Running on empty?
A case study of fuel security for civil and military air operations at Darwin Airport

John Coyne, Tony McCormack and Hal Crichton-Standish

May 2020
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EXECUTIVE SUMMARY

The question of fuel supply and storage in Australia’s north is central to Australia’s nation-building endeavours. However, despite agreement from all stakeholders, little has been done to invest in and develop the north to strengthen our national capacity.

Australia is one of the only nations in the developed world with no mandated minimum reserves of liquid fuel for an emergency, relying instead on economical but risky just-in-time delivery for fuel. While that approach works well in peacetime, and undoubtedly helps keep costs down, it has left Australia’s supply chains at greater risk in an emergency.

On 22 April, Energy Minister Angus Taylor announced that the government would establish a national oil reserve. Australia is spending $94 million to buy oil at the current low price (at US$20 per barrel, that’s roughly 30 million barrels or 3 days of national supply at the current usage rate). It’s a sound economic decision, given the dramatic fall in global oil prices in recent months.

However, the proposal has exposed one of the problems with Australia’s national liquid-fuel supply chains: a lack of bulk storage capacity.

The government has made a deal with the US to store Australian government–owned crude oil in the US Strategic Petroleum Reserve, which is one of the world’s most cost-effective long-term oil-storage facilities.

Australia will be able to store its new national crude oil reserve in the US for an initial period of 10 years. Although the oil will be sitting half a world away, it will count towards our International Energy Agency 90-day stockpiling commitment—a commitment we’ve struggled to meet since 2012.

Private industry, for the most part, believes that this is sufficient to maintain business as usual. The north of Australia lacks a critical mass of population or demand for fuel that would make further investment in northern fuel-security infrastructure commercially viable.

However, problems with the status quo become apparent when we consider how military exercises and other activities, such as the search for Malaysia Airlines Flight MH370, have threatened fuel shortages. Fuel supply-chain disruption in other global crises, whether manmade or natural, seems less remote in the light of the current global Covid-19 pandemic.

Australia’s Defence organisation, for its part, has relied heavily on the capacity of the private sector to scale up to meet short-notice demands rapidly. Increasingly, the pursuit of reduced costs through further efficiencies is cutting spare capacity across a range of sectors, including the jet-fuel market. Probably more concerning is the possibility of deep and extensive supply-chain disruption or increased global demand, which could rapidly reduce the private sector’s capacity to meet Defence requirements, but the immediate impact of the Covid-19 crisis on spare capacity shouldn’t be overlooked. Airlines could become even more cost conscious as a result of Covid-19 and so less willing to hold stocks. While there’s some argument here that this could mean that current capacity becomes more available for Defence, it assumes that the market will continue to hold the same quantity of bulk liquid fuels as
before the pandemic. That would only occur if either oil companies or airlines accept responsibility for maintaining—together with testing and treating—liquid fuel held in storage. Given that both industries are under increased financial pressure as a result of the pandemic’s impact on economies, that seems unlikely.

It’s in this context that a consortium led by the Airport Development Group has proposed the establishment and provision of long-term fuel supply and storage capabilities in Darwin. The development includes an aviation fuel pipeline directly connecting RAAF Base Darwin and Darwin International Airport to import facilities and additional fuel storage facilities at the East Arm port precinct. The proposed fuel storage facility would be capable of holding 60 megalitres of diversified fuel and be able to expand to hold 94 megalitres.

This proposal would require capital investment. The Northern Territory and Australian governments, as well as our US ally, support the idea of an investment in improved jet-fuel security, but are unwilling to pay for that security in either infrastructure investment or increased fuel costs. Defence wants jet-fuel resilience, but also appears to be unwilling to pay for it, especially if that involves spending more on fuel or on infrastructure that it doesn’t own. In the civil aviation sector, which is under stress from the Covid-19 pandemic, there doesn’t appear to be much willingness to pay more for fuel or to absorb any of the costs of this project. For the oil companies, the northern Australian jet-fuel market, commercial and military, is too small to make capital investment attractive. The market’s unwilling to absorb additional fuel costs: understandably, market actors are always reluctant to have their profit margins reduced.

Regardless, jet-fuel security in the north remains perilously at risk, and surety of supply seems a higher priority in the world we’re now living in than past policy and investment settings have recognised.

The result is that all stakeholders must revisit their assumptions about jet-fuel resilience in Australia’s north and make investing across the spectrum in liquid-fuel security a national priority.

On 1 May, Angus Taylor announced the government’s three-part fuel security package.

The first part of the package is a restatement of the government’s 22 April commitment to establish a government-owned oil reserve for domestic fuel security. The second is a commitment to work with the private sector to develop options to increase local storage as quickly as possible. The third involves the government considering a temporary change to fuel standards.

In implementing its fuel package, the government needs to acknowledge that it’s not starting from a zero base. There are also several projects that, given the renewed focus on energy security, could soon break ground.
ASPI’s stable of defence and national security subject-matter experts have written extensively on the impact of the new era of great-power competition. All have highlighted the challenges of an increasingly unpredictable strategic environment. In the light of those changes, it seems clear that northern Australia has become vital political, military and economic terrain.

Most Australian strategists, policymakers and governments are in fierce agreement on the strategic importance of the north. Despite that, they can’t seem to articulate a coherent long-term plan to develop the capacity of the north or to devise or implement a sustained investment strategy.

Most of the future ADF can sensibly be based and maintained in the south. However, in defending Australia, its vital combat systems will deploy from and perhaps even fight in Australia’s north and northern approaches. Deployment from the south takes time and is reliant on the right key enabling functions being in place in northern Australia. Australia’s long national defence supply chains haven’t been truly tested since the 1940s. At worst, they’re perilously vulnerable to kinetic and non-kinetic disruption.

In a somewhat ironic twist, the US, Japan and Singapore seem to have had much more success in clearly defining the strategic importance of Australia’s north to their national interests. The US Marine Corps’ annual deployment of a rotational force, Japan’s massive investment in energy resilience through the INPEX liquefied natural gas plant near Darwin and Singapore’s Sun Cable’s proposal to build a $20 billion solar farm to supply power to Singapore illustrate this point.1

The drivers for change in our strategic perspective extend beyond siloed national security thinking. In an age when we’re now responding to the vulnerability of global supply chains that’s been glaringly exposed by the Covid-19 pandemic, and when we’re likely to experience increasing extreme weather events driven by climate change, northern Australia has become a critical front line for Australian security and for support to our regional partners.

