ASPO-Australia

Australian Association for the Study of Peak Oil & Gas
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20 July 2006

The Secretary,
Senate Economics Legislation Committee,
Suite SG.64, Parliament House
Canberra ACT 2600

SUBMISSION- Inquiry into the Price of Petrol in Australia

ASPO-Australia is the only body dedicated to the study of the impacts of Peak Oil on Australia and to the risk assessment and risk management arising from our Oil Vulnerability. ASPO-Australia is a nationwide network of people with professional interest in the impacts, and in options for mitigation and adaptation, in many fields. Our working-group structure is intended to allow professionals to focus on specific parts of the overall impact scenarios, and to make use of relevant expertise in those areas. We make this submission to your Inquiry (Reference e) as we believe that it is the global issue of peak oil that is driving up Australian petrol prices (as in other countries), not the actions of oil companies, Australian petrol distributors and refiners.

There is a high probability of global Peak Oil occurring soon, before 2010 or 2015, and this will lead to even higher petrol prices in Australia.

The flow-on economic and social impacts in Australia from Peak Oil are likely to be very serious, UNLESS we make serious and courageous decisions to take the obvious sensible precautions very soon.

ASPO-Australia recommends four main options which are capable of halving Australia's transport fuel usage. All are behavioural options. These four could then lead to a plethora of important but relatively minor changes, including the technological options, which in total can make the substantial reductions in demand that we will require when (or if) Peak Oil strikes. All are aimed at minimising our automobile dependence. They are:-

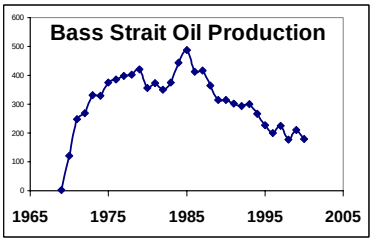
Community Engagement: Empowering people to understand and to help decide the best options for us all when we are facing Peak Oil.

Individualised Marketing: A proven rapid cheap technique to offer people the option of reducing travel. 13% reduction in car-kms has been achieved in large programmes in Australia. It can also be adapted to alert people to Peak Oil probabilities and risks.

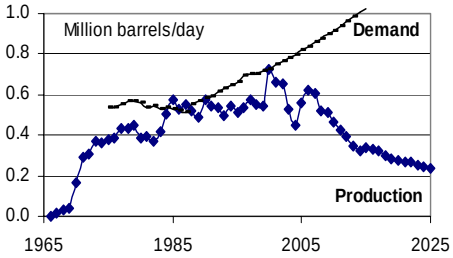
Margaret Thatcher's Fuel Tax Escalator: Increasing fuel taxes smoothly and incrementally to UK levels provides a clear signal that we must value fuel much more than we do now. This would provide funds for schools, hospitals, and for sustainable transport infrastructure. Increasing fuel taxes and lowering income taxes would be one simple variant.

Smartcard flexible tradable fuel allocation and pricing mechanism: Providing a basic safety-net ration for modest usage, and extra fuel at an increasing taxation rate for those who want to use more than average. Unused allocations can be traded to reward those with ingenious ways of reducing fuel usage.

Peak Oil is one term for the inevitable change from a rising trend of oil production to a terminal decline as oil fields age.

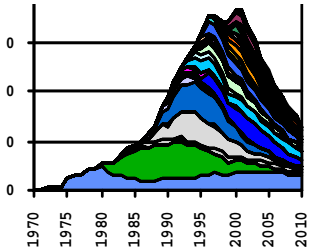


Australia's Bass Strait province started production in 1970, reached its peak in 1985 and has declined steadily ever since (right diagram).

