoria alone.

3.3 Availability and use of biofuels in Victoria

Ethanol as an E10 blend is now available in Victoria through selected United outlets. Two products, Boost 98 and Plus ULP, contain 10% ethanol. United have 50 service stations in Victoria which represents approximately 2.5% of the total service stations located in Victoria.

Of the major oil companies Shell is the only company with an ethanol blend product available in Victoria. Shell Optimax Extreme petrol contains 5% ethanol. Shell Optimax Extreme is refined at their Geelong plant and is available at 19 selected Coles Express service stations in Victoria (predominately in Melbourne). These outlets represent approximately 7% of the total number of Shell service stations in Victoria.

SAFF, a South Australian based fuel distribution business now have one outlet in Victoria, in Ouyen, which sells a B20 blend of biodiesel as 'Premium diesel' and an E10 blend as 'Bio Unleaded 95'.

Biodiesel produced in small volumes is being used 'on-site' by some manufacturers such as Cookers (60 kilo litres per annum).

CSR also manufactures or has some capacity to manufacture ethanol at its plant in Yarraville, Victoria.

3.4 Fuel consumption in Victoria

Based on the Australian Bureau of Standards; 9210.0.55.001 - Survey of Motor Vehicle Use: Data Cubes, Australia, 01 Nov 2003 to 31 Oct 2004, Sustainability Victoria estimates that the:

- total fuel consumption in Victoria is approximately 7.5 billion litres per year; and
- diesel consumption in Victoria is approximately 2 billion litres per year.

The Department of Sustainability and Environment's report '*Alternative transport fuels and technologies – development of a whole of government policy position, Progress report – conclusions, proposed policy directions & next steps*,' June 2005, states that:

> *"The majority of fuel consumed by Victorian vehicles (2002 data) is petrol (4,697 ML – 62% of total fuel consumption). Diesel use constitutes 1,530ML (20%) and gaseous fuels (predominantly LPG + CNG) 1,392ML (18%). Of Victoria's petrol consumption, the vast majority (83%) is by passenger vehicles. Diesel is predominantly used by trucks (73%) and gaseous fuels are primarily used by passenger vehicles (75%)."*

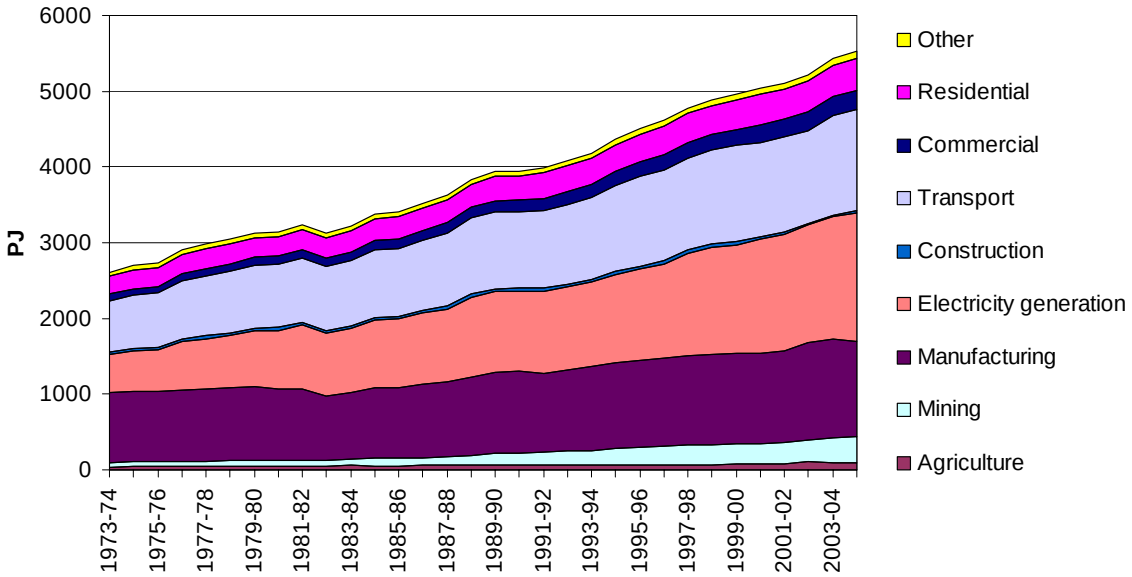
4 Potential environmental, economic and social impacts of increased manufacture and use of biofuel for transport applications

4.1 Environmental impacts

4.1.1 The sustainable energy challenge

Demand for energy in Victoria is increasing by an average of 1.6% per annum[1]. This is as a result of new investments in energy intensive industries, sustained increases in the use of technology in the industrial and commercial buildings sectors, the increasing size of residential homes, a trend towards smaller households, and the increased use of appliances. Figure 4-1 shows the growth in energy consumption by sector for Australia.

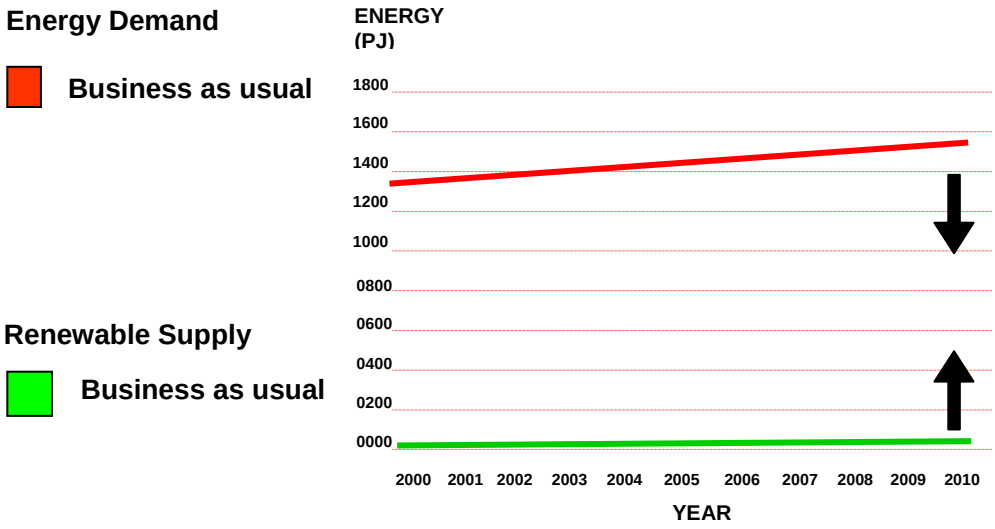
Figure 4-1 Growth in energy consumption by sector[2]



At the same time, the proportion of energy from renewable sources is remaining low. As a result, the gap between energy demand and the energy supplied from sustainable sources is continuing to widen as shown in Figure 4-2.

[1] 'Final energy consumption' data from ABARE eReport 05.9 *'australian energy: national and state projections to 2029-30,'* 2004
[2] *'Energy update 2006,'* Table B1 - Energy consumption in Australia by industry, ABARE

Figure 4-2 The sustainable energy challenge



To reverse these trends, measures need to be implemented both to reduce energy demand, and to increase the amount of energy supplied from clean, renewable sources.

4.1.2 Energy consumption in Victoria's transport and agriculture sector[2]

The transport sector in Victoria consumed 336.7 PJ of (primary) energy or 24% of all energy consumed in Victoria in 2004-05. Energy consumption in the transport sector over the last 5 years increased by 2.5% compared to 1.2% Australia wide.

The agriculture sector in Victoria consumed 19.4 PJ of (primary) energy or 1% of all energy consumed in Victoria in 2004-05. Energy consumption in the agriculture sector over the last 5 years increased by 12% compared to 7.5% Australia wide.

Figure 4-3 shows the trend in energy consumption in the transport and agriculture sector over the last 30 years.

