

THE IMPACT OF OIL DEPLETION ON AUSTRALIA

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I. SUMMARY

The impact of global oil depletion on Australia is likely to be very severe, unless substantial mitigation and adaptation policies are implemented urgently. Many available options will have substantial social and economic benefits as well as reducing oil dependence. However, the likelihood of significant Government action before an oil depletion crisis is currently very low.

Hirsch et al., [1], have outlined for the US DOE the requirements to start countermeasures 20 years before the peak of global oil production. This is in line with the Noah analogy presented at the first ASPO workshop [2]. It is best to finish the ark before the flood. Western Australia's Minister for Planning and Infrastructure, Hon. Alannah MacTier-nan has said *"It is also certain that the cost of preparing too early is nowhere near the cost of not being ready on time."* [3]

Australians are largely urbanised with 66% of the population living in sprawling cities along the south and east coast. The rural and remote parts of the country are very sparsely populated, and are highly dependent on oil for transport. The countermeasures suggested here for Australia could be applicable in many other countries, both those with largely urbanised populations and those with large land areas and long transport distances.

II. AUSTRALIA'S OIL PRODUCTION

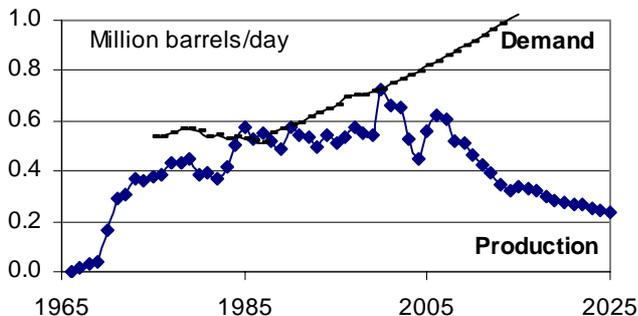


Fig.1. Australian crude oil and condensate production and demand to 2004, and forecasts [4,5,6].

Australia's domestic oil and condensate production became significant in 1967, reached a peak in 2000, and is now starting a post-peak decline phase.

III. OIL CONSUMPTION AND TRANSPORT

Australia's population is 20 million people and there are 13.2 million motor vehicles, each travelling an average of 15,300 kilometres pa. Petrol taxes are the lowest in the OECD outside North America. About 80% of Australia's petroleum liquids use is in road transport and 10% for aviation.

Australia uses about 0.74 million barrels of oil products each day, about half as much oil per capita as does the United States. Crude and condensate production in 2004 was about 0.45 M bbl/day, imports were 0.63 M bbl/day and exports 0.34 M bbl/day [5]. Australia is still about 60% net self-sufficient in oil, but our imports are currently about 85% of daily usage, and balanced by high exports. This high import dependence makes us vulnerable to short-term international supply shortages.

Two recent Government reports summarised Australia's petroleum use. The Energy White Paper, [7] is not forthright about declining future domestic oil supplies and completely avoids mention of global oil depletion. It may come to be regarded as a significant "intelligence failure". The review of the Liquid Fuel Emergency Act [8] concentrates on short to medium term supply disruptions and our responsibilities under IEA agreements.

Australia is extremely "automobile-dependent" [9]. Our cities and transport-intensive economy have been shaped by cheap oil. There are innumerable policies which heavily subsidise car use, the domestic car industry and road freight, and which penalise users of more sustainable transport modes. Subsidised freight transport centralises production at the expense of local industries. Some of these "perverse policies" are outlined by Denniss [10]. Even our supermarkets offer petrol discounts so that those

without cars subsidise heavy fuel users through increased food prices.

Australia is a dry continent and its soils are generally nutrient deficient. Agriculture in Australia is dependent on increasing fertiliser inputs, mechanised farming and long distance transport. It is becoming a way of using land to convert petroleum into food. Encouraged by cheap oil and fertiliser, these practices have depopulated many rural communities. Australian farmers will be faced with re-inventing their industry including returning to using natural nitrogen fixation with legumes.

IV MITIGATION AND ADAPTION OPTIONS

A: Post-Peak Options

A simplified diagrammatic scenario, Fig. 2, shows how the growing gulf between current demand trends and forecast supply might be accommodated. It is important to realise that there can be no single panacea, but there will be many partial solutions. Some options could be implemented quickly (for example tax changes and rationing), but many will require a very long time and much capital investment.

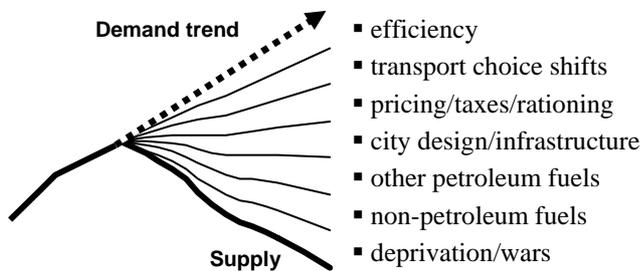


Fig.2. Post-Peak scenarios, filling the gulf between demand trend and forecast supply [11].

Some unusual strategies used successfully in Perth are included here as analogies for what could be achieved to reduce oil consumption.

