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Rob Katter MP
Member for Mount Isa

Queensland Biofuels Mandate

Thank you for the opportunity to make a submission on the Queensland Biofuels Mandate. In accordance with the KAP's desire to see an ethanol mandate in Queensland, this submission will focus mainly on ethanol.

This submission does not seek to answer every question set out in the Discussion paper, only those on which I have some knowledge. I will leave it to industry experts to answer questions on liable parties, penalties, etc.

1. **Will the changes to excise arrangements proposed by the Federal Government have an effect on the use of biofuels by consumers?**
   While we applaud the lowering of the fuel excise to zero, it is counterproductive to then increase it by 2.5c per litre for the next five years. This would wipe out the cost advantage of ethanol over unleaded petrol. The excise tax was started in the 1970s to identify the huge amounts of oil imported into Australia from the Middle East. Then instead of taxing Australian-made fuel and oil from drilling like a royalty, they extended the fuel excise tax to home grown fuel. Ethanol is grown and produced from the soil, just as sugar cane, or beef. It is not a fossil fuel or a static resource that is property of the Commonwealth. As there is no excise on beef production or sugar cane production, so there should be no excise tax on ethanol.

2. **What measures can be taken to offset any possible negative impacts by the proposed changes to excise arrangements by the Federal Government?**
   Increase the mandate to 10% to encourage the industry in Queensland, providing jobs and driving further capital investment.

3. **Is a two per cent ethanol mandate appropriate?**
   It is not bold enough to encourage growth in this fledgling industry in Queensland. Without a mandate the take up rate is approximately 1%. A 2% mandate is not enough to give impetus to the industry, let alone sustain it. It will simply absorb the capacity of the two existing biofuel plants, at Dalby and Sarina. The two current ethanol plants are operating at below capacity, and can immediately move to adequately supply a 4% ethanol fuel mandate in Queensland.

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4. **Should the percentage increase, and if so, over what time period should any increases occur?**
   We suggest the ethanol fuel mandate should be at least 5% of the total petrol consumption in Queensland from 1 January 2016, rapidly increasing to 10% by 2020. It needs a decent starter mandate of at least 5% to give surety to the industry, encouraging private investment in the infrastructure.

5. **What is an appropriate mandated percentage for biodiesel?**
   As above, a mandate of 10%. Australia is one of the few developed countries in the world that does not have a national ethanol mandate. Over 63 countries have ethanol fuel mandates or targets. (See attached map).

6. **What timeframe would stakeholders need to prepare for and meet this requirement?**
   With a 4% mandate, stakeholders are ready to go now and existing ethanol plants would easily cope with extra capacity.

7. **When do you think a mandate will no longer be necessary?**
   I see no reason to have a time limit on a mandate. Companies and private investors need confidence and certainty to invest in the biofuels industry. The concept of a two year review of the ethanol fuel mandate, or a ten year sunset clause would only signal a lack of commitment by the Government. It is important to look at a mandate in the light of Australia's woeful fuel security status. Currently we are not even meeting and consistently fail to meet our International Energy Agency (IEA) 90 day net oil import stockholding level. Australia has just 22 days' worth of liquid fuel stock if our supplies were cut. By 2030, NRMA suggests that Australia will have less than 20 days of fuel stock, no refineries and therefore will be 100% dependent on oil and fuel imports. There is no public Government policy on maintaining a minimum level of oil refining capacity in Australia. Since 2000, this dependence on imported fuel and oil for transport has grown from around 60% to over 90% of transport fuel demand.
   (See attached *Fuel Security Report NRMA*). Given these serious statistics re our lack of fuel security, it is irrelevant to look at a closing date on a mandate, before we have even begun.

18. **Should Queensland have an expert panel or implementation board? If so, which sectors should be represented?**

An implementation or advisory board, under the direction of the Minister should include:

- An ethanol producer with relevant experience and knowledge;
- A fuel retailer representative;
- An oil major;
- A representative from the automotive industry; and
- A representative from an agricultural body (sugar industry).

20. **Are these sustainability principles appropriate? Should more stringent environmental measures be applied to the biofuel sector? What other environmental risks must be considered in relation to an expanded biofuels industry? How should they be enforced?**

The ethanol industry has been in place 25 years in Australia. Ethanol production has helped Australia's environment and energy security, adding millions of litres to Australia's fuel supply. In Australia, we are well into second and third generation technology which has dramatically improved efficiency, lowered energy and water demand and further reduced the environmental footprint of biofuels production.

24. **What are the issues that need to be addressed if consumer choice is maintained? Will choice of fuel increase costs to retailers or consumers? Would a targeted education campaign on the actual benefits and disadvantages of biofuels/ E10 contribute to informed consumer choice? What are the key messages that must be included in any education campaign for biofuels? Who is the primary audience and what is the most appropriate mechanism to target them?**

Since the introduction of the ethanol fuel mandate in NSW the price of unleaded petrol (ULP) has fallen by 1c compared to other states. This is attributed to the introduction of ethanol enhanced fuels.

The oil majors should pass onto motorists the savings they enjoy in cost differential between E10 and RULP to ensure it remains a cheaper alternative. According to the oil majors, as stated at industry forums, the consumer switching point is 4c a litre. The oil

majors and wholesalers continue to market the price differential at 2c, at a retail and wholesale level, to discourage consumers and retailers to switch to home grown ethanol enhanced fuels.

In 2014, NSW consumers saved $38.4m through the purchase of E10, and ethanol enhanced fuels were only 2.74% of the market share.[1] If the proper ethanol mandate of 6% was complied with it would amount to a saving to the NSW motorist of $70.3m annually.

In the United States, comparing gasoline and spot prices for ethanol generally, ethanol is 50-60 cents per gallon less expensive than gasoline.

In Queensland, E10 as a cheaper alternative must be widely provided (ideally at all service stations) to provide motorists with real choice at the bowser.

Regarding an education program on the key advantages of ethanol, the Queensland Government should implement a public awareness campaign, to both dispel myths and negative perceptions on the use of fuel ethanol in vehicles and also, importantly promote its many benefits.

A consumer awareness campaign should be coordinated by the Government rather than industry stakeholders and this campaign should highlight the following benefits of ethanol enhanced fuel:

1. Compatibility: The compatibility of an E10 fuel ethanol blend with post 1986 vehicles;

2. Farmers: Support and diversify our largest agricultural commodities while increasing on-farm investment;

3. Environment and Health: Reducing emission particulates and having cleaner healthy air in the major cities;

4. Fuel Security: Reduce our dependence on fuel supplies in Middle Eastern countries and on single fuel supply line;

5. Price: Reduce fuel prices at the bowser;

[1] BREE 2013-2014 Financial Figures Table 3C

6. Economy: Creating jobs and investment in regional Queensland;

7. Automotive Industry: Increase the quality of our base fuel;

8. Queensland: Supporting Australian farmers and buying Australian products; and

9. Research and development: The development of the biofuel industry will facilitate ongoing research and development into second generation technologies.

28. **What options could we employ to protect consumers? How can we ensure that fuel companies pass the benefits of ethanol through to consumers? What is an appropriate method for estimating a 'reasonable' ethanol price? What is an appropriate balance between costs to consumers and the creation of regional jobs?**

To protect consumers, the Queensland Government should ensure that oil majors label E10 correctly as a 95 octane fuel and that legislation establishes precise blending of E10 with exactly 10% ethanol.

Most Australians would not realise that over 90% of our fuel is imported. Ethanol is grown in Australia, by Australian farmers. Through the purchase of ethanol, motorists are supporting Australian producers, farmers and businesses. Australian consumers are entitled to know the country of origin of their fuel.

I agree with the Manildra Group recommendation that the proper labelling of ethanol enhanced fuels should be "Australian made".

32. **Will an effective 'floor' in grain prices, as a result of a mandate, signal to grain growers an opportunity to increase production and investment on-farm? What mechanisms, if any, should be put in place to avoid distorting the drought feeding market next time drought conditions persist in Queensland?**

It is envisaged, as Queensland's largest agricultural commodity is sugar, that the ethanol industry would be predominately targeted to the sugar sector. As a regular large exporter of raw sugar, thus through the processing of the by-product, the sugar industry is value adding.

Australia is a net exporter of grain and hence domestic prices are mostly priced off export parity. Indeed, both wheat and sorghum are still currently being exported out of Queensland despite the state being declared over 80% in drought at present.

Increasing global grain consumption (via an increasing overall population and importantly an increasing middle class population in China/India/Middle East which is demanding a higher protein/meat/grain diet) has increased grain prices over the last decade. This has then prompted farmers around the world (including Australia) to expand their planted acreage of grains in order to keep the supply and demand in balance. Both spot and forward grain markets have developed to the extent that gives the opportunity for both Australian farmers and Australian grain users to manage their grain price exposures.

The Manildra Group purchases wheat from Australian farmers and value adds through converting it into a variety of products, including baking flour, gluten, glucose, brewing syrup, starch for paper recycling and corrugated cardboard and the residual waste starch is converted into ethanol. A high protein feedstock is also produced in the manufacturing process, which is sold into both the domestic and export feed markets (beef cattle, dairy cattle, pig and poultry).

34. **What is the role of the Government in attracting a new bio-manufacturing industry in Queensland? Are there specific policy mechanisms or actions that will attract investment and development? What additional actions can the Queensland Government take to increase the likelihood of project opportunities becoming operational projects? Development of the biofuel industry, specifically ethanol, has struggled from a lack of long-term certainty and a problematic history. How do stakeholders including the Government provide the long-term certainty necessary for the development of, and investment in, bio-manufacturing? What regional centres could become hubs for bio-refinery investment/development in Queensland? How could Queensland science support the development of the industry? How should it build on previous research (including the involvement of key end users)?**

There is no doubt that Government-set mandates have given life to biofuel industries worldwide. Without a higher target than 2%, a biofuel industry will not be established in Queensland. To attract a new bio-manufacturing industry in Queensland, the Queensland Government could implement the following:

- Government funded research and pilot projects;
- Tax relief or incentives for research and development;
- Incentivise oil companies to; and

- Concessions for the establishment of new bio-businesses (as occurs for other industries)

The Government's business attraction unit within the State Development Department could be instrumental in establishing domestic opportunities and provide incentives, for the establishment of biofuel operations in Queensland.

Regional centres where ethanol plants already exist and where the raw material is produced should be the starting point, including centres with ports and transport hubs.

Finally, I would like to touch on **the health benefits of ethanol**. This relates to the above questions, regarding "Bio-manufacturing – a new approach" as well as previous ones on protecting the environment and maintaining consumer choice. The health benefits can be used positively and aggressively in a public campaign on the benefits of ethanol and the Queensland government could undertake new research to build on existing knowledge and to update statistics.

1. **The Bureau of Transport and Regional Economics, NSW, 2005**, estimated that in 2000 motor vehicle-related ambient air pollution accounted for between 900 and 4500 morbidity cases—cardio-vascular and respiratory diseases and bronchitis—and between 900 and 2000 early deaths. (Australia wide figures). The economic cost of morbidity ranges from $0.4 billion to $1.2 billion, while the economic cost of mortality ranges from $1.1 billion to $2.6 billion. The value of a statistical life used was $1.3 million—a discount of 30 per cent on the Bureau's costing of transport accident fatalities. This reflects the older age profile of air pollution-related early deaths. These estimates are derived using the results of an international study which estimated the long-term health impacts of ambient air pollution using particulate matter of less than 10 microns as a surrogate for all air pollutants. The USA has legislation to stop these fatalities in addition to their ethanol mandate.

