

**Submission to the Inquiry by the
Senate Rural and Regional Affairs and Transport Committee into
Australia's Future Oil Supply and Alternative Transport Fuels**

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Summary Points:

- The Australian oil market is completely integrated with the global oil market,

the latter determines oil prices, and production or demand changes in Australia will not alter petrol prices or availability here.

- While it will not affect prices, greater oil production in Australia, either from conventional or new sources, such as biofuels or gas, may well be beneficial as regards the economy generally, regional development or environmental effects, depending very much on the circumstances of each type of production.
- The optimal use of gas on a large scale would be as a lower greenhouse emissions substitute for coal, rather than as a replacement for oil.
- The point of 'peak oil' has probably occurred, or will do so soon. This means from now on (barring global recession) prices broadly will rise gradually and in the longer term will be much higher than now.
- Peak oil reflects the inevitable depletion of the large cheap oil reserves that were all found before 1970 and the very inelastic global demand for oil in the short and medium term, even at current prices.
- Higher oil prices will bring on new supplies from sources such as biofuels, enhanced recovery from existing wells, new expensive wells, tar sands, heavy oils and oil shale, but these will be higher cost, so that at the very least oil prices will plateau rather than fall to what they were when oil came completely from very low cost oil wells.
- The current higher oil prices and the prospect of even higher prices mean that owners of reserves of low-cost oil, which are mainly countries rather than companies, are going to be extraordinarily wealthy.
- In this context Australia's Petroleum Resource Rent Tax needs reviewing. It is the main way Australians benefit from new oil discoveries within Australia's jurisdiction, but was designed when no-one imagined oil prices might be permanently at the much higher price levels we now face.
- The Australian and the global economy seem able to handle gradually increasing oil prices. The main problem for Australia is social inequity - the impact on low income outer suburban and regional Australians who are very dependent on car travel, often more so than some higher income urban dwellers.
- Reducing transport fuel taxes is the wrong way to go in dealing with these social impacts. It would undermine the only long-term answer to higher oil prices, which is greater efficiency in their use, in the broadest sense.
- It would also create further anomalies, such as the greatest absolute benefit going to higher income earners, and low petrol users being penalised on average because of the need to raise other taxes or cut services.
- The only realistic long-term answer to higher transport fuel costs is increased efficiency in their use, and a move to transport modes that use no or much less oil. Fortunately the technology to do this readily available.

- Change to much more efficient use of oil for transport will be market-driven by oil prices, but government actions working in the same direction are needed to facilitate change.
- To some extent change involves less car use (more walking, cycling and public transport), but given the way our cities are arranged and people's way of life, the largest change will need to come from personal transport using oil in a far more efficient way. This means small, extraordinarily efficient cars (already designed and tested) and more light motor bikes and motor scooters.
- The vast range of government actions to facilitate this include changes to roads, to traffic regulations, and to taxes and charges, and working with industry in various ways.
- Looming over all energy issues is the enhanced greenhouse effect. Higher oil prices will assist in this challenge by promoting greater energy efficiency, but oil and gas depletion is unlikely to put off global warming in any significant way later this century.

Terms of Reference of the Inquiry

Projections of Australian oil production and demand, and global oil production and demand, and implications for the availability and pricing of transport fuels in Australia

The key point about the oil market in Australia is that it is an integral part of the global oil market. Essentially the price we pay in Australia is the global price, and barring events such as a major war, if we pay the global price we will have availability.

This integration with the global oil market reflects general government policy on economic integration with the global economy. It is reinforced however by the nature of oil production in Australia, where despite production of crude oil being about 70% of consumption, about half of Australia's crude oil is exported without being refined here. Consequently most crude oil refined here is imported. This reflects industry economics and the kind of oil Australia produces.

This integration makes irrelevant the idea of national 'self-sufficiency' in the quantity of oil produced here, a concept that is often mentioned in relation to Australian oil production. While the more oil we produce the more general benefit to the national economy, self-sufficiency is irrelevant to the price we might pay, and given the physical integration with the global oil market, it is unlikely except in extreme circumstances to be any guarantor of availability, that is, of energy security.