Figure 4-3 Victorian energy consumption in transport and agriculture[3]

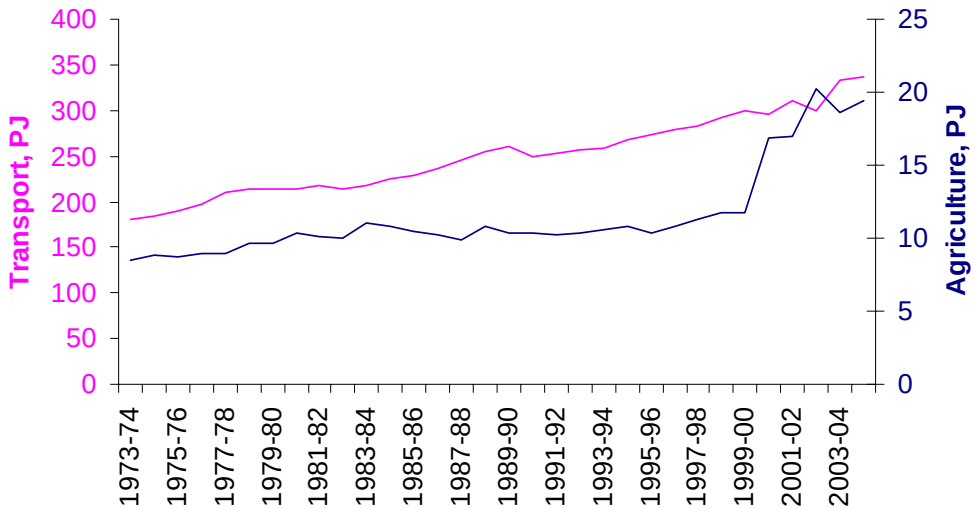
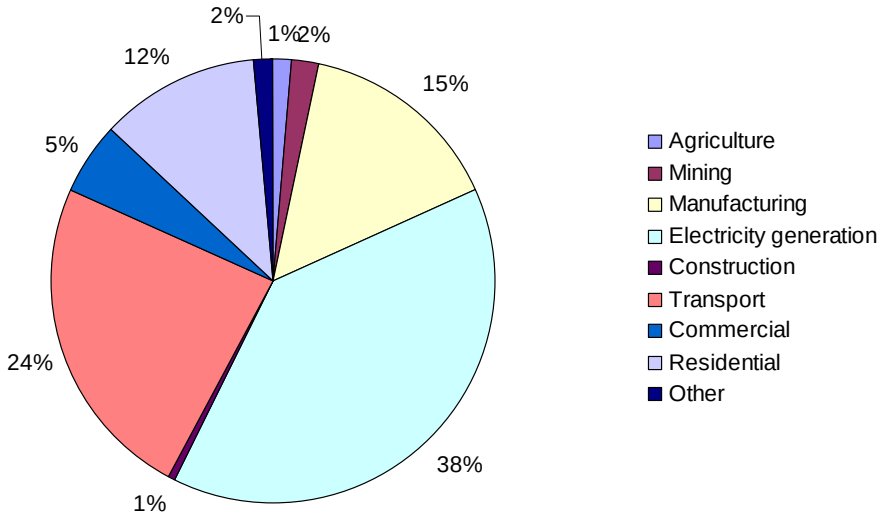


Figure 4-4 shows the energy consumption by sector for Victoria.

[3] '*Energy update 2006*,' Table B3 - Energy consumption in Victoria, by industry, ABARE

Figure 4-4 Energy consumption in Victoria, by industry for 2004-05[3]



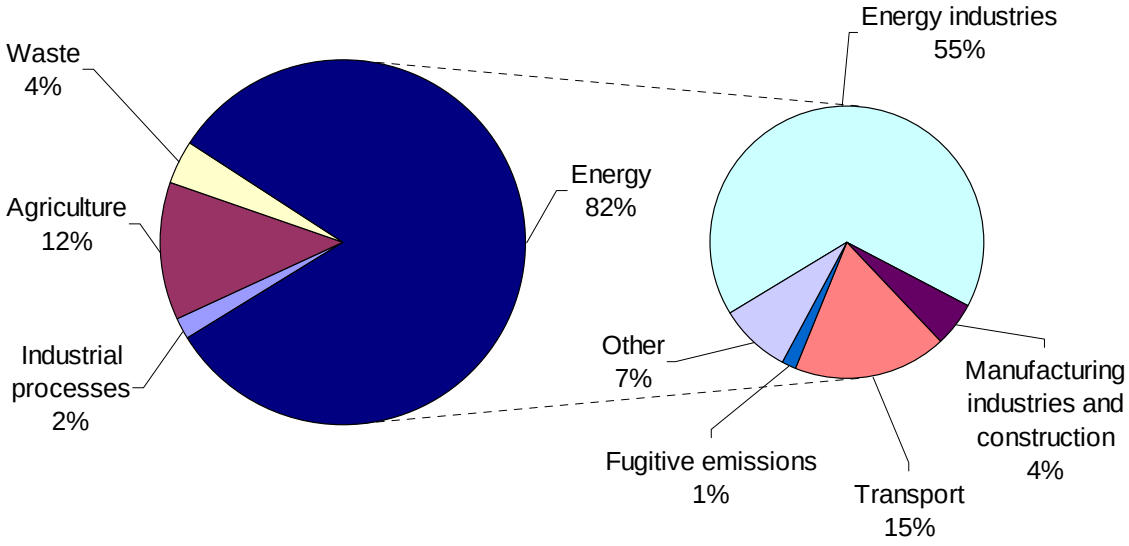
The transport sector is the second largest user of energy in Victoria at 24%.

4.1.3 Victoria's greenhouse footprint

The CSIRO predicts that, as a result of greenhouse gas emissions from human activities, average temperatures will increase by between 1 and 5 degrees by 2070 across Australia. The impacts of this warming could include reduced productivity in the agricultural sector, and destruction of some of our most precious natural systems.

Victoria produces close to a quarter of all of Australia's greenhouse gas emissions. Figure 4-5 depicts Victoria's greenhouse gas emissions by sector. The stationary energy[4] sector accounts for most of the greenhouse gas emissions, comprising about 67% of Victoria's greenhouse gas emissions. The transport sector accounts for the second largest proportion (15%) of the State's greenhouse gas emissions.

Figure 4-5 Victorian greenhouse gas emissions by sector, not including land use (*Victorian Greenhouse Inventory 2004*)

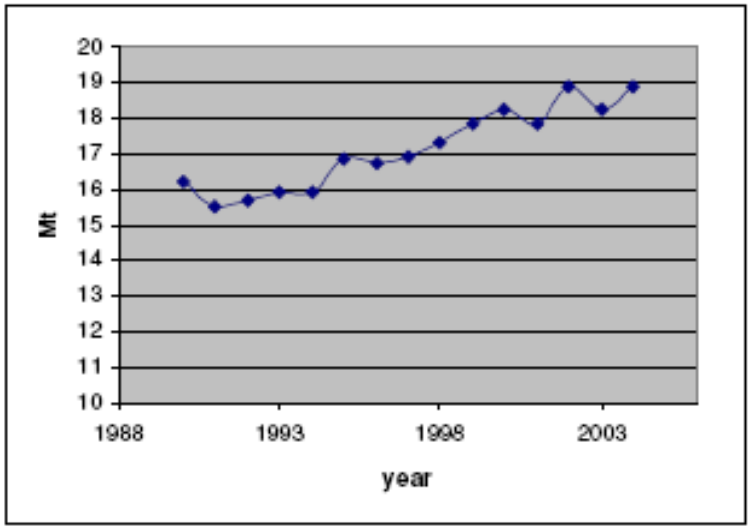


[4] Stationary energy can be defined as the energy which is generated at and consumed at fixed sources

4.1.3.1 Transport

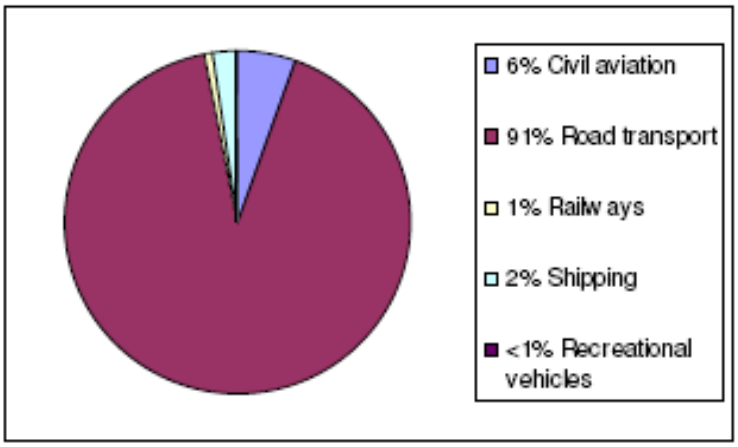
Transport was the second largest contributor to Victoria's total net greenhouse gas emissions in 2004, with emissions of 18.9 Mt (15.4% of the State total). Emissions increases in this sub sector were significant – growing by 16.4% from 1990 to 2004.

Figure 4-6 Trends in Victoria transport emissions (*Victorian Greenhouse Inventory 2004*)



As shown in Figure 4-7, road transportation was responsible for 91% of emissions from the transport sub-sector in 2004. It should be noted that the emissions shares presented in Figure 6 do not include the emissions associated with the use of electricity by Melbourne's metropolitan train and tram system – its electricity use is accounted for within the energy industries sub-sector.

