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10 November 2014

Tim Watling
Committee Secretary
Senate Rural and Regional Affairs and Transport References Committee
PO Box 6100
Parliament House
Canberra ACT 2600

By email: rrat.sen@aph.gov.au


Dear Mr Watling,

RE: Inquiry into Australia's transport energy resilience and sustainability

I have pleasure in submitting the attached response from The University of Queensland (UQ) to the Senate Rural and Regional Affairs and Transport References Committee with regard to the inquiry into Australia's transport energy resilience and sustainability.

The UQ submission draws upon the expertise of a number of UQ academics from various faculties and institutes. Our comments are offered constructively and we recognise the considerable challenges and inevitable trade-offs in balancing economic with security objectives. Nonetheless, we feel that transport energy security is a serious issue for Australia and one which warrants the urgent attention of policy makers.

UQ welcomes the opportunity to participate in the Senate Committee's consultation process and we look forward to ongoing engagement in this important policy initiative.

Yours sincerely

Professor Peter Høj
Vice-Chancellor and President



The University of Queensland (UQ)

Submission to the

Senate enquiry into Australia's transport energy

resilience and sustainability

for the

Rural and Regional Affairs and Transport References Committee

10 November 2014

Executive Summary

Australia's transport sector is heavily and increasingly reliant on imported liquid fuels. Any significant disruption to Australia's liquid fuel supplies would have a devastating impact on the Australian economy. **UQ considers that the Australian Government should play a critical role in facilitating energy security for Australia, including transport energy i.e. liquid fuel security.**

Australia's vulnerability is exacerbated by the fact that Australia's oil-equivalent stocks are declining (now less than 60 days) and we are the only one of the 28 IEA member countries to not meet a 90 day minimum obligation. **UQ considers that the IEA obligations represent the minimum requirement but that actual strategic stocks needs to be determined from risk assessments and supply interruption scenarios.**

The resilience and sustainability of Australia's liquid fuel supplies is subject to supply risks across all parts of the supply chain from upstream production, shipping, refining, storage and distribution.

UQ recommends that the Australian Government regularly undertake studies of the cost of discrete, import fuel-interruption scenarios to inform the value of any initiative or intervention to improve supply resilience and sustainability. The potential causes of interruptions are many, and include, geopolitical actions and conflict, natural disasters, terrorist attacks, sabotage (e.g. by activists), equipment outages, industrial action, etc.

Based upon an assessment of the supply risks across all parts of the supply chain, the types of risk mitigation and contingency plans that should be considered include:

- (i) Development of new fuel reserves to meet Australia's international oil security obligations and augment domestic security;
- (ii) Investigate ways to encourage diversification of import sources;
- (iii) Increased strategic reserve/stocking requirements of refined products and the security, spread and diversity of storage sites;
- (iv) Increased storage capacity of crude oil at ports and at domestic refineries and the security, spread and diversity of storage sites; and
- (v) Incentives to maintain a 'minimum strategic' Australian refinery capacity or ramp-up capacity. Such incentives could be funded through a *Transport Energy Security Levy*.

UQ further recommends that the Australian Government examine the merits of initiatives to increase supply in the longer term, as well as to reduce dependency on oil. Such longer term measures could include:

- (i) Acceleration of precompetitive exploration and release of acreage in new frontier offshore basins and development of onshore unconventional resources;
- (ii) Strategies to foster a transition of the light passenger vehicle sector from conventional petroleum to electric driven and fuels derived from domestic gas and coal;
- (iii) More stringent vehicle fuel efficiency targets and standards; and
- (iv) Examining the techno-economic feasibility studies for producing liquid fuels from Australia's abundant non-oil, hydrocarbon resources, i.e. large scale Gas-to-liquids, Coal-to-liquids (collectively referred to as *XtL*) and oil shale projects.

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1. Context

Australia is considered energy-rich and is a major exporter of energy resources, especially coal, liquefied natural gas and uranium. However, one energy resource in which we are not self-sufficient, but heavily reliant on imports is liquid fuels. Indeed Australia imports some 43% of its refined petroleum products and 85% of its crude oil inputs to local refineries¹. This import dependency is set to grow as Australia's proven oil reserves deplete and with further retirements planned in the Australian refinery sector.

Australia's transport sector remains almost 100% reliant on refined liquid fuels. While there has been a very small uptake of electric vehicles in the light passenger sector and some electrification in the passenger rail and bulk rail freight sectors, all sectors especially heavy road freight, maritime and aviation transport are likely to remain wholly or largely oil dependent for decades to come.