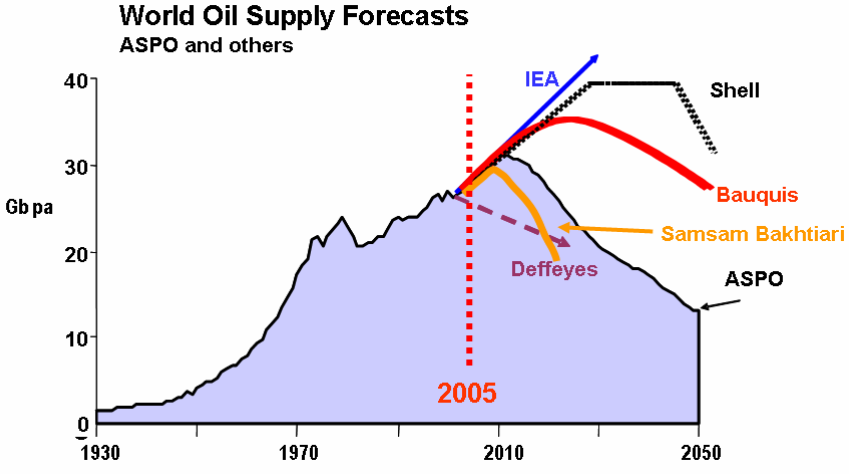


Australia's overall production peaked in 2000 and is declining. Geoscience Australia's 50% probability forecasts show a continual steep decline, while our consumption trend is steeply upwards (left). The probability of new Australian discoveries even meeting our past peak production is very low indeed.

North Sea production, for instance, peaked in 1999 (UK), and 2001(Norway, right-hand graph) and has been falling sharply since.



Excluding deepwater oilfields, output from 54 of the 65 largest oil-producing countries in the world is in decline. Global oil production is still rising and there are many estimates of when it might peak. The absence of any reliable audited reserve and field by field production data means it is not possible for more than uncertain probabilistic estimates to be made. Serious questions, about the veracity of the official Saudi reserve figures for instance, make the uncertainties higher than many assume. One estimate of the timing of global peak oil as a probability distribution suggests 50% probability of a peak in the range 2010-2015, with perhaps a 10% chance of peak oil being before 2007, and only a 10% chance it will be later than 2025. Put another way, there is perhaps a 30% chance that Peak Oil will hit us either within the term of the current Federal parliament or the term of the next parliament.

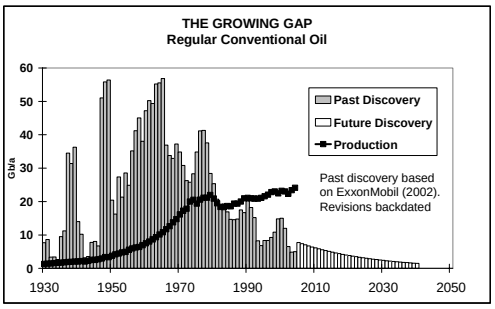


Price Scenarios:

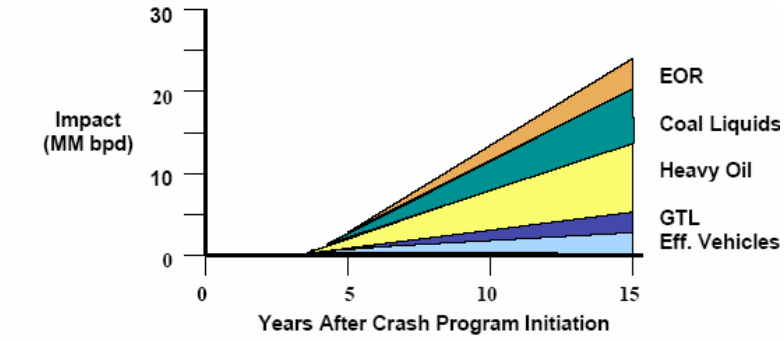
When global peak oil occurs, oil shortages, many-fold price rises and possible international and national oil rationing are all plausible scenarios which should be considered in any planning for the future.

Future oil discoveries and new sources of oil:

The annual volume of oil discovered globally has been falling steadily since the 1960s (Dr Campbell, 1998). Australia is also showing declining discovery rates. The probability that these long-established trends will reverse is very low. The yet-to-be discovered oil fields are most unlikely to be able to do more than make the post-peak decline curve less steep.



Alternative transport fuels:



The recent study for US DOE (Hirsch et al, 2005) shows that even with (unlikely) massive crash programmes, there will be lead times of decades needed before synthetic crude oil, from coal, or gas or tar-sands can be produced in volumes sufficient to make a serious impact on declining conventional oil production. These measures need to be started 20 years before the peak to avoid serious shortfalls.

Physical limits, especially dwindling natural gas supplies, are very likely to limit Canadian tar-sand syncrude production below Hirsch's estimates (Aleklett, 2006)

Increasing the production of biofuels also has similar physical limits (for instance the lack availability of arable land not devoted to food and the environmental limits of clearing tropical forests for palm oil plantations). More detail is provided in the ASPO-Australia Biofuels working group submission.