Figure 4-7 Composition of transport emissions (*Victorian Greenhouse Inventory 2004*)



4.1.3.2 Agriculture

The agricultural sector contributed 12.5% of Victoria's total net emissions in 2004. Emissions from the sector increased by 0.5 Mt (3.0%) over the period 1990 to 2004.

Enteric fermentation (livestock 'burps') was responsible for 71% of agricultural greenhouse gas emissions. Nitrous oxide from agricultural soils contributed 24% and emissions from manure management contributed about 5%. Emissions from livestock were relatively stable, with a decrease of 0.15 Mt between 1990 and 2004. Emissions

from agricultural soils increased from 3.1 to 3.7 Mt (18.8%) between 1990 and 2004, and this accounted for most of the increase in net agricultural emissions.

4.2 Environmental impacts of the manufacture and use of biofuels

There have been several analyses comparing emissions from petroleum derived fuels and biofuels. Some of the key results from relevant analyses are quoted here to show that **in the short to medium term biofuels are an effective way of reducing greenhouse emissions from the transport sector because biofuels are renewable and can be grown, manufactured and used locally.**

4.2.1 Australian CSIRO analysis

The Australian Government has previously commissioned assessments by CSIRO of the environmental impacts of the use of biofuels[5,6].

These reports state that:

> *"All forms of biodiesel are more climate-friendly than diesel,"* and
>
> *"On the basis of greenhouse gas considerations, the renewable fuels: ethanol and biodiesel – either in the form of canola, or as an esterified biofuel - are the lowest emitters because they combust non-fossil fuels."*

4.2.2 Biofuels Taskforce Report[7]

The Prime Minister recently announced the appointment of a taskforce to examine the latest scientific evidence on the impact of ethanol and other biofuel use on human health and environmental outcomes amongst other issues.

The Biofuels Taskforce found that:

- there are potentially significantly greater health benefits from ethanol use than previously thought; and
- greenhouse and regional benefits are similar to previous research undertaken.

The Biofuels Taskforce Report states that:

> *"On life-cycle analysis, savings from E10 in greenhouse gas emissions over neat petrol are generally from 1% to 4%, depending on feedstock. However, a recent life-cycle analysis for a proposed ethanol plant has suggested that savings of between 7% and 11.5% can be achieved with optimum use of non-ethanol co-products."*

---

[5] '*Life-cycle Emissions Analysis of Alternative Fuels for Heavy Vehicles - Stage 1*,' Tom Beer et al; CSIRO Atmospheric Research Report C/0411/1.1/F2 to the Australian Greenhouse Office, March 2000, available from http://www.greenhouse.gov.au/transport/publications/lifecycle.html

[6] '*Final Report (EV45A/2/F3C) to the Australian Greenhouse Office on the Stage 2 study of Life-cycle Emissions Analysis of Alternative Fuels for Heavy Vehicles*,' Tom Beer et al; CSIRO in association with The University of Melbourne, the Centre for Design at RMIT, Parsons Australia Pty Ltd and Southern Cross Institute of Health Research, available from http://www.greenhouse.gov.au/transport/comparison/index.html

[7] On 30 May 2005, the Prime Minister of Australia announced the appointment of a taskforce to address amongst other issues, whether the Australian Government's target of 350 million litres of production of biofuels by 2010 could be met. On 22 September 2005, the Prime Minister released the report of the Biofuels Taskforce. This is available from http://www.pmc.gov.au/biofuels

> *"On life-cycle analysis B100 from waste cooking oil produces 90% less greenhouse gas emissions than XLSD [Extra Low Sulphur Diesel]. Biodiesel from tallow or canola reduces emissions by less than 30%."*

It appears that both these assessments could be overly conservative. CSIRO's report for the Australian Greenhouse Office[5] presents data (for urban buses) which shows 50-60% emissions reductions from biodiesel over normal diesel.

4.2.3 National Renewable Energy Laboratory analysis

The National Renewable Energy Laboratory (NREL) in USA states that,

> *"Biodiesel represents a significant energy resource and could someday supply 3% to 5% of the distillate fuel market. According to an NREL biodiesel life cycle analysis, roughly 81% of the well to wheel energy in biodiesel is renewable and displaces petroleum."*

A joint study sponsored by U.S. Department of Agriculture and U.S. Department of Energy[8]; states some of its key findings as:

> *"**Reductions in petroleum and fossil energy consumption***
>
> *Biodiesel offers tremendous potential as one component of a strategy for reducing petroleum oil dependence and minimizing fossil fuel consumption.*
>
> *The benefit of using biodiesel is proportionate to the blend level of biodiesel used. Substituting B100 for petroleum diesel in buses reduces the life cycle consumption of petroleum by 95%. (A 20% blend of biodiesel and petroleum diesel (B20) causes the life cycle consumption of petroleum to drop 19%.)*
>
> *Biodiesel yields 3.2 units of fuel product energy for every unit of fossil energy consumed in its life cycle. By contrast, society uses 1.2 units of fossil resources to produce 1 unit of petroleum diesel. Such measures confirm the renewable nature of biodiesel."*

That means for every unit of fossil energy consumed in the production of biodiesel or petroleum diesel, we get 3.2 units of energy from biodiesel and 0.83 units of energy from petroleum respectively. This shows the advantage of using a renewable resource.

The study goes on to state:

> ***"Reductions in CO2 emissions***
>
> *Because biodiesel production requires such small amounts of fossil fuel, its CO2 life cycle emissions are, not surprisingly, much lower than those of petroleum diesel. Displacing petroleum diesel with biodiesel in urban buses is an extremely effective strategy for reducing CO2 emissions.*
>
> *Biodiesel reduces net CO2 emissions by 78.45% compared to petroleum diesel. For B20, CO2 emissions from urban buses drop 15.66%.*
>
> ***Changes in air pollutant emissions***
>
> *Using B100 in urban buses substantially reduces life cycle emissions of total particulate matter (32%), CO (35%), and SOx (8%), relative to petroleum diesel's life cycle.*

[8] '*An Overview of Biodiesel and Petroleum Diesel Life Cycles*,' John Sheehan et al., National Renewable Energy Laboratory, report NREL/TP-580-24772, May 1998, available at http://www.nrel.gov/vehiclesandfuels/npbf/pdfs/24772.pdf

Tailpipe emissions of particulates smaller than 10 microns are 68% lower for buses that run on biodiesel (compared to petroleum diesel). Tailpipe CO emissions are 46% lower. Biodiesel completely eliminates tailpipe SOx emissions.

The reductions in air emissions reported here are proportional to the amount of biodiesel in the fuel. Thus, for B20, users can expect to see 20% of the reductions reported for B100."

4.2.4 The significance of the findings of these reports

As discussed above, the sustainable energy challenge is to address the widening gap between energy demand and what can be provided from renewable sources.

To increase the sustainability of Victoria's energy supply and use in the context of transport fuels, Sustainability Victoria is focusing on two key areas:

> renewable energy; and

> distributed energy.

Renewable energy is clean energy that can be replenished or replaced from natural sources and produces little greenhouse gas emissions. Renewable energy delivers sustainable outcomes by producing less greenhouse gas emissions and by increasing the diversity and therefore the security of supply. Biofuels are made from renewable organic sources.

Distributed energy is the supply of energy from sources close to where the energy is used (such as the use of biofuels to fuel local transport use). By being located close to where the energy is used, distributed energy sources reduce losses and therefore emissions implicit in the transport and distribution of the fuel and therefore increase productivity. Increased diversity and geographical distribution of supply also adds to increased energy supply security.

All the work on environmental impact assessments **shows that both ethanol and biodiesel result in greenhouse savings. There is no other fuel or transport technology currently available or available in the short to medium term that is better than this.**

Compressed Natural Gas (CNG) and Liquefied Petroleum gas (LPG) may offer reductions in greenhouse emissions, but offer no other benefits in terms of reducing our reliance on petroleum derived fuels or developing the economy of provincial Victoria. According to the CSIRO report[5] the supposed emissions reductions from CNG and LPG need further investigation to account for 'fugitive emissions'.

Electric vehicles require electricity for charging batteries. In Victoria this is likely to come from coal fired plant. Hydrogen fuelled fuel-cell vehicles require hydrogen, which in Victoria will come from coal gasification or other fossil fuel processing. Coal gasification will not reduce greenhouse emissions unless it incorporates CO_2 capture and sequestration.

4.3 Economic impacts

The economic viability and impacts of biofuel production and use have been the subject of several analyses. The most recent analyses available are those of ABARE[9], Covec[10] and an impact assessment of the EU Strategy for Biofuels[11].