2. **Australian Senate Inquiry into Air Quality – April 2013**

The Greens senator Richard Di Natale, who initiated the inquiry, said there were more Australian deaths each year from air pollution than road accidents.

More than 3000 died due to urban air pollution in 2003, nearly twice the national road toll, according to the federal State of the Environment 2011 report.

3. **Australian Medical Association submission to the Senate Inquiry into Air Quality 2013:**

It has been estimated that, each year, urban air pollution accounts for significantly more deaths than the nation's road toll.[Begg, S, Vos, T, Barker, B, Stevenson, C, Stanley, L, Lopez, A, (2007). *The burden of disease and injury in Australia 2003.* AIHW cat. no. PHE 82. Canberra: Australian Institute of Health and Welfare (AIHW). www.aihw.gov.au/bod/index.

The economic costs of these premature deaths and the chronic and acute health effects of air pollution are substantial.

- **The estimated health costs associated with outdoor air pollution are up to $8.4 billion per annum**[Department of Environment and Conservation (DEC), 2005. *Air Pollution Economics: Health Costs of Air Pollution in the Greater Sydney Metropolitan Region*. Department of Environment and Conservation NSW: Sydney.]
- Across Australia, the costs associated with motor vehicle emissions alone are estimated to be between $600 million and $1.5 billion per annum.[Bureau of Transport and Regional Economics, (2005). *Health impacts of transport emissions in Australia: Economic Costs*. Working Paper no. 63, Bureau of Transport and Regional Economics. Department of Transport and Regional Services: Canberra.]

In summary: Health, sustainability, jobs, new industries, decrease in fuel costs, fuel security – these tick all the boxes for a serious ethanol mandate in Queensland.

Sincerely

Rob Katter

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Australia's Liquid Fuel Security Part 2

A report for NRMA Motoring & Services

Prepared by John Blackburn AO
February 2014

About the author

Air Vice-Marshal John Blackburn AO (Ret'd)

John retired as Deputy Chief of the Royal Australian Air Force in 2008. His RAAF career included being an F/A-18 fighter pilot, test pilot, Head of Policy Guidance and Analysis and Commander of the Integrated Air Defence System in Malaysia. He is now a consultant in the fields of Defence and National Security.

He is Deputy Chair of the Kokoda Foundation Board and the Deputy Chair of the Williams Foundation Board. He holds a Master of Arts and a Master of Defence Studies.

In February 2011 the Kokoda Foundation published John's report *Optimising Australia's Response to the Cyber Challenge*, which he co-authored with Dr Gary Waters. In February 2013 NRMA Motoring & Services published his report *Australia's Liquid Fuel Security*.

Contents

Executive Summary

This report is the second in a series commissioned by NRMA Motoring & Services and authored by John Blackburn AO. Both reports address Australia's liquid fuel security and the growing risks in our fuel supply chain and suggest remedial action.

The first report, *Australia's Liquid Fuel Security*, was published in February 2013. It revealed the little known fact that Australia has small and declining fuel stocks – about three weeks' worth of oil and refined fuels. The report highlighted the reasons for our oil dependence; explained the risks to our liquid fuel supply chain; pointed out the impact on our way of life of a severe supply interruption; and made recommendations for improvements.

This follow-up report addresses four key questions:

1. How much more serious could the problem get?
2. Why has no action been taken to date?
3. What can we do about it?
4. How can we initiate action on a fuel security plan?

Australia's combined dependency on crude and fuel imports for transport has grown from around 60% in 2000 to over 90% today.[1] In an ever-changing world, we need a plan to stop our import dependency growing to 100% in the future if we are to have an acceptable level of fuel security. Since the first report was published, another likely Australian refinery closure has been announced; the political instability in some Middle Eastern countries has worsened; our net import fuel stockholdings have declined; and the domestic supply of a special type of fuel required by the Australian Navy (F44) has come under threat.

If a scenario such as a confrontation in the Asia-Pacific region were to happen, our fuel supplies could be severely constrained and we do not have a viable contingency plan in place to provide adequate supplies for Australia's essential, everyday services and for our military forces.

1 Adapted from Australian Petroleum Statistics Table 2 and Table 4, BREE 2014.

Figure 1: Australia's low liquid fuel stockholdings

Much of the analysis required to address the risks described in this report has already been conducted and the right expertise exists across Government, business and in academia to devise a solution. However, the coordination and cooperation across these areas of expertise has been lacking.

The primary information sources that Governments use to understand our energy security are the periodic National Energy Security Assessment and the Energy White Paper. In the past, they have both placed a strong emphasis on ensuring market structure and delivery at the expense of considering the consequences of unlikely but highly detrimental supply disruptions.

We should expect clear assurances from our Government that we have sufficient Australian-controlled sources of fuel to support essential needs in the event of overseas supply interruptions. Given the lack of publicly-owned fuel stocks, the lack of reporting on industry stocks and the very limited public analysis of supply chain risks, it is difficult to see how our new Government could currently provide us with that assurance. Past Governments do not appear to have had a Plan B.

The good news is that we can do something to improve our fuel security. We do not need to accept our current trajectory, nor do we need to aspire to return to our position of 15 years ago. Instead, we should recognise that the world is changing and balance economic reality with our security needs.

This report recommends a comprehensive response to our growing import fuel dependency that considers a full range of plausible scenarios and assesses the contribution to be made by changes to both demand and supply sides of the liquid fuel delivery chain. This will entail a holistic look at what drives demand for transport; the technologies and energy sources that are used; the efficiency of these technologies; and alternative fuel supply and storage options.

This report also examines the feasibility of improving our liquid fuel security. It concludes that an increase of secure fuel supply (Australian sourced and refined) from 10% to 30%, for example, would be feasible. Components contributing to a more secure liquid fuel supply could include:

- Mode shifting, such as transporting freight by rail rather than road and supporting increased use of public transport;
- Improved efficiency of vehicles;
- Expansion in the number and use of electric and fuel cell vehicles;
- Alternative sources of liquid fuels such as biofuels; and
- Increased liquid fuel stockholdings.

Recommendations

Developing a cost-effective plan to reverse Australia's growing liquid fuel security problem should be possible, but will require a much more comprehensive analysis than has been the case so far.

For the 2014 National Energy Security Assessment and the 2014 Energy White Paper, this report recommends a greater degree of involvement and ownership of the assessment process by agencies experienced in national security risk analysis, and greater consultation with business and consumer groups. This approach will give both these core documents a depth that has been missing in previous years.

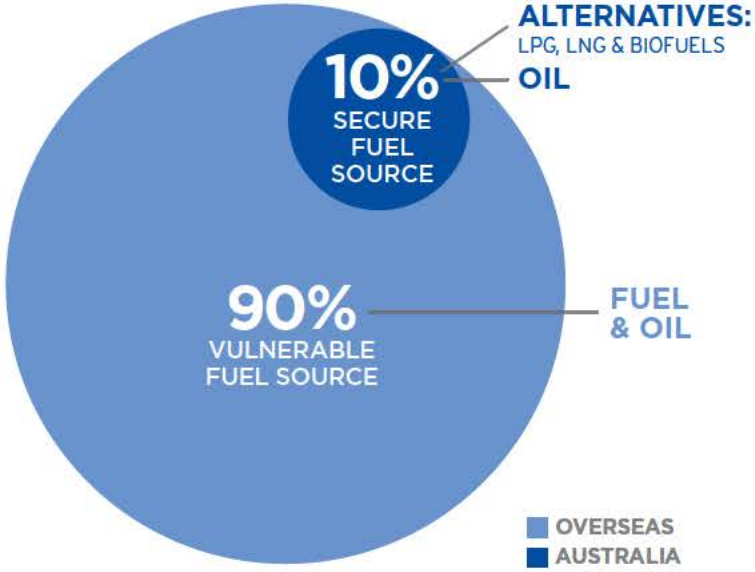


Figure 2: Fuel sources today

Introduction

There is no public Government policy on maintaining a minimum level of oil refining capacity in Australia. Since 2000, our dependence on imported liquid fuel and oil for transport has grown from around 60% to over 90% of our transport fuel demand. There is no plan to stop our dependency growing to 100% or to halt the further decline of our fuel security.

The implications of this situation are serious and affect all Australians. To support a public debate on this important subject, NRMA Motoring & Services[2] has commissioned a series of reports authored by Air Vice-Marshal John Blackburn AO (Ret'd) that discuss the issues involved and put forward recommendations for change.

The first report, *Australia's Liquid Fuel Security*[3] concluded there are several problems with our liquid fuel security:

- Australians are heavily dependent on energy imports, with over 90% of domestic transport liquid fuels being sourced from imported oil or refined oil products;
- Our transport system and, in turn, our society is almost wholly oil dependent – we are at risk if we experience supply chain interruptions or a reduction in the availability of affordable oil supplies in the future;
- We have very small consumption stockholdings in Australia – about three weeks of total stocks of oil and refined liquid fuels as shown in Figure 1; and
- While our 'just in time' oil and liquid fuel supply chains work well under normal circumstances or under small scale or short duration interruptions, the resilience of the supply chains and associated infrastructure under a wider range of plausible scenarios has not been assessed.

Furthermore, Australia faces ongoing changes to our liquid fuel security situation. In the 12 months since the first report was published:

- Another Australian refinery sale and potential closure has been announced;
- Tensions have risen further in the Middle East;
- Australia's reported levels of net import liquid fuel stockholdings have declined by 11 days (a 16% reduction); and
- The Department of Defence has been advised that at least one military-specific type of liquid fuel (F44) is unlikely to be refined in Australia as of mid-2014.[4]

2 The NRMA has a history of pioneering advocacy across a range of issues affecting its Members. Ensuring Australia's liquid fuel security is one such issue.

3 Australia's Liquid Fuel Security, 28 February 2013 www.mynrma.com.au/about/fuel-security.htm

4 Department of Defence DGSL/OUT/2013/186 dated 5 Jul 13 www.ret.gov.au/energy/energy_security/reporting/Documents/MPDR2013-Department-of-Defence.pdf

Australia is moving towards a situation where by 2030 we could have:

» No refineries;

» Less than 20 days of liquid fuel; and

» 100% imported liquid fuel dependency.

Following publication of the first report in this series, the NRMA held a series of workshops and interviews to further explore the liquid fuel security issue.

Representatives from Government, industry, business and the wider community addressed four key topics:

» Australia's worsening liquid fuel security problem;

» Why no action has been taken to date;

» What we can we do about it; and

» Initiating a liquid fuel security plan.

This report explores these issues and proposes actions to address the risks. The actions need broad-based public support, as they will require Government intervention. Some may involve public investment, which may impact on the cost of liquid fuel for consumers.

The measures address risks to our liquid fuel security and national resilience that we may face in the future.

The Australian people must decide if they are worth investing in now.