Hydrogen gas is an energy carrier, not an energy source, and it requires very large energy input for its manufacture. The most common route for hydrogen production is the use of natural gas (methane) to provide both the hydrogen atoms and the energy for its production. *"The Hype about Hydrogen"* (Romm, 2004) is an objective summary by a former US DOE programme manager. The likelihood of the hydrogen economy playing any role in delaying peak oil is very low indeed, <1%. Hirsch omitted hydrogen as a technology which might counteract oil production decline, as fuel cells are not currently available in mass-production. A University of Warwick study estimated Britain would need 100 nuclear power plants for electricity to make hydrogen to replace its existing transport fuel use. This is a magnitude of investment and timeframe that puts glib statements about hydrogen for transport into perspective. The UK uses 2.5 times as much oil as Australia does, so we would need only some 40 nuclear plants to make the hydrogen for transport from electricity. Hydrogen is not a practical transport fuel and certainly not panacea. It is increasingly unlikely that hydrogen will be used for transport in any significant way, especially if battery and light vehicle technology continue to improve substantially. It is predicted that far more people-kms will continue to be travelled in Australia by bicycle than by hydrogen vehicle for the foreseeable future.

For Australia, natural gas is the most obvious alternative fuel for transport purposes. Already a proportion of the urban bus fleet runs on natural gas in diesel engines. However, Australia only has

some 1.4% of the world's known reserves of natural gas, and our gas extraction is growing rapidly. Our natural gas reserves will be depleted relatively quickly, leaving very little for future generations. Our gas is not a Magic Pudding that can be consumed continually while it miraculously regenerates itself. It is not physically possible to use our limited natural gas resources simultaneously and for long periods for electricity generation and for large-scale LNG export and to replace oil as a transport fuel, and to make urea fertiliser and to use for domestic cooking, while at the same time leaving a legacy for future generations. However many advocate that we use it for all these purposes. Certainly, history is likely to view the large-scale export of natural gas at very low prices as a serious national mistake. We could use the gas for our transport needs for the next 50 years (at current usage rates), but only if we halted exports and stopped generating electricity from natural gas.

The flow-on economic and social impacts in Australia

The flow-on economic and social impacts in Australia from Peak Oil are likely to be very serious, UNLESS we make serious and courageous decisions to take the obvious sensible precautions very soon.

ASPO-Australia knows of a number of hopeful scenarios, where impacts are predicted and minimised, opportunities grasped and the oil vulnerability of different industry and community sectors is assessed, while mitigation and adaptation strategies and the necessary adjustments and safety nets are provided.

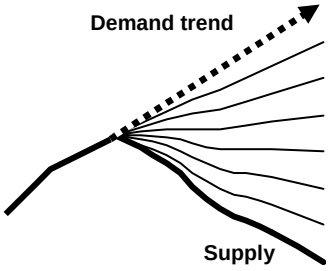
These positive scenarios will require an informed and engaged community, and thoughtful and forward-looking decision-makers and community leaders. We outline below recognised strategies which could help these necessary conditions arise.

The probability of the positive scenarios coming to pass is low on current trends, but the Australian community can rise to the occasion and we do have the power to reduce the probabilities and magnitudes of the negative aspects of Peak Oil and to take advantage of the many opportunities which will arise in the Peak Oil future.

There are many relatively recent examples of substantial changes in community attitudes and behaviour to unhealthy and inequitable past practices. These include smoking in the workplace, drink driving, attitudes to gender and racial equity, and to many environmental matters. There is a high probability that the community could change its attitudes to fuel usage and its behaviour if people understand the serious risks and costs involved in continuing our current trends.

Options for reducing Australia's transport fuel demands

There are many options for reducing substantially our transport fuel usage. The probability of a smooth demand reduction trend is low, but it is well within the control of the Australian community. This is in sharp contrast with the supply side of the equation, which is almost entirely dominated by global and geological factors outside Australia's control.