This integration means that a biofuels industry, while probably beneficial for

environmental, regional development or general economic reasons, will have no significant effect on fuel price or availability. Even if it became very large (not foreseen at present) and low-cost in terms of world prices for biofuels, it is hard to see Australian producers accepting lower than world prices on the Australian market.

It has been suggested that Australia's gas reserves could be exploited more extensively for use as transport fuel here. However, this would not assist with lower prices and greater availability in Australia, because it would face the same obstacle as proposals to insulate Australia from global oil pressures: the gas industry is integrated with the global gas market, and the world gas market faces the same pressures as oil - limited reserves and the inevitability of higher prices.

A further reason to question this use of gas is the enhanced greenhouse effect. Gas has a vital role in Australia, and globally, to provide energy with much lower greenhouse gas emissions than coal, that is, as a transitional fuel to even lower greenhouse emission levels. It would therefore be less than optimal if gas were used on a very large scale as a transport fuel. Further, as argued below, there is huge scope for greater transport efficiency, and using (cheaper) gas could well undermine the necessary long-term shift to greater efficiency in transport.

Any likely projections therefore of either oil production or demand in Australia are unlikely to have any significant implications for price/availability of oil in Australia. These will be overwhelmingly determined by the global scene. It is here that the concept of global 'peak oil' is relevant.

Broadly, peak oil is a term coined to describe the situation where global oil supplies cease to grow to meet demand at the price levels and availability that we have been used to so far. Cheap oil supplies cease to grow because of the depletion of the reserves of cheap oil that the world has relied on for decades. 'Peak oil' is the point where demand growth based on earlier availability and prices diverges from supply at these prices. After the point of peak oil, prices steadily increase, and oil becomes gradually less widely available than to date.

Increased prices for oil will bring on some new supplies that were not viable before, but given the gradual depletion of known reserves, and growing world demand from the industrialisation of China, India and other developing countries, it would need massive new sources of oil that no-one has yet identified, to fill the gap and keep prices from gradually rising further.

In fact virtually no-one denies the likelihood of peak oil at some time: views differ simply as to whether it will arrive in the next year or two (or may have already begun), or can be put off till perhaps 2030. The protagonists for early peak oil include extremely well qualified world authorities such as Matthew Simmons, Colin Campbell and the Energy Institute of London, who have carried out detailed studies of world oil reserves.

They point out indisputable facts such as that the world still relies heavily on a few massive low-cost reserves, that were all discovered before 1970, that no such fields have been discovered since, despite massive oil exploration efforts, and that detailed analysis of oil production in most oil producing countries shows it has plateaued or is

steadily falling. An important point is that these 'early peak oil' protagonists are independent experts, while those promoting a 'much later peak oil' view are almost all representatives of oil producing countries or companies who for various reasons tend to have an interest in overstating the size of their reserves, and understating possible future rises in oil prices.

Higher prices will bring on augmentation of current oil supplies by enhancement technologies, to get more out of wells, and the operation of more marginal oil wells, such as deep-sea. These are all more costly. However, the hope for additional large supplies rests mainly on alternative sources of oil, such as tar sands, heavy oils and oil shales. But all the indications are that it would take continuing high prices to make them viable, as all involve extensive processing with costs which are an order of magnitude greater than that needed for conventional oil.

Interestingly, neither the pessimists nor the optimists on oil supplies foresee a major global contribution from biofuels. This seems to reflect the high marginal cost of manufacturing biofuels if they became a major global source of fuel, but more profoundly the global pressures that a huge biofuel industry would put on limited supplies of arable land, fresh water and forests.

Because of these new higher cost sources, it is possible that the global oil price will not continue to rise for some years but plateau. In other words, given the usefulness of oil and how we have all become dependent on it, world demand will easily accommodate itself to higher prices, and the determinant of price will be the global supply curve derived from all sources of oil, conventional and unconventional.