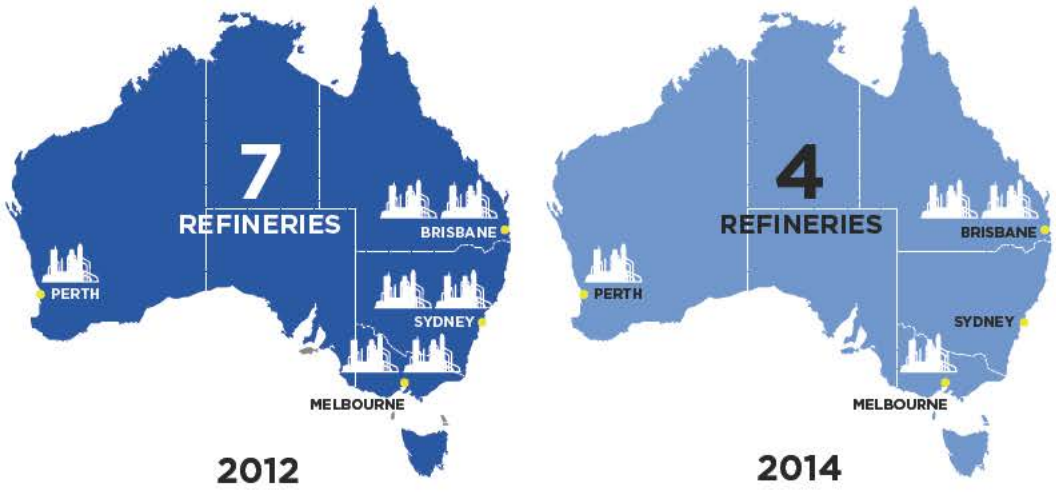


Figure 3: Decline in Australian refineries

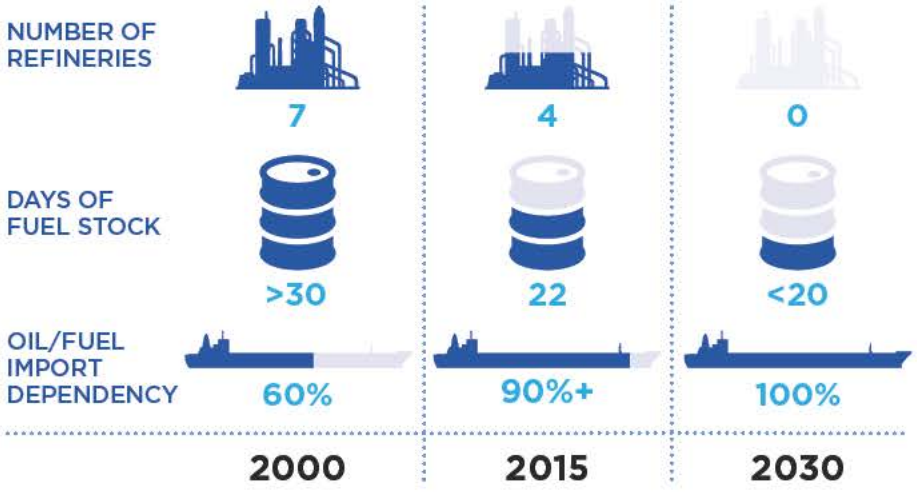


Figure 4: Projected Australian fuel production and stockholding decline

Australia's worsening liquid fuel security problem

Australian liquid fuel refining industry has been shrinking for some years due to a series of factors including increasing domestic costs and the cost of upgrading ageing refineries.

This decline is accelerating. By 2014, local refinery closures mean that total Australian refinery capacity will have declined 28% in just two years

There is also the high probability of the closure of Shell Geelong refinery when Shell exits the oil refining business in Australia in 2014. This refinery produces specialist aviation fuel types for Defence and commercial aircraft; Shell describes it as "the leading provider of aviation fuels, representing 1000 flights per day".[5] If the Geelong refinery closes, we will experience a loss of refining capacity in Australia of 42% over two years as illustrated in Figure 3.[6]

Without Government action, the remaining refineries are unlikely to be competitive with regional liquid fuel suppliers in the future and could close over the next decade.

Figure 4 illustrates the loss in Australia's liquid fuel production and storage capacity since 2000 and projects the possible loss through to 2030. In 2000, our combined dependency on crude and fuel imports was around 60% of our needs.[7] It is now in excess of 90%. If we have no refineries in Australia by 2030, our import dependency will rise to 100% as all fuel products will have to be fully imported.

With no refineries we will not be able to refine any Australian sourced oil and will be completely dependent on imports. There is currently no government policy to avoid this outcome.

Our dependence on imported liquid fuel is increasing

We have two sources of liquid fuel: those from Australian territory that are relatively secure, and those from overseas that are largely from reliable markets, but have some security vulnerabilities for supply.

Unfortunately, not all the oil produced in Australia can be refined in Australia due to the configuration of our refineries. Over the last 13 years, as our oil production has declined and imports have grown, there has been a rapid decline in Australia's capability to produce its own transport fuels. Australian refinery closures that have been announced, and the further significant changes anticipated in Australia's refinery industry,[7] will likely result in further erosion of our national production capability.

A breakdown of our liquid fuel sources is illustrated in Figure 5. As previously stated, around 90% of our transport liquid fuels are sourced from potentially vulnerable imported oil and refined fuel products. Alternative liquid fuels – including renewable energy – have yet to reach significant market share or commercial viability in most cases.

With a high dependence on imports, an important question is: who owns the refineries that we will increasingly depend on and how could they influence the availability of liquid fuel imports in times of future regional instability?[8]

We could ask similar questions regarding the ownership and reliability of oil and fuel shipping companies; there are no Australian owned commercial oil/fuel tankers.

5 www.shell.com.au/aboutshell/who-we-are/shell-au/operations/downstream.html

6 Australia's Liquid Fuel Security, February 2013, p8 www.mynrma.com.au/about/fuel-security.htm

7 Article, BP, Shell Assets on the Block, Australian Financial Review 7 Jan 2014.

8 For example, the SRC Jurong Island Refinery in Singapore is 50% owned by Chinese companies.

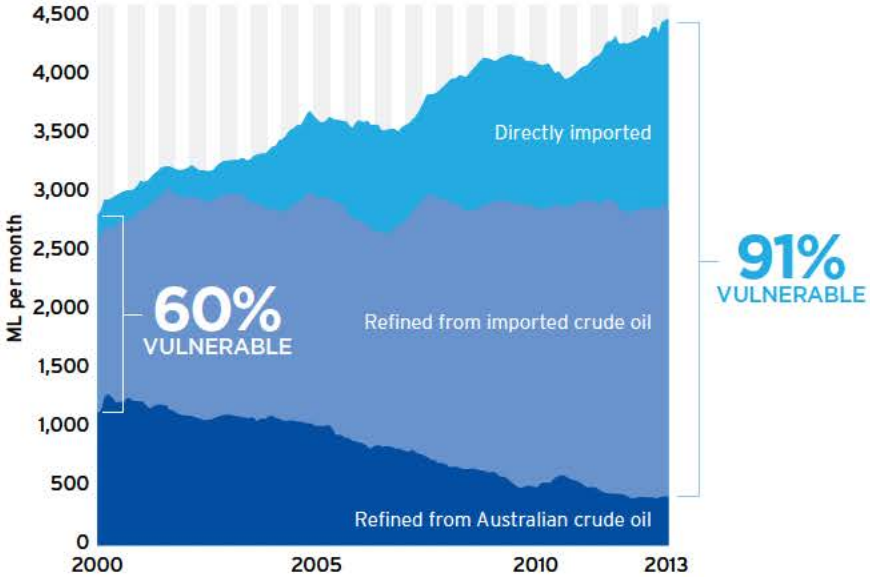


Figure 5: Declining local supplies and increasing imports of fuel products[9]

Figure 6: Fuel supply infrastructure in decline

Given the majority of our refined liquid fuels are sourced from Singapore,[10] we should assess refinery ownership implications in Australia's liquid fuel supply across a range of feasible scenarios. In the event of regional conflict, or even conflict over trade or political positions, the ownership of refineries and shipping companies could be important factors in the willingness of refinery and shipping company owners to supply liquid fuel to Australia.

Supply chains are shrinking

The way the world works continues to change. Since the 1980s, commercial supply chains have been redesigned to reduce overhead costs. Companies have relocated production and manufacturing capabilities, embraced just-in-time inventory management and introduced lean manufacturing techniques.

These trends have impacted our liquid fuel supply infrastructure of import facilities, refining, stockholding and distribution elements. The oil and fuel companies operating in Australia have optimised their supply chains and have effective just-in-time delivery of oil and liquid fuel stocks that minimise overhead and production costs.

While such supply chain changes are economically logical and in the interest of company shareholders, the collective actions of market players have resulted in increased overall risk. Such changes can reduce resilience and can introduce new and often unrecognised risks. These new risks are often described as 'systemic risks' because they result from how a system changes as a whole when parts of the system are changed in an uncoordinated manner.

Figure 6 illustrates the components of our supply infrastructure and highlights the likely reductions in both refining capacity and stockholding if we keep doing business as usual and continue to shrink our refinery industry.

Stockholdings are declining

Australia is consistently the only one of the 28 member countries that fails to meet its International Energy Agency (IEA) 90-day net oil import stockholding level. In February 2013, *Australia's Liquid Fuel Security* noted that Australia had only 71 days of net import oil holdings as at April 2012.[11] This equated to an estimated 23 days of real oil and liquid fuel stocks in-country.

By May 2013, Australia's reported levels of net import liquid fuel stockholdings had declined a further 11 days to 60 days: a 16% reduction in seven months,[12] as illustrated in Figure 7.

9 Adapted from Australian Petroleum Statistics Table 2 and Table 4, BREE 2014. **10** The Australian Institute of Petroleum report, Maintaining Supply Reliability in Australia, September 2013, p7 notes that in 2012-13, 53% of petroleum products were imported from Singapore, 18% from Korea and 12% from Japan.