This scenario illustrates that there will be no "magic bullet" to replace cheap abundant oil. Many measures can together help bridge the growing gap between current demand trends and forecast supply decline. Many attractive options (like more efficient cars) are inevitably slow to take effect and not particularly significant overall. We concentrate on the two areas highlighted, which can be the fastest acting of available

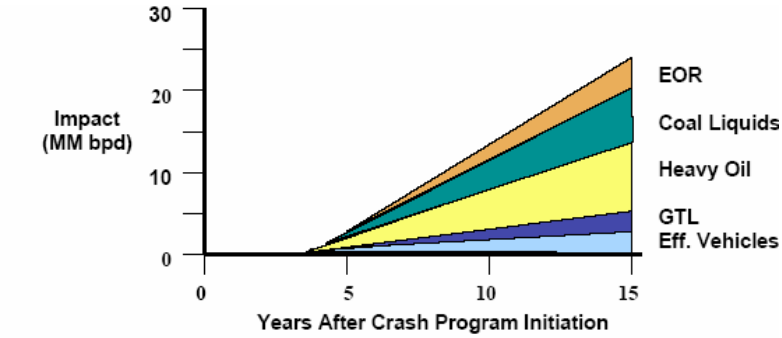
options.

- efficiency
- **transport choice shifts**
- **pricing / taxes / rationing**
- city design/infrastructure
- other petroleum fuels
- non-petroleum fuels
- deprivation/wars

President Bush recently acknowledged *"..we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world"*. ASPO-Australia agrees with the President about the US and recognises Australia is almost as addicted to oil and automobiles as the US. Australia uses a total of over 6 litres of oil per person per day, while the US uses10 l/person/day.

However, we strongly disagree with President Bush that the main hope is in technology. We are certain that the major chance lies in a sea-change in community recognition of the probability and the magnitude of Peak Oil, and subsequently in attitudes and policies after the risks of Peak Oil become widely accepted.

Certainly technology will play a part, but it will be far to slow, and relatively insignificant in magnitude to be effective in meeting the challenges of an early Peak Oil (as outlined in the Hirsch report to the US DOE, left). Even if crash programmes are funded, they need to be started 10-20 years before peak.



The chance of such crash programmes being underway well before Peak Oil is quite low.

ASPO-Australia is also very sceptical of the other panacea often suggested; the power of the market. "Demand destruction" is a US term indicating the raw power of market forces. A recent news article was entitled *"Demand Destruction: But who will be destroyed?"* This illustrates the risks and inequity of relying on fuel usage reduction by market forces alone. [See the ASPO-Australia Social Services Sector working group submission for some of the probable problems if the market is the final arbiter]

In summary, ASPO-Australia recommends four main options which together are capable of halving Australia's transport fuel usage. All are behavioural options. These four could then lead to a plethora of important but relatively minor changes, including the technological options, which in total can make the substantial reductions in demand that we will need to have achieved when (or if) Peak Oil strikes. All are aimed at minimising our automobile dependence (or "addiction" to use President Bush's term).

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1: Community Engagement:

It is crucial that Australians comprehend the probabilities and risks of Peak Oil and that we are empowered to suggest, consider and evaluate all possible options. Experience in WA has shown a number of successful examples where community engagement can lead to solutions to substantial transport and planning problems being both found and accepted. The necessary tough political decisions can not be made without an informed and supportive community.

Details are available on the website of the WA Department of Planning and Infrastructure

> *Community engagement is critical in the successful development of acceptable policies and decisions in government, the private sector and the community. We know it can be done much better. In Western Australia we have taken a leading role in exploring innovations in community engagement, with 21st Century Town Meetings (Dialogues), Deliberative Surveys, Citizens' Juries, Multi Criteria Analysis Conferences and Consensus Forums.*

http://www.dpi.wa.gov.au/communityengagement/727.asp
http://www.dpi.wa.gov.au/cityplanning/1208.asp

These techniques will be essential tools in changing attitudes to our oil vulnerability, and expanding the range of options in urban planning, transport usage choices and in community accessibility and mobility.

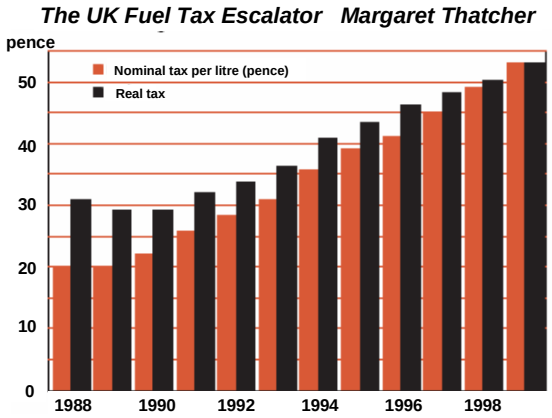
Without very substantial changes to reduce our oil usage, we are at very considerable risk
Attitudinal changes are a vital precursor before decision-makers can change policies to implement oil vulnerability risk management strategies, many of which are contrary to current community views (based as they are on the myths of cheap and unlimited resources continuing well into the future)