Northern Australia has also become the front line for a range of domestic and border security issues ranging from drug smuggling to illegal fishing. The criticality of Darwin in responding to the Bali bombings, and more recently the use of Darwin in support of the evacuation of Australians from Wuhan in response to Covid-19, illustrate this point well.

Since the publication of ASPI’s 2019 report, Strong and free? The future security of Australia’s north, public discourse on the strategic importance of northern Australia has intensified.2 To date, the conversation has coalesced around two themes: the first comprises high-level declaratory statements committing, in words, to the strategic importance of the north; the second, discussions of force posture in northern Australia.

The Northern Territory Government probably welcomed this development, seeing it as an indicator of future investment and showing that the nation was catching up to an assessment that territory agencies and leaders had made for some time. But the discourse so far has stopped well short of what’s needed to ensure the development of northern Australia’s role in defence and national security. Australia needs increased clarity on defence and national security policy in the north to support the right investments in critical infrastructure and resilience.
For the foreseeable future, this discourse will ensure closer political scrutiny of any proposed force posture developments and ADF personnel numbers in Australia’s north. That scrutiny will no doubt rankle those strategists and policymakers who believe that the ADF ought to be based at and deployed from Australia’s southern bases. More than a few of those who contest the importance of strategic geography will be hoping that the current trend of strategic discourse on northern Australia will follow historical patterns, and quickly ebb in intensity.

While personnel numbers and capability mixes that are based in the north need reconsideration, the broader challenge for Australia’s government and Defence policymakers is to act to ensure that an economically and socially prosperous north exists and is capable of maintaining a scalable industry base for national security and defence. Defence is a part of this bigger concept about Australian national power in the north. Without this broader conceptual and practical planning, simply relying on assumptions that industry will be at the ready and capable of filling short-notice operational needs will produce underwhelming results. Knowing what we do, it’s wilful blindness at best.

The government’s Our north, our future: White Paper on developing northern Australia identified the need for greater public–private partnership in the development of Australia’s north. It established two major northern funding programs: the Northern Australia Infrastructure Facility (NAIF; $5 billion) and the Northern Territory Investment Fund ($200 million), but neither has delivered much. It’s clear that nation building in the north needs considerably more thought and commitment than it has received until recently. Unfortunately, the clock is ticking for getting that thinking right.

This report uses a case study of jet-fuel security at the Darwin International Airport to illustrate the many barriers and hurdles to nation building for national security in Australia’s north. Market forces and current Australian nation-building frameworks, including the NAIF, don’t deliver the support they promised for the development of critical infrastructure and national resilience, although Defence has, to date, met some of its critical infrastructure development requirements.

We first conceptualise the problem by considering it in the context of Australia’s broader strategic fuel challenges. We then identify the drivers for change and argue that the government needs to respond in Australia’s north differently from its approach to problems in more densely populated areas.

We explore the market’s response to this challenge and highlight the various private- and public-sector responses to the problem and the potential market solution.

We make recommendations on both fuel security in northern Australia and regional development to support building Defence’s industry ecosystem.
LIQUID-FUEL SUPPLY IN AUSTRALIA

To situate a case study of jet-fuel security in Darwin, it’s first necessary to understand the state of Australia’s broader fuel supply chain. The appendix to this report provides a summary of Australia’s liquid-fuel supply arrangements.

Liquid fuel supply in northern Australia

In February 2020, Australia held 25, 20 and 22 days of consumption cover for petrol, diesel and jet fuel, respectively.4 However, the geographical distribution of those holdings across Australia is far from uniform. Most of them are in Brisbane, Sydney, Melbourne, Perth and Adelaide. In those centres, fuel reserve sizes are, for the most part, maintained by just-in-time supply chains. Market forces have led to long-term investment in critical fuel infrastructure, including for storage and distribution, in those locations. Those infrastructure investments have mitigated some of the risk associated with long, exposed supply chains vulnerable to disruption.

The story in Australia’s north, especially in the Northern Territory, is different. There, demand for petrol, diesel and jet fuel is considerably lower than in the more populous southern states. The limited market makes critical investments in fuel storage commercially unviable, so there’s little market competition. Continuity of liquid-fuel supply relies on maintaining regular, scheduled maritime deliveries, while other petroleum products are trucked (yes, trucked) from interstate. Because of the limited quantities required and the long overland and maritime supply lines, fuel replenishment in the north of Australia takes longer and is more vulnerable to supply-chain delays, making the region significantly less energy secure. In defence terms, that makes northern Australia a place where the ADF has to deploy with an expeditionary mindset, as it would overseas, rather than being able to operate with deep national supply lines. That’s a poor strategic handicap to inflict on ourselves.

Oil companies argue that their flexible and responsive global supply chains mitigate the impact of limited storage in northern Australia, but that seems overly optimistic, especially given the global supply-chain experiences thus far during the Covid-19 crisis.

While relying on market forces to drive critical fuel infrastructure development may result in commercially efficient outcomes in quiet times, it doesn’t ensure the best strategic investments for Australia and our national security and resilience in times of crisis. The focus on efficiency in normal conditions is resulting in a premium cost for energy in northern Australia that continues to inhibit northern development and create risks of supply failure.

The liquid-fuel supply chains in the Northern Territory are highly vulnerable to disruption from natural crises and hostile actors.

The supply side of the equation: jet-fuel supply in the Northern Territory

A key feature of our national strategy to defend Australia is to create defence in depth. In that strategy, we would use our strategic geography to deter, deny and defeat attacks in our northern air and maritime approaches. RAN major fleet units, home ported in the east and west of the continent, would be deployed north to defend Australia’s maritime approaches. Additional strategic capability would be provided by air assets from RAAF Tindal and Darwin.
This would be augmented by further air assets from South Australia, New South Wales and Queensland. Finally, land forces in Darwin, with additional troops from other northern and southern garrisons, would provide vital asset protection and ground manoeuvre capability.

For this strategy to be effective, the north needs to be equipped and ready to receive the forces from the south. It needs an ecosystem that sustains a fighting force, facilities that are fit for purpose to operate from, communications systems with multiple backups that can support the enormous amount of data that a modern defence force uses, industry that’s able to work with Defence to repair and sustain systems and platforms, and a logistic system that can sustain a force with munitions, spare parts, food and fuel.

One of the key elements of that logistic supply chain is jet fuel, which will be the lifeblood of any operation. And yet, its critical infrastructure and associated supply chains have often struggled to meet pre-planned surges in demand, even for carefully constrained training activities and exercises.