11 Australia's Liquid Fuel Security, February 2013, p9 www.mynrma.com.au/about/fuel-security.htm
12 www.iea.org/netimports.asp?y=2013&m=05

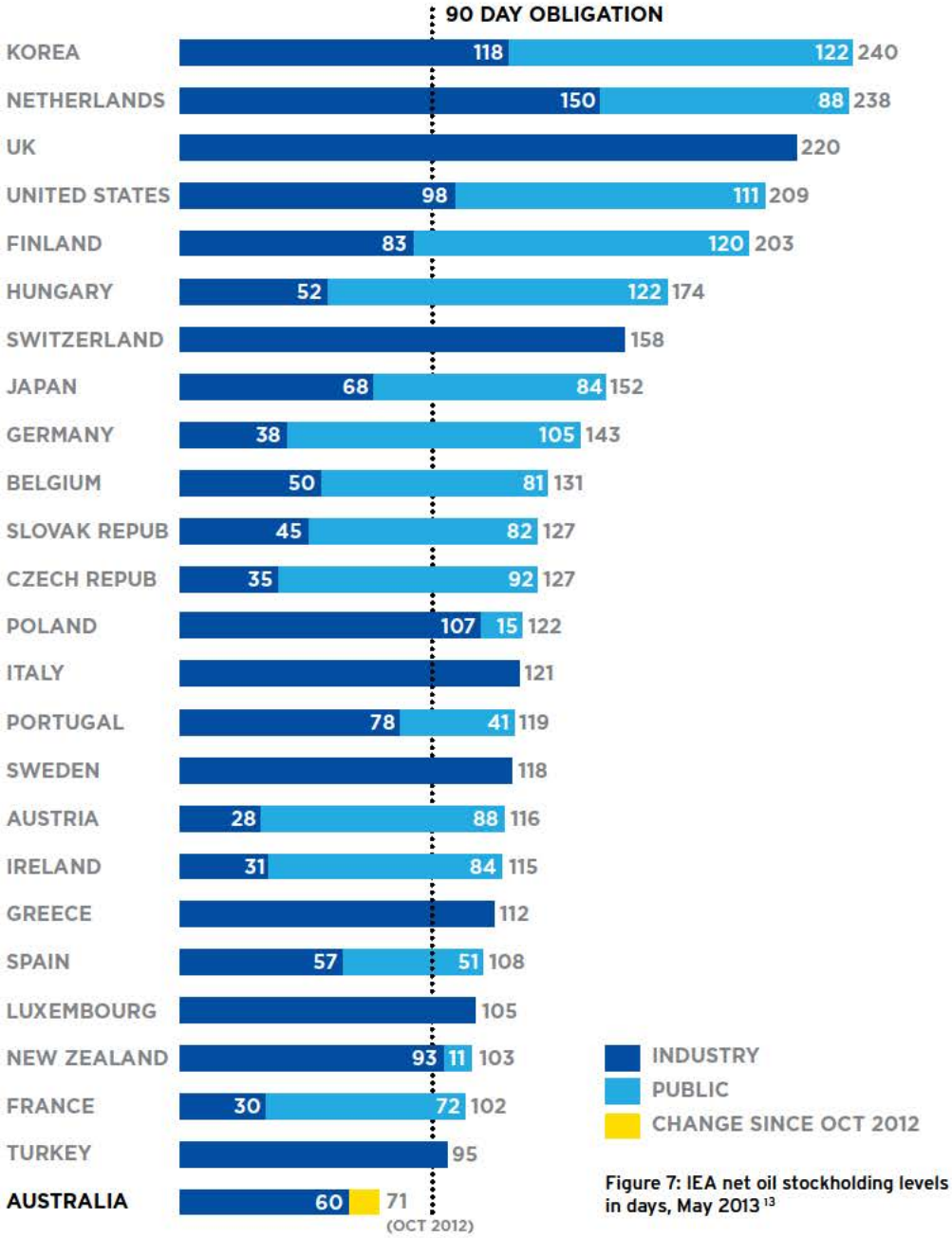


Figure 7: IEA net oil stockholding levels in days, May 2013 [13]

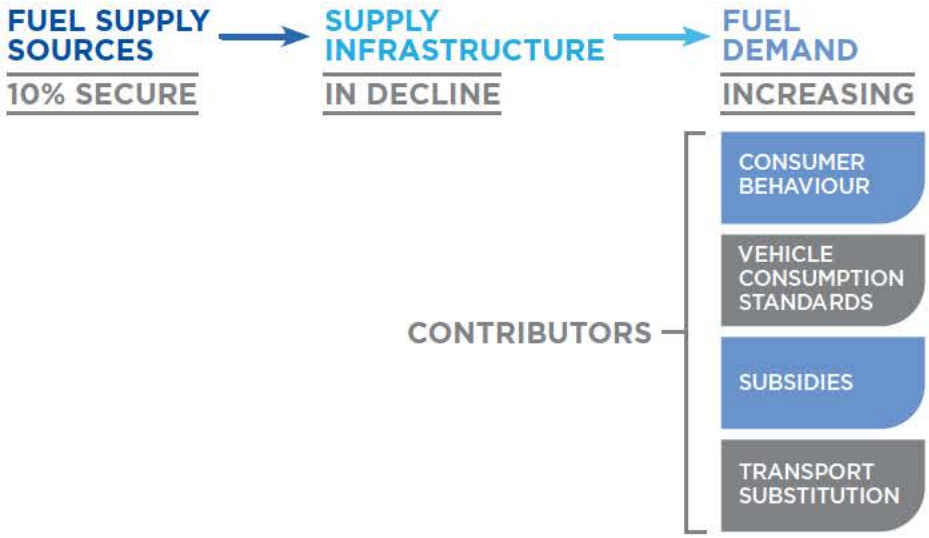


Figure 8: Fuel demand

Demand is increasing

Australia's liquid fuel demand is increasing rapidly, driven by business growth and the contribution of a range of factors relating to consumer and government actions around how we live, travel and consume (see Figures 5 and 8).

IEA membership obliges Australia to have a demand restraint program for reducing national oil consumption by up to 10%.[14] There is little evidence of our compliance with this requirement.

What does this mean for Australians?

While Australia's refining capacity is being reduced and our liquid fuel supply chain is in decline, demand is increasing. This is clearly not sustainable.

If we eventually have no oil refineries, we will join Luxembourg as the only other IEA member country without an oil refining capacity. This would be like being 100% dependent on imported food – a situation Australians would be likely to find unacceptable. A 100% dependency on imported liquid fuel should also be viewed as unacceptable.

Such a lack of capacity puts at risk our national security and lifestyle should there be a major event that impacts our liquid fuel supply chain. The potential impact is spelled out in the next section of this report.

The IEA has suggested that Luxembourg should swiftly implement a plan to improve the security of its oil supply.[15] We have the opportunity to address Australia's liquid fuel security before we join Luxembourg.

13 Australia's Liquid Fuel Security, February 2013, p9 amended by May 13 IEA data www.mynrma.com.au/about/fuel-security.htm

14 www.iea.org/countries/membercountries/

15 www.iea.org/countries/membercountries/luxembourg/

What is the impact of a declining refining industry?

Increased liquid fuel imports

As our refining industry shrinks, Australia will be obliged to import an increasingly large percentage of our transport liquid fuels as refined products from overseas refineries. This will lead to an increase in risk to fuel security.

Loss of refining abilities

The impact of losing all our oil refineries would be the complete loss of any future capability to refine Australia's own oil supplies. We would no longer have any liquid fuel supplies that could be considered secure, and we would lose the option to resurrect some or all of our local liquid fuel supply chain as part of a solution to a crisis.

Defence implications

The closure of the Shell Geelong refinery would result in a major reduction in Australian production of specialist aviation fuels. This will make us even more reliant on overseas refineries to be willing to supply liquid fuel for our airlines and military forces. The Department of Defence has also been advised that the F44 fuel necessary for all ship-based helicopters is unlikely to be refined in Australia as of mid-2014.[16] As a result, the Australian Defence Forces may not be able to operate helicopters from Naval ships, including our new amphibious ships, without the tacit approval of foreign refineries.

Refinery by-products more expensive

The loss of the refining industry in Australia would also raise concerns about the impact on other industries that depend on the local production of refinery products other than liquid fuels. Petrochemical feedstocks and petrochemicals are by-products of our refining industry. The cost and complexity of having to fully import existing refinery by-products should not be underestimated.

Broader supply chain risks

The risks discussed in this report are not just in the supply chain for liquid fuels. There are other risks to many aspects of our daily lives because the services and supplies we rely on, and their associated supply chains, are reliant on imports. Examples for food and pharmaceutical supplies were discussed in the previous Liquid Fuel Security report.[17] These supply chains are vulnerable to the impact of a major disruption that means shortages of essential items would be likely.

Stockholdings reduced further

A Department of Industry (formerly Department of Resources Energy and Tourism) report[18] analysing the impact of the loss of refineries in Australia suggests the level of liquid fuel stockholdings in Australia would reduce from 23 days to less than 20 days if oil refinery numbers were reduced to zero and replaced by import depots.[19]

The report states that being fully dependent on imports would have *'... a significant impact on the International Energy Agency (IEA) reported stocks and therefore security in terms of its IEA measure.'*[20]

What does this mean for Australians?

As long as normal market conditions persist, we will continue to receive the services and supplies we depend on. However, there are several potential scenarios impacting the liquid fuel market that could dramatically change our daily lives.

These scenarios have been considered by many other countries and businesses and by our own security agencies but they have been discounted in the analysis of our nation's energy security conducted by past Governments as discussed in the following section.

16 Department of Defence DGSL/OUT/2013/186 dated 5 Jul 13 www.ret.gov.au/energy/energy_security/reporting/Documents/MPDR2013-Department-of-Defence.pdf

17 Australia's Liquid Fuel Security, February 2013, pp6-7.

18 National Energy Security Assessment (NESA) Identified Issues: Competitive Pressures on Domestic Refining, 29 June 2012 www.ret.gov.au/energy/energy_security/national_energy_security_assessment/Pages/NationalEnergySecurityAssessment.aspx

19 NESA Identified Issues: Competitive Pressures on Domestic Refining, 29 June 2012, p22.

20 ibid.

The need for a new approach

Consider the unlikely

In reviewing potential scenarios and the impact of refinery closures on Australia's liquid fuel security, the Department of Industry NESA report concluded the following:

'*... there could be scenarios that are more severe such as war in the Middle East, war in the Asia Pacific region, disruption of shipping lanes or disruption to key refining centres in the Asia Pacific region. In this case the markets may not operate normally and the impact on the supply chains would need to be considered.*'[21]

While the report notes that extreme scenarios '*... are things that Governments need to consider ...*',[22] such scenarios were not included in the then Department of Resources Energy and Tourism 2011 Liquid Fuels Vulnerability Assessment (LFVA) that supported the 2012 Energy White Paper.[23]

It is clear that past Governments have been of the view that our energy security can be reliant on market forces without Government intervention on the supply side.

'*Our liquid fuel security is expected to remain high because of our access to reliable, mature and highly diversified international liquid fuel supply chains.*'[24]

The report goes on to say:

'*In some of these scenarios it is clear that Australia will be losing some supply security in the case of a complete shutdown of its refining industry. However, those scenarios are quite unlikely and would not have been true for any of the global disruptions seen over the past thirty years.*'[25]

This statement is surprising as it assumes the way the world functions has not changed and will not change in the future. This approach is contrary to how most security analysis is conducted, where unlikely, but significant, impact scenarios are fully considered.

As a Deloitte Risk Management Study points out: '*Some of the greatest value losses (in business) were caused by exceptional events such as the Asian financial crisis, the bursting of the technology bubble, and the September 11th terrorist attacks. Yet many firms fail to plan for these rare but high impact risks.*'[26]

It is apparent that in some cases, both companies and Governments avoid contemplating the unlikely – or the unpalatable.

Improve transparency

The Australian Institute of Petroleum (AIP) has stated '*The current levels of commercial stockholdings reflect a considered assessment of the operating conditions throughout the supply chain and the risks more likely to be encountered by major fuel suppliers.*'[27]

There is currently no mandated requirement to report stock levels in Australia[28] and there are no public stocks – the limited stocks are held in industry supply chains and the public does not know how much is in stock at any point in time. Having low or no confidence in the level of stockholdings and in the ability of industry to manage supply interruptions is a problem for Australian businesses and consumers.