It is therefore quite feasible that for some years the price of oil might remain somewhere between US\$50 and \$100 a barrel, with the price held down by new supplies from the more viable unconventional oil sources. In this price range global demand might have the edge taken off its growth, but it is hard to see global demand falling. For instance, in Australia this price range means motorists would pay between \$1.12 and \$1.60 a fully taxed litre.

Because oil is so useful and valuable a material, permeates the provision of so many goods and services, and has become so bound up with consumption in rich and poor countries, its demand is amazingly price-inelastic, certainly in the short (up to say two years) and medium (up to five years) terms. It has been estimated that for private driving in the US a 10% rise in the price of petrol only causes a 1-2% fall in demand.

But the figures for Australia seem to show an even greater inelasticity: in the last three years the retail price of petrol has risen about 100% without a significant effect on petrol consumption, which would make petrol almost unique as a commodity. Normally a 100% rise in price leads to a drastic fall in demand. With petrol however it leads to a fall in demand for other products: witness the claims by retailers that petrol price rises affect their sales volumes. And the private car demand for petrol could well be more price elastic than for other segments of oil demand such as much commercial transport, mining, agriculture, and chemical, plastics and fertiliser industries.

To give an idea of why demand might not alter greatly in Australia for some years with a price of \$1.60 a litre consider an essential or highly desirable trip by a family in an Australian city of 20km. \$1.60 is twice the price of petrol about four years ago, and the petrol cost of this trip (at 10 litres for 100km) has risen from about \$1.60 to \$3.20, an increase of \$1.60. This sort of price increase just is not significant enough to greatly dissuade most car travel, and in the short and medium term most people are going to have the same house or car. This price inelasticity of oil demand seems to be a global phenomenon.

In the longer term however, barring economic recession, the remorseless depletion of conventional (cheap) oil reserves, and the need for supplies from increasingly expensive unconventional sources, will drive the price up further. Nothing will be able to replace the enormous resource of cheap oil currently being depleted. Prices far higher than US\$100 a barrel will finally have the effect of greatly lowering effective demand. We will have to live with much less oil, and price will allocate it to the more essential uses.

Becoming less dependent on oil involves long-term decision-making, profound change and large investment choices by people, government and industry, and essential facilitation by government actions, as is discussed further below.

Potential of new sources of oil and alternative transport fuels to meet a significant share of Australian fuel demands, taking into account technological developments and environmental and economic costs

As noted already, it is unlikely that new or alternative sources of oil in Australia will make either a really significant difference to the price or availability of oil in Australia. Furthermore, they are unlikely to make a large contribution in an absolute sense either. For instance, the Government's biofuels taskforce, reporting last year, worked on the assumption that biofuels might be producing 350m litres of fuel in a few years time. This figure represents about two-thirds of one percent of oil use in Australia today. Such new fuels might make a small but useful contribution in terms of regional development, the environment or the economy generally, but won't affect fuel prices or availability.

It should be noted that the taskforce did not find that biodiesel would be financially viable in the longer term, once protection in the form of excise exemption was removed, and it doubted if ethanol was viable either. However, these findings were based on an ABARE forecast in 2005 that the future global oil price would be US\$32 a barrel. Even last year this looked like a very optimistic forecast, and it looks even more optimistic now. It is highly likely therefore that these industries will be much more viable, even if not large, than the taskforce found.

Flow-on economic and social impacts in Australia for continuing rises in the price of transport fuels and potential reductions in oil supply.

The major implications for rising oil prices in Australia are social (effects on particular social groups) rather than relating to general economic management.

The big question on economic management is whether oil price rises could be

sudden and severe enough to generate a global economic recession. Gradually rising global price rises should be able to be accommodated, even if they present problems for those economies which are heavy net importers. After all, when some pay more for oil, someone else is better off, and provided the increased income is put back into the global financial system and spent the global economy should keep ticking over. As most oil is owned by countries rather than companies, those countries with the large remaining reserves of cheap oil are going to enjoy extraordinary income as the world price rises over coming years.