The ABARE work shows that **at current oil prices both ethanol and biodiesel are economically viable. This means that with current oil prices (at Sept 2006) all environmental and social benefits of biofuels come at no added cost.**

Sustainability Victoria interpretation of ABARE's results about the relative economics of ethanol and biodiesel is that they may not apply to Victoria. This is likely because cheap feedstock from the sugar industry for ethanol production is not available in Victoria.

ABARE's results are also conservative because they fail to account for any environmental or social cost associated with the use of petroleum derived fuels. For example, a more recent report for the New Zealand Government shows that **break even oil price for biodiesel is reduced from US$52/barrel to US$45/barrel when environmental and social benefits are accounted for**.

4.3.1 ABARE report to the Biofuels Taskforce[9]

Biofuels taskforce report quotes the results of ABARE's economic analysis as:

> *"At a long-term exchange rate of US65c, the long-term world price of oil (West Texas Intermediate) would need to average US$42–47/bbl in 2004 dollars (depending on the feedstock used) for new ethanol producers to be viable post- 2015 without assistance. Biodiesel producers would require an oil price of US$52–62/bbl without assistance."*

The ABARE report states that:

> *"…biodiesel producers may still seek to invest in the industry as there are substantial returns to capital that can be achieved in the short term. For a biodiesel plant using tallow that commenced full production in 2006-07, the average annual return to capital between 2006-07 and 2015-16 is estimated to be 19 per cent, despite significant losses occurring late in the period."* and
>
> *"A C molasses based plant is estimated to generate 12 per cent return on invested capital in 2015-16, whilst a sorghum based plant is estimated to generate a 10 per cent return. With significantly lower effective excise rates payable in the short to medium term and assumed higher oil prices, the ethanol production is estimated to be able to earn an annual return on invested capital in excess of 30 per cent in the period to 2010-11."*

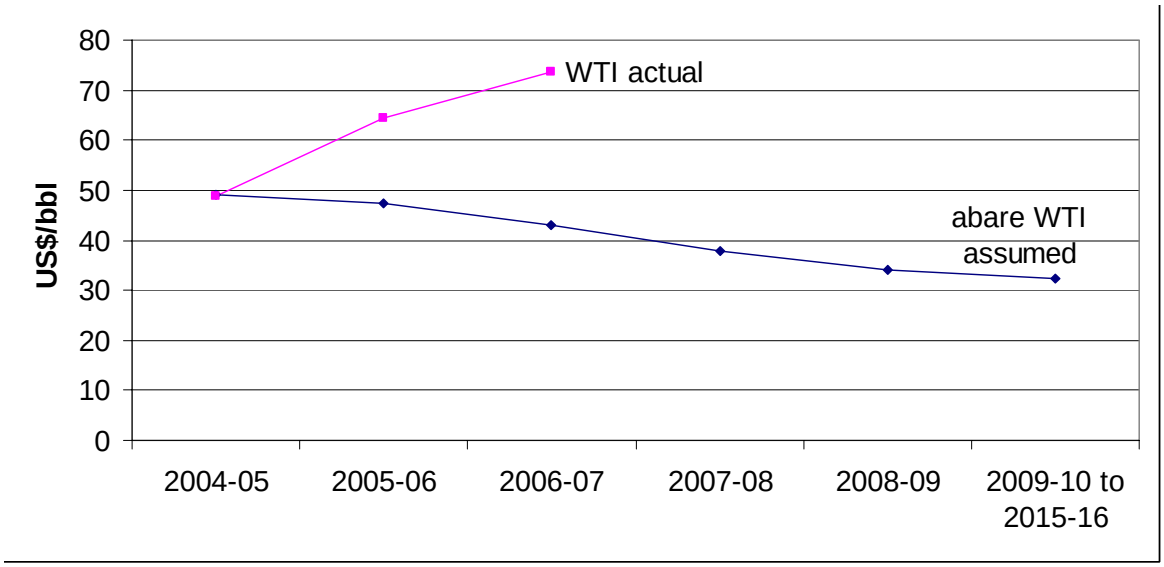
It is important to note that current oil prices and short to medium term projections are all in excess of the price paths assumed by ABARE as shown in Figure 4-8

[9] '*Biofuels: An Assessment of their Viability*,' Short and Riwoe; ABARE Report to the Biofuels Taskforce, Canberra, July 2005, available at http://www.dpmc.gov.au/biofuels/report/appendix_3.pdf

[10] '*Enabling Biofuels: Biofuel Economics*,' Prepared for Ministry of Transport by Covec, June 2006, available at http://www.transport.govt.nz/assets/NewPDFs/Covec-Biofuels-Economics-Final-Report-16.06.06.pdf

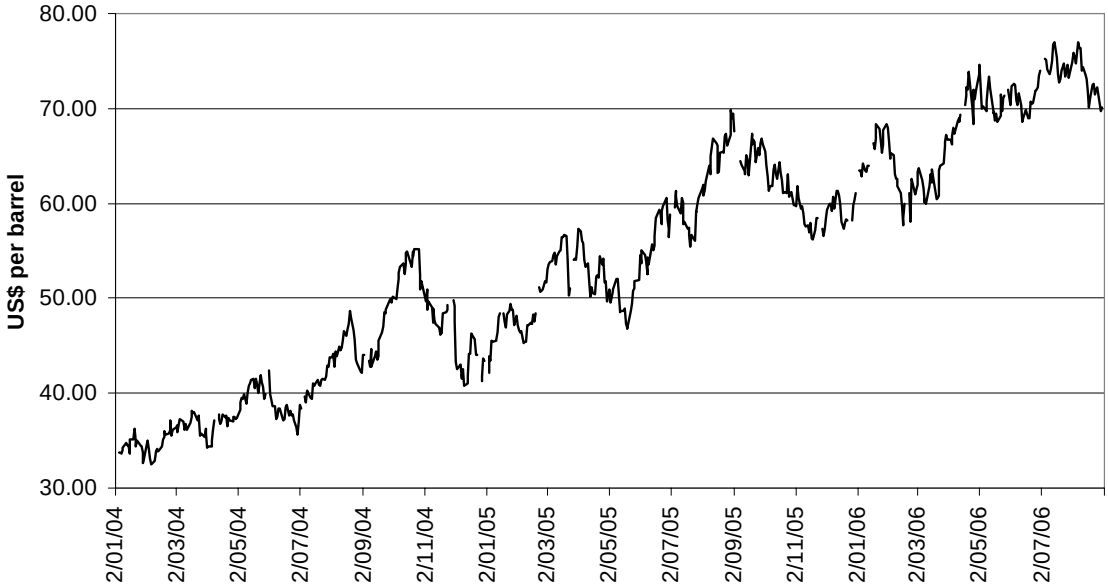
[11] '*An EU strategy for biofuels: impact assessment*,' Commission of the European Communities, Annex to the communication from the commission, {com(2006) 34 final}

Figure 4-8 West Texas Intermediate, actual[12] vs. ABARE assumption



West Texas Intermediate (WTI) has not been below US$42/bbl, ABARE's breakeven figure for ethanol, since late 2004 as shown in Figure 4-9.

Figure 4-9 West Texas Intermediate daily spot price[12]



With current oil prices (at Sept 2006) all environmental and social benefits of biofuels come at no added cost. This is because at current oil prices both ethanol and biodiesel are economically viable.

The risk remains that the likely long-term trajectory for world oil prices is highly uncertain. Oil prices may return to below US$47/bbl (in 2006 dollars) potentially making returns on ethanol and biodiesel production lower in the future. Even if this was to happen, and oil prices returned to the forecast trajectory assumed by ABARE, investment committed to plant now would return in excess of the ABARE forecast (19% for biodiesel plant and 10 - 30% for ethanol plant).

[12] Data from Energy Information Administration, Official Energy Statistics from the U.S. Government, available from http://www.eia.doe.gov/emeu/international/oilprice.html

Sustainability Victoria's interpretation of **ABARE's results about the relative economics of ethanol and biodiesel** is that they **do not apply to Victoria** because cheap feedstock from the sugar industry for ethanol production is not available in Victoria.

A more recent (June 2006) report by Covec for the New Zealand Government[10], where feedstocks for biofuels are similar to Victoria is also available.

