

**The Secretary
Senate Rural and Regional Affairs and Transport
Parliament House, Canberra ACT 2600**

**Submission to the
Inquiry into Australia's future oil supply**

**from
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Introduction

Growing evidence indicates that conventional oil production worldwide will peak within this decade. This will make oil considerably more expensive and will affect adversely most of the more-profitable ("productive") aspects of world economies. The global economy has become heavily dependent on oil - not only as a transport fuel - but to fuel agricultural production and the production of almost the entire range of synthetic materials on which we rely.

Australia is particularly vulnerable to oil prices because of our extravagant use of fuel for transport, the need for heavy use of fuel to farm agriculturally marginal areas, and because oil production in Australia has already peaked - making us increasingly reliant on imported oil.

It has become clear, too, that the Enhanced Greenhouse Effect is actually causing global warming, and is linked strongly to the vast amount of fossil fuel being used worldwide. This is predicted to increase the likelihood of extreme weather events and their associated disasters.

Global warming is predicted to bring a disastrous reduction in the water available across Australia, leading to a major decline in agricultural productivity. This last will increase the required energy per unit of agricultural output and worsen the problem of rising oil prices.

Our only realistic response is to decrease our energy consumption in general and our oil consumption in particular. To do this without reducing our wellbeing, will require careful planning, beginning as promptly as we can. In this, we can see two basic strategies: reducing waste, and redefining our welfare in terms of outcomes, rather than material inputs.

"Renewable" and "Alternative" energy sources have their places in a strategy for energy security and when total demand is brought under control, but their potential magnitude is inconsequential in the present situation of exponentially-increasing use.

Although large changes are needed in Australia, we can learn a great deal from the national energy policies developed in The Netherlands, Japan and other countries under the shadow of the 1972 Oil Crisis.

Uncontrolled energy demand

This Senate enquiry has already received many submissions detailing oil depletion forecasts from people such as Brian Fleay, Alan Parker and others. This author supports their contentions but will not attempt to detail them further.

Oil consumption worldwide has become problematic-enough that even USA President Bush has referred to the "addiction" of the USA to oil supplies. Australia's consumption per head is very close to that of the USA and the concept of "addiction" applies as validly here.

"Economic growth" is correlated very closely with increasing energy usage in most economies. Although authors such as Lovins, Lovins and Weisacker ("Factor Four") have demonstrated the potential for maintaining economic wellbeing at around a quarter of present energy-usage levels, only a few forward-thinking nations have succeeded in "decoupling" energy usage from economic wellbeing to any significant extent.

Integration for efficiency

Dramatic increases in energy efficiency are seen in "compounded" or "integrated" power systems. If the waste heat from a gas turbine is used to drive a steam turbine, and the waste heat from that is used for domestic or

industrial warming, energy-conversion efficiencies can be increased by factors close to double. This can serve as a model for improvements to national and world economies.

A simple example is the facilitation of walking and cycling at a local level to reduce the usage of private cars for short local trips. Although with higher occupancy rates, reasonable trip lengths and restrained driving technique ordinary cars can achieve fuel efficiencies close to those of public transport and reasonably low air pollution, that is not the present reality. In Australian cities, some 40% of journeys are of less than 5 kilometres and occupancy rates are very low. Observations of 85% single-occupant trips are typical.

Short car trips are disproportionately polluting and wasteful of fuel because neither the engine nor the catalytic exhaust converter are warmed to efficient operating temperatures. Crashes, too, are correlated more strongly with trip numbers than with distance because so many crashes happen within the first twenty minutes of a trip. Excessive use of motorcars also reduces the efficiency of public transport in several ways at once: it substitutes car trips for trips on public transport, an excess of cars on the road slows trams buses and taxis, and makes access to public transport by walkers and cyclists less pleasant and often more dangerous. The overuse of motorcars on short trips means a lot less incidental exercise by those drivers. Physical inactivity is strongly implicated in the incidence of obesity and its associated problems, and in the incidence of depression.

By encouraging and facilitating local walking and cycling, we have an integrated strategy to help combat fuel usage, air pollution, obesity, depression and motor crashes but the benefits don't stop there. By encouraging walking and cycling, we encourage people to use local facilities and to shop locally, so we reduce urban sprawl and its associated costs in infrastructure and social isolation. Through encouraging local shopping, we build local economies and improve the wellbeing of the entire society, including of those who cannot afford a car or to use public transport.