The transport sector is critical for not only moving people from place to place (for work, leisure and medical treatment), but also, for example, in a range of critical everyday services and industries including the supply and distribution of food supplies, fuel, pharmaceuticals and health care products, personal hygiene products and chemicals. Last but not least Australia's essential services (police, ambulance and fire) along with defence and national security services are all highly dependent on transport.

Clearly, any significant disruption to Australia's transport fuel supplies, would have a devastating impact on the personal wellbeing of many, safety and national security, national productivity and the economy overall.

As a member country of the International Energy Agency (IEA) Australia, being a net oil importer, is obliged to have immediately accessible reserves of oil or equivalent product stocks equivalent to 90 days of the previous year's imports. We note that Australia's stocks declined from over 300 days in 2002 to 53 days in July 2014² and we are the only one of the 28 member countries to not meet this obligation.

2. Purpose

The purpose of this submission is to respond the Australian Senate enquiry into Australia's transport energy resilience and sustainability. Specifically the Rural and Regional Affairs and Transport References Committee requests that the submission address:

- (i) Options for introducing mandatory oil stockholdings;
- (ii) The role of Government in ensuring Australian energy for Australians, including maintaining refinery capability; and
- (iii) Australia's role and responsibility regarding energy security as a member of various multilateral fora.

¹2014 Australian energy statistics, Bureau of Resources & Energy Economics, Canberra, July 2014.

² www.iea.org/netimports

3. Critical Issues

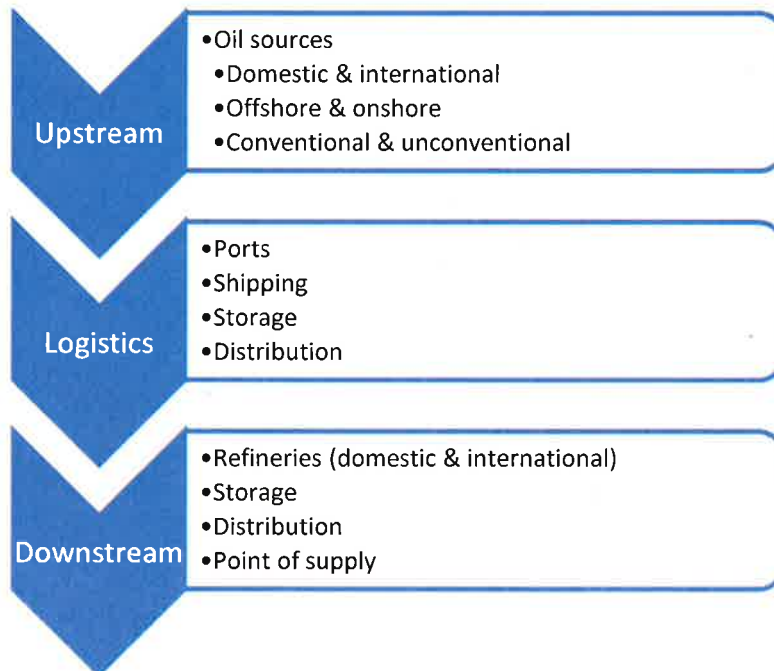
Any assessment of the resilience and sustainability of Australia's transport energy services, must address three critical issues:

- (i) The risk (consequences and likelihood) of a disruption to supply;
- (ii) The potential mitigation options and contingencies to avoid disruption; and
- (iii) The role of governments and/or the private section in disruption risk mitigation.

As stated in section 1, Australia's transport sector is almost 100% reliant on liquid fuels and so this submission will focus exclusively on that aspect of transport energy.

4. Liquid Fuel Supply Risks

Australia's liquid fuel supply chain comprises the following elements:



The Energy White Paper released by the Department of Energy in 2012³ stated:

Our lack of oil self-sufficiency and the prospect of further refinery rationalisation does not in itself compromise or reduce our energy security. Our liquid fuel security is expected to remain high because of our access to reliable, mature and highly diverse international liquid fuel supply chains. These statements are considered courageous and appear not to consider the crucial role of resilient infrastructure identified by Energy Security Assessment modelling⁴.

The resilience and sustainability of Australia's liquid fuel supplies needs to consider supply risks across all parts of the supply chain from upstream production, shipping, refining, storage and distribution.