B Public discussion and debate

Australian Governments at all levels have been reluctant even to mention the taboo topic of our oil vulnerability. The Western Australian Government leads marginally, with oil vulnerability discussed in its State Sustainability Strategy [12] and its Cabinet briefed by Dr Samsam Bakhtiari. However, even in

WA there has been little done to discuss publicly the risks of oil depletion. USGS geologist Les Magoon [13] suggests correctly that the first thing to do is to "Talk about it, talk about it. You can't solve a problem until you know you have one."

A substantial Government communication programme is needed to make the community aware of approaching oil depletion and its impacts before action can be implemented to reduce our oil vulnerability. Participatory democracy strategies like public forums will be essential to engage the community. These can empower people and businesses to work for the greater common good and find equitable ways to make the difficult changes needed. Such forums are being used in Western Australia to solve complex issues in transport and planning [14].

Once the community is aware of the risks of oil vulnerability, governments must lead with policies and countermeasures to minimise future impacts, providing the framework for crucial individual, community and corporate initiatives. Then stakeholders can actively consider possible oil shortages when buying a house or a car, expanding a business or restructuring neighbourhoods.

C: Rational Pricing Structure: The Water Analogy

Water has long been recognised as scarce in many parts of Australia. Perth, like other cities, has a rational pricing structure for household water use.

A basic household water allowance is relatively cheap, and increasing consumption above that is on a sliding scale where the higher the water use, the more the cost per kilolitre. Watering gardens with sprinklers is also restricted to two days per week in the morning or evening. These sensible water conservation measures are now well accepted by the community.

Similarly, when the community fully understands the risks of oil depletion and its possible impacts, an analogous incremental fuel pricing system and usage restrictions would also be accepted, as was wartime fuel rationing.

D: Individualised Marketing Demand Management

A significant proportion of Perth has seen successful cheap travel demand management (TDM) implemented, reducing car-kilometres by 13% on

average. These Individualised Marketing programs, (TravelSmart) are being used in other Australian cities and around the world [15], with benefit-cost ratios of 30:1.

Empowering individuals to change oil-intensive travel habits is a "No-Regrets" option, already justified on health, social and economic grounds. Globally, TDM could save 5-10% of transport oil consumption.

E: Government Policy and Action Possibilities

A list of some possible actions is provided to show the wide range of options available to ameliorate the impacts of oil depletion often while enhancing community wellbeing.

Governments should :-

1: Issue repeated credible warnings that oil shortages are approaching us. Advise the community openly of the various estimates of the timing and the impacts of peak oil.

2. Engage the community, through participatory democracy, to create practical, equitable options and countermeasures, and to select preferred steps. Many perceived "options" like the "hydrogen economy" are most unlikely to be realistic until long after oil shortages impact and should be identified as such.

3. Dismantle the many "perverse policies" [10] that subsidise heavy car use and excessive freight transport. Examine all subsidies taxes and charges to weed out those that encourage car-dependency.

4. Instigate policies, taxes and pricing regimes that encourage frugal use of fuel, and disadvantage profligate users. A fuel tax escalator such as that introduced by the UK Thatcher Government in 1988 is a proven example. Australian fuel taxes should be incrementally raised to European levels to reduce usage, and to provide funds for improvements to health and education and for the needed sustainable transport infrastructure.

5: One novel policy would be to set up a Smart-Card personal fuel allocation system. This would provide a modern adaptable mechanism for handling short-term oil shocks, similar to those of 1973 and 1979 and as well for encouraging people to reduce their fuel usage. Each person would receive an allocation of an amount of fuel sufficient for modest car travel at a base price. Increasing amounts of fuel would be available at an increasing tax-rate per litre. In addition, those who are able to avoid using their entire allocation would be encouraged to trade the

unused rights on an open electronic market.

5. Recognise the psychological and social dimensions of automobile dependence as well as the physical aspects, and implement the cheaper people-oriented solutions as well as technologically based alternatives. Focus on the social benefits of reduced transport use.

6. Implement nationwide "individualised marketing" travel demand management campaigns.

7. Divert infrastructure funding to less oil-dependent urban structure and transport options. Rail, cyclepaths and public transport will be far better investments than more urban roads.

8. Priority access to remaining oil and gas supplies must be provided for food production and distribution and other essential services. Remote indigenous communities will have special needs. Practical, flexible priority fuel allocation mechanisms can utilise the electronic Smart-Card system.

9. Promote through the United Nations a Kyoto-like protocol to allocate equitably the declining global oil production among nations. An international tradable sliding scale allocation mechanism is one hypothetical option. Every nation would be entitled to a base amount of oil, on a per-capita basis at a modest cost. Increasing amounts per capita would be available at increasingly higher costs to encourage conservation. Nations which use less than their base allowance can trade the excess to their more profligate or wealthy neighbours. This provides a significant incentive for demand reduction and conservation everywhere. This is an international equivalent of the system suggested above. Global oil allocation procedures are now based solely on price, so rich nations get the bulk of the oil and the poor countries get very little. Another undesirable but quite possible future allocation mechanism is the real threat of resource wars over the remaining oil.

F: Conclusion

Many of the policy options to reduce fuel usage and the impact of oil depletion on Australia will also lead to healthier, happier and more equitable communities and improve local and global pollution levels. Failure to take action now will lead to severe future economic and social impacts on Australia.

REFERENCES

A full list of references and links is available at www.STCwa.org.au/aspo