4.3.2 Covec report to the New Zealand Ministry of Transport[10]

Covec's June 2006 report states that:

> *"…at an average tallow cost, biodiesel is lower cost to produce than conventional diesel at oil prices of $52/barrel or above. For policy purposes the analysis takes a social perspective, ie it assesses the costs and benefits to society as a whole. Taking account of the security of supply and environmental benefits (including a CO2 price of $15/t), and using a 10% discount rate, the oil price above which biodiesel has net benefits for New Zealand, is US$45/barrel. At a 5% discount rate the value falls to US$43/bbl."*
>
> *"Ethanol is competitive with petrol only if petrol is taxed and ethanol is not. If ethanol was also taxed (or if neither fuel was taxed), then ethanol is a lower cost fuel only at oil prices above US$84/bbl, compared with US$39/bbl if ethanol is not taxed. Analysis of the net social costs of supply of ethanol in comparison with regular petrol suggests that the oil price, above which ethanol has net benefits for New Zealand, is US$80/barrel or US$78/bbl at a 5% discount rate."*

Sustainability Victoria's view is that this work is more relevant for the Victorian situation because it is unlikely that sugar based feedstocks would be transported to Victoria for local production of ethanol. Therefore biodiesel is seen as more suited economically to Victoria.

4.3.3 Market sentiment – uncertainty in demand

Three biofuels companies have recently floated on the Australian share market and the share price history for two of them is shown in Figure 4-10 and Figure 4-11.

The three successful floats (as well as Axiom's withdrawn Initial Public Offering) successfully raising capital for biofuels plant indicate that biofuels production is viewed positively in the Australian market.

The biofuel production from the major proposed plants for Victoria adds up to less than 5% of Victorian consumption of petrol and diesel.

Uncertainty in demand in the Australian market for biodiesel means that the bulk of the production is contracted for export to Europe. Most of the production from plants in planning and development now, such as the Australian Renewable Fuels and Australian Biodiesel Producers facilities are based on in excess of 80% of their production being shipped to Europe.

Uncertainty in local demand for biofuel means that investors are unlikely to commit to substantially greater biofuel production and distribution.

The development of a local market will add to international demand and provide demand security and drive local investment.

While export demand may support some of the local economic benefits through investment, no environmental benefits will be realised locally, and no reduction in demand for petroleum will mean that the economic benefits are limited.

Figure 4-10 Australian Renewable Fuels share price chart from the ASX

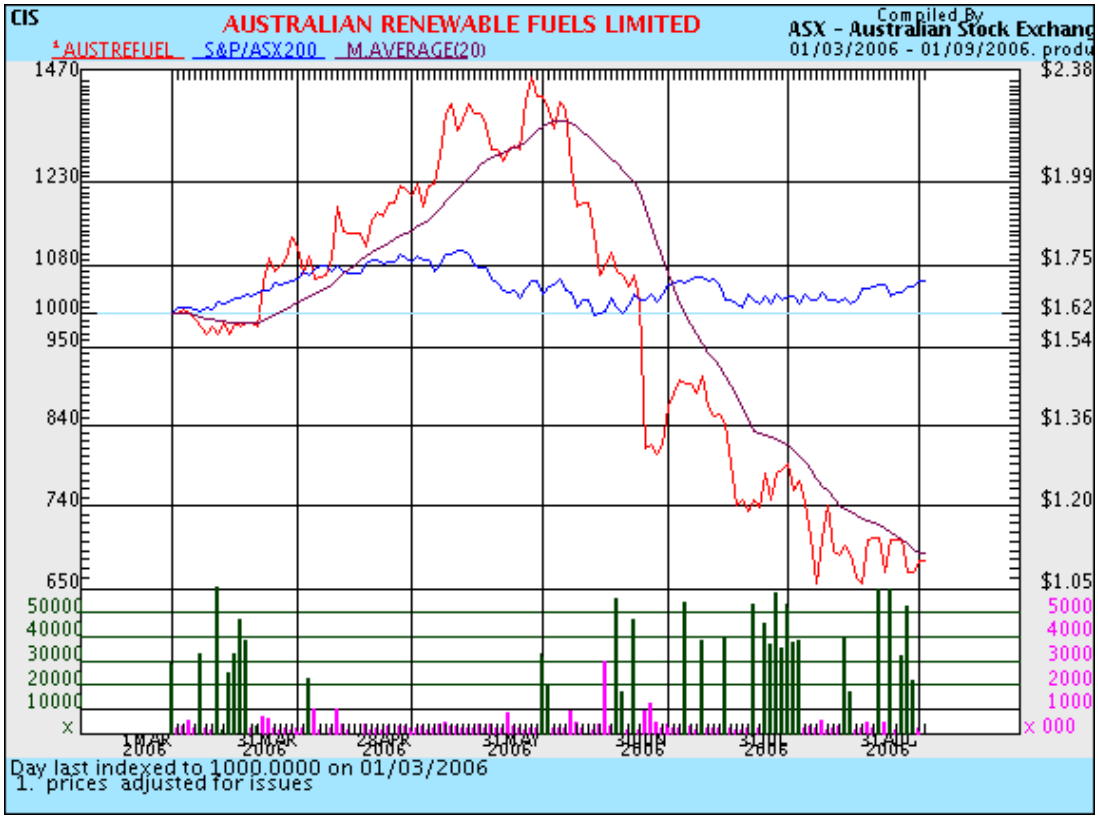
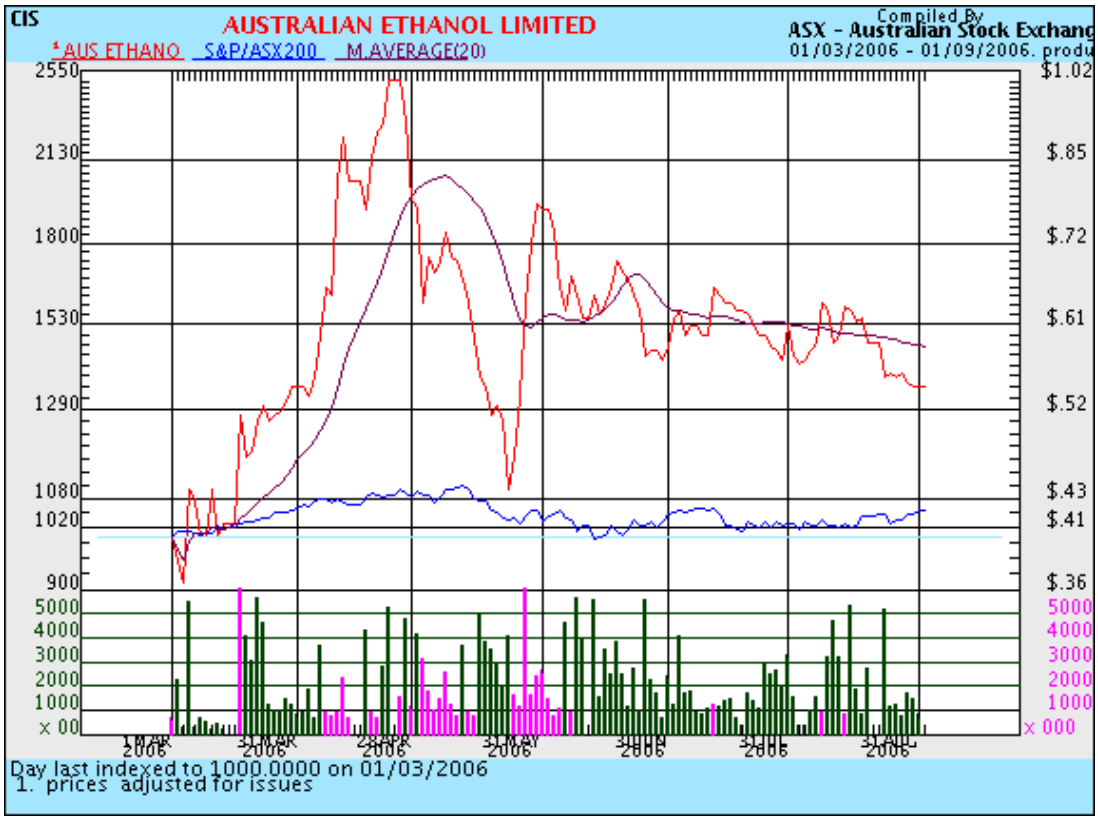


Figure 4-11 Australian Ethanol Ltd share price chart from the ASX



4.3.4 Externalities of petroleum derived fuels are not accounted for

In the existing market, most environmental and social costs associated with petroleum derived fuels are not accounted for in their pricing, and as a result, the price of biodiesel (and to a lesser extent ethanol) appears high relative to the price of diesel (and petrol). There is no feasible way to reflect the environmental benefits from using biofuels, especially biodiesel (other than via a carbon cost).

This is borne out by the results of the Covec report[10] quoted above in Section 4.3.2. This is the most recent and most comprehensive attempt to include the environmental and social costs of using petroleum derived fuels. This work quantifies clearly that when security of supply and environmental benefits[13], are accounted for the oil price above which biodiesel has net benefits (for New Zealand) drops from US$52/barrel to US$45/barrel. In other words the social and environmental benefits of displacing petroleum fuels amount to US$7/barrel.

