BAA Response to
Inquiry into Australia's future oil supply and alternative transport fuels.

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Summary

Australia is in a position similar to Brasil, where with the correct selection of suitable crops and expansion of rural infrastructure both in existing cropping areas and other high rainfall areas where foods crops are not viable to displace a significant proportion of our liquid fuel requirements with biofuels.

Brasil has a target of better than 80% self sufficiency by 2020 and the USA has recently released a target of better than 75% self sufficiency from by 2025.

The South American target is almost all biofuel based while the US approach will include a range of alternatives with a large focus on Natural Gas and Coal resources.

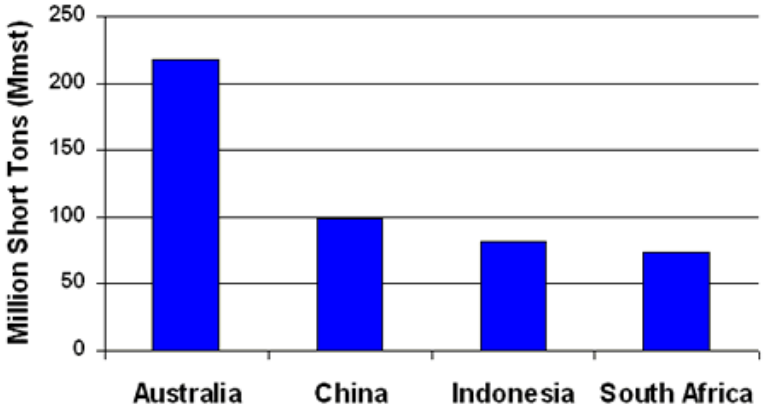
Australia has fallen from being more than 80% self sufficient in liquid fuels in a few short years and if we are to meet the shortfall in oil production a new 'oil' rush will need to be created from our farming resources.

Along with the information presented in this submission, I have recently attended the US NBB Biodiesel Seminar in San Diego. I would also like to opportunity to present, in person, some of the findings from the seminar. I cannot do this now as the presentations are not yet publicly available.

Energy in Australia

'Almost 92 percent of Australia's electricity is produced from fossil fuels -- coal and natural gas. Most of the balance is hydro-electric power. Even allowing for Federal and State government intervention to promote the use of fuels with lower or no greenhouse gas emissions, it is probable that fossil fuels will still account for 90 percent of the generation mix at the end of the decade.'. The total Electricity Demand currently exceeds 180,000 GWh[1]

Australia is by far the largest exporter of Coal to the world, which potentially puts it at odds with developing and promoting viable alternatives.



World Coal Exports [2]

The only currently viable non renewable alternative for transport and General Energy is Natural Gas. There are significant reserves in the North West Shelf of Natural Gas. With the current consumption of energy in Australia, it is projected that there would be 50+ years of supply. With the committed sales of LNG to China and other large energy consumers, this supply has dwindled to around 20 years at our current consumption of Natural Gas.

If an additional demand is placed on this resource to produce liquid fuel from say a Fisher Tropsch process of any significance in volume, it would reduce the life of the resource to the point that would make the development unlikely to produce a profitable return.

Biomass projects have been touted and developed around Australia. When looking at the limitations on the MRET and RECS programs, unless the utilisation of the renewable resource is on a distributed basis, the cost of transportation and storage is uncompetitive to its competitor – coal - by a large margin.

Energy Balance of the World

The world is entering a new era of energy prices and a supply/demand cycle sharply pushing up oil prices and increasing the fragility of markets dependent on importing their liquid energy requirements.