2: Individualised Marketing

Empowering people to make informed transport mode and trip choices has been proven to make substantial sustained reductions (10-13%) in car-kms driven, in large-scale programmes in Perth, Melbourne and Redlands (outer Brisbane). This technique, also widely used overseas, can also be used to help people make decisions to reduce water and electricity use, and may be synergically more powerful if used as an overall sustainability enhancement tool. Australian TravelSmart programmes often include individualised marketing as a major plank. Individualised marketing has been shown to have a very high benefit-cost ratio (30:1) and to be able to be implemented rapidly. The resultant travel behaviour changes are shown to be sustained over a period of a year or two at least. Individualised Marketing is a very powerful tool at our disposal to tackle the challenges of Peak Oil. It can also be further modified to improve awareness of Peak Oil. Trials of this novel aspect of Individualised Marketing should be undertaken urgently

3: Fuel Tax Escalator

Margaret Thatcher's greatest legacy to Britain may her implementation of the fuel tax escalator in 1988. This has made Britain far less oil-vulnerable than it would have been without the community knowledge that fuel taxes will rise slowly and manageably but substantially. To minimise our risks of serious Peak Oil impacts, it is essential that Australia follows Lady Thatcher's lead and sets the nation



Australian fuel taxes should be raised to European levels on a fuel tax escalator

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The Economist, 30th April 2005 said ***"“Add in the geopolitical costs of oil and the case for raising petrol taxes, especially in America, becomes overwhelming".*** The same applies to Australia

Increasing Australian fuel taxes to UK levels would achieve a number of essential aims simultaneously.

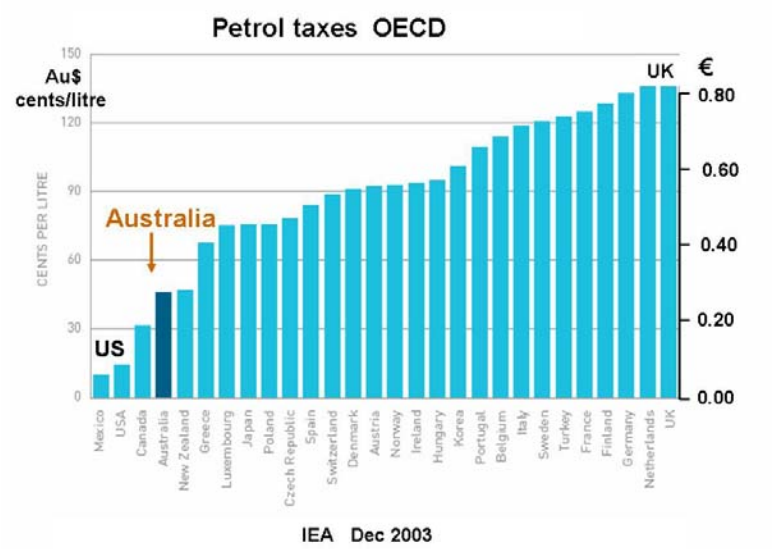
(a). It would provide a clear unequivocal warning that transport fuels are going to rise steadily in future, so individuals and businesses can plan ahead for the changes.

(b). It would provide the resources essential to improve our schools and hospitals and as well to fund sustainable transport infrastructure like light-rail and bicycle networks in our cities. It would also provide funds for income tax relief.

(c). It would avoid many of the problems which will occur if we just wait passively for world oil shortages to dictate the timing and magnitude of fuel price rises. If we leave fuel taxes constant (or reduce them), global oil prices will result in us exporting enormous amounts of money to pay for our oil imports. Raising the price of fuels with taxes allows the extra money to stay in Australia and allows a smoother transition from cheap to expensive fuel. It also provides the funds for us to build the defences against the serious problems Peak Oil will bring.

on a fuel tax escalator. Clearly this requires the community to understand the need for such a controversial move.