For the Australian economy, at a crude oil price of US\$60 a barrel, Australia spends about 3% of GDP on crude oil, but with about two-thirds nominal self-sufficiency this reduces to a nominal net 1% of GDP on imports, and the price rise doubling in recent years suggests an increased import bill of only about 0.5% of GDP. The Australian economy has evidently been able to handle this, with continued economic growth and low inflation. Provided oil price rises are gradual, this should hold in the near future.

However, this raises the question of what return the Australian community gets from crude oil discoveries, particularly in northern Australia where the oil is exported for refining elsewhere. This is a growing proportion of Australia's oil. A great deal of the income earned will not remain in Australia: most of the capital equipment and all the diesel oil to power operations will be imported. Profits will go offshore depending on whether the oil company is Australian or a multinational firm. Many of the skilled workers will be foreign and saving rather than spending in Australia. In other words, an increase in exports from within Australia's jurisdiction will be offset directly by large imports or expatriation of earnings. In fact the major benefit to Australia will probably be through the Petroleum Resource Rent Tax.

Under the PRRT, 40% of the profit, after company tax, of a new oil field is paid to the Commonwealth Government. This is the main way in which the owners of oil, the Australian community, benefit from their ownership. Assuming that the accounting is correctly done, this means that of the profit from a new oil field 30% will be paid through company tax, and then 40% of the remaining 70%, making a total of 58% of profit to the Australian community and 42% to the oil company.

This PRRT formula was introduced in the late 1980s when oil prices hovered in the US\$20-30 range. If oil prices rise permanently to US\$50 to \$100, or higher in time, this formula may prove enormously generous to oil companies and far more generous than is necessary to induce exploration and recovery. It should be noted that the tax only applies once profits have been made. Its appropriateness should be reviewed in relation to the likelihood of inevitable long-term rises in the price of oil.

An appropriate change could be to keep it as it is for oil prices at present day levels and well above that, but for those times when prices are at far higher levels than anyone imagined possible until recently (say US\$100 a barrel) a new formula would apply, so that a generous incentive still exists for oil companies, but as much as possible of the excess well above current prices is returned to the owners, the Australian community.

The major impact in Australia of high oil prices is likely to be social. This is because some in the community are far more vulnerable than others to a price rise. The more vulnerable are essentially the great majority of lower income earners who have become dependent on cars for everyday activities. They are more likely to be live in outer suburban or regional areas, where facilities are further away and the journey to work longer and unserved by public transport.

Griffith University Urban Research Program has carried out a survey of oil price vulnerability in Brisbane, Sydney and Melbourne, and mapped where the most to least vulnerable live. Three factors were used to measure oil vulnerability: income level, car ownership rates and car trip frequency. Greatest vulnerability is based on low income, combined with high car ownership and high number of car trips per week. The most vulnerable in these cities are overwhelmingly in lower income outer suburban areas. Lower incomes mean that petrol costs would be a greater proportion of income, but also mean options to address this, such as buying a new fuel-efficient car, or moving to a more convenient house location, are relatively more expensive.

It is relevant in this regard that if anything the correlation of income level with public transport use for the journey to work, and availability, in Australian cities is positive: the better off you are, the more you use, and the more available to you is public transport.

If anything many lower income earners in regional areas could be even worse off than those in outer suburban areas. The following section discusses ways the impact of high petrol could be ameliorated.

Options for reducing Australian transport fuel demands

One action that should not be followed in the face of rising oil prices is to reduce tax levels on petrol, currently 38.143 cents a litre excise plus 10% GST on total price including this excise (except in Queensland where the excise is reduced by the size of the GST component).

Taxes should not be lowered principally because this would undermine more efficient use of oil, which is the only long term solution to scarcer oil - it would point Australia completely in the wrong direction (and partial tax removal would only raise the pressure for more removal as prices rise further).