Most of the jet fuel consumed in northern Australia is produced in Singaporean refineries (Figure 1). Suppliers then ship fuel to Darwin to meet customer demand. This fuel supply chain is susceptible to a range of potential environmental and climatic disruptions, such as cyclones, even in peacetime. Despite this vulnerability, there’s no legislated or mandated requirement for a strategic reserve of jet fuel to be held in northern Australia.

Once a tanker arrives in Darwin, the jet fuel is unloaded at the Landbridge-leased Darwin port and then transferred into the Vopak terminal.

Figure 1: The Northern Territory jet-fuel supply chain

Darwin’s Vopak terminal is a large independent petroleum import and distribution terminal located in East Arm, Berrimah. Across its 21 tanks, the Vopak terminal can store up to 173,583 cubic metres of liquid fuel and chemical products. Jet fuel makes up only 30,000 cubic metres of that storage capacity. A 1995 estimate of potential demand underpins the design and capacity of the Vopak facility.

Unlike at major airports in Australia’s south, jet fuel in Darwin is transported from the Vopak terminal to consumers throughout the Northern Territory via road. Market forces dictate that there is some, but limited, excess capacity, including drivers and trucks, that ensures a capacity to meet higher than usual demand. Transport by road can be challenging, and flooding in the wet season can interrupt supplies to several airfields in more remote areas, including RAAF Base Tindal.

Jet fuel that’s been delivered by road is then stored and managed locally. In the case of RAAF bases Darwin and Tindal, there have been efforts in recent years to increase the overall quantity of jet fuel stored at each location. This focus on the expansion of storage is discussed below. It suffices to say at this point that jet-fuel supply chains in the north are few, long and highly vulnerable.

The scalability of the current supply chains is limited. Key critical infrastructure is designed to support the regular operations of domestic air traffic in quiet times. While Defence could expand the airfield storage facilities, and is doing so, those investments will do little to strengthen supply chains. Multinational air force exercises, such as Pitch Black, have illustrated that the main supply routes struggle to carry additional road traffic. While there’s
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some excess capacity (trucks and drivers) to move fuel, it’s limited. And the land-side supply chain is constrained by the availability and storage capacity of the Vopak terminal and the transfer rate of the pumps that move the fuel between storage tanks and fuel tankers. The infrastructure has several points of vulnerability and failure.

During the research for this project, no evidence of national- or territory-level regulation or policy on jet-fuel reserves was identified. While there’s a national mechanism for monitoring jet-fuel supplies, there was little evidence to suggest that this reporting was considered more broadly in either a defence or a national security sense. The requirements for resilience in national supply fall within the national security element.

Jet-fuel supply chains operate effectively under normal conditions and normal levels of demand. Oil companies believe that, for the most part, the arrangements that are currently in place meet requirements. They also have sufficient control over their supply chains, so that, should demand rise in northern Australia or a ship fail to make its delivery, the supply chain has overall redundancy and the deficiency can be swiftly rectified. However, that assumption doesn’t appear to engage with the possibility of broader supply-chain challenges or a widespread consumption increase, such as would be experienced during a conflict in the region (Figure 2).

Figure 2: Fuel-use estimations
Darwin International Airport is a joint-user airfield with RAAF Base Darwin. It’s the busiest airport serving the Northern Territory and is a hub for flights to Singapore and Indonesia. More than 2 million passengers have been using Darwin airport every year on approximately 27,000 flights, 85% of which have been domestic and the remainder international.

Prior to Covid-19 disruptions, Darwin Airport hosted more than seven different airlines that ran regional services (such as Airnorth), domestic services (such as Jetstar, Qantas, Virgin Australia and Tiger Air) and international services (such as Donghai Airlines and Silk Air). Darwin had more than five direct international routes servicing Singapore, Denpasar, Shenzhen, Makassar and Langgur, as well as direct flights to most major Australian cities, including Sydney, Melbourne, Perth, Adelaide, Brisbane and Cairns.

Along with the business and tourism sectors, Darwin Airport has a vital role in supporting the federal government. Public-sector personnel regularly use commercial airlines to travel to and from Darwin. Darwin is the closest state or territory capital city to Australia’s northern maritime approaches, and Darwin Airport serves as the chief port for supporting government departments and agencies engaged in border protection and national security tasks. It’s also an essential hub for fly-in, fly-out workers in the minerals sector. As Australia gets back to work under Covid-19 safe protocols, many of those users are likely to again be travelling to and from the Northern Territory.

RAAF Base Darwin is one of the key forward operating bases of the RAAF and shares the runway with Darwin International Airport. The airfield is critically important as the northernmost major airbase with a high capacity and access to broader critical infrastructure. Both RAAF Base Darwin and RAAF Base Tindal can host all types of aircraft, including B-52, B1 and B2 bombers. Darwin’s location on the doorstep of the Indonesian archipelago is a crucial strategic strength that can be leveraged by Australia to prepare for and meet any regional contingency.

Northern Australia is becoming increasingly important to Washington, as the US Marine Rotational Force (Darwin) (MRF-D) is located at the nearby Robertson Barracks. The MRF-D and the accompanying Enhanced Air Cooperation (EAC) initiative are a tangible illustration of America’s continued commitment to Indo-Pacific security. While the future development of this deployment is difficult to predict, US investment in critical infrastructure at RAAF Base Darwin seems to indicate more, rather than fewer, deployments into the future. Under the Force Posture Initiatives, the US and Australia have shared the costs of some infrastructure investments, including airfield strengthening and some additional fuel storage at Tindal.

RAAF Base Darwin itself plays host to several military exercises, including Pitch Black, High Sierra and Diamond Storm, and is the air transport hub for other exercises that take place across the Northern Territory. While the base has a small cadre of staff who ensure that day-to-day functions are carried out, its workforce regularly surges throughout the year to meet the tempo of activity needed for operations and exercises.

RAAF Base Tindal is a purpose-built air base located approximately 320 kilometres southeast of Darwin and 15 kilometres south of Katherine. Despite being one of the most recently constructed operational air bases, it’s of crucial importance to the Air Force because of its northern location and its separation from civil facilities. From an
exercising and training perspective, it’s also invaluable owing to its proximity to the Delamere Air Weapons Range, which is one of the largest and most advanced weapons ranges in Australia and the region.