To provide some context, in late 2012 supplies of diesel ran out in North West Victoria during harvest time, just two days after a refinery

21 NESA Identified Issues: Competitive Pressures on Domestic Refining, 29 June 2012, p27. **22** Ibid p28. **23** ACIL Tasman Liquid Fuels Vulnerability Assessment report, October 2011.

24 2012 Energy White Paper, p53.
25 NESA Identified Issues: Competitive Pressures on Domestic Refining, 29 June 2012, p30.

26 Deloitte Risk Management Study, Disarming the Value Killers, 2005, p6.

27 Australian Institute of Petroleum report, Maintaining Supply Reliability in Australia, September 2013, p15. **28** The Government is considering introducing mandatory reporting as of 2015.

incident in Geelong. Given there are known peaks in supply demand at the end of each calendar year,[29] this incident does not build public confidence regarding the fuel industry's management of the liquid fuel supply chain. Perhaps the fuel industry's risk assessment for its business needs is not the same as a risk assessment for the wider community.

For security reasons, we should not reveal publicly what percentage of our critical liquid fuel demands could be met from Australian sources. This information encompasses, for example, our essential services and military forces.

However, we should expect a clear assurance from our Government that we have sufficient Australian-controlled liquid fuel sources to support our Defence forces and essential services if overseas supply is interrupted. Given the limitations on publicly owned liquid fuel stocks, reporting on industry stocks and supply chain risk analysis, it is difficult to see how our Government could provide us with that assurance.

Accept responsibility

When talking about severe disaster scenarios, the Department of Industry NESA report says: '*In discussions with industry … it was agreed it was only in these extreme (very low probability) circumstances that there may be an impact from a smaller refinery industry in Australia. The companies indicated that these are the sorts of circumstances that companies would not plan for rather they are things that Governments need to consider …*'.[30]

Despite the concerns identified in this liquid fuel security report, none of the oil and fuel companies is acting irresponsibly or negligently. They are operating responsibly in the interests of their shareholders.

From discussions with senior fuel company executives and from the Department of Industry NESA report, it is clear these companies see their responsibility as being reliability of supply, not security of supply. In other words, they seek to provide their customers with a reliable supply of liquid fuel products within a normal range of market conditions. This protects their market share and their brand and is clearly sensible.

However, it is not their responsibility to assure the security of supply in a wider range of circumstances such as the types of scenarios discussed in the Department of Industry NESA report. It is the responsibility of our elected Government.

What does this mean for Australians?

If a scenario such as a confrontation in the Asia-Pacific region were to eventuate, our liquid fuel supplies could be severely constrained. We do not have a viable contingency plan in place for this event. As the first Australia's Liquid Fuel Security report highlights, if this happens then Australians will suffer food shortages, will not have adequate access to medical services or pharmaceutical supplies, will not be able to get to work and, if the problem lasts for more than a few weeks, many will no longer have work to go to. It is that serious.

The fuel companies are not responsible for addressing these types of risks and past Governments do not appear to have taken on the responsibility either.

Meanwhile, Australians are not told about these changes and have no say in what level of risk is acceptable for their businesses, themselves and their families.

29 Australian Institute of Petroleum report, Maintaining Supply Reliability in Australia, April 2008, p10 – '*However, there are demand spikes (particularly at the end of each year) as a result of harvest time, holidays and Defence Department requirements.*'

30 NESA Identified Issues: Competitive Pressures on Domestic Refining, 29 June 2012, p28.

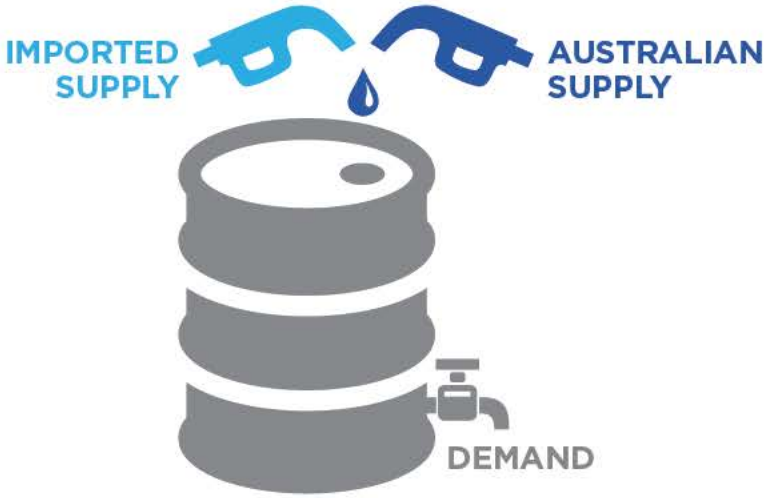


Figure 9: The Storage Tank Question

Why no action has been taken to date

Daunting complexity

Many recent reports and studies have dealt with alternative fuels and energy challenges. Studies such as the NRMA-commissioned Jamison reports[31] contain excellent analysis and make sound recommendations. However, little action to tackle our struggling liquid fuel supply chain appears to have resulted. Why?

The answer seems to be that there is no simple solution: it is a complex, interlinked set of problems that need to be addressed systemically rather than in a piecemeal fashion.

The main questions posed by some politicians are: *'How much extra storage capacity is required, what will be the cost per litre of fuel to pay for it and will Australians be willing to pay?'*

Unfortunately, while increased storage is part of the solution, it is by no means the complete answer. As Figure 9 illustrates, we still need a secure supply of liquid fuel to fill our national 'storage tank.' In other words, we need to think about the hoses that feed the tank (supply) and the tap draining the tank (demand) as well as the storage tank.

Over-reliance on market forces

Because the liquid fuel security problem is complex, past Governments have relied on market forces to address the issues. There is also significant pressure from large business groups to prevent market intervention by Government.

It is true that Government interventions can be counter-productive in many parts of the markets, preventing action being taken to address risks. However, there is an alternative view that where market forces cannot deal with a particular market failure scenario, Government intervention may be vital.

Providing market subsidies is one example. Transport fuel tax credits[32] are viewed by some as market incentives that perpetuate the use of fossil fuels and limit opportunities for alternative fuels to become financially viable in the market.

Markets may learn from failure. However, when it comes to threats to our way of life and national security, we need to anticipate risks and, where necessary, lead markets to pre-adapt in order to improve our national resilience.

Recent reports[33] of potential changes in ownership of oil and fuel import, refining and distribution networks in Australia give rise to concerns regarding future market behaviour. Will the market behaviour of private equity firms, consortia and superannuation funds differ from long-established market behaviour of the oil and fuel majors?

If we can see a risk to supply emerging then it is our national responsibility to address it and not just to wait for the markets to respond. They may respond too late.

Other Government priorities

In a recent speech, Professor Robert Hill, the former Minister for Defence and Minister for the Environment, discussed the contrasting priorities of the United States of America and Australia with respect to national energy policies.[34] In essence, he said energy security and domestic energy supplies are among the highest priorities for the United States of America Government, with energy exports a second priority that is subject to licensing.

By contrast, past Australian Governments have placed energy exports as a high priority, exporting as much as possible. They have relegated domestic energy security to a

31 Jamison report www.mynrma.com.au/about/jamison-report.htm

32 Where heavy vehicle users are refunded fuel excise costs minus a road user charge.

33 Article, BP, Shell Assets on the Block, Australian Financial Review 7 Jan 2014.

34 National Business Leaders' Forum on Sustainable Development, 27 June 2013, Parliament House Canberra.

lesser priority that the market will take care of.

With such a contrasting approach, it is not difficult to see why little action has been taken to date in Australia. It is also interesting to compare Australia with smaller countries such as Norway, which retains part Government ownership of the refining industry and mandates minimum stockholding levels.

Lack of coordination

Much of the analysis necessary to address the risks described in this and the previous liquid fuel security report[35] has already been conducted. This expertise, which exists across Government, business and in academia, could be applied to reduce Australia's liquid fuel security risks. Unfortunately, it appears the coordination and cooperation between these experts may be lacking in some areas.

We need a mechanism that brings together this knowledge and provides a venue for discussion, debate and decision-making and – more importantly – results in a willingness to act.

Low public awareness

As previously stated, for security reasons, it is not wise for the Government to release precise details about, for example, how much liquid fuel our Defence Forces have in reserve.

However, there is plenty of robust data around the impact of having low or no Australian oil refining capabilities on the country as a whole. Given the importance of an assured liquid fuel supply to our economy and way of life, a public debate about the issues around liquid fuel security would be a positive step towards encouraging our Government to build an action plan.

What does this mean for Australians?

Australia's oil refining industry is in severe decline and could be non-existent by 2030.

Supply risks are unlikely to be addressed until there is a significant supply failure because:

- Past Governments have relied on market forces rather than direct action;
- the complexity of the systemic changes required; and
- a lack of public discussion on the subject.

So the question we should be asking our Government and ourselves is: is this situation in the interest of our country and our citizens?

If the answer is no, then is it important enough to make sure we retain some refining capability in Australia so we keep the ability to meet a proportion of our liquid fuel needs from Australian-controlled sources?

Waiting for a catastrophic failure before acting could result in damage to our security, our economy and our way of life. And the longer we wait to act, the fewer options we will have.

35 Australia's Liquid Fuel Security, February 2013. www.mynrma.com.au/about/fuel security.htm

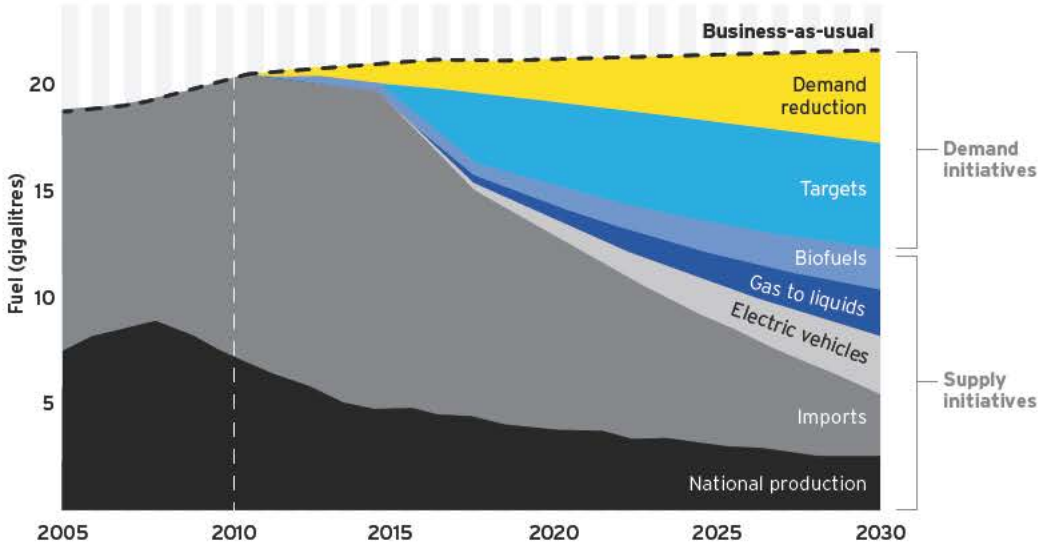


Figure 10: Proposed contribution of demand reduction, targets and alternative fuels to a reduction in import dependency

What we can do about it

The good news is that Australians can do something to improve our liquid fuel security. The bad news is that the solutions are not simple, not free, and not understood, as most Australians have no visibility of the growing risks to supply.

