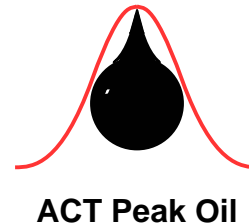


Submission from ACT Peak Oil  
to the Senate Rural and Regional Affairs and Transport Committee's  
[Inquiry into Australia's future oil supply and alternative transport fuels](#)  
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The Secretary  
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## Introduction

[ACT Peak Oil](#) was formed in early 2005 by Canberrans concerned about the implications of Peak Oil.

Addressing the terms of reference:

a. projections of oil production and demand in Australia and globally and the implications for availability and pricing of transport fuels in Australia

In forecasting future oil production, the important issue is not when oil will run out. The problem is when the peak of world oil production will occur, how much oil will be produced in that year (the greatest amount ever), and how steep the downslope will be.

The world oil supply picture is clouded by a lack of accurate data. For instance, according to *Twilight in the Desert: The coming Saudi oil shock and the world economy* (Simmons 2004, p80-81), estimates supposedly made by anonymous sources at major world ports as to the volume, source and destination of oil shipments have become the basis for official IEA oil supply figures. This is unacceptable.

Simmons' book casts doubt on the state of Saudi reserves. Saudi Arabia, held up as the world's last swing producer, with plentiful reserves that will supposedly keep up with demand, has been very secretive. Using technical reports of the Society of Petroleum Engineers he demonstrates that Saudi Arabia is not being upfront. For instance, he tellingly describes how, while Aramco (the Saudi state oil company) has been extracting oil at unsustainable rates at various times, little apparent attempt was made to use other fields now touted as major oil sources for the coming decades. This would be at odds with good reserve management, as extracting oil too fast from a field can reduce the total amount of crude ultimately recovered. Why hasn't Saudi Arabia brought these bountiful future fields on line already? Simmons doubts these fields will cover the shortfall as Ghawar and other major fields go into decline. The decline could be rapid, as illustrated by the production profile of 8 giant fields (Simmons 2004 p288).

If Saudi Arabian production declines, the world will have likely peaked. Australians could then expect dramatic increases in fuel prices. Saudi Arabia is not the only nation with dubious reserve figures.

**Recommendation: the Commonwealth help initiate urgent international efforts to improve the transparency of world oil reserve and production data; and that the Precautionary Principle be applied in formulating Australian oil supply policies.**

b. potential of new sources of oil and alternative transport fuels to meet a significant share of Australia's fuel demands, taking into account technological developments and environmental and economic costs

Rather than delving into the details of various options, it may be better to outline some essential principles that should apply when finding ways to ameliorate Peak Oil.

## Physical constraints

- Energy return on energy invested ([EROEI](#))

An energy carrying substance is generally only worth producing if the energy obtained from it is greater than the energy required to collect, extract and ready it for use. Presently there is doubt that ethanol is worth producing as a fuel for this reason since it currently requires diesel and oil-derived fertilisers to farm and transport the feedstock (Pimentel et al, 2005). Note that the EROEI of ethanol produced from sugar cane in Brazil is improved by use of the cane trash or stubble as a fuel during processing and distillation.

- Energy quality

Fuel quality is a rough measure of how easy it is to transform the fuel into usable energy. Petroleum in particular has a very high quality, due to its high energy density and being a liquid. A negative EROEI may be worthwhile if it creates a fuel with a higher quality – e.g. turning coal into oil.

- The Laws of Thermodynamics

In essence that energy is neither created nor destroyed, but is transformed into other forms of energy, and inexorably, tends to be dissipated as unusable heat energy. Usable energy is known as exergy. Unusable energy is entropy. No thermodynamic system can operate at 100% efficiency, and is almost always at a fraction of that. More energy is lost with each additional step in a process.

## Broader principles

- Scientific approach

Science is a process of inquiry, not a set of laws or absolute truths. As such, government should avoid slipping into complacent acceptance of beliefs (popular, institutional or otherwise) in contradiction of observational evidence. An inquisitive, open-minded approach is required for finding the best options.

- The Limits to Growth

There are limits to exponential growth in a finite system. Growth tends to overshoot if there is inadequate knowledge of available resource supplies and pollution sinks, or a lack of foresight. In the worst case there is the possibility of die-off. So if we have little idea how much oil is left, yet continue to grow the economy or population as fast as we can, disaster awaits us. There is an inexorable tendency for new and insurmountable limits to emerge as a result of attempting to evade other limits. This was the crucial but usually forgotten insight of *Limits to Growth: Beyond the Limits* (Meadows et al, 2004). Techno-fixes cannot solve all of our biggest problems.

- Appropriate use of economics

Economics offers some insights into human behaviour and how to achieve ends in the most efficient way. For instance, if oil producers in the Middle East fear their reserves will be taken unlawfully, they may sell the oil at fire-sale prices, giving the false impression that oil is plentiful. It seems their fears were justified. Respect for property rights is a basic principle of economics. Nonetheless economics is

subordinate to ecology and needs to be seen in that context. There is no economy without the environment.