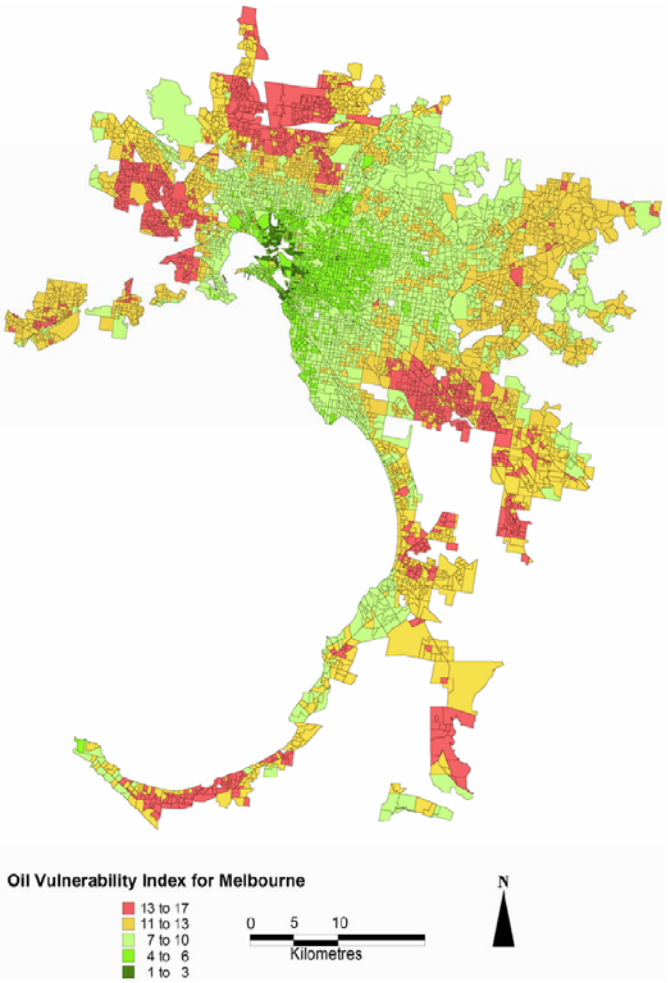
Currently Australian fuel taxes are very low by world standards, and there is an expanding range of fuel uses which are exempt from fuel excise.



4: Smartcard sliding scale fuel pricing and tradable allocation mechanisms

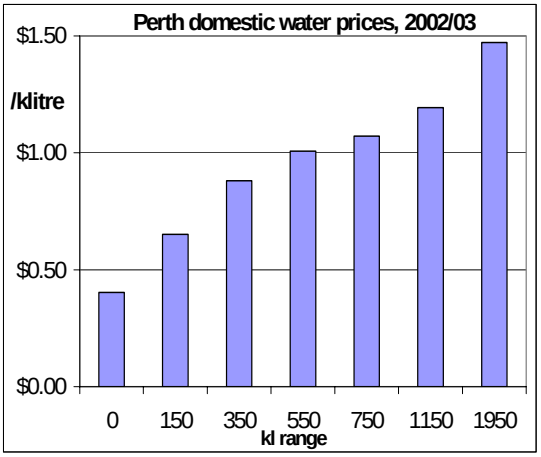
Increasingly high fuel prices (either from taxation or from global markets) will have very serious economic and social impacts on many in Australia, however loud and long the advance warnings have been.

A flexible equitable and transparent mechanism for allocating increasingly scarce fuel will be essential to avoid a market forces crisis where only the wealthy can afford fuel. The Griffith University study (Dodson and Sipe, 2005) provided maps of an Oil Vulnerability index in Australian cities (below).



Low-income people living in outer suburbs will be very hard hit by sharply rising fuel prices while those in leafy well-off suburbs mostly have shorter travel distances, and more public transport options and closer services, as well as more financial options.

A mechanism will also be needed for equitable allocation of fuel for essential services, like Meals on Wheels, staff working night-shifts at major hospitals, Flying Doctor services, food production and distribution, health services, and so on. Allocations to lower priority areas, like essential trades for emergency repairs, will also need to be made, and in the event of shortages, non-productive and counter-productive uses, for instance in car rallies and Grand Prix races, should receive very low priority indeed.



Smartcard technology, using existing petrol station credit-card systems or perhaps the Medicare card, or the proposed personal identity card, could provide a technologically practical mechanism of adopting the sliding scale pricing system now used for essential commodities, especially water.