Integration can bring solutions to multiple challenges in many other areas as well. The Australian Conservation Foundation's head office in Melbourne offers an example of the synergies flowing from reducing inputs to reduce the needs for amelioration. By using efficient computers, for instance, the need for cooling is reduced considerably. Reducing usage of water means that a significant part of its supply can be from rainwater, and so forth.

In industry, reducing waste can bring linked benefits right down a production chain, including reducing the costs of waste disposal.

Renewable energy sources.

"Renewable" energy sources are only realistic in conjunction with moderating overall demand for energy.

Collection of solar energy has much greater potential, but more in the unspectacular areas of low-grade heating for heating water supplies and buildings, and for industrial pre-warming.

Solar voltaics will play an increasing role at specific locations, to avoid the costs of networked electricity, but are unlikely to play a major part in general electricity production unless current increases in cost efficiencies continue for a considerable time.

Wind power has considerable potential and modern generators are estimated to return within about 18 months the energy embodied in their manufacture. Wind power remains a contentious issue and politically sensitive, so its use may be limited for some time. Its erratic output means that wind energy is unlikely to become a major part of electricity generation.

Given the high inputs of oil energy to agriculture in Australia, biofuel estimates even as pessimistic as those of Brian Fleay (Australian Liquid Biofuels National Production Boundaries; Fleay, January 2006) are excessively optimistic for biofuels from crops in Australia.

Methane from waste, however, has considerable potential as an integrated solution. The methane generated by millions of tonnes of waste in tips throughout Australia is potentially a high-grade fuel. However, its escape direct to the atmosphere contributes notably to global warming because methane is around 12 times as effective as carbon dioxide as a Greenhouse gas. By sequestering landfill methane, we gain a source of fuel and reduce Greenhouse gas emissions (GHGs) together.

Other sources of energy

Nuclear power is being promoted widely as a way to reduce GHGs and dependence on oil. A key problem is, however, that the whole nuclear process (it is not really a "cycle") uses a largely-unknown, but considerable, amount of oil energy in the mining, processing, transport and concentrating of the fuel, in the building, and later decommissioning of the power stations, and in the long-term storage - often refrigerated - of the wastes. It is likely that the energy input from oil exceeds the output of nuclear power from all but the highest grades of uranium, even before we include the energy costs of misuse of nuclear materials by unauthorised people and rogue governments. There is also a considerable risk to non-fuel resources such as agricultural land. Much of the area despoiled by the Chernobyl failure is still uninhabitable and will be for a long time.

Fuels such as Shale oil and tar sands usually involve very high costs in energy and air pollution to make them usable. They are not realistically part of mainstream energy use although they may have some value as substitutes for petroleum as chemical feedstocks.

Lignite, of which Victoria has a great deal, is difficult to burn cleanly and efficiently. Converting it to liquid or gas for transport usage involves even greater inefficiencies, although probably less than those of oil shales and tar sands. The use of lignite should continue to be phased out.

Measures of welfare

Too much of economic reportage in Australia centres in crude and misleading measures such as Gross Domestic Product (GDP) and its derivative, Economic Growth.

The raw measure of production embodied in GDP measures waste and wealth, creation and destruction alike. It equates human welfare with the ownership of material goods alone. It fails utterly to evaluate the human benefits such as clean air, drinkable water and a secure society for people to live in.

Such a measure ensures that our economic systems will continue to work inefficiently and human needs will continue to be met poorly. We need to be using much more refined measures of how our economy is meeting actual human needs. In this area, economics seems to have lost a great deal in the past generation, perhaps because computers are so good at simple linear measures and it is so difficult to program them to process more meaningful measures.

Summation

Australia needs to look to The Netherlands, Japan and other nations that have already developed national energy policies, and to learn from both their mistakes and their successes.

We need, particularly, to be looking at integrated solutions to increase real welfare while reducing inputs of energy and other resources.

To evaluate our achievements, we need general usage of more refined and indicative measures than the crude measurement of GDP or Economic growth. We need to decouple our economic welfare from energy consumption, and to increase energy efficiency markedly, rather than look to substitute sources to power the wasteful modes of the present.