Further, such a change would give rise to various social equity anomalies. Less tax on petrol, while assisting low income people who drive a lot, would provide the greatest financial benefit to those high income drivers who use fuel-inefficient vehicles heavily and are the greatest petrol users.

Indirectly it would also give rise to anomalies, because the loss of revenue would cause either heavier other taxes, or lower services to society. Either way all those in the community who currently use less petrol per head, such as very low income people without a car, or those who do not use cars heavily, would on average be indirectly worse off, that is, penalised when they should be encouraged.

The only long-term answer is transport arrangements which are far more efficient in oil use than at present, or do not use oil, as follows.

There is an enormous scope for greater levels of personal transport which does not involve private use of oil, such as walking, bicycling and public transport. However, given the layout of our cities and towns, and the way of life we have developed, the main answer to higher oil prices, even for low income earners, lies in far more efficient private travel.

In 2002 Volkswagen unveiled in Germany a two-passenger car which uses one litre of diesel for 100km of travel, or one-eleventh of the average fuel efficiency of the Australian car fleet. This car can reach 75kmh and has a one-cylinder conventional motor - it doesn't even use relatively new technology such as a hybrid motor or fuel cells.. This is indicative of the scope for far more efficient use of fuel in cars. Slightly larger vehicles with better performance might be slightly less efficient in fuel use but could still be several times more efficient than average vehicles at present.

As well as cars, highly fuel-efficient private travel is possible in light motor bikes and motor scooters. The technology already exists therefore to make the switch so that low income earners can accommodate higher oil prices and not be reduced to tough decisions about travel necessities versus other necessities.

This switch, like the switch to more walking, bicycling and public transport, will be market driven through rising oil prices, but to occur in the most optimal way it needs numerous government facilitating actions to assist it. The market and government actions will be working in the same direction, reinforcing each other. Government actions should include:

- alter government charges and taxes, such as registration fees, tariffs, and FBT arrangements to favour smaller, fuel efficient private transport, and to discriminate against larger fuel inefficient vehicles. This will help address the major problem for low income earners taking advantage of fuel-efficient vehicles, the cost of a new vehicle. To date low income earners have tended to trade off the low purchase cost of old cars against the higher petrol cost of older cars;
- facilitate through the car industry the widespread availability of smaller, low cost, fuel efficient vehicles.
- alter all traffic regulations and road and parking provision to favour light motor bikes, motor scooters, bicycles, walking and small efficient cars, and discriminate against larger private cars; for instance fuel-efficient-only traffic lanes, or bicycle road networks;
- encourage public transport, and in particular do not foreclose on public transport options in the future such as selling off land owned as part of public transport networks;
- coordinate rail transport better, so as move more freight by rail. Rail uses diesel but it is much more fuel efficient than road transport;

- have a complete speed limit on all roads of 80kmh, as was done by the Nixon Administration in the 1970s (as 50mph). This would save everyone money, be less time consuming than it seems, while there would be enormous safety benefits;
- encourage the delivery of bulkier goods to houses by retailers, so that people could walk, bicycle or motor scooter to shopping centres and not have to use a car for the weekly food and grocery trip.

Introduction of these measures could see a scenario where a low-income outer suburban family who at present have to run two older fuel-inefficient vehicles could have the same choices and activities with one small new highly fuel efficient car and one motor scooter/motor bike/bicycle, with a consequent petrol consumption a fraction of previous levels.

Looming over all energy issues is the enhanced greenhouse effect and global warming. The shift to more efficient use of oil because of rising oil prices will be beneficial in dealing with global warming, because it will help bring about necessary technological change.

However, it is unlikely that a much diminished use of oil and gas in a few decades will greatly reduce global warming this century. This is because of the dominant contribution of coal to total greenhouse gases; the further growth of coal under 'business-as-usual' scenarios; increased greenhouse emissions arising from any substitution of coal for oil or gas as the latter become scarce; and the long time that CO₂ remains in the atmosphere, meaning that oil and gas greenhouse emissions in the early part of the century will still be having an effect at the end of the century.