4.3.5 Economics of Victorian feedstock for biofuels

ABARE's analysis relates only to molasses (sugar) and sorghum derived ethanol. Neither of these is likely to be feedstock for biofuel in Victoria. In Victoria wheat or whey waste from the dairy industry are likely to be used for ethanol production, and it is likely that ethanol will be more expensive to produce from these. This is reflected in the fact that there is only one large scale ethanol plant proposed for Victoria and the rest are biodiesel.

Tallow, canola and possibly safflower are the likely feedstock for biodiesel in Victoria. The New Zealand Government reports quoted in Section 4.3 show that biodiesel is more viable than ethanol. This is probably because, as in Victoria, relatively cheap sugar and sorghum feedstocks are not available.

4.3.6 Impact on oil prices

The European Union impact assessment report states that:

> *"… in a tight market, some analysts expect that even small increases in fuel supply (i.e. biofuels) would significantly reduce the gap between production capacity and oil demand and would thus have significant beneficial effects on oil prices."*

4.4 Social impacts

Biofuels production and use aligns entirely with the Government's $502 million blueprint, '*Moving Forward in Provincial Victoria,'* for continued growth in provincial Victoria launched by the Premier, the Hon. Steve Bracks, in November 2005.

4.4.1 Investment and jobs

Current proposals for biofuels plant amount to approximately $250 million to $500 million in new investment in Victoria. This does not include investment in distribution infrastructure, or investment in new cropping options such as safflower or other oilseed crops.

No estimate has been made of the potential jobs associated with a new biofuels industry, but this should number in several thousand jobs in construction and several hundred on-going operations related jobs if all the major proposals for Victoria are realised.

[13] Note that the environmental benefits are calculated at a very conservative $15/tonne of CO2. The Victorian Government's Greenhouse Challenge for Energy considers three scenarios: *Business as Usual* for no or low carbon cost, a *Greenhouse Action* scenario with $20 - 30/tonne of CO_2 and a *Greenhouse Crisis* scenario at $75/tonne of CO_2.

Even if biofuel producers import feedstock (such as palm oil) and export their biofuel production the local investment in production plant and employment in construction and operation will be beneficial to the Victorian economy.

4.4.2 Current use of feedstocks

There are currently some 110,000 tonnes of tallow produced in Victoria[14] every year.

ABS data indicates that some 340,000 tonnes of canola were produced in Victoria in 2004.

Both tallow and canola are commodities traded on international markets.

Diversifying the market into which Victoria's primary producers can sell their product will have a positive impact on the industry.

4.4.3 New options for primary producers

Oilseeds such as safflower may have potential for improving options for primary producers in Victoria. Safflower, with its ability to be planted in a wider range of soil conditions than other crops can provide another option for primary producers.

Cropping trials for oilseeds, local crushing and biofuel manufacture done collaboratively with local government and industry associations should be eligible for funding under the *Provincial Victoria Growth Fund*.

[14] '*The potential for using tallow as a fuel for the production of energy*,' Biomass Energy Services & Technology Pty Ltd, report for SEAV, September 2004

5 Barriers to and incentives for the increased use of biofuel for transport

There are significant opportunities in the transport sector to use biofuels and initiate greenhouse reductions, and result in net economic benefits for Victoria.

There are a range of barriers that are preventing the benefits of biofuel production and use, and investment in renewable energy from being realised. These barriers are summarised below.

5.1 Making the change from business as usual practices

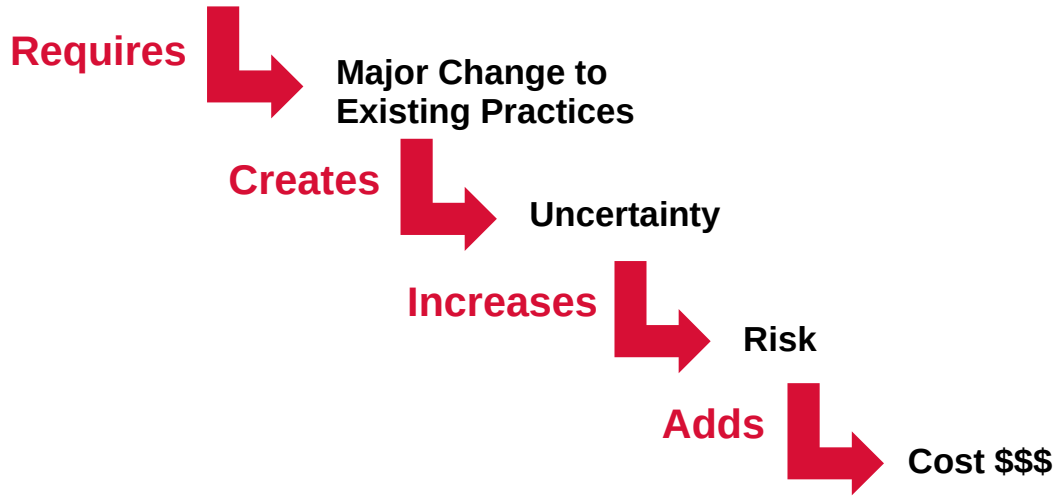
In order to make the transition to a sustainable energy future, a step change away from existing practices is required. This will mean investing in new technologies, process improvements or practices that may not be demonstrated locally. The need for change creates some of the greatest challenges for accelerating the adoption of sustainable energy.

Any change to existing practices creates uncertainty around:

- how a new technology or process will work;
- the actual costs and returns of implementing or adopting a sustainable practice; and/or
- the skills and expertise of the suppliers of technologies and services.

Uncertainty increases the risk (real or perceived) associated with an investment. As a result of the increased risk, significantly higher risk premiums are applied, adding costs. This is illustrated in Figure 5-1. This can reduce the investment attractiveness of a new technology or practice – that would otherwise be commercially viable.

Figure 5-1 Barriers to sustainable energy

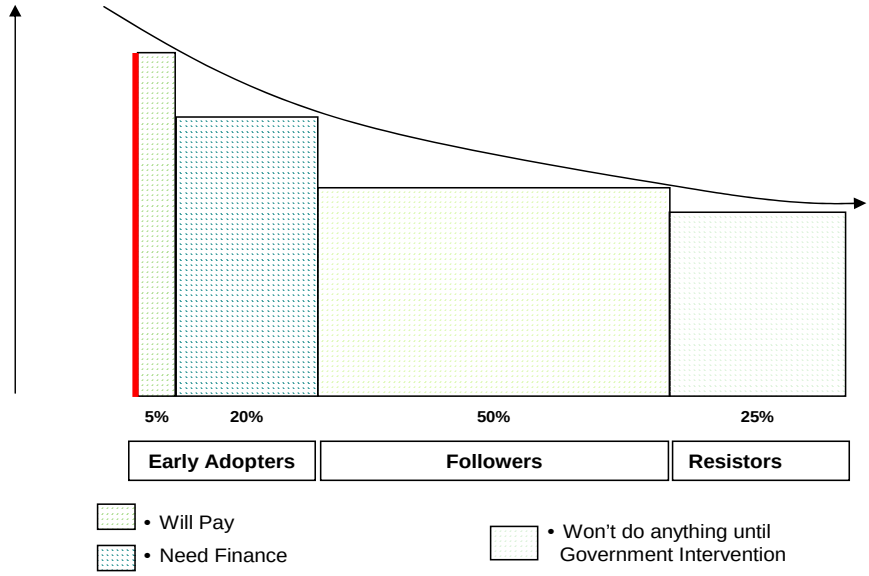


For early adopters or ‘first movers’, assistance is often required in order to encourage them to be the first (or among the first) to implement or adopt innovative technologies and practices. These early adopters provide the examples which are necessary to convince others that making the change is worthwhile. With the technologies and practices demonstrated, the challenge is to create market transformation by providing tailored and targeted information to those who are likely to be best placed to follow the example.

This is true for motorists as well as fuel and automotive manufacturers and distributors. There will be some people who will be prepared to take risks and pay additional costs to be among the first to adopt new technologies. For others, they will wait to see what happens with the cost, maintenance support and performance of the technology.

Figure 5-2 broadly characterises consumer and industry segments according to their level of interest in sustainability and the likelihood that they will take action. The early adopters are prepared to pay more and take more risks. There are comparatively few early adopters and the followers make up the major segment. The resistors wait for government to intervene before taking action.

Figure 5-2 Preparedness to act[15]



In the community sector there will be those for whom the driver to adopt new technologies is not primarily economic and they are willing to participate at almost any price. For others, despite a strong desire to participate, they are not able to do so because of economic barriers, real or perceived.

