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ENGINEERS
AUSTRALIA

The Secretariat
Senate Standing Committees on Rural and
Regional Affairs and Transport
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– BY EMAIL –

Dear Sir/Madam

Re: Submission: Inquiry into Australia's Transport Energy Resilience and Sustainability

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. With membership of over 100,000 Australia wide, Engineers Australia is the largest and most diverse professional engineering body in Australia. Engineers Australia maintains representation in every state and territory.

Australia's logistic operations are almost wholly dependent on oil. In the near and medium term, there are no alternatives to substitute fossil liquid fuels used for transport with other fuels. Consequently, liquid fuel supply poses an enduring risk to Australia's economic security, national security, food security and social stability. The key mitigation strategies are to have strong liquid fuel supply chains, hold emergency oil stocks, have a domestic refinery capability, and maintain an emergency fuel distribution system for times of shortage. Australia undertakes all of these actions to various degrees, but it is questionable whether they actually achieve liquid fuel security and the systemic interdependencies of the key mitigation strategies are not fully understood.

Liquid Fuel Supply Chains

Australia imports the majority of its liquid fuel and about 90 percent of Australia's transport fuel is imported. At any one point in time, Australia's stockholdings of oil and liquid fuel consists of two weeks of stocks at sea, 5 to 12 days of supply at refineries, 10 days of refined stock at terminals and 3 days of stocks at service stations.

There are significant geopolitical issues affecting liquid fuel security supply chains. For example, conflicts and disasters in oil producing and refining countries could disrupt supply lines. Another issue is national oil companies, such as Petro China and Saudi Aramco, which are beginning to dominate the production and refining of oil at the expense of private oil companies.

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National oil companies, as their name suggests, have strong strategic and political links to their governments and almost 80 percent of the world's proven-plus-probable reserves of conventional and unconventional oil are controlled by national oil companies or their host governments. China's net crude oil imports continue to grow and could reach eight million barrels per day by 2025, with the greatest volume coming from the Arabian Gulf. A key approach by China to managing its energy security risk is to expand its national oil companies' role in global supply chain risks.

Australia's persistent faith in global supply chain stability could be sorely tested in the future if such national oil companies make decisions based on national energy security interests rather than commercial interests.

The House of Representatives' Standing Committee on Economics report on Australia's oil refinery industry in January 2013 stated that:

> "[t]*here are reliable, mature and highly diversified international fuel supply chains, which provide Australia with economic security. The Australian Institute of Petroleum and refiners were also confident about the reliability of Australia's supply chains and infrastructure to continue to meet local fuel demands, as it has done over many decades.*"

However, other groups are concerned about liquid fuel supply and seek to improve it. For example, the 2014 NRMA Study into Australia's Liquid Fuels Security reports that:

> "*Australia's combined dependency on crude and fuel imports for transport has grown from around 60% in 2000 to over 90% today. In an ever-changing world, we need to plan to stop our import dependency growing to 100% in the future if we are to have an acceptable level of fuel security.*"

Domestic Refinery Capability

On 2 April 2014, BP announced its intention to halt refining operations at its 102,000 barrels-per-day Bulwer Island refinery in Brisbane by mid-2015. By the close of 2015, there will be only four refineries operating in Australia – Vitol operating at Geelong, BP at Kwininna, Caltex's Brisbane (Lytton) refinery and Exxon-Mobil's Altona operation in Melbourne.

This reflects structural change within the fuels supply chain in Australia due to the growth of very large, and far more cost efficient, refineries in the Asia-Pacific region. Cost pressures on small Australian refineries are likely to continue as oil refining capacity is expanding in Asia, along with the development of super refineries in the Middle East. Without renewal, Australia's aging refineries cannot compete effectively against these newer, more technically advanced and large scale refineries. The ongoing decline in domestic refining capability will continue to increase Australia's reliance on imported refined products.

Since 2002, the proportion of refined petroleum, oils and lubricants sourced from overseas has risen from 11 percent to 37 percent in 2012, and it is estimated that this will reach 43 percent in 2014 with the closure and conversion of the NSW refineries. This increases Australia's vulnerability to the influences of the global market in terms of availability of refined products. However, the House of Representatives Standing Committee on Economics report on Australia's oil refinery industry appeared unconcerned by this, as it stated "[t]*he changes in domestic refining capacity to date will not* [affect] *Australia meeting its liquid fuel requirements.*"

Emergency Oil Stocks

As a member of the International Energy Agency (IEA), Australia is obligated to maintain reserves of crude oil and/or product equivalent required to sustain consumption for 90 days, based on the prior year's average net oil imports. The IEA has put the 90-day requirement in place to assist member nations in ameliorating global oil shocks.