RAAF Tindal’s remote location enables it to accommodate more extensive equipment and explosive ordnance storage facilities, as it can meet stringent safety requirements. By comparison, RAAF Darwin has been subjected to urban encroachment and therefore is limited in the amount and types of explosive ordnance that can be stored at the airfield.

While RAAF Darwin has seven private companies located on the civilian side of the airfield, RAAF Tindal, in comparison, hosts only one—the Katherine Tindal Civilian Airport, which supports around seven Airnorth flights per week.

Tindal’s inland location has considerable strategic advantages. Weather-wise, it’s afforded greater protection from cyclones than Darwin, and its location complicates any opponent’s attempt to target the base by land or air. Furthermore, its sheer size ensures that aircraft, fuel, weapons and explosive ordnance can be dispersed over a greater area.

On paper, the Australian Government has continued to make a robust declaratory commitment to northern Australia. The 2015 White Paper on developing northern Australia included a pledge to strengthen Defence’s presence in the region. The 2016 Defence White Paper committed to ‘Investment in our national defence infrastructure—including the Air Force bases in northern Australia, including in Townsville and Darwin, as well as the Air Force bases Tindal, Curtin, Scherger and Learmonth.’

In early 2020, Prime Minister Scott Morrison announced that RAAF Base Tindal will receive a $1.1 billion upgrade. Much of the money ($737 million) will be spent extending the runway and creating a new fuel storage facility. Much of the investment in the Defence White Paper, though, is about the remediation of ageing infrastructure rather than increasing capability.
Publicly available information suggests that Australian and US defence fuel reserve capacity and supply in northern Australia will grow from 2019. Any increase in demand is likely to be seasonal and, for the most part, dependent on exercise schedules. With increasingly strategic uncertainty and more frequent and intense weather events, short-notice demands seem to be increasingly likely.

The current method of fuel supply to RAAF Base Darwin presents severe limitations to the RAAF’s and US Air Force’s capability during peak usage periods when conducting high-tempo flying and extended training exercises. While the Australian and US defence organisations will increase their reserve supply and capacity infrastructure at Tindal and Darwin, that will buy time but isn’t a solution to supply-chain vulnerabilities and challenges. The storage capacity at Vopak is insufficient to facilitate the significant stock draw required at peak periods.

The immediate question here is whether there are enough drivers to warrant the investment, private or otherwise, in changes to the current jet-fuel security arrangements in Darwin. Over the past several years, there’s been increased public policy discourse on enhancing Australia’s fuel resilience. For the most part, though, those discussions have lacked the kind of detail that would promote investments in the infrastructure needed to ensure Australia’s compliance with the International Energy Agency’s mandated 90 days of net oil stockholding levels. Unfortunately, discussion to date has coalesced around definitions and formulas for calculating oil stock levels.

At the strategic level, there’s a fierce agreement across the public and private sectors on the importance of national fuel resilience. However, that agreement hasn’t yet resulted in any substantial improvements to bulk jet-fuel holdings or supply chains. However, as a result of Covid-19, it appears that the federal Energy Minister, Angus Taylor, is looking closely at options.12

On 22 April 2020, Taylor announced that the government would take advantage of historically low fuel prices and build a strategic fuel reserve through the purchase of $94 million worth of crude oil.13 With insufficient storage capacity in Australia, this fuel stockpile would be located in the US under an agreement to access the US Strategic Petroleum Reserve. The agreement is initially for a period of 10 years. Unfortunately, it appears that this decision does not increase jet-fuel holdings.

Oil companies provide assurances to their private- and public-sector clients in northern Australia that jet-fuel supply chains are resilient and have inbuilt redundancy and agility. That redundancy and agility appear to be predicated on assessments of localised risk and based on historical precedents. For example, road and rail supply chains are alternative supply channels during extreme weather, but those arrangements remain untested. Furthermore, the early lessons of the Covid-19 pandemic are that significant global or regional events, be they black swans or black elephants, do have widespread impacts on supply chains.

Fuel security is a worrisome issue in defence logistics circles. Many elements of Defence’s logistics planning are underpinned by an overreliance on the capacity of the private sector to scale up to meet short-notice demands rapidly, without too deep an enquiry into the supply-chain arrangements that scaling up may depend upon. For the most part, this has worked. During the International Force East Timor deployment in 1999, no military forces starved; nor did they go without fuel.
But, increasingly, the quest for further efficiencies is cutting spare capacity across a range of sectors, and the jet-fuel market is no different. It isn’t commercially viable for the private sector, without regulation, to maintain excess capacity, including expensive infrastructure, on the basis that the ADF might need it in the future. The effects of Covid-19 on the airline industry make this even more likely to be the case, given the financial and operational pressures already evident.

Probably more concerning is that this thinking doesn’t consider the possibility of deep and extensive supply-chain disruption or increased global demand. Developments such as those could rapidly reduce the private sector’s capacity to meet Defence’s requirements.

Regardless, the experience of two decades of air combat exercises in Australia’s north has illustrated that the supply chains consistently fall short during periods of high training and exercise tempo (for example, Exercise Pitch Black). And this occurs against the background of long planning times and a pre-programmed rate of effort. Defence contests this perspective. Jet-fuel shortages in northern Australia occur because of individual failures in the supply chain, such as a late ship or a contaminated cargo that’s unusable. Assumptions regarding just-in-time supply chains and poor understanding of private-sector capacity underpin far too much of northern Australia’s jet-fuel security. If they already show strain during exercising, then their suitability during a military conflict or crisis seems likely to be low.

To date, the ADF and its US ally have focused on one element of the supply-chain challenge: airside storage. At RAAF bases Darwin and Tindal, significant investments have been made and continue to be made in increasing jet-fuel storage. The MRF-D and its accompanying aviation support force have made similar investments to overcome Australia’s lack of jet-fuel storage capacity in northern Australia.

The bigger factor is that these issues are occurring during a period of ever-increasing strategic unpredictability. The possibility of operational misadventures and strategic miscalculations is increasing. In short, Professor Paul Dibb’s 1986 assessment that Australia would have more than 10 years notice of a future major conflict in what we now consider the Indo-Pacific no longer holds. Major conflict within the next 10 years is possible. Australia needs to be prepared, on short notice, to increase its air operations in the nation’s north. And at the moment, the fuel storage and supply lines needed to support such operations can’t be guaranteed.

Just as importantly, major climatic events are increasing in their frequency and intensity—and their unpredictability. Northern Australia’s supply chains, particularly given the region they flow through, are likely to experience more frequent and enduring disruptions. If it isn’t already the case, Australia will face increasing demands on jet-fuel storage in Darwin to mitigate the irregular but frequent disruption of supply chains.

