

Australia's petroleum supply and its implications for the ADF

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The primary cause of our failure was a shortage of fuel.

General Paul von Kleist, Commander Panzer Forces in Russia (Liddell Hart, 1947)

Introduction

Between 2003 and 2015, Australia suffered a 50 per cent reduction in its domestic crude oil refining capacity, largely because of the closure of refineries at Port Stanvac (South Australia) in 2003, Clyde (NSW) in 2012, Kurnell (NSW) in 2014, and Bulwer Island (Queensland) in 2015 (Byrnes *et al.*, 2013). If remedial measures are not undertaken, it is projected that by 2030 Australia will have lost all its refining capability (Wraith, 2013).

Compounding this situation is that Australia has limited oil reserves and has become nearly

entirely reliant on imported oil for its aviation fuel, marine diesel, gasoline and motor diesel (Dahl, 2015; Wraith, 2013). This overdependence on imports, and the fact that Australia obtains fuel for its military functions from a sole supplier (Caltext), potentially puts ADF operations at risk.

This article examines Australia's energy security, particularly in relation to petroleum supply, and its impact on the ADF. It addresses the key issues relating to Australia's increasing dependence on the import of refined petroleum, such as fluctuations in global fuel prices and existing fuel sources and infrastructure. It also evaluates Australia's refining capacity, existing storage capacity, and sources of refined petroleum and crude oil. Finally, it assesses the potential impact of terrorist activities, instability in source countries, and challenges associated with maritime supply lines, and their potential effects on the ADF.



Changes in global fuel prices

Even though Australia's heavy reliance on imported fuel is not viewed with any particular concern at present, obtaining it from limited sources may turn out to be a problem in the future, especially in the event of reduced availability and continuing high prices (Epstein and Buhovac, 2014). Unpredictable and volatile market forces may also affect the volume of refined petroleum available to the ADF and the country as a whole. Therefore, when developing a national energy security strategy, it is essential that projections be made up to 20 years into the future.

Notwithstanding concerns regarding the surety of supply from overseas sources, the reality is that imported petroleum is cheaper than refining crude oil in Australia (Andrews-Speed and Dannerneuther, 2014). Australia currently imports most of its refined supplies from Singapore, which is relatively close to Australia and politically stable, providing a 14-day supply line that is unlikely to be easily disrupted. Even if the major supply line into Singapore from the Middle East were to be disrupted, Singapore has broadened its supply sources and increased its storage capacity, further enhancing the prospects of an adequate distribution of refined petroleum to meet the ADF's fuel requirements (Wraith, 2013).

However, even though Australia currently imports sufficient quantities of fuel at considerably lower costs compared to domestic refining, this scenario might not always be so (Mauter *et al.*, 2014). In other words, even if adequate quantities can be obtained from sources such as Singapore, it is essential to have an appreciation of alternative sources, particularly when there is a surplus of supply and when prices are low. Moreover, it is vital to consider the implications of possible disruptions in supply as a result of the non-availability of oil tankers or disrupted maritime routes.

As mentioned, while Singapore is Australia's principal source of petroleum, it relies entirely on imports for its crude oil feedstock (Parker and Stewart, 2014). Additionally, despite substantial export quantities, it has relatively low total refining capacity, meaning it has minimum capacity to expand in response to a surge in demand. Contrarily, Japan and the Republic of Korea, for example, have lower production capacity

risk but higher export capacity risk, primarily because their distance from Australia is greater than that of Singapore.

According to a 2012 report into Australia's use of aviation fuel, significant quantities are obtained from domestic refineries using imported crude oil, while the rest is externally sourced, largely from Singapore (Kopp, 2012). This situation puts the country in a risky position should there be significant fluctuations in international oil prices (Belkin, Nichol and Woehrel, 2013). The ADF, which uses several thousand tonnes of fuel every day, would obviously be affected by continuing high prices, impacting its ability to conduct military operations.

Yet with its relatively small population and minimal oil reserves, Australia has very little influence on the price of oil, which often has fluctuated markedly over the space of a decade. For example, in the aftermath of the global financial crisis in 2007-08, oil prices fell to US\$40 per barrel. However, by 2011, it had increased to over US\$120 per barrel. In 2014, the price of Brent crude—a blend of oils from the North Sea, particularly suited for making gasoline—was around US\$115 per barrel. However, few had predicted the price collapse that would take place later that year, when stocks of unsold oil grew steadily and prices in Asia spiralled downwards to around US\$29 per barrel in early 2016 (Mullhall, 2016). Today, the price of Brent crude oil is around US\$60.