As government reports and independent bodies like the NRMA have concluded in its report on Australia's liquid fuel security, Australia is in breach of its 90-day liquid fuel stockholding obligations under IEA agreements.

Australia's policy stance takes comfort in the notion that our IEA obligations would be met by simply recognising unrefined oil in tankers destined for Australia. This policy equivalent of 'the cheque's in the mail' is worrying. Liquid fuel in transit to Australia through some of the world's geopolitical hotspots is not fuel security, it is wishful thinking.

The myth of an Australian strategic fuel reserve needs to be busted. With indicators pointing to an ever-reducing domestic refining capacity we need to shift our thinking to recognise that energy security does not come from energy storage, but instead from energy flow

An Emergency Fuel Distribution System

The Australian Government has long had an emergency response capacity to deal with the effect of a sudden oil supply shortage. The *Liquid Fuel Emergency Act 1984* provides the Australian Government with the authority to prepare for and manage a national liquid fuel emergency. In an emergency, the Minister for Industry can activate the Act to control the industry's stocks of crude oil and liquid fuels, Australian refinery production, and the distribution of fuel stocks. Each State and Territory is responsible for liquid fuel emergencies at their jurisdictional level and ensures that arrangements are in place for dealing with the emergency.

The Act aims "*to minimise the total impact on the community… and minimising economic dislocation.*" In fact, the Act provides a level of economic insurance to industries with a heavy reliance on fuel. The detailed actions or plans of the National Oil Supplies Emergency Management Committee are not publicly available as they contain sensitive information and are event driven.

However, there are concerns about the distribution system. For example, in 2013, the Kokoda Foundation's Security Challenges Journal raised concerns that the policy, plans and committees implementing the Liquid Fuels Act may not adequately address defence fuel security needs. The author argued that the 2007 amendments to the Act de-emphasise defence needs, and goes on to question the robustness of testing the approaches to fuel shortage scenarios in exercises. Australia's heavy dependence on liquid fuel imports means that any unexpected shocks to the system will test the nation's resilience, both collectively and individually.

Adapting and Innovating

The key to adapting to the changing liquid fuel situation, including the decline of Australia's refining operations, is to develop a strategic approach to creating a sustainable and risk-based liquid fuel sector. This involves seeing this sector as a national capability with people, skills and education that can generate innovative products and services, rather than a commodity supplier where the location of the production is irrelevant.

Encouragement is required for Australia's refining operations to become more innovative, particularly in processes, markets, products, services, delivery and business and management models. This was identified as essential in the Australian Government's Manufacturing Workforce Study released in April 2014. The industry needs to be better engaged in research and development, design, production of prototypes, and the small-scale manufacture of complex, high value-added goods.

To achieve this, the liquid fuels industry needs to reverse its declining research and design capabilities as well as its technical skills base. Specifically, greater effort is required to encourage deeper engagement between industry and universities to obtain skilled graduates, and policy attention to transition the industry to a sustainable state.

A sustainable liquid fuel sector also needs greater innovation from resource developers. Such innovation provides a feedstock for the refineries. For example, the development of tight oil offers such a source although this has had limited success in Australia. Finally, as liquid fuels are a major source of greenhouse gas pollution, it is necessary to transition to low-carbon fuels which the refining industry should seek to produce. Thus, the liquid fuel sector should also prepare to shift into low-carbon fuels including the substitution of fossil fuels.

Recommendations

The Australian Government in partnership with the petroleum industry, users and other stakeholders should develop a liquid fuel strategy that includes the following components:

- Rigorously and publically investigating what are acceptable levels of emergency self-sufficiency in oil supplies in the context of the international agreement to maintain supplies of at least 90 days, and implementing the most effective approach to achieving these levels.

- Ensuring through innovation the sustainability of the domestic refining, storage and distribution industry so that it can supply essential civil and military needs in the event of crises.
- Commissioning a detailed analysis of the costs, benefits and timelines for the redirection of currently exported Australian crude oil to be refined domestically in times of crises.
- Accelerating activities to substitute low-carbon fuels for fossil liquid fuels.

The uncertainty around our domestic fuel supply is one of the many reasons why Australia needs to ensure that resilience and security are core components of our national infrastructure strategy. This is a policy consideration that must involve coordination across sector, portfolio and jurisdictional lines.

The engineering profession has a key role in the planning and delivery of Australia's energy infrastructure, and we are pleased to see that this issue is being recognised by the Parliament through the Rural and Regional Affairs and Transport References Committee, and we welcome the opportunity for national debate on this critical issue.

Engineers Australia thanks the Committee for the opportunity to present our views and we would welcome the opportunity to appear before a public hearing if the Committee desires clarification on any matter outlined in this submission.

Yours faithfully

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