Designs of a multi-level tradable rights rationing system should be developed and evaluated. The system should aim to provide every person with a basic personal allowance of fuel, for a relatively modest price (eg the normal or pre-emergency price), and successive increments of allocated fuel at increasing taxation levels. Allowance can be made so those

living in country towns or areas poorly served by public transport receive a larger base allowance than those living in a fashionable inner-city suburb close to a train station, for instance.

This would expand upon the model of domestic water pricing used in Western Australia and elsewhere, where a modest household allowance is provided at a low price and those households that use more are charged increasingly more per kilolitre (see diagram at right).

A graded-price tradable rationing system means those who are frugal with their fuel usage can then electronically trade unused entitlements to businesses and people who need more. This offers a substantial financial incentive for innovation in fuel-saving strategies, like car-sharing, using bicycle transport or just in rational trip planning.

The current emergency rationing systems in place in Australia are based on a per-vehicle allowance, or odds-and-evens number plate rationing. This means those owning the most cars get the most fuel. This is firstly grossly inequitable, and secondly it merely encourages people to buy more cars so they have a greater fuel allowance. This is not a rational way to deal with ongoing long-term shortages or a sudden fuel emergency. Both scenarios have a substantial probability of coming to pass, and existing planning is seriously inadequate.

Like the Fuel Tax Escalator, of which the Smartcard system could form an important subset, any increased revenue could be devoted to improving public services like health and public transport, and in covering the increased costs in other areas hit by transport problems at Peak Oil. It should be used to fund the removal of fixed vehicle ownership costs, such as third party insurance, and to implement, on the New Zealand model, a universal no-fault injury compensation scheme. This would be substantially more equitable than the current third party insurance system and avoid the current cross-subsidies from frugal vehicle owners to those who travel far greater distances than average (and hence are more likely to be involved in a crash in which someone else is injured).

The allocation of fuel for business purposes would have to be investigated closely. "Business" use of cars would have to be very closely controlled if scarce fuel was to be allocated at the base rate. Encouragement of untrammelled pseudo-business use, as done by the current Fringe Benefits Tax, would have to be reversed. There will no doubt be practical and equitable mechanisms for allocating priority to different busines types on the basis of their importance in the event of shortages. Providing fuel to luxury businesses should receive low priority if fuel is very scarce. As one example, it is a gross waste of fuel to deliver drinking water in plastic bottles by truck, when a far more fuel efficient delivery system exists in our cities (piped scheme water) which also does not need the fuel for the subsequent disposal of mountains of plastic bottles also made from petroleum.

Other options for reducing Australia's transport fuel demand.
There are innumerable other options, some of which are mentioned in the submissions from ASPO-Australia specific sector working groups. It is not practical to list more than just a few here

These options include dramatically expanding provision of infrastructure for sustainable transport modes, like public transport, bicycle and low-powered vehicle transport (electric scooters/gophers and intelligent power-assisted bicycles), and of course walking as a transport mode.

The removal of the "perverse policies", especially the FBT, which subsidise heavy car usage [Denniss, 2003], and discouragement or prohibition of the supermarket fuel discounts where the grocery bills of the battlers and those frugal with fuel use subsidise the big 4WDs with 150 litre tanks. [Subsidies of $100 million pa. have been estimated to the fuel discount schemes from each major supermarket chain]

Urban planning and transport planning clearly can encourage or moderate our automobile addiction. Building a freeway or tollway creates more vehicle travel "Build it and they will come" is one adage, and there is good evidence that the reverse is true, closing roads can cause traffic levels overall to decrease.

Oil Vulnerability Risk Assessment and Risk Management
Clearly, methodology has not yet been developed for considering Peak Oil probabilities, the assessment of risks and the opportunities likely to arise. Experience is also lacking in the rational evaluation of the various mitigation and adaptation strategies. It is essential that we all, especially Governments, urgently start the process of outlining and refining the probable scenarios which may well arise from global Peak Oil occurring within the next five or ten years, as seems quite probable.

ASPO-Australia is very keen to expand its network of professionals interested in the field and to collaborate with departments, business and industry to better define and control the uncertain future that Peak Oil is likely to bring, probably soon.

CONCLUSIONS:

There is a high probability of global Peak Oil occurring soon, before 2010 or 2015, and this will lead to even higher petrol prices in Australia.

The flow-on economic and social impacts in Australia from Peak Oil are likely to be very serious, UNLESS we make serious and courageous decisions to take the obvious sensible precautions very soon.

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