Those same conditions will see the ADF called upon to launch various air and sea humanitarian assistance and disaster recovery operations across the Indo-Pacific to work with and render assistance to our regional partners. Those activities occur with little to no notice and, depending on the location of the event, are likely to require some kind of support from Australia’s north.

Northern Australia’s increasing role as a node in Japan’s and perhaps Singapore’s energy resilience further complicates the challenge but also provides opportunities. A strong and resilient north is vital in starting northern Australia’s journey towards becoming a critical energy security hub. A strong and resilient northern Australia needs to be able to scale up to meet the needs of industry and the ADF. As it stands, a major defence exercise or increased operational activity reduces jet-fuel availability in northern Australia. Those shortages have greater impacts if such an event occurs against the backdrop of a broader and sudden change in regional jet-fuel consumption or a disruption of maritime trade routes.

Darwin’s current jet-fuel supply chain can meet normal private and public demands when everything is working as it should in a business-as-usual environment. The challenge is that market forces and commercial drivers have failed to ensure redundancy or spare capacity. And Defence’s expectations and assumptions that the private sector is agile enough to meet sudden changes in demand are risky and have never been thoroughly tested. Furthermore, while Defence investments in airside fuel storage provide insurance against disruption, they’re only short-term solutions and fail to address the totality of the problem.
A consortium, led by the Airport Development Group, proposes the establishment and provision of long-term fuel supply and storage capabilities in Darwin. The development will support the Australian and US defence organisations. The consortium’s supplementary infrastructure will further enhance the existing supply chain’s capacity to support high fuel consumption periods and allow the maintenance of increased strategic stock levels. The key components of the proposed estimated capital investment of $155–200 million are as follows:

- An aviation fuel pipeline will directly connect RAAF Darwin and Darwin International Airport to import facilities at East Arm to provide a superior fuel replenishment rate. It provides a robustness of supply security that road transportation can’t match. The 16–17 kilometre pipeline will provide open-access fuel delivery to transport jet A1 fuel to the base and the airport.
- Additional fuel storage facilities at East Arm will support the import, storage and bunkering of large quantities of fuels for naval operations (diesel and F44) and provide extra aviation fuel storage external to RAAF Darwin. The proposed facility will be capable of holding 60 megalitres of diversified fuel and can be expanded to hold 94 megalitres.

Given the long-term strategic nature of this investment, the proposed storage facility will be capable of holding 60 megalitres of diversified fuel (terminal tankage will provide for diesel and aviation fuel supply). The pipeline will be a dedicated open access jet-fuel pipeline transporting jet A1 fuel from both the Vopak facility and the proposed storage facility to RAAF Base Darwin and Darwin International Airport.

This project creates a significant capacity to sustain fuel supply through high-demand periods and quickly scale up replenishment rates at minimal notice, providing significant storage and pumping capacity.

The consortium argues that a long-term (30-year) formal fuel infrastructure commitment is required from the Australian and US defence organisations to ensure the financial viability of the project. That’s reasonable, as both organisations are key beneficiaries of the increased capability. Qantas, Air North and Virgin, as well as other smaller private operators, aren’t expected to pay any additional costs.

The consortium’s initial financial and legal analysis shows the cost to these government agencies for this increased capability and resilience to be $14–18 million per year (including civilian operations), representing the fuel capacity and reservation charges.
SECTORAL RESPONSES

Like most proposals of this scale, on face value there’s a compelling argument. It would be extremely difficult to find any stakeholder in the private or public sectors that would argue that fuel resilience ought not to be a priority—and a greater priority now that we’ve experienced the vulnerability of many of the supply chains we’ve taken for granted.

Defence

Defence’s approach to jet-fuel storage and supply chains is selectively opaque to external review. Liquid fuels are a critical and essential input to Defence activities, and the national support base is a crucial enabler for Defence. At the strategic policy level, the 2016 Defence White Paper noted that reliable access to essential critical infrastructure, including fuel installations, underpins the ADF’s ability to conduct and sustain operations in Australia and the region.

Reliable fuel supplies enable Defence to power its aircraft, ships and other military vehicles and to transport personnel to where they’re needed.

Defence argues that it has a range of measures in place to support its liquid-fuel requirements. Those measures include Defence’s fuel holdings and arrangements with commercial providers. Interestingly, Defence doesn’t mandate where its fuel comes from, only that deliveries are in full, on time and meet the required specification. This approach allows commercial fuel providers flexibility to meet Defence’s requirements within the international fuel supply chain.

Further, Defence doesn’t rely solely on commercial contracts. It has in place a range of mutual logistic support agreements with allied and partner nations that could be used if commercial stocks are limited or not available, although those arrangements are more useful when operating in other nations’ territories, which is the need they’re designed to meet. The arrangements also remain largely untested and are perilously susceptible to the cascading risks likely to occur during a period of sustained regional instability and strategic uncertainty, whether natural or manmade. Importantly, they also rely on the ally or partner having sufficient spare capacity beyond its own requirements that could be provided to the ADF.

But, at the same time, too much reliance on commercial arrangements places Defence at the mercy of global supply chains and the risk management practices of oil companies. There are obvious risks associated with an approach like this when supply chains are vulnerable to cascading risks.

Insisting that the private sector can provide Defence’s liquid fuels when and where they’re needed is a risky endeavour. For a peacetime military over the three decades since the Dibb Review brought to light the strategic importance of being able to project power from our north, this model has been an almost universal success, delivering the right amount of fuel at the right price. That era turns out to have been strategically and environmentally benign, however.
On 12 June 2018, the Australian Government approved the Defence Fuel Transformation Program, identifying approximately $1.21 billion to fund an improved Defence fuel supply chain nationally. Defence argues that the program will reduce enterprise risk, increase resilience and optimise the total cost of ownership through a combination of actions, including targeted risk reduction and increased industry collaboration. This was driven by the appallingly degraded and unsafe nature of much of Defence’s fuel storage and distribution arrangements.

Defence has considerable operational and strategic fuel holdings compared to most commercial organisations. While many commercial companies only hold fuel for several days of operation, Defence fuel holdings can last for several weeks under typical rates of consumption. As I’ve noted, there are also estate and infrastructure projects underway that will significantly increase Defence’s bulk aviation fuel capacity in the Northern Territory.

However, despite that, you don’t have to look too far into the jet-fuel supply chain to see that the government will have to deal with some very challenging issues outside RAAF Base Tindal’s perimeter fence to realise the full benefits of this investment.