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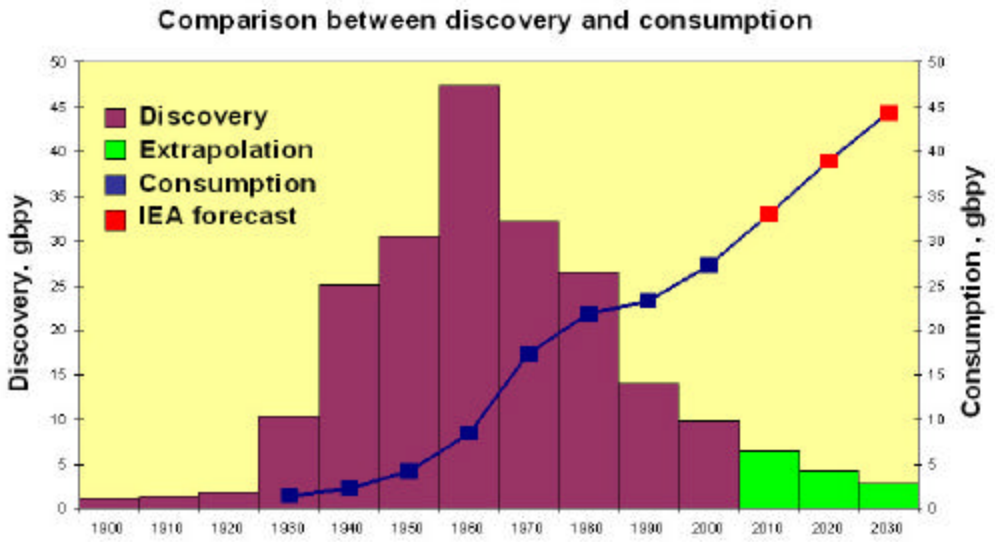
[1] Source "Energy Supply Association of Australia"
[2] Source www.eia.gov



As the above graph shows, the rate of discoveries for new oil reserves has been reducing sharply compared to the growing demand. Despite this, reported available reserves have remained reasonably constant over the last 10 years. While this trend will, longer term, reduce the amount of crude oil available to the market, the current oil prices have little to do with the availability of crude oil.

Production capacity is the key. Due to the growing demand of the Chinese and Indian market the capacity of the refineries to produce the finished products from the crude oil has been reached with only the slimmest of margins. Even if you take all the additional capacity being developed (as known to the public domain), and the continued growth in the Chinese market, this situation will remain for some time to come.

If the other commodity markets are anything to go by, a 5% deficit in the availability of a product does not increase the price by 5 or even 10%, it can quickly double or triple as futures markets try to grab their share of an essential resource.

This is a sharp contrast to the forecasts being used by the Australian Federal Government as recently as 12 months ago where the current oil price was predicted to be $32 a barrel.

The rate of growth being provisioned for by the Chinese alone is staggering – see the attached article from the Sunday Herald. This growth will continue to put pressure on oil refining capacity as well as Coal and Uranium resources.

All our current energy sources are under severe stress and the implications of expansion is more damage – faster!

Biodiesel

Biodiesel is a diesel engine fuel made from natural vegetable oils and animal fats. The process replaces the glycerine in the oil/fat with an alcohol, creating an oxygenated fuel that is naturally very pure and extremely low in toxicity.

Biodiesel is the only alternative fuel that can be used in a totally unmodified vehicle from straight Biodiesel (B100) through to the smallest of blends (where petroleum manufacturers are using Biodiesel for its lubricity benefits).

Depending on the source of the oil or fat used in the production of Biodiesel a greenhouse benefit of up to 90% can be obtained. Although it is typically quoted at an average of 30%.

Emissions from Biodiesel are also very low with up to a 90% reduction in particulates and other carcinogenic components, along with a 50% reduction in carbon monoxide and unburnt hydrocarbons.

The main challenge for Biodiesel is finding enough of the right source of fats and oils.

The current production facilities in Australia are relying on Used Cooking Oil (UCO) and animal fats (Tallow). There are only limited supplies of these oils/fats, however there is more than enough available in Australia to well exceed the current goal of 350ML/y by the Federal Government.

Source	**Quantity**
UCO	<60ML/y collected/available[2]
Tallow	>400ML/y exported/available[3]
New Oil (Canolla)	>750ML/y grown/exported[4]

The limiting factor in developing the production of Biodiesel is how to get the oils and fats in a way that does not impact of the food market.