5.1.1 Consumer confidence

Consumer confidence in relation to biofuels is addressed in detail in the Biofuels Taskforce Report. Sustainability Victoria generally endorses the recommendations of the Taskforce in relation to consumer confidence.

It should be noted that the Department of Industry Innovation and Regional Development's (IIRD) Biofuels Industry Roadmap and Action Plan is also addressing consumer confidence and marketing of biofuels specifically.

Gull Petroleum is selling B20 at its outlets in WA. They have recently launched the "cough-up less" marketing campaign for their product which is 3c/l cheaper at the bowser.

At a presentation by Gull Petroleum at the June 2006 Bioenergy Australia meeting, acceptance by the automotive manufacturers was highlighted as the key barrier to successful behaviour change of consumers.

Vehicles in the US run on up to E85, in Brazil up to E75, and most nations now have 'flex-fuel' vehicles for sale. In Sweden, Ford's flex-fuel models (which can run on both an 85% ethanol blend (E85) and petrol or any mix of both in one fuel tank) are outselling its ordinary petrol and diesel cars.

[15] '*The Cultural Creatives*,' Ray and Andersen, Three Rivers Press, New York, 2000

5.1.1.1 Access to information

A potential barrier to participation by motorists is access to credible information. Information needs to be accessible to all Victorians in order to enable informed decision-making. To facilitate access to information, it must be provided through a range of channels. These channels include: the internet, printed information distributed through community information outlets, displays at events where motorists are seeking advice (i.e. home shows), telephone hotlines and face to face communication.

Information also needs to be produced and distributed by credible sources. There are numerous sources of information in today's society. Motorists can be distrustful about performance claims made about products. It is important that information which is provided is independent, credible and authoritative.

In addition, information must be simple enough to base a decision upon, but needs to be backed by comprehensive data when required. In particular, information needs to be such that members of the community can choose how much and how little information they access. While some people will find recommended actions and lists of products and services from a credible source, a sufficient base on which to make a decision, others will want detailed information showing how the data was derived before they make a decision.

5.1.2 Biofuel and automotive manufacturers

The same issues around 'first mover' risks apply to local biofuel and automotive manufacturers and distributors. The Biofuels Taskforce states that:

> *"A key barrier to uptake of biofuels into the market, cited by both oil companies and biofuel producers, is the high level of commercial risk associated with market entry.*
>
> *Commercial risks for the oil majors are very high and are associated with low levels of consumer confidence and therefore a lack of consumer demand for the product; establishing a pricing regime that appropriately balances risk and results in reasonable returns; and additional infrastructure costs and supply reliability concerns. These risks are higher for 'first movers'.*
>
> *For new biofuel producers, long-term supply contracts are required by project financiers and investors to underpin investments, and investments are considered high risk given the lack of consumer demand."*

5.2 Uncertainty in demand

With crude oil prices around US$70 per barrel biofuels are economically viable. However uncertainty in oil prices and feedstock commodities means that investors are wary of committing to large scale production.

Uncertainty in demand has been addressed previously in Section 4.3.3.

5.3 Regulatory barriers

5.3.1 Fuel tax bill 2006 and Federal regulations and Standards

Sustainability Victoria, through consultation with stakeholders has been made aware that there are several excise, regulatory and Standards related barriers for biofuels. This information is anecdotal and is yet to be verified.

5.3.1.1 Excise exemptions for biodiesel reduced

Although the Australian Government has given its support to the biofuels industry the *Fuel Tax Bill* 2006 that was passed in early July appears to have removed or reduced excise exemptions for biodiesel.

Off-road (business and private) users of biofuels, such as the mining industry, were until recently able to blend up to 49% biodiesel directly into their storage tanks. The permissible blend ratio has been lowered (to 20%), or the definition of 'diesel' no longer applies to blends up to B49.

The Biofuels Taskforce Report outlines the net effect of fuel taxation reforms.

The Australian Taxation Office's '*Biodiesel - fuel tax credit and fuel grant entitlements*' states the entitlements available to users of biodiesel and biodiesel blends, and provides calculations and examples for the excise and associated grants.

5.3.1.2 Blending

Blending particularly for off-road use and users with large storage tanks was accomplished easily by mixing directly in the tankage. Blending must now also be done at a certified blending facility.

5.3.1.3 Diesel Standard

The Standard for diesel allowed up to 20% blended biodiesel without requiring notification. This has now changed or is being changed to a 5% limit.

The Standard for biodiesel is available through the 'Fuel Standard (Biodiesel) Determination 2003'.

5.3.1.4 Certification of bowsers and tanks

Bowsers and tanks to be used for blended biodiesel require separate certification. This supposedly incurs a cost of $20,000 when the requirements for certification are identical to those for normal diesel.

6 The role of Government in the manufacture and use of biofuels for transport

6.1 Existing biofuel policies and initiatives

6.1.1 International developments

6.1.1.1 Biodiesel

Biodiesel has been produced on an industrial scale in the European Union (EU) since 1992, largely in response to positive signals from the EU institutions. Today, there are approximately 40 plants in the EU producing biodiesel mainly located in Germany, Italy, Austria, France and Sweden.

Consumption of biodiesel in Europe had reached almost 2.1 million tons per annum (630 million gallons per annum) in 2003 and was available at more than 1500 locations in Germany.

The EU Directive 2003/30/EC sets a target of 5.75%[16] renewable fuels content by 2010. If the target is achieved the estimated production in Europe could reach over 7 million tons per annum (2.1 billion gallons per annum) of biodiesel.

Production capacity for biodiesel in Germany will rise in 2006 to over 2 million tonnes per year. With 1,900 sales points, equal to one in every ten public filling stations, biodiesel is the first alternative fuel to be available nationwide. The industry is expecting a surge in demand since the authorisation at the beginning of 2004 of a maximum 5% biodiesel admixture to conventional diesel fuel.[17]

The United States Congress has mandated a near-doubling of US biofuels production to eight billion gallons a year by 2012. In the United States, biodiesel is being used in transit bus fleets, heavy-duty truck fleets, airport shuttles, marine, national parks, military and mining operations, as well as other state and federal fleets.

Recently passed tax incentives should encourage commercialization in the United States. Biodiesel consumption in the United States could reach 1 to 2 billion gallons/yr (3-7million tons/yr) over the next decade.

6.1.1.2 Bioethanol

The three biggest bioethanol producers are Brazil, USA and China.

Currently, five million of the 150 million vehicles in the United States operate on fuel containing bioethanol.

The United States Government is promoting bioethanol as a potential replacement for 75 per cent of United States crude oil imports from the Middle East by 2025. To this end Federal funding has increased for the commercialisation of a process for production of ethanol from ‘woody’ materials by 2012. This would enable the manufacturing of bioethanol from crop and wood waste instead of more valuable grain crops.

[16] 5.75% biofuel calculated on the basis of energy content.
[17] Union for the Promotion of Oil and Protein Plants. http://www.ufop.de/hilfe.html

United States corn ethanol blenders currently receive 51 US cents per gallon in federal tax credits plus in some cases additional state-based subsidies. A new federal tax credit was introduced in October 2004 of 1 per cent for every 1 per cent of biodiesel in the fuel mix. The United States domestic bioethanol industry is protected from imports of cheaper Brazilian bioethanol by the imposition of 54 cents per gallon import tariff.

A number of overseas jurisdictions have established a mandatory minimum biofuels content target for their transport fuels mix. This guarantees a minimum market scale for investors in biofuels cultivation, production and distribution.

Other overseas policy instruments in support of the biofuels sector include:
- mandating the use of biofuels blends for all government vehicle fleets and public transport systems;
- reducing or removing excise taxes on biofuels;
- offering free metropolitan parking and reduced vehicle taxes in a number of EU member states;
- promoting the environmental benefits of biofuels to consumers; and
- providing advice on the safe use of biofuels within the existing national vehicle fleet.

Several alternative drivers have influenced overseas Governments' biofuel policies. New Zealand, Japan, Canada and the European Union (including the United Kingdom) are all responding to a need to reduce their greenhouse gas emissions in accordance with their Kyoto Protocol targets for 2012.

Japan, the European Union and the United States are also pursuing aggressive agricultural support programs for their primary producers and believe energy crops will provide new growth opportunities. Sweden, like Australia, is pursuing regional development goals linked to expansion of domestic biofuels production.

Energy security and agricultural support are key drivers in the United States and China.

6.1.2 Australian Government

In 2001, the Australian Government set an objective that biofuels would contribute at least 350 million litres to the total fuel supply by 2010.

The Australian Government introduced a fuel standard for the production of biodiesel in September 2003 and is currently considering submissions for an ethanol fuel standard[18].