The ships supplying northern Australia’s jet fuel depart from Singapore, transit through the Indonesian archipelago and then around a week later dock at Darwin’s port, which remains leased to the Chinese-owned Landbridge Group. From portside, the fuel is transferred to the Vopak terminal Darwin, where almost all of northern Australia’s jet fuel is stored. Tindal’s fuel is then transported the 300 plus kilometres from Darwin to Katherine along the Stuart Highway by road trains owned and operated by private companies.

For most of the year, Australia’s airlines are the biggest consumers of jet fuel in Australia’s north. The ADF’s figure of 30 megalitres annually pales in comparison with the commercial sector’s recent consumption of 125 megalitres.

The immediate impact of the Covid-19 crisis on spare capacity should not be overlooked. Airlines could become even more cost conscious as a result of Covid-19 and so less willing to hold stocks. While there’s some argument that this could mean current capacity becomes more available for Defence, it assumes that the market will continue to hold the same quantity of bulk liquid fuels as before the pandemic. That conclusion also assumes that either oil companies or airlines will accept responsibility for maintaining—and testing and treating—liquid fuel held in storage.

It’s during major military exercises, when consumption rates rapidly rise, that the jet-fuel supply chain in northern Australia gets stretched, despite those exercises being planned for some years in advance and operating to a pre-planned flying program.

It’s been long rumoured and reported that, despite the long lead times of important exercises, several have been ended early due to supply-chain issues. In contrast, Defence argues:

During the three weeks of Exercise PITCH BLACK 2018, over 1,120 missions were flown, which equated to approximately 95 percent mission success rate. By 15 August 2018, exercise directors assessed that all of the training objectives for PITCH BLACK had been achieved, and the primary goals of offensive and defensive air combat operations, air–land integration, and importantly, interoperability between nations had been exceeded.\footnote{14}

That’s reassuring, but it also seems to admit that fuel supplies were stretched in the exercise—and military operations during conflict are considerably more demanding than the largest exercise.

Even in peacetime, jet-fuel supply from Singapore is subject to the availability of product and shipping and the prevailing weather conditions. Despite this vulnerability, there’s no legislated or mandated requirement for a strategic reserve of jet fuel to be held in northern Australia for any type of contingency.

Resupply to Tindal is limited by the availability of trucks and drivers, and none are waiting on standby just in case the ADF needs more fuel. Critically, the Stuart Highway must also be open to traffic.
Defence’s answer to this problem, and the increasing fuel demands of larger aircraft, is to increase the amount of storage at Tindal. Increased jet-fuel storage would allow Defence to store enough in reserve to support short periods of high fuel consumption such as those experienced during large-scale, multilateral exercises such as Pitch Black. However, experience has shown that contingency operations can’t be constrained by noise curfews; nor do they adhere to a scheduled flying program—rates of effort are higher than in exercises and consequently consumption is also at a much higher rate.

Defence’s approach to jet fuel in Australia’s north assumes that the market will continue to ensure its availability and that there’s no requirement to invest in other fuel infrastructure or pay extra for surge capacity or reserves. However, market forces won’t support the level of investment needed to develop strategic fuel infrastructure—especially if Defence isn’t willing to make upfront investments in capacity, pay more for its fuel or use a combination of those approaches. In the absence of such investments, Defence—and Australia’s security—simply accepts the resulting risks.

While the Tindal investment sends a clear strategic message about Australia’s commitment to national security and the US alliance, it will do little to address the broader fuel-supply vulnerabilities in northern Australia.

To be fair to Defence, it’s neither responsible for nor funded to build, maintain or operate infrastructure that could be considered commercial or public. While Australia’s defence and national security writ large are the beneficiaries of infrastructure that adds to resiliency and redundancy, the investment is in the national interest and therefore there’s some reason in the argument that the costs should not be borne by a single department or agency.

As part of the Defence Fuel Transformation Program, Defence is currently conducting a three-stage procurement process to establish a nationwide fuel services contract. In addition to other services, the contract will cover the provision of bulk fuel across the Defence fuel supply chain. It will replace the current arrangements of multiple standing offers for the supply of all fuel nationally with a single supplier for each location. While Defence argues that these arrangements are robust and that industry has proven to be reliable in meeting its requirements in all areas, including the Northern Territory, the current approach is failing to promote necessary investments in critical national infrastructure and resilience. Indeed, the current Defence approach seems rooted in a peacetime efficiency approach that’s more interested in industry-recognised price variation formulas to determine the cost per litre for fuel than in national resilience.

Defence has advised that it keeps its policy settings under regular review to ensure that it can deliver government and Defence objectives and respond to shifts in the strategic environment. As part of its enterprise planning, it regularly reviews, assesses and responds to security challenges in the strategic environment, which helps to build resilience in its planning and preparedness for its fuel requirements. This includes activities such as humanitarian aid and disaster relief, Defence aid to the civil community and a range of other scenarios and contingencies that form part of regular Defence planning.

During the research for this report, Defence highlighted that, as a last resort to guarantee fuel supply, the government may invoke the *Liquid Fuels Emergency Act 1984*. Under that Act, Defence has access to fuel as an ‘essential user’ for activities in the ‘defence of Australia’, but interviews with various stakeholders indicated that many don’t understand this legislative requirement. Regardless, with no legislated strategic reserve level in Australia’s north, limited storage, just-in-time supply chains and vulnerable maritime routes, this approach is underpinned with risk. Using law to demand what isn’t available is unlikely to meet the need. Importantly, under the Act, Defence is also not the only entity that can be designated an essential user.

In short, Defence wants jet-fuel resilience, but is unwilling to pay for it, especially if that involves spending more on fuel in order for a commercial organisation to provide it. Furthermore, while the Defence organisation is willing to invest in infrastructure on existing bases, it’s taking a far more conservative approach to external supply chains, which is where many of the vulnerabilities that will affect defence operations exist. This is ably demonstrated with the facilities upgrade at RAAF Base Tindal, where Defence has ruled out constructing a rail spur onto the base, preferring instead to have all fuel delivered by road. It also seems to be reluctant to raise the issue of fuel resilience,
choosing instead to rely on whole-of-government efforts, and the Department of Industry, Science, Energy, and Resources leads on whole-of-government fuel policy. That department does not have a long-term investment program like Defence’s, however.