It is important we view liquid fuel security as a challenge where economic and security aspects are considered together to make sure decisions taken in one area do not produce unintended consequences in the other. An economic plan without security is as bad as a security plan that is not economically viable.

So, what could we do in Australia and how could we go about implementing a solution? In general, we should seek diversity in both supply and demand in order to limit our liquid fuel security risks. Such diversity should include Australian sources of liquid fuel, not just diversity of international sources.

We should:

- Reduce our national liquid fuel demand by adopting measures around fuel efficiency, public transport and alternative fuels.
- Decide whether we want a proportion of our liquid fuel supply to be secure: if so, how much and for what purpose?
- Determine the least costly way of achieving this level of security, considering both demand and supply related initiatives.
- Institute measures to assure the appropriate secure sources of supply and ensure that sufficient refining, processing and storage capacity is retained in Australia to provide a secure source-to-consumer supply chain for a portion of our liquid fuel demands.

Reducing demand

The first step in addressing our liquid fuel security at least cost should be considering measures to reduce liquid fuel demand. These would deliver positive outcomes for Australians in terms of reduced energy costs and could reduce the need for costly solutions to address supply security.

An excellent discussion of the issues associated with demand reduction is in the NRMA-commissioned Jamison report *Fuelling Future Passenger Vehicle Use in Australia*.[36] Figure 10, sourced from the Jamison report, illustrates how demand reduction would be an essential component of a liquid fuel security solution.

A comprehensive discussion of Figure 10, related to demand reduction targets, is also contained in the report.

Unfortunately, Governments have taken no action to implement its recommendations over the past three years.

These recommendations include:

- Increasing fuel efficiency standards, use of electric vehicles and use of public transport.
- Rebalancing modes of transport: given the greater energy efficiency of rail transport, it is concerning to realise that only 5% of the north-south freight on the east coast of Australia is by rail. The remainder is largely carried by the trucking industry, which benefits from the transport fuel tax credits scheme but has a higher energy consumption per kilometre, resulting in a higher overall liquid fuel demand. A reform of the fuel excise system could in time both reduce demand and encourage investment in alternative fuels and transport modes.

36 www.mynrma.com.au/images/About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, pp45-57.

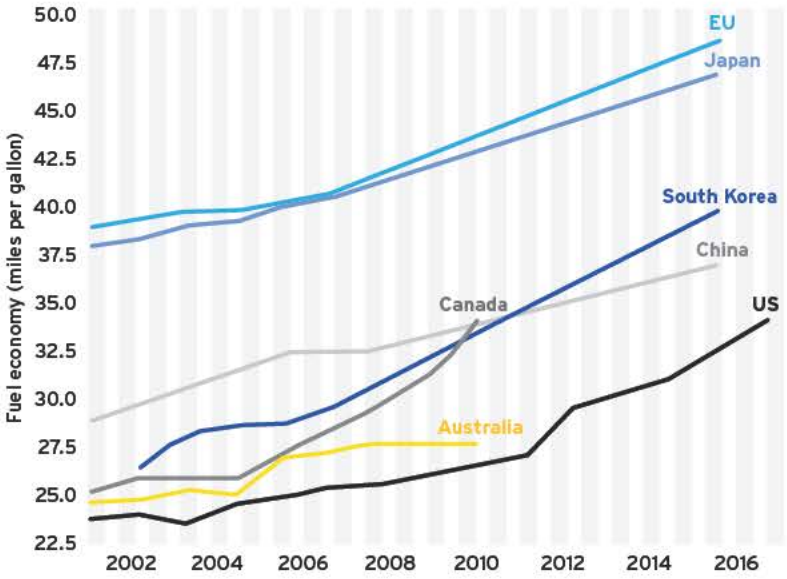


Figure 11: Comparison of actual and projected average fuel economy for new passenger vehicles

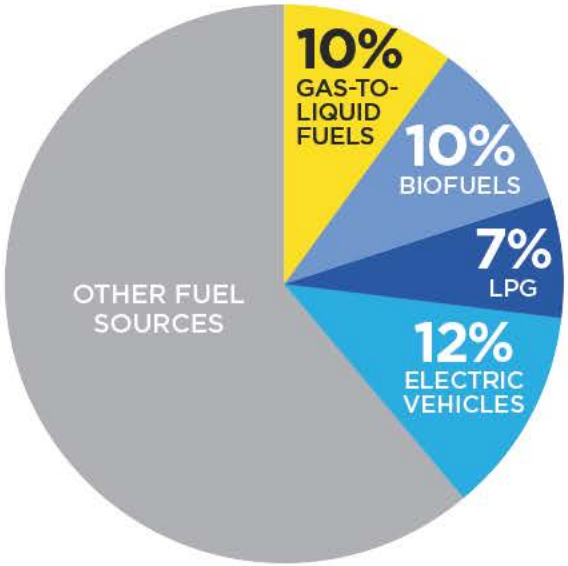


Figure 12: Jamison Group estimate of 2030 transport alternative fuel sources

A reduction in demand through increased use of public transport would be ideal but difficult to convince consumers, who value the independence of their cars.

A reduction in demand through improved car fuel consumption levels would appear much easier to achieve. Figure 11 compares the actual and projected corporate average fuel economy for new passenger vehicles.[37] The graph highlights Australia's poor vehicle efficiency performance compared with other nations, suggesting that significant improvements are technically achievable.

Mandatory fleet fuel economy targets could significantly reduce fuel demand over time.

Improving our liquid fuel security

It is reasonable to assume Australians want some degree of liquid fuel security. The question is: how secure do we want to our liquid fuel supply to be? The percentage of liquid fuel security we need and can afford must be the result of extensive analysis and informed debate.

100% security would mean energy independence. While the United States may aspire to this, it is fantasy for Australia given current technologies, energy sources and economic realities. As at 2013, our fuel security is in the order of 10% of supply and decreasing.

The Jamison report shows that more than 30% of domestic transport energy demand can be met by secure supplies[38] as illustrated in Figure 12. That is, 30% of our transport supply would be secure from source through to delivery. This would ensure basic services could function in Australia in the event of a major and sustained liquid fuel supply disruption.

The remaining 70% would be supplied by the market and subject to normal commercial market forces and supply risks.

30% is a realistic goal for Australia. However, the Jamison report goals for 2030 may not be achieved because of the failure of past Governments to act in time.

What could a 30% secure supply look like?

A partially secure liquid fuel supply implies:

- Sufficient Australian sources of liquid fuel to meet essential needs;
- A matched level of refining and processing in Australia; and
- A level of stockholdings of liquid fuel to allow for foreign fuel supply interruptions, as illustrated in Figure 13.

These would need to be continually monitored and adjusted over time to remain in balance with our changing liquid fuel demand. None of these elements is currently specified in our Energy Policy.

To achieve 30% liquid fuel security at least cost we would need to implement a balanced portfolio of initiatives that:

- Reduce the demand for liquid fuels;
- Develop additional alternative fuel sources to complement the existing oil produced in Australia;
- Ensure sufficient refining and processing capacity is maintained in Australia to process the secure liquid fuel sources; and
- Ensure liquid fuel stockholdings levels in Australia do not drop below the level necessary to support a secure supply chain.

37 www.wri.org/resources/charts-graphs/comparison-actual-and-projected-corporate-average-fuel-economy-new-passenger

38 www.mynrma.com.au/images/About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, pp 14-17.

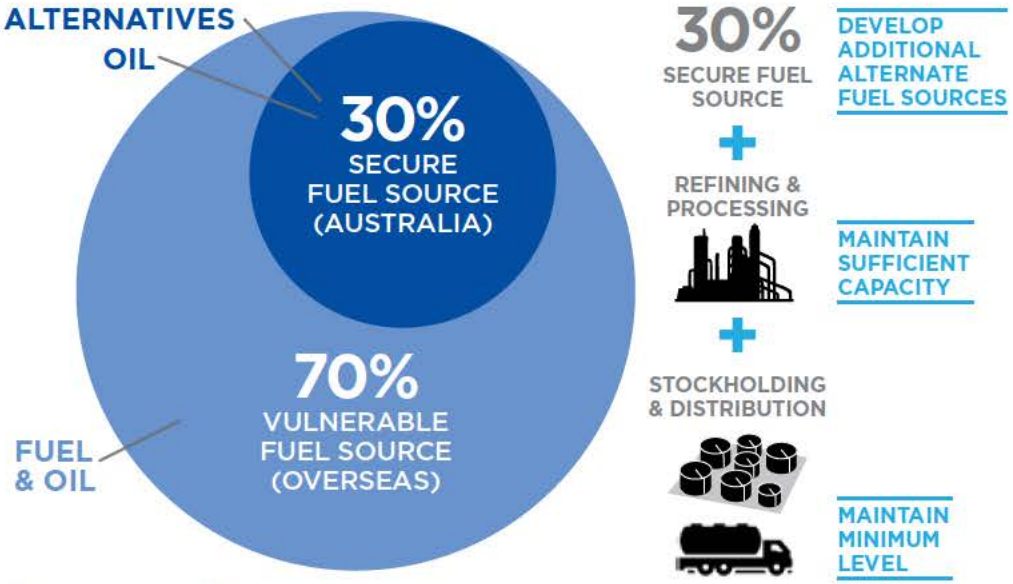


Figure 13: Example 30% secure fuel supply

The 30% could, for example, comprise 10% from Australian-sourced oil and 20% from Australian-sourced alternative fuels. These alternative fuels could include:

- Biofuels;
- Gas (LPG/LNG[39]/CNG);
- Gas-to-liquid from conventional and non-conventional sources;
- Coal-to-liquid fuels (in the longer-term); and
- We could also support the increased use of electric transport options.