There is already more than 700ML/y in Biodiesel plants planned for Australia over the next 2-3 years. The first plants will take all the available UCO and a large portion of the available tallow from the market.

If Biodiesel is to become a sustainable industry in Australia, new crops and cropping areas outside of the current food crop areas will need to be developed.

A significant risk for the industry is the displacement of food crops for Biodiesel production andexpansion of crops that rely heavily on pesticides and herbicides.

The long term potential for Biodiesel is the non-food nature of the product. This means that inedible oils can also be used from plants that are naturally pest resistant and vigorous growing enough to compete with the weeds.

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[2] Industry Estimates
[3] Meat and Livestock Association of Australia
[4] AOF (http://www.australianoilseeds.com/info/industry_facts_and_figures)

Impact of continuing without change

The biofuels industry keeps hearing about the 'problems' with changing and the costs of conversion (which are virtually zero for Biodiesel) being such a burden.

While we must be considerate of the alternative – as we don't want to make matters worse – we need to make some changes now. Otherwise, the changes are happening so fast that it won't be just for the next generation to pay the price. We will see and pay for the changes as well.

So, where is the earth heading? What happens to the world we live in if we don't change and continue to use all the available oil and other resources stored in the earth 'while we still can'?

What is/how do you measure the cost to the environment, lost incomes and health?

Health impacts

Air pollution leads to a range of serious health effects, as well as visual pollution and damage to buildings. The health impacts of transport emissions (which account for only a part of total air pollution) in Australian capital cities have been estimated as costing around $3.3 billion per year[5]. With the current energy demand in Australia increasing by around 2% pa [6], the health impacts can be expected to increase at about the same rate, not including the continued growth of the major cities and the multiplying effects that will have.

If the same money was put into biofuels that is spent every year on the "Road Toll", we would have the double effect of a bustling, viable biofuels industry and the saving of more lives killed every year by the other "Road Toll" - emissions – more than are killed by accidents.

Just moving the pollution away from the cities with Hydrogen or electric vehicles is not the answer, unless you change how we generate the electricity/hydrogen.

CO2 – not just global warming, Acid Oceans

The CO2 we are emitting into the atmosphere is having another effect. It's turning our oceans acidic[7].

What does this mean? Our reefs, a source of billions of dollars worth of revenue each year will die and fishing grounds will be forever changed putting more pressure on limited fish stocks and other agricultural resources.

Change required to reduce the impact

The benefits of liquid fuels are hard to beat. High energy content, ease of storage and distribution and simple technology to utilise the energy stored.

These benefits have been the limitations for CNG and Hydrogen.

There are three ways to reduce the impact from our emissions – increase efficiency (use less), cleaner fuels and focus on renewables.

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[5] Source BTRE 2003
[6] Source SEAV
[7] See attached article – Acid Seas

The most common renewable energy sources (Solar & Wind) work well, but usually do not meet peak demands. These are potentially good sources for hydrogen production as long as the distribution and storage concerns are resolved.

Dams are an efficient method of storing energy for use when needed. Other environmental concern have stopped further development in Australia for many years and given the modern understanding of the impacts of dams on our waterways and eco systems, is unlikely to expand in the foreseeable future.

Hybrids have a considerable cost for the additional technology and with the added cost of replacing the batteries periodically, they are unlikely to provide a cost saving long term, especially when you factor in the additional environmental costs of the batteries and technology required.

Diesel hybrids, while more efficient again, have an additional cost that is unlikely long term to survive. The one scenario is for long distance travel where the efficiency of the diesel engine takes over.

Either way, Hybrids are a important next step for inner city transport where the re-generation and battery systems provide for unparalleled economy and reduction in emissions, better still (for that air shed) are some of the new generation hybrids that can be plugged in, further reducing the demand on fuel for short runs. For long distance highway/freeway travel, small petrol engines are more efficient.

The best efficiency overall is still held by the small and mid sized common rail diesels now available. Fuel efficiency ranges between 3 -5 litres 100 km. When combined with Biodiesel, there is the benefit of massive net CO2 reductions and air toxic e missions reduced to extremely low levels.