These examples are significant, given Australia's heavy reliance on Singapore, Japan and the Republic of Korea for refined petroleum products (Cleaver, 2013). Moreover, small-use countries such as Australia are competing in the same markets with the likes of China, India and Indonesia. Hence, price rises as a result of an increase in demand—which have occurred and been managed successfully in the past—will likely become more challenging as these countries become more industrialised and urbanised, requiring ever-larger proportions of the available resources.

Nevertheless, Australia can and should develop risk management strategies for its refined petroleum imports through constant assessment of the risks associated with its present sources and the identification of possible alternative

sources. One obvious strategy is to maintain essential levels of domestic refining capacity to act as a strategic reserve. In addition, there is a need to build and retain existing infrastructure to stock more fuel, which would mitigate the threat of disruptions to supply and ameliorate future price increases.

It is also the case that the petroleum industry worldwide is experiencing a number of changes, some of which provide opportunities for Australia to enhance its strategic energy security, such as through a broadening of sources. However, this creates constraints and challenges that must be understood and adjusted to, such as surging demands for a particular refined petroleum product within a particular region, and sudden changes in the global refining sector output (Byrnes *et al.*, 2013).

In summary, despite Australia's over-reliance on imported refined petroleum, it is possible to mitigate or treat the known risks by ensuring the employment of sensible infrastructure enhancement and conducting risk management of the sourcing and transportation options. Australia and the ADF can also play an important role in contributing to region-wide efforts to protect the security of the supply line of petroleum, both into source countries and between them and Australia.

Overdependence on imported fuel

There has been considerable discussion over the years as to whether Australia's overdependence on overseas fuel supply is an issue that can be successfully moderated by the changing aspects, extensiveness and free-flowing nature of global petroleum markets. There is, however, a consensual view that Australia needs to maintain essential levels of domestic refining capacity to act as a strategic contingency in case of disruptions overseas which, among other impacts, could limit the availability of fuel for military operations (Mulhall, 2016).

It would seem prudent, therefore, that the government should take steps to prevent the curtailment of Australia's domestic refining capacity. Retaining the operating capacity of the

remaining refineries would ensure improved supply resilience on both the east and west coasts of Australia (Australian Army, 2014). In particular, it would ensure that the remaining capacity is capable of crude oil refining and providing sufficient levels of diesel, petrol, jet and other fuels to meet the requirements of the ADF and other essential services.

However, some commentators have a different take (Mulhall, 2016). They argue that even if the authorities provide the required support to retain Australia's domestic refining capacity, it is possible that the refineries will still be significantly impacted by commercial pressures and ultimately compelled to close. They contend that from a commercial point of view, the domestic supply of petroleum in Australia has experienced increasingly minimal profit margins, which has forced the closure of the refineries (Griffin and Teece, 2016).

Commentators also make the point that even though the government might be willing to increase storage capacity and provide financial support to refining capabilities, it cannot—in a free market economy—force non-state Australian companies to keep refineries operating, let alone those owned by multinationals. Seeking external supplies of refined petroleum is therefore seen as a necessary step to ensure sufficient national energy security for ADF and the nation.

There has been some discussion in recent years on the use of alternative fuels, such as bio fuels (produced through biological processes). This and other potential fuel types are obviously worthy of urgent consideration. Research into the development of synthetic fuels, for example, is being conducted in Queensland through the Linc Energy program, in conjunction with the US developer Syntroleum (Belkin, Nichol and Woehrel, 2013). However, it seems unlikely that these fuel sources, or alternatives such as electric or hydrogen-fuel cell vehicles, will become viable options for the entire ADF in the short to medium term.

Accordingly, the most practical option to ensure the nation's fuel supply security and resilience would seem to be through improving Australia's capacity to store additional stock (Andrew, 2013). Although Australia has geographically dispersed import terminals, its storage capacity

is inadequate to provide a minimum requirement of 90-days' stock, as recommended by the International Energy Agency. Furthermore, the areas of highest fuel requirements are typically located at a considerable distance from existing refineries and import terminals.

One option would be to store crude oil and/or refined product at some of the refineries that have been decommissioned, as they typically still retain considerable tank storage capacity. The storage capacity at current import terminals could also be increased by the installation of additional tanks. A number of new import terminals have also been constructed in recent years, which substantially enhance Australia's storage capacity.