While this approach sounds relatively straightforward, it would not be easy to achieve. A number of challenges would need to be addressed. These include:

- **Affordability of secure alternative liquid fuel sources:** The percentage of alternative liquid fuel sources would need to increase over time. However, there are currently issues of viability for many of these sources in the Australian market from either a cost or an environmental perspective.
- **Lack of feedstock:** The Jamison report estimated that biofuels could meet 10% of our liquid fuel needs by 2030.[40] However, a lack of affordable feedstock for large scale production of biofuels could be a limiting factor, particularly where farmers obtain higher financial returns for food crops.
- **High gas prices:** High regional gas prices are forecast to drive up domestic gas prices significantly in the next few years.[41] Without market intervention such as domestic gas supply reservation, gas-sourced liquid fuels may not be a financially viable alternative fuels source for Australia. This is a policy tightrope that must be walked with great caution.[42] The Jamison report estimated that 10% of our liquid fuel needs could have been met by gas-to-liquid sourced liquid fuels by 2030 had past Governments taken action in 2011.[43]
- **Slow LPG vehicle uptake:** LPG fuels could meet a greater percentage of transport liquid fuel demands; the Jamison report estimated that LPG could satisfy 7% of our liquid fuel needs by 2020.[44] However, the uptake of LPG vehicles has been slow due to poor consumer perceptions. The planned increase of the LPG excise by 2014 could further impact the uptake.[45]
- **Environmental issues:** Gas-to-liquid and coal-to-liquid fuels processes are in use internationally but there are concerns regarding water consumption and environmental emissions associated with some conversion processes. The CSIRO is researching an environmentally acceptable coal-to-liquid conversion process.[46]
- **Adjustment of market subsidies to enable commercially viable alternative fuels:** Businesses developing biofuels are concerned about excise levels and subsidies and their impacts on other liquid fuel types. For example, Virgin Australia has said that current production grants for renewable/bio-diesel may improve margins for that product and disincentivise biojet production. In other words, in an environment of uneven biofuel

39 LNG as an alternative transport fuel is also on the new Federal government's agenda. The Coalition's Policy for Resources and Energy (September, 2013) lists as one of its 14 points 'Support Development of Logistics Systems for LNG as a Transport Fuel'. www.nationals.org.au/Portals/0/00_Election_00/Coalition%20 2013%20Election%20Policy%20-%20Energy%20and%20 Resources%20-%20Final.pdf **40** www.mynrma.com.au/images/ About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, p 51. **41** This is in contrast to the gas markets in the United States, where Government policies (and existing infrastructure) have resulted in a domestic gas price that is currently 25% of some Asian markets. **42** The risk of market controls is that they may prevent international investment in the gas production infrastructure, which in turn could lead to gas price increases. **43** www.mynrma.com.au/images/About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, p51. **44** Ibid, pp36-37. **45** Ibid, pp50-51. **46** If such a process were feasible, Australia's extensive coal resources would make coal-to-liquids an attractive alternative fuel option in the longer term but an unlikely candidate in the next decade.

subsidies, producers will utilise available feedstocks for bio-diesel fuel production that has higher product margins because of existing production grants.[47]

» **Availability of adequate refining/ processing capacity in Australia:** As is the case with conventional oil refining, the production of biofuels (e.g. synthetic aviation fuel) depends on a refining or processing capacity of some sort.[48]

» **Australian production costs:** A common view is that the growth in cost of production in Australia has made our industry non-competitive in this region. Our production costs and productivity will need to be addressed as an essential part of a national liquid fuel security program. To date we have seen much blame apportionment but little concrete action.

» **Adequacy of our supply infrastructure:** The lack of consumer delivery infrastructure for non oil based fuels (e.g. electric vehicle charging points) severely limits the adoption of such transport modes. These forms of transport could make a significant contribution to reducing our demand for oil and increasing our energy security. The Jamison report concluded that using electric vehicles based on renewable energy could result in a 12% reduction in liquid fuels demand by 2030.[49]

» **Skills shortages:** According to industry body Engineers Australia,[50] future demands for infrastructure to support the import, refining and distribution of liquid fuels highlights a growing concern related to the lack of sufficient numbers of engineers graduating from Australian universities to meet the growing skills demand. With projected engineer graduation rates of less than 50% of market demand, Australia's dependence on imported skilled workers will increase. This is a national vulnerability that extends well beyond the issue of the infrastructure needed for liquid fuel security.

» **No stockholding policy:** While the issue of stockholding is prominent in any debate on liquid fuel security, in reality it is only a part contributor. Current analysis appears to be wholly focused on achieving IEA mandated stockholding level obligations, bearing in mind that Australia is the only IEA member country that does not meet these obligations. Unfortunately, merely meeting our IEA obligations will not address the optimum storage levels that we need.[51] Australia exports a significant amount of oil that cannot be processed in our refineries as they are currently configured. This 'improves' our IEA stockholding position but does nothing to assist our domestic liquid fuel security position. A stockholding policy should mandate stockholdings that are tailored to location and potential demand and should be accompanied by a mandated stockholding reporting regime.

What does this mean for Australians?

There is a way to address our liquid fuel security without being extreme. We don't need to keep everything as it is or return it to what it used to be. We need to be sensible and balance economic reality with our security needs.

A small amount of Government intervention could be the best compromise between market forces and market control. Without the issues being discussed and the options analysed, we are likely to have our lives shaped by commercial forces largely out of our control. There is an opportunity here for the creation of a new industry in Australia based on production of oil alternatives.

47 http://ussc.edu.au/ussc/assets/media/docs/other/130226_LCF_Boyd.pdf, p9. **48** http://ussc.edu.au/ussc/assets/media/docs/other/130226_LCF_VanEwijk.pdf, p6.

49 www.mynrma.com.au/images/About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, p33.

50 Engineers Australia is the national forum for the advancement of engineering and the professional development of its members.

51 IEA stockholding is calculated by dividing the amount of commercial fuel and oil stocks in the country by the average daily amount of imports minus the average daily rate of oil exports.

Initiating a liquid fuel security plan

As with most difficult problems in life, if you get the right people together and they cooperate, solutions can often be found. There is already relevant research, analysis and expertise in Australia, but much of it is in Government, industry and academic silos that do not coordinate or cooperate with each other.

A potential mechanism for broadening the necessary discussion and debate is the planned 2014 National Energy Security Assessment (NESA) and the 2014 Energy White Paper. The last NESA was conducted in 2011 as a precursor to the 2012 Energy White Paper.

This approach will only work if we examine the shortcomings of the last NESA and Energy White Paper and make sure we address them in the next versions.

The 2011 NESA

This assessment considered the key influences on the supply of energy in Australia in the short, medium and longer terms.

The people we consulted when writing this report concluded that the 2011 NESA did not adequately address the concerns of a number of agencies outside the then Department of Resources Energy and Tourism and that the Department did not employ a sufficiently diverse set of scenarios to conduct the risk analysis.

Given these concerns regarding the lack of depth of past NESAs, a greater degree of involvement and ownership of the NESA process by agencies experienced in national security risk analysis is warranted.

The 2014 NESA

SCOPE: To assess the risks to our oil and liquid fuel supply chains, the 2014 NESA should include a broader risk assessment of Australia's liquid fuel supply vulnerabilities. It should encompass the whole of the liquid fuel supply chain, including import and refining infrastructure and critical supply linkages, both in the public and private sectors. It should examine the supply chain risks in peacetime and in conflict scenarios. It should also be accompanied by appropriate risk mitigation strategies that are incorporated in an update to the Energy White Paper.

PARTICIPANTS: If the 2014 NESA is to be more comprehensive than the last, it needs to be developed cooperatively by a wide range of Government agencies in addition to the Department of Industry. These should include

IT IS CRITICAL TO REMEMBER THAT ANY CHANGES WE MAKE TO OUR ENERGY MIX IN ORDER TO IMPROVE OUR FUEL SECURITY SHOULD NOT BE AT THE EXPENSE OF CLIMATE OR ENVIRONMENT FACTORS. OTHERWISE WE WILL MERELY SUBSTITUTE ONE POTENTIAL CRISIS FOR ANOTHER.

the Attorney-General's Department, Department of Transport, Department of Agriculture Food and Fisheries and Department of Defence. The process should also involve greater participation by business and consumer groups.

OWNERSHIP/TIMING: Ideally, the next NESA will not be the product of the Department of Industry but a product of the Department of the Prime Minister and Cabinet. This would ensure greater integration of expertise across Government and industry and raise the profile of the whole enterprise. A broader-based NESA analysis should provide comprehensive input into the White Paper and support the development of strategies to address liquid fuel security concerns such as those outlined in this report. However, the NESA is unlikely to be completed before the planned publication of the next Energy White Paper in September 2014. This inversion of the NESA and the White Paper timing should result in a White Paper update in 2015, if warranted by the NESA findings.

The 2014 Energy White Paper

Formulating a least cost approach to liquid fuel security by considering a balanced portfolio of demand-side and supply-side responses is a task that could sensibly be addressed in the 2014 Energy White Paper.[52]

The White Paper should also incorporate the 2010 Jamison report proposal for a National Transport Fuels Strategy, which recommended addressing the following key issues:[53]

- Increased liquid fuel demand related to our growing population, economic growth and community aspirations;
- Diminishing national oil production;
- Global competition for oil;
- Potentially higher prices in the face of diminishing resources and rising international demand;
- Balance of trade and payments;
- Low probability but very high impact threats to security of supply;
- Public health issues related to vehicle emissions;
- Limitations to greenhouse gas emissions; and
- Co-benefits and possible conflicts between the future of the wider energy sector and other industries in Australia.

Five years after the first Jamison report was published, the recommendations are as valid and urgent as at the time of publication. In 2014, the lack of progress in the areas highlighted is concerning.

A climate and environment caution

The use of alternative fuels and renewable energy sources should result in significant environmental benefits. Conversely, a shift to non-conventional oil and gas, utilising controversial extraction methods such as fracking, is the subject of much debate. While this report does not address the environmental and climate aspects of the liquid fuel security issue, it is critical to remember that any changes we make to our energy mix in order to improve our liquid fuel security should not be at the expense of climate or environment factors.

Otherwise we will merely substitute one potential crisis for another.

52 The Department of Industry has announced that the next Energy White Paper should be published in September 2014.

53 www.mynrma.com.au/images/About-PDF/Jamison-Group-Fuelling-Future-Passenger-Vehicle-Use-in-Australia-February2010.pdf, p68.

Conclusion

This report has examined four topics:

1. Australia's worsening liquid fuel security problem: Our dependency on imported liquid fuel and oil to fulfil our transport needs has grown from 60% in 2000 to over 90% now. By 2030, it could be 100% and we don't have a plan to stop this happening. If a scenario such as a confrontation in the Asia-Pacific region were to eventuate, our liquid fuel supplies could be severely constrained and there is no viable contingency plan for making sure we can get supplies for essential services and our military forces. We should expect clear assurances from our Government that we have sufficient Australian-controlled sources of liquid fuel to support our essential needs in the event of overseas supply interruptions. Given the lack of publicly owned liquid fuel stocks, the lack of reporting on industry stocks and the very limited public analysis of supply chain risks, it is difficult to see how our Government could currently provide us with that assurance.

2. Why no action has been taken to date: The liquid fuel security problem is dauntingly complex and there has been an over-reliance by past Governments on market forces to address liquid fuel supply issues. There is also a low level of community awareness due to a lack of information, and significant pressure from large business groups to prevent Government intervention in the marketplace. While markets learn from failure, when it comes to our national liquid fuel security we need to anticipate risks and, where necessary, lead the markets to pre-adapt and improve our resilience.

3. What we can do about it: The good news is that we can do something to improve our liquid fuel security. We can move beyond a 'just in time' supply chain to a 'just in case' supply chain. We don't need to accept our current trajectory, nor do we need to aspire to return to our position of 15 years ago. We need to be sensible and balance economic reality with our security needs. A small measure of Government intervention could be the best compromise between market forces and market control. Such actions will require broad based public support as they will need some investment and may have a small impact on the cost of liquid fuel for the consumer. Australians will need to decide if the risks we may face in the future are worth the investment now in improving our national resilience.

4. Initiating a liquid fuel security plan: Action is possible but it will require the involvement of the Australian public in an issue that is vitally important to all of us. With community support we can prompt political action to address emerging liquid fuel security concerns. Much of the analysis necessary to address the risks has already been conducted and the right expertise exists across Government, business and in academia. However, the coordination and cooperation across these areas of expertise appears to be lacking. One possible mechanism for this broadened discussion and debate is the 2014 National Energy Security Assessment and the next Energy White Paper. Given the lack of depth of past National Energy Security Assessments, a greater degree of involvement and ownership of the assessment process by agencies experienced in national security risk analysis as well as business and consumer groups is warranted.