On 30 May 2005, the Prime Minister announced the appointment of a taskforce to examine the latest scientific evidence on the impact of ethanol and other biofuel use on human health, environmental outcomes and automotive operations.

On 22 September 2005, the Prime Minister released the report[19] of the Biofuels Taskforce. The Taskforce found that:

- there are potentially significantly greater health benefits from ethanol use than previously thought;
- greenhouse and regional benefits are similar to previous research undertaken;
- the biofuels industry faces considerable market barriers including low consumer confidence and high commercial risk;
- on current settings the Government's biofuels production target of 350 million litres by 2010 will not be met.

[18] http://www.deh.gov.au/atmosphere/fuelquality/standards/index.html
[19] www.pmc.gov.au/biofuels

In response to these findings, the Prime Minister reaffirmed the Government's commitment to achieving the target of at least 350 million litres of biofuel production by 2010. The Prime Minister also announced a package of measures to help address market barriers and restore consumer confidence in the biofuels industry. One of these measures involves working closely with oil companies to develop Industry Action Plans to underpin the achievement of the 350 million litres target.

An industry-government partnership involving the major oil companies, members of the Independent Petroleum Group, and the major retailers was established and produced the Biofuels Action Plan in December 2005.

6.1.2.1 Biofuels capital grants program

The Australian Government announced on 25 July 2003 its intention to provide a capped amount of $37.6 million to fund one-off capital grants for projects that provide new or expanded biofuels production capacity.

Successful applicants under the two rounds of the Biofuels Capital Grants Program were:

- CSR Distilleries, an ethanol plant at Sarina, Qld ($4.16m);
- Biodiesel Industries Australia, a biodiesel plant at Rutherford, NSW ($1.28m);
- Schumer Pty Ltd (Rocky Point Sugar Mill and Distillery), an ethanol plant at Woongoolba, Qld ($2.4m);
- Biodiesel Producers Ltd, a biodiesel plant at Barnawartha, Vic ($9.6m);
- Australian Renewable Fuels, a biodiesel plant at Port Adelaide, SA ($7.15m)
- Riverina Biofuels Pty Ltd, a biodiesel plant at Deniliquin, NSW ($7.15m); and
- Lemon Tree Ethanol Pty Ltd, an ethanol plant at Millmerran, QLD ($5.85m).

6.1.3 Queensland Government Initiatives

6.1.3.1 Queensland Ethanol Industry Action Plan 2005 – 2007

The Queensland Ethanol Industry Action Plan 2005 – 2007[20] was launched by the Premier of Queensland at the International Ethanol Conference held in Brisbane in May 2005.

Under the Action Plan the State Government has committed $7.3 million over the next two years (2005/06 and 2006/07) for major programs to support development of the Queensland ethanol industry.

The primary objectives of the Action Plan are 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;
- Assist the development of retail and distribution networks.

The Queensland Government's biofuel support program[21] is called "Ethanol: powered by nature" and includes:

- An advertising and information campaign called the +e campaign. The **+e campaign.** A government website lists information of ethanol fuel and where it can be bought in Queensland.

[20] http://203.210.126.185/dsdweb/v3/guis/templates/content/gui_cue_cntnhtml.cfm?id=35622
[21] http://www.sdi.qld.gov.au/dsdweb/v3/guis/templates/content/gui_cue_menu.cfm?id=5946

- Support for the development of the State's **ethanol fuel infrastructure** through the Queensland Ethanol Conversion Initiative (QECI).

The Queensland labor party launched an election policy, '*Ethanol: Cutting the burden at the bowser,*' on August 16, 2006. Under this policy a re-elected labor Queensland Government would mandate 5% ethanol blended in all petrol sold in Queensland.

A 5% ethanol mandate will increase the use of ethanol 20 fold to over 200 million litres a year in Queensland.

6.1.4 Biofuels policy in Victoria

6.1.4.1 Existing policies or initiatives

Biofuels have been the subject of a three Government reviews and/or policy initiatives recently:

- Commitment of $100,000 for the development of a *Biofuels Industry Road Map*, announced in the Victorian Government's Provincial Statement *Moving Forward*, November 2005;
- In July 2006 the Victorian Government released *Our Environment Our Future*. Action 15.2 reinforced this commitment;
- Action 15.2 also states that *"As well as requiring drivers of Government vehicles to use ethanol blended petrol (E10) wherever it is available, practicable and cost-effective, we will trial the use of biodiesel (B5) in our heavy vehicles depot and work in partnership with International Council for Local Environmental Initiatives to promote the use of biodiesel in heavy vehicles in the local government sector."*
- Department of Primary Industries is drafting a 'Discussion Paper' on bioenergy and biofuels.

Other than this the only support available for biofuel projects has been the Renewable Energy Support Fund. The Fund can provide up to 20% capital support for 'medium-scale' biofuel production under the 'access' category. The access category broadly aims to support projects which increase Victorians' access to renewable energy. No biofuels projects have been funded as yet under the Fund.

6.1.4.2 Biofuels Industry Road Map and Action Plan

Development of the Biofuels Industry Roadmap and Action Plan is being done by the Department of Innovation, Industry and Regional Development (IIRD).

Sustainability Victoria understands that IIRD will also be making a submission to this enquiry.

6.2 Recommendations for the role of Government

Biofuels policy has seven aspects:

- Stimulating demand for biofuels/reducing growth in demand for petroleum;
- Capturing the environmental benefits;
- Developing the provincial economy;
- Developing the production and distribution of biofuels;
- Expanding feedstock supplies;
- Enhancing trade opportunities; and
- Supporting research and development

These can help drive the viability of biofuels by increasing demand, leading to greater economies of scale, greater competition and reduced production costs.

Sustainability Victoria believes that there are a number of actions which can be taken now, which will provide certainty in the market and therefore deliver biofuel production, distribution and use in Victoria. These include Government led initiatives as well as some policy options.

6.2.1 Government leadership

7. Government initiative, perhaps in partnership with organisations like Greenfleet to provide a **biofuel 'fuel card'** which serves as a promotion and incentive, and removes one barrier (taking the first step) to fuelling Government vehicles on biofuels.
8. Government leadership in **requiring the use of E10 and B20 for Government vehicles** where possible. This will help give the message that biofuels are safe and easy to use.
9. **Requiring a percentage of the Government's own consumption** (at least 20% to be meaningful) to be met with biofuels should be considered. There are a number of ways in which this may be done to address logistical and distribution issues such as requiring all depot based vehicles with access to their own refuelling facilities, to use biofuels.
10. **Build market confidence** around biofuels in particular B20 and E10. The main issue is the perception that these fuels will affect the warranties offered by the car manufacturers. The Government could facilitate clear statements regarding the effect of biofuels on vehicles to consumers in partnership with vehicle manufacturers, and work to establish the appropriate fuel quality standards.
11. **Facilitate local distribution** of biofuels to enable easy availability of these fuels.
12. Work with Local Government and large users to **form 'demand' groups** which can drive supply of biofuels. Local Councils are also responsible for planning permits for refuelling facilities.

6.2.2 Policy options

6.2.2.1 Option 1: Financial incentives

Facilitate local production of biofuels, by providing capital support to reduce the uncertainty and risk associated with first-of-a-kind businesses in the State.

It is generally thought that these are considerably less effective than simply mandating that a certain quantity of biofuel be used, because financial incentives can lead to the development of sub-marginal plant. Financial incentives are not preferred as a primary mechanism for encouraging biofuels use. The approach in the EU and in New Zealand has been to mandate demand.

6.2.2.2 Option 2: Mandatory blending target

A blend target would require that a certain quantity of biofuels be added to every litre of petrol and diesel. A blend target would provide fuel of a uniform quality to consumers. A blending target is, however, relatively inflexible regarding implementation. It would apply to all of the relevant conventional fuel sold (petrol or diesel) and therefore has a State wide impact. It would also apply at all times making it difficult to adjust to variable supply constraints. In addition, it would affect all consumers (petrol or diesel) and therefore prevents the targeting of consumer groups that are least responsive to price changes or can benefit most.

6.2.2.3 Option 3: Preferred option: mandatory sales targets

A sales target would require that a certain percentage of fuel sales from each company be biofuels.

The preferred option at this stage of analysis is a sales target for biofuels across the board (as opposed to a target for ethanol and a separate target for biodiesel). In practice this would mean:

> For each company importing or distributing petroleum transport fuels, a set percentage of the total annual combined petrol and diesel sales volume would be required to be replaced with biofuels which meet the appropriate fuel quality specifications;

> The company would be able to decide which biofuels to use, when, where and at what percentage blend;

> Companies would need to report on annual sales of petroleum fuels (as at present) and biofuels sales.