In Europe, with the high taxes on fuel and the push to smaller engines and diesels, people use 50% of the fuel per Km travelled compared to the US. A move toward that model would save Australia around 30% of its oil demands and drop our CO2 from transport emissions by around the same amount – up to 50% with Biodiesel and ethanol in the mix.

Possibilities within Australia for biofuels

The current goal of 350ML of biofuels is a good one, however it already looks like being doubled with just the coming biodiesel production over the next two years! If Australia is to see the benefits to regional economies and marginal/salt affected lands, considerable research and trials of non-competitive non-food oil crops needs to be undertaken.

There are considerable areas of Australia that regularly get a high rainfall, but are not suitable to conventional agriculture do to temperature ranges or endemic species that are toxic to livestock or humans. Neither of these issues presents a problem to the development of non-food crops.

With the high rainfall of some of these areas, an area the same size as typically under Canola could displace some 15% of Australia's diesel requirements. This would result in a multi-billion dollar improvement in our balance of payments.

Acid seas 'will kill off coral within 70 years'

By Charles Clover, Environment Editor
(Filed: 04/02/2005) – UK Telegraph

Coral reefs could be dead within two generations and cod replaced by jellyfish because of the acidification of the sea, scientists said yesterday.

The potentially disastrous problem, discovered only recently, is being caused by the build-up of carbon dioxide in the atmosphere.

It is parallel to man-made climate change and scientists believe that it will give new urgency to efforts to phase out fossil fuels.

Carol Turley, the head of science at the Plymouth Marine Laboratory, told a conference in Exeter that the acidity of the sea was rising through chemical processes that turned carbon dioxide into carbonic acid.

She said: "It is happening now; nobody is saying it is not happening. It is O-level chemistry but no one noticed until 15 months ago. This is a rapid change that the world - and the organisms in the sea - have not seen for hundreds of thousands of years, if not millions. There is a very urgent need to do more research."

Ms Turley said that acidification was likely to have "a severe impact" on organisms with calcium in their shells or skeletons, from plankton to sea urchins.

Corals' ability to produce calcium is expected to decline by up to 40 per cent by 2065.

Lobsters and crabs, which form their shells out of another compound known as chitin, may be less susceptible to damage.

As half of all carbon from the atmosphere is "fixed" by microscopic plankton, the take-up of carbon is likely to slow down as the seas became more acidic, accelerating global warming.

Ms Turley said that cod and other fish ate plankton and shellfish that relied for their growth on calcium carbonate. If fish were not there, the sea would fill up with organisms such as jellyfish, which could eat other kinds of plankton.

"In cartoon form, you could say that people should be prepared to change their tastes from cod and chips to jellyfish and chips," she said. "The whole composition of life in the oceans will have changed."

Ms Turley told the conference, called Avoiding Dangerous Change, that coral reefs could find the sea too acidic within 35 to 70 years.

"Your grandchildren are unlikely to be able to dive on a [living] coral reef," she told delegates.

The rise in the acidity of the sea, which is believed to have begun with the burning of fossil fuels during the Industrial Revolution, has emerged as one of the key messages from the conference on climate change that will be relayed by Tony Blair to world leaders at this year's meeting of the G8, of which Britain is president.

An estimated 400 billion tons of carbon dioxide from fossil fuels emitted since the Industrial Revolution has been taken up by the oceans - some 50 per cent of the carbon dioxide emitted.

Scientists from the Plymouth laboratory have given the Government an urgent briefing on the problem.

Jerry Blackford, a colleague of Ms Turley, said that the rise in acidity could kill coral reefs long before global warming made the sea too hot for them.

The carbon from fossil fuels that was already in the atmosphere could be enough to stop the coral forming.

"It is getting towards inevitable that the coral reefs have had it," Mr Blackford said.

- 18 August 2004: Scientists fear acidity threat to marine life
- 15 February 2002: Coral reef 'hotspots' mapped to save sealife