- Avoiding the tragedy of the commons

Shared resources can be depleted or polluted by people who do not feel the full costs of their own actions, but when everyone does the same thing, everyone suffers – costs are externalised. Economic systems need to take account of this by internalising externalities e.g. by taxing or banning. This is the basis for the Polluter Pays Principle.

- Intergenerational equity

Governments need to make human development sustainable so that older people do not advantage themselves at the expense of the young and those yet to come.

- Wealth equality

The wealthy usually have a greater say as to how society works, but if they can shield themselves from the consequences of their behaviour (i.e. externalise them) then they have little incentive to conserve resources and reduce pollution – unless they are particularly conscientious. Extreme wealth disparity is a threat to a society's survival.

- The Precautionary Principle - the problem of insufficient information

In assessing the cost and benefits of action, government must assess the risk of worst case scenarios eventuating and account for this. For instance, even if there is only a 10% probability of disastrous climate change, prudent insurance risk management would recommend taking preventative action. Similarly for Peak Oil. As the WA transport minister said (MacTiernan 2004) "It is also certain that the cost of preparing too early is nowhere near the cost of not being ready on time."

**Recommendation: government adopt the above principles prior to evaluating or committing to measures to ameliorate Peak Oil.**

c. flow-on economic and social impacts in Australia from continuing rises in the price of transport fuel and potential reductions in oil supply

## Agriculture

ACT Peak Oil is concerned that agriculture will be greatly affected by higher oil prices. This is not just due to higher costs for getting food to market. A higher oil price will increase pesticide prices, which are made from oil. As consumption switches from oil to natural gas, the price of natural gas will rise, increasing the price of fertilisers.

Combined with other threats to Australia's agriculture from salinity, water shortages and climate change, we cannot assume Australian agriculture will adapt seamlessly to declining oil production. People may be compelled to start growing their own food as a supplement to commercial production, and start experimenting with new methods.

Government must support innovators. An example is the case of Peter Andrews who converted degraded saline land into fertile drought-resistant pastures (Australian Story 2006). Government and others ignored and dismissed his work. It was *Australian Story* which finally turned the situation around. We cannot afford to have authorities close their minds to the many solutions that may emerge in agriculture, and in any other field for that matter. A scientific approach, in its true sense, is essential.

**Recommendation: government pay particular regard to the effects of Peak Oil on food security.**

## Debt-dependent financial system

Debts have been taken out on the assumption that they will be repaid out of future profits. Many future profits rely on cheap oil to make a return on the capital investment. As debts become unrepayable, a cascade of business failures and bankruptcies would occur.

Peak Oil would be far more manageable if there were not the risk of an economic collapse — a “Greater Depression”. Unfortunately not nearly enough has been done to prepare for Peak Oil and as a result, not just will things be physically harder to do, but economic uncertainty threatens to make efforts futile.

The ease with which money has been created through borrowing world-wide over the last century has arguably led to excessive resource consumption. Being in debt has been rewarded as central banks have inflated the money supply. This became more pronounced as the US abandoned the gold standard. The system is not sustainable if there is not enough profit to pay off debt plus interest. So economic growth is mandatory – a later year’s activity must be greater than this year’s.

M. King Hubbert, originator of the “Hubbert Peak” pointed out the incompatibility between ecological systems based on matter and energy, which are effectively finite, and the monetary system based on interest, which is potentially infinite and therefore not adapted to the former. For a discussion of the monetary system see (Heinberg 2003).

The inquiry is likely to receive submissions on proposals to shift to currencies backed by energy production. These, along with energy quota systems, should be considered (Hopkins, 2006).

**Recommendation: the inquiry examine the role of the monetary system in promoting excessive resource consumption, as opposed to technological and societal improvements.**

## Power-down

There are broadly four ways in which people can react to Peak Oil (Heinberg 2003).

- **Power-down** – voluntary or enforced reductions in per-capita energy consumption and deliberate reduction in societal complexity. Simpler systems are less vulnerable to breakdown in times of stress.
- **Last one standing** – people and nations compete for remaining energy resources, maybe with nuclear weapons. The worst option.
- **Waiting for a magic elixir** – living in denial or ignorance of the problem. This is what most people are doing.
- **Building lifeboats** – preserving skills and knowledge of civilisation before its disintegration. This is akin to what the monasteries did during the dark ages in Europe.

Powerdown is by far the preferred option. It would require massive government intervention, on the scale of the Allied effort during WWII or the Apollo moon missions. However it may be too late to effectively implement, so consideration should be given to the “Lifeboat” option. This is not something government should necessarily get involved with but could encourage. During a prolonged economic collapse each community would be strengthened by the local availability of people with practical know-how, skills and knowledge.

During the petroleum interval we have grown physically lazy because petroleum does the work for us, and the danger is that we have become intellectually lazy as well. We cannot learn to survive without oil unless we get a bit sharper.

**Recommendation: government urgently begin a Powerdown in cooperation with other nations,**

similar in magnitude to the Allied effort during World War II or the Apollo moon missions.