**Civil aviation**

There are a number of diverse aviation-sector stakeholders, ranging from recreational pilots and small charter services to regional carriers and national airlines. This section explores the perspectives of the local and national carriers.

In a broad sense, Australia’s national carriers look to invest in ‘the right infrastructure at the right price’, and those decisions are determined based on each airport.

All of the civil aviation operators at Darwin Airport would argue that they have a low capacity to absorb the costs associated with either increased jet-fuel storage or a port-to-airport pipeline. Even before the challenges of Covid-19, flight operators in northern Australia operated with small profit margins and limited capacity to absorb any additional costs. Now their viability and overall business future are in doubt, and their industry is likely be one of the most exposed to demand reduction and economic slowdowns from the effects of the pandemic.

Each airline has a different jet-fuel procurement strategy, and, while some airlines may only need a single supplier, no one supplier is capable of completely covering the needs of an airline such as Qantas. Airlines peg their fuel prices against a base price and an import parity price. The price of fuel in Darwin is affected by shipping costs, off-airport storage costs, trucking costs, on-airport storage costs and inter-plane costs. In the case of Darwin operators, they already accrue fuel through-port levies and an infrastructure fee for on-airport fuel infrastructure.

In general, airlines aren’t averse to investing in similar infrastructure. For example, Melbourne Airport recently invested in additional tank storage, which Qantas views as justified in the context of Melbourne’s flight traffic. Qantas will support infrastructure projects when it sees a ‘reasonable need’ for the project and where its resources allow.

Compared to other Australian airports, Darwin’s fuel storage is seen as comfortably stocked by the national carriers. For example, recent Qantas use has drawn approximately 120,000 litres a day of fuel in Darwin. Airside, about 1.5–3 days of fuel is stored. Not all Australian airports hold three days of fuel storage to cover for contingencies; Darwin often exceeds that amount.

Airlines very rarely see an ‘amber traffic light’ indicating low fuel stocks in Darwin and consequently are less concerned for Darwin’s fuel storage. But those assessments are based on a steady and regular demand and don’t refer to increased military demand, take account of supply-chain disruptions, or take into account the possibility of the application of the Liquid Fuels Emergency Act.

Previous Pitch Black exercises have not reduced the availability of fuel for commercial operators, but some operational events have. The multinational search for MH370 led to a potential fuel shortage in Western Australia. However, the impact of that on day-to-day airline operations was mitigated as suppliers responded and rerouted shipments to ensure continued access to fuel. In that case, the market reacted as advertised to a single unexpected event. Had another concurrent incident placed further pressure on the supply chain, it’s questionable whether the demand could have been met.

The operational reality for Darwin’s aviation sector is that there are lower strategic reserves of aviation fuel in between resupply shipments, and, in response, it has risk mitigation strategies. If Vopak is unable to hold or transport fuel, then it can be trucked in from elsewhere. But these measures are, for the most part, untested and reliant on the availability of critical capabilities: rolling stock for rail transport or additional trucks and the supply routes from the south remaining open.
Experts watch out for extreme weather events and can suggest overordering fuel supplies to anticipate demand. Darwin’s proximity to Singapore and South Korea (the other major supplier of jet fuel) in comparison to other major Australian ports means that it’s less likely to lose access to supply routes. Vopak’s storage is more than sufficient for the private sector, in the view of major carriers. And it’s unlikely that private-sector companies will increase their services in the immediate future, especially in the light of recent world events. Increasing fuel storage is therefore not a priority for commercial airlines.

While airlines have listened to the argument that higher storage capacity and diversified ownership may make fuel prices more competitive, they don’t necessarily agree in practice, as the profit margins on fuel are quite small, so extra competition is unlikely to have much impact.

There doesn’t seem to be any consensus on who prioritises fuel in the case of an emergency. During the recent bushfire season, airlines experienced aircraft delays, which they attribute to a shift in fuel allocation priorities in the national interest.

Interestingly, when it comes to fuel supply, carriers believe that in an event declared to be a *force majeure* situation they would be willing to work with the government to help out. Of course, *force majeure* requires them to accommodate government needs. And, as they said this, it was apparent that some stakeholders may be unaware of the impacts of the provisions of the Liquid Fuels Emergency Act.

At the national level, some stakeholders indicated future challenges emerging in the wake of the closure of some of Australia’s domestic refineries and the shift to import terminals. Primarily, there was concern about supply security, especially in situations in which a shipment of fuel doesn’t meet specifications and needs to be returned to be re-refined, leading to long wait times for a replacement shipment to arrive.

What’s clear is that the commercial aviation sector is comfortable with current fuel security and resilience arrangements in Darwin. The aviation businesses assume that there are sufficient stocks on hand to meet their requirements and that the oil companies will manage the supply chain to ensure continued availability. That assessment assumes that fuel supplies will continue to flow unimpeded and that alternative capacity to transport fuel will be available.

In short, civil aviation doesn’t currently need additional fuel storage capacity or a pipeline service. While there are arguments about the ability of both projects to reduce costs in the long term, there appears to be little capacity or desire in the civil aviation sector to pay any additional upfront costs for fuel for the project to be realised.

### The oil industry

The oil industry stakeholders’ perspective is that there are no significant risks or vulnerabilities to its offshore supply chains to Australia. Indeed, the sector believes that Darwin’s proximity to Singapore would assure supply. Those assumptions and assessments may be being tested and probably need to be rethought in the light of increasing great-power competition and the vulnerabilities in global supply chains exposed by Covid-19, although they’re deeply embedded approaches that have shaped the way the industry operates.

The oil industry’s decision-making on liquid-fuel supply is based on a future-focused market profile in advance, which allows for an assessment of the commercial working capital balance. Oil companies will endeavour to maintain a certain level of fuel stock in reserve and try to the best of their ability to make sure that supply meets demand.

If Defence needs a rapid increase in fuel supply from the market (for example, in the case of a national emergency or military contingency), whether suppliers can provide that increase will largely depend on the suppliers. Most suppliers have a specialised shipping division in Singapore that monitors global shipping and fuel supply, with the view of responding to unplanned supply shortfalls by redirecting deliveries. BP, for example, might prioritise one project over another, and would try to balance the government interest and its corporate social responsibility with...
its business interests. However, in at least one case, a major oil company sees that it has no legislative or contractual obligation to ensure that the Australian Government’s changing needs are met.

While risk assessments underpin that approach, the supply chain may be vulnerable to cascading risks.

Most of the oil industry uses the Vopak terminal to some extent. While Vopak has a monopoly of the liquid-fuel storage in Darwin, the prevailing commercial view is that that monopoly doesn’t have an impact on prices.