Without discussing these issues and analysing the options, we are likely to have our lives shaped by commercial forces largely out of our control. It is not too late for us to ensure the debate and discussion take place.

Recommendations

In order to assess and address the risks to our liquid fuel supplies:

The 2014 National Energy Security Assessment (NESA) should:

- Include a broader risk assessment of Australia's liquid fuel supply vulnerabilities that encompasses the whole of the liquid fuel supply chain, including import and refining infrastructure and critical supply linkages, in the public and the private sectors, as well as the demand for liquid fuels;
- Examine the supply chain risks in both peacetime and conflict scenarios; this examination should be accompanied by the development of appropriate risk mitigation strategies that are incorporated in an update to the Energy White Paper in 2015;
- Be developed cooperatively by a wide range of Government agencies in addition to the Department of Industry, including the Attorney-General's Department, Department of Transport, Department of Agriculture Food and Fisheries and Department of Defence;
- Involve greater participation by business and consumer groups; and
- Be led by the Department of the Prime Minister and Cabinet to ensure greater integration of expertise across Government and industry and a raised profile for the topic.

The 2014 Energy White Paper should:

- Contain strategies to address emerging fuel security concerns such as those outlined in this report;
- Provide detail to the Australian public as to how the Government will ensure we have sufficient Australian-controlled sources of liquid fuel to support our military forces and essential services in the event of overseas supply interruptions;
- Deliver a National Transport Fuels Strategy as recommended in the 2010 Jamison report; and
- Be reviewed in 2015 to cater for any significant changes in the energy security assessment that are identified in the 2014 NESA process.

ACRONYMS

AIP – Australian Institute of Petroleum

CNG – Compressed Natural Gas

CSIRO – Commonwealth Scientific and Industrial Research Organisation

IEA – International Energy Agency

LFVA – Liquid Fuel Vulnerability Assessment

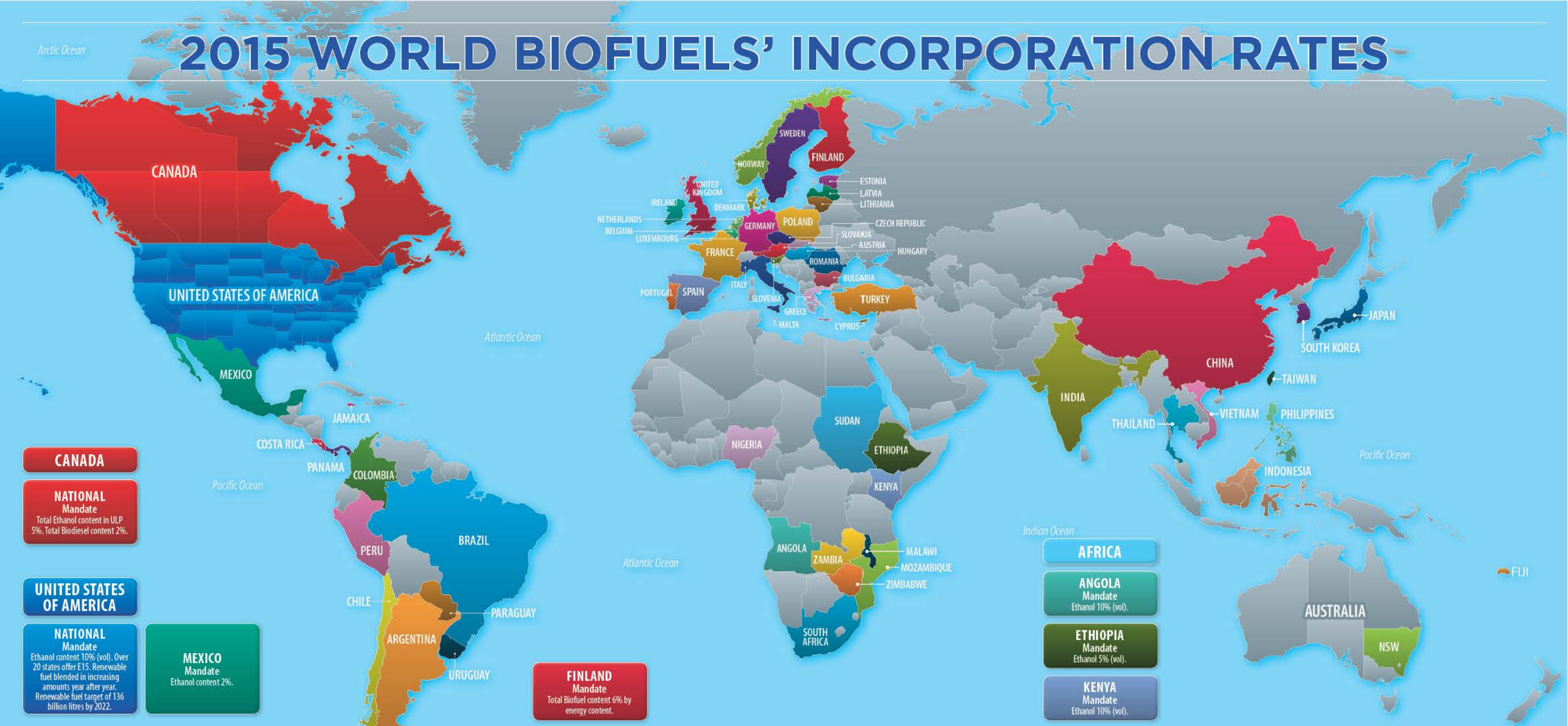
LNG – Liquid Natural Gas

LPG – Liquid Petroleum Gas

NESA – National Energy Security Assessment

NRMA – National Roads and Motorists' Association

2015 WORLD BIOFUELS' INCORPORATION RATES



CANADA

NATIONAL
Mandate
Total Ethanol content in ULP 5%. Total Biodiesel content 2%.

UNITED STATES OF AMERICA

NATIONAL
Mandate
Ethanol content 10% (vol). Over 20 states offer E15. Renewable fuel blended in increasing amounts year after year. Renewable fuel target of 136 billion litres by 2022.

MEXICO
Mandate
Ethanol content 2%.

SOUTH AMERICA

ARGENTINA
Mandate
Ethanol 10% content (vol).

BRAZIL
Mandate
Ethanol content 27% (vol), Biodiesel 7% (vol).

CHILE
Mandate
E5 Ethanol and B5 Biodiesel.

COLUMBIA
Mandate
Ethanol content 10%.

COSTA RICA
Mandate
Ethanol content 7% (vol) and B20 Biodiesel.

JAMAICA
Mandate
Ethanol content 10% (vol).

PANAMA
Mandate
Ethanol content 5% (vol).

PARAGUAY
Mandate
Ethanol content 24% (vol).

PERU
Mandate
Ethanol content 8% (vol), Biodiesel 5% (vol).

URUGUAY
Mandate
Ethanol for 5% (vol), Biodiesel 2% (vol).

EUROPE

AUSTRIA
Mandate
Total Biofuel content 5.75% by energy content (3.4% for Ethanol content).

BELGIUM
Mandate
10% for Ethanol (vol).

BULGARIA
Mandate
Biofuels market share of 5.75% by energy content.

CYPRUS
Mandate
Total biofuel content 2.5% by energy content.

CZECH REPUBLIC
Mandate
Total Biofuels market share 5.75% based on energy content. Ethanol 4.1% (vol). Biodiesel 6% (vol).

DENMARK
Mandate
Total Biofuel content of 5.75% based on energy content.

ESTONIA
Mandate
Biofuels market share of 5.75% by energy content.

FINLAND
Mandate
Total Biofuel content 6% by energy content.

FRANCE
Mandate
7% biofuels market share by energy content. 7% for Ethanol (vol).

GERMANY
Mandate
Biofuels quota 6.25% increasing by 0.25% annually until 2015. Minimum obligation Ethanol 2.8% by energy content. Biodiesel 4.4% by energy content.

GREECE
Mandate
Total Biofuel content 5.75% by energy content.

HUNGARY
Mandate
Total Biofuel content 5.75% by energy content. Min 4.4% for Ethanol (vol).

ITALY
Mandate
Total Biofuel content 5% based on energy content.

IRELAND
Mandate
Total Biofuel content 6% based on energy content.

LATVIA
Mandate
Total Biofuel content 5.75% by energy content. 5% for Ethanol (vol).

LITHUANIA
Mandate
Biofuels 5.75% (vol).

LUXEMBOURG
Mandate
Biofuel content 2%.

MALTA
Mandate
Total Biofuel content 1.25% by energy content.

NETHERLANDS
Mandate
Min 3.5% for Ethanol (vol).

NORWAY
Mandate
Ethanol content 5% (vol).

POLAND
Mandate
Total Biofuel content 7.1% by energy content.

PORTUGAL
Mandate
Biodiesel content 6.75%, 5.5% for Ethanol (vol).

ROMANIA
Mandate
Total Biofuel 5% (vol). 6% for Ethanol (vol).

SLOVAKIA
Mandate
Total Biofuel content 5.75% by energy content. 3.2% for Ethanol (vol).

SLOVENIA
Mandate
Total Biofuel content 6.5%.

SPAIN
Mandate
Biodiesel 4.1% by energy and 3.9 for Ethanol.

SWEDEN
Mandate
Biodiesel 5% (vol) and Ethanol 5% (vol).

TURKEY
Mandate
2% Ethanol content by January 1, 2013. Increasing to 3% in 2014.

UNITED KINGDOM
Mandate
Biofuels 4.75% (vol).

AFRICA

ANGOLA
Mandate
Ethanol 10% (vol).

ETHIOPIA
Mandate
Ethanol 5% (vol).

KENYA
Mandate
Ethanol 10% (vol).

MALAWI
Mandate
Ethanol 10% (vol).

MOZAMBIQUE
Mandate
Ethanol 10% (vol).

NIGERIA
Mandate
Ethanol blend of 5-10%.

SOUTH AFRICA
Mandate
Ethanol 10% (vol).

SUDAN
Mandate
Ethanol 5% (vol).

ZAMBIA
Mandate
Ethanol 10%, Biodiesel 5% (vol).

ZIMBABWE
Mandate
Ethanol 10% (vol).

ASIA

CHINA
Mandate
10% Ethanol (vol) in nine provinces only.

FIJI
Mandate
Ethanol blend of 5-10%.

INDIA
Mandate
Ethanol mandate 5% content.

INDONESIA
Mandate
Ethanol 3% (vol), Biodiesel 10% (vol).

JAPAN
Mandate
3% Bioethanol mandate, currently reviewing option to increase to 10%.

PHILIPPINES
Mandate
Minimum Ethanol content of 10% total volume. E10 is mandated.

SOUTH KOREA
Mandate
Biodiesel 2% volume.

TAIWAN
Mandate
B1 Biodiesel mandate.

THAILAND
Mandate
Currently 5% (vol). Ethanol will be a compulsory 20% (vol) by 2016.

VIETNAM
Mandate
E5 Ethanol blending mandate.

AUSTRALIA

NEW SOUTH WALES
Mandate
6% ethanol content (vol).