## Geopolitical implications

### International oil depletion protocol

World-wide oil dependence is afflicted by “the tragedy of the commons” wherein prior to the Peak there is no incentive to curtail consumption for fear that rival nations will gain advantage by consuming what we forego.

The Association for the Study of Peak Oil and Gas (ASPO) has proposed an international oil depletion protocol known as the “Rimini Protocol” or the “Uppsala Protocol”. Participating oil producing nations would voluntarily reduce production to match their depletion rate. Participating oil consuming nations would reduce their imports at the world oil depletion rate. The objective is to minimise international upheaval by cooperatively managing the oil price while encouraging conservation (Heinberg, 2005). The alternative could be war and economic collapse on an unprecedented scale. At the very least it would combat the view that Australia can go it alone, squandering its own gas and oil resources while the rest of the world fights amongst itself.

**Recommendation: the Commonwealth should help initiate international negotiations toward an oil depletion protocol.**

### Australia's international relations

Post-peak international relations will likely be less centred around great powers and more about cooperating with your neighbours. This phenomenon is already emerging in Latin America and between India and Pakistan.

Australia may develop a new conception of itself as a relative safe-haven from a world of troubles. Globalisation will be unwound. The tyranny of distance may end up being our saving. However Australian energy reserves are much sought-after, particularly due to our political stability. We should bear Peak Oil (and gas) in mind when we sign decade-long energy agreements to supply other nations.

In a world of oil scarcity and melting ice-sheets, it is even conceivable that many nations may attempt to conduct oil exploration in Antarctica. As a claimant to a large portion of Antarctica, the Commonwealth needs to be vigilant.

**Recommendation: the inquiry examine whether current oil and gas export agreements are viable given our own energy demands after the peak of world oil production; the Commonwealth ensures that all oil and gas reserves under its control are exploited as sustainably as possible and are not squandered.**

#### d. options for reducing Australia's transport fuel demands

Our oil consumption is very profligate, but this gives us many ways to reduce it.

## Cycling

Cycling is a very promising option great health and environmental outcomes. Recent advances have seen the emergence of the electric bike, essentially a conventional bike with a compact electric motor

and a battery pack. Electric bikes open up cycling to those inhibited by hills, long distances or a disability. Cycling is likely to become the most popular alternative to the daily commute by car. As it becomes more popular, demand for cycling infrastructure will grow. Unfortunately bikes with motors with output greater than 200 Watt must be registered. This threshold should be increased to 600 Watts.

**Recommendation: government implement the Australian National Cycling Strategy 2005-2010 with both conventional and electric bikes in mind; government greatly increase spending on cycling infrastructure; government lift the power threshold for e-bike registration.**

## Urban planning

Urban planning has been based on an assumption of indefinite cheap petrol. Urban planning needs to be re-considered from the ground up in light of Peak Oil.

If people live near where they want to be – for work, school, shopping, church and friends – there is less need for them to travel. If people have the land and the skills and the willingness, they can grow their own food, reducing the need for transport (of food) and travel (for shopping). If neighbourhoods become communities, there can be exchange of food, clothing, skills, services, further reducing dependence on oil (Heinberg 2004, Litman 2004)

**Recommendation: governments take into account the likelihood of rising transport, energy and raw material costs in all consideration of the siting of new suburbs, the approval of industrial, retail and office development, infrastructure work, the redevelopment of existing towns, suburbs and CBDs. This should include (1) enlarging the scope of environmental impact statements to include the impact of expected energy costs and supply instabilities, (2) make such EISs publicly available in full, (3) require that any approval of proposed works formally address the EIS in a publicly accessible response.**

## Transportation Demand Management

Transportation demand management (TDM) has been shown to be the most effective way to reduce fuel consumption (Litman 2004). Methods include Pay-As-You-Drive car insurance and registration (Litman 2005).

Australia is a world leader in individualised marketing of sustainable transport. These programs are highly cost-effective and achieve decreases in fuel usage of around 12-13% overall (Robinson 2004, Socialdata 2004).

Changes to the tax system, such as Fringe Benefits Tax concessions for vehicles, would give people greater incentive to make the switch away from cars sooner (Denniss, 2003).

**Recommendation: government adopt TDM to reduce fuel consumption; and embark on a wide-ranging review of distortions in energy consumption due to the tax system.**

## Rail and public transport

Oil prices have risen 45% over the past 20 months, which is already resulting in increased public transport patronage, with 6% increase in Perth and a 8.5% increase in Melbourne, and a 15% increase in adult passengers in Canberra, as people economise on their travel.

However, bus based public transport is also facing increasing costs with rising oil prices. Light and heavy rail, powered by electricity, protects public and freight transport from these price rises.

Switching public and freight transport away from oil and gas is an important step and electrified light

and heavy rail is a key solution, as its power is derived from non oil and gas sources.

**Recommendation: We need to invest now in transport alternatives to minimise the economic pain of leaving the transition too late.**

## Conclusion

Peak Oil is a great “learning opportunity”. We will learn that there are physical limits to the economy and population. This awareness will help us deal with many other limits we have already started encountering – such as limits on fresh water and climate-changing pollution – and any new and unforeseen limits.

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