For example, a new import terminal opened in Mackay in 2014, with a storage capacity of 56 megalitres. The facility was specifically developed to supply the expanding fuel requirements of the Queensland mining industry but has also contributed considerably to providing a solution to the decline in Australia's domestic refining capacity. However, while its refining capability has reduced the volume of imported diesel fuel, its output cannot be sustained for more than a few days without the importation of stock.

Another facility is the 85 megalitres fuel storage terminal at Pelican Point near Port Adelaide in South Australia, which also opened in 2014. It was designed to allow for two major future expansion phases, with a potential capacity to store up to 135 megalitres (Beaumont, 2013). A diesel fuel import terminal was also opened at Port Bonython in South Australia (near Whyalla) in 2016, with a capacity of 81 megalitres (Andrew, 2013). Other facilities recently opened have been three chemical and fuel storage sites, built by GrainCorp, in Queensland, Western Australia and New South Wales, with a total capacity of 65 megalitres.

These examples are encouraging developments, and suggest that commercial companies, at least, are responding to the decline in Australia's refining capacity by increasing both the number and capacity of import terminals. However, Australia arguably still needs to enhance its storage capacity to the extent that it becomes less dependent on threats to its supply line from Singapore and other East Asian countries.

Terrorism and instability in the source countries

There have been a number of instances in recent history of fuel tankers being targeted in warfare and by terrorists or criminals. During the Iran-Iraq war between 1980 and 1988, for example, both sides attacked the shipping of the other, including using Exocet missiles against tankers, in what became known as the 'tanker war' (Cribb, 2013). From about 2000 onwards, criminal gangs operating off the Somali coast also interdicted numerous tankers plying from the Persian Gulf, typically attempting to hold their crew and cargo for ransom, until anti-piracy operations—organised by the US and European Union—effectively quelled their activities by around 2012 (Samimi and Bagheri, 2013).

Another example occurred in October 2002, when a small boat packed with explosives was used by al Qaeda-backed insurgents to ram the French supertanker *Limburg*, with a capacity of 300,000 tonnes of crude oil, off the Yemeni coast, resulting in severe damage to the ship and an environmentally damaging oil spill (Dryzek, 2013). Shore-based oil facilities have also been attacked, either in warfare or by terrorist groups. Examples are the attacks against the oil terminal at Basra in Iraq in 2002 by suicide bombers in small boats, followed by a similar attack in 2004, albeit both were relatively ineffective, although they resulted in a number of deaths.

In a similar though less likely scenario, it is possible that individual tankers on Australia's line of supply from Southeast Asia could be threatened and attacked by terrorists or pirates. However, it is unlikely that the supply line between Southeast Asia and Australia—or indeed between the Middle East and East Asia—could be seriously interdicted, other than by the improbable outbreak of conflict (Heidenkamp, Louth and Taylor, 2013).

Similarly, while it is possible that shore-based facilities in Singapore or elsewhere in Southeast Asia or East Asia could be attacked by terrorists, the risk seems considerably lower than in the Middle East. However, even there, which is the main source of Singapore's imports, there have been no serious disruptions to oil-related

facilities since 2004, other than a failed al Qaeda attack on the Abqaiq oil facility in Saudi Arabia in 2006, and the bombing of the pipeline between Saudi Arabia and Bahrain in November 2017, neither of which impacted exports to East Asia.

Nevertheless, it is evident that Australia needs to constantly evaluate potential threats to its petroleum imports (Murphy, 2013). Any serious interruptions to supply would obviously impact the ADF and its ability to sustain its air, sea and land operations (Small *et al.*, 2014). This is a strategic imperative, therefore, that needs to be addressed on a close and continuing basis.

Conclusion

Since fossil fuels remain the primary requirement in the civil transportation system and the means by which the ADF operates, Australia has to be reliant on the resilience and security of its petroleum resource. It is generally agreed that Australia overly relies on imported petroleum for its military operations, and that Australia's current fuel-holding capacity is inadequate. There are also a number of potential threats to Australia's fuel supply that need to be recognised and addressed, including the potential loss of Australia's remaining refineries.

A number of other factors, many of them outside the control of Australia and the ADF, such as the global volatility of fuel prices, an upsurge in terrorist activities, and internal conflicts in source countries, are additional energy security concerns. The reality is that Australia's petroleum supply chain is complex and lengthy, and its oil reserves are limited. The ADF's reliance on this supply and its ability to sustain enduring operations seem reasonably assured but should not be taken for granted, either by the ADF or Australia more broadly.

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Notes

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