A study of the cost of discrete, import fuel-interruption scenarios is essential to inform the value of any initiative or intervention that the government might consider in order to improve

³ Energy White Paper 2012. Department of Resources Energy and Tourism, October 2012.

⁴ ACIL Tasman Liquid Fuels Vulnerability Assessment, October 2012.

supply resilience and sustainability. The potential causes of interruptions are many, with varying likelihood. They include, geopolitical actions and conflict, natural disasters, terrorist attacks, sabotage (e.g. by activists), equipment outages, industrial action, etc.

Notwithstanding this qualifier, risks in the upstream elements of the supply chain are known to be significant, having arisen as a result of geopolitical actions and conflict primarily in the Middle East from which Singaporean refineries source more than 40% of their crude feedstocks. Typically, such events have not caused interruptions to supply but have been responsible for increases in oil price and increased price volatility.

However, the study of supply interruption scenarios must not be limited to the Middle East. The impact of system interruptions in Singapore, from which Australia more than 50% of Australia's refined products are imported, and Australian ports and import terminals must also be assessed.

And finally, the impact of significant system interruptions domestically should also be considered. In such cases, while the impact might not be felt by the whole country, significant public services and utilities may be impaired, affecting large numbers of the population. There are also likely to be adverse economic outcomes arising from by disruption to mining and other productive enterprise.

5. Potential mitigation options and contingencies to avoid disruption

Based upon an assessment of the supply risks across all parts of the supply chain, the types of risk mitigation and contingency plans that should be considered include:

- (i) Development of new fuel reserves to meet Australia's international oil security obligations and augment domestic security;
- (ii) Investigate ways to encourage diversification of import sources;
- (iii) Increased strategic reserve/stocking requirements of refined products and the security, spread and diversity of storage sites;
- (iv) Increased storage capacity of crude oil at ports and at domestic refineries and the security, spread and diversity of storage sites; and
- (v) Incentives to maintain a 'minimum strategic' Australian refinery capacity or ramp-up refinery capacity. Such incentives could be funded through a *Transport Energy Security Levy*.

The Australian Government should also examine the merits of initiatives to increase supply as well as to reduce dependency on oil. Such measures could include:

- (i) Acceleration of precompetitive exploration and release of acreage in new frontier offshore basins and development of onshore unconventional resources;
- (ii) Strategies to foster a transition of the light passenger vehicle sector from conventional petroleum to electric driven and fuels derived from domestic gas (e.g. CNG, LNG) or coal;

- (iii) More stringent vehicle fuel efficiency targets and standards; and
- (iv) Examining the techno-economic feasibility studies for producing liquid fuels from those non-oil, hydrocarbon resources which Australia has aplenty, i.e. large scale Gas-to-liquids, Coal-to-liquids (collectively referred to as *XtL*) and oil shale projects.

6. The role of Government in ensuring Australian energy for Australians.

As outlined in section 1, Australia is almost entirely reliant on liquid fuels for transport and transportation services underpin significant economic activity, utilities and essential services. Accordingly, any significant disruption to Australia's transport fuel supplies, would have a devastating impact on the personal wellbeing of many, safety and national security, national productivity and the economy overall.

Therefore UQ considers that the Australian Government should play a critical role in facilitating energy security for Australia, including transport energy i.e. liquid fuel security.

While governments can and should facilitate the release of acreage, undertake precompetitive exploration and otherwise incentivise new private-sector oil exploration, they cannot create reserves. Government must therefore also intervene to assure transport energy resilience through mitigation and contingency strategies. Such strategies include those outlined in section 5, informed and prioritised by the outcomes of risk assessments and supply interruption scenarios described in section 4.

7. Australia's role and responsibility regarding energy security as a member of various multilateral fora.

As stated above, UQ considers that the Australian Government should play a critical role in facilitating energy security for Australia, including transport energy i.e. liquid fuel security.

As a member country of the IEA, Australia is obliged to have immediately accessible reserves of oil or equivalent product stocks equivalent to 90 days of the previous year's imports. Australia is the only member country that does not meet this obligation. Of course meeting such an obligation may or may not also assure our liquid fuel security. Australia is a remote and vast continent and distribution routes to consumers within the country are also vulnerable.

UQ considers that the IEA obligations represent the minimum requirement but that actual strategic stocks needs to be determined from risk assessments and supply interruption scenarios described in section 4. Such scenarios should also consider the relative stocks that are held by government and industry and located within Australian shores and abroad.

End