For oil companies, the more significant challenge is that the limited liquid-fuel demand in Darwin precludes the commercial viability of further capital investment in storage infrastructure. Unless the market landscape changes significantly, it’s difficult to see a strong enough commercial case to invest in increased fuel security in the north. The predicted long-term economic recovery from Covid-19 makes it even more unlikely.

From the oil industry’s perspective, it would appear that there’s no interest in or commercial driver for liquid-fuel infrastructure investment in Darwin. Research interviews suggested that market projections failed to indicate any statistically significant jet-fuel demand increases. Furthermore, it seemed that the market might not be able to absorb the costs of increased fuel prices, which could result in a further reduction in profitability.

The United States

Discerning the US perspective on this project has been problematic, not least because of the challenges of Covid-19. To begin, it’s clear that Washington is becoming increasingly aware that Australia might be key political, military and economic terrain in what’s quickly becoming a new era of major-power competition.

Announced in November 2011, the US Force Posture Initiatives are an extension of Australia’s existing defence relationship with the US. The two initiatives—the MRF-D and EAC—are crucial to broadening and deepening the alliance between Australia and the US.

Through these initiatives, Australia and the US are gaining new opportunities for combined training and improved interoperability between our armed forces.

An increasing US presence has resulted in a growing demand for critical infrastructure, including greater airfield access and jet-fuel storage. Discussions on ‘who pays’ for those investments have delayed the growth of these initiatives to their full potential.

Given that the MRF-D and EAC will increase the demand for jet fuel in Darwin, the US Government has chosen to add redundancy to the overexposed jet-fuel storage by building its own bulk storage infrastructure in Darwin.

In late 2019, Naval Facilities Engineering Command (NAVFAC) Pacific awarded a $63 million firm-fixed-price contract to Nova Nacap JV of Napa, California, for the construction of bulk fuel storage tanks in Darwin. The work to be performed provides for two nominal 8 megalitre cut and cover bulk fuel storage tanks. After demolition and site preparation, also to be built are pump vaults, truck unloading and loading gantry, filter equipment and building, operations facility with laboratory, modifications fuel farm #7, fuel system controls, pipelines, pavements, grading and draining improvements, and supporting utility infrastructure.

One advantage the US has over Australia is that the US Military Sealift Command operates a fleet of tankers that provide refined petroleum products to the US Department of Defense worldwide. Unlike Australia, it isn’t almost completely reliant on commercial suppliers.

Strategic uncertainty is accelerating changes to how Australia, our allies, friends and competitors understand northern Australia’s geography. In a military sense, that geography has ensured that ADF capabilities in the north remain fully operational during the Covid-19 pandemic. In contrast, the operational readiness of key US capabilities in strategic locations in the Indo-Pacific has been degraded by the pandemic. Defence strategists in Washington and Canberra would do well to consider what lessons could be learned from this, especially about maintaining the operational readiness of their capabilities.
Australia’s ability, at least to date, to slow the spread of Covid-19 and the unprecedented success of that effort in Australia’s north is likely to pique the interest of US military officials. To be fair, they’re destined to be the same officials who were already attracted to northern Australia by its strategic geography and world-class training facilities. It seems possible that Australia may receive requests to increase and broaden the US military presence in Darwin before the end of the Covid-19 crisis.

With a more significant US presence likely, and the possibility of an increasing number of short-notice humanitarian assistance and disaster response deployments, demand for liquid fuels, including jet fuel, could increase. The US would be likely to welcome further investments in building the resilience of jet-fuel supply in northern Australia. While that might not result in equity investments, it could be indicative of a willingness to pay more for fuel.
Northern development has been a wicked problem for governments since federation. In periods of strategic uncertainty, it has taken on significant value. However, the north’s remoteness from Australia’s population centres has meant that economic investment is a costly endeavour with little benefit at the polling booth. To the casual observer, such analysis might appear glib, but a long-term investment in northern development is a fleeting policy focus. Over the past 50 years, consecutive governments have relied upon market forces and demanded a return on investment to drive nation building in Australia.

Australia’s declining strategic certainty and its Covid-19 lessons on national resilience indicate a need for a change. Or, more accurately, perhaps policymakers will need to do more to ensure that our national interests and strategy aren’t subordinated to commercial profits or economic models that we now see have major gaps and flaws.

The Northern Territory and Australian governments, as well as our US ally, support the idea of an investment in improved jet-fuel security. But, at the same time, they’re unwilling to pay for it in either infrastructure investment or increased fuel costs. Civil operators, while not against the idea of improved fuel security, are unable and unwilling to pay more for fuel, especially when the profitability of air services in northern Australia is already under pressure.

For the oil companies, the northern Australian jet-fuel market is too small to make capital investment attractive. And, if the market is unwilling to absorb additional fuel costs, they’re reluctant to have their profit margins reduced. Regardless, jet-fuel security is vulnerable. Oil companies’ approach to jet-fuel supply risk mitigation is perilously focused on market agility and relies on a model of globalisation that’s now being reappraised. That approach leaves Australia’s north and the ADF vulnerable to the impacts of global or regional events. For example, a sudden change in the Korean Peninsula’s security situation would be likely to generate a widespread increase in demand that oil companies might not be able to respond to.

Defence’s response to the problems of jet-fuel security in Australia’s north reflects the views of logisticians and bureaucrats who are overly comfortable with Australia’s long peace. In peacetime, and under normal conditions, the ADF can rely on contracting out our risk and not needing to bear the investment costs of assuring resilience in supply. In this context, you may rely on companies to deliver fuel in the quantity, quality, location and time of your choice and, if that doesn’t work out, then you can always shorten an exercise.

Defence’s current approaches to the problem, including increasing fuel-storage holdings, offer some additional stockpiling. Still, they do little to mitigate the supply-chain risks, including single points of failure, the capacity to scale up supply operations using existing infrastructure and broader storage capacity.

In short, all parties are in furious agreement that there needs to be more redundancy and resilience in the supply chain, but, when it comes to apportioning responsibility to build that redundancy and resilience, no one wants to take on the responsibility or, perhaps more importantly, the cost.

It seems clear that increasing fuel-storage capacity, and improving supply, have great utility for the Australian and US defence organisations. There’s some argument that the proposed pipeline between Darwin Port and Darwin Airport does little more than replace vulnerable road supply with vulnerable pipelines, but it does far more than
that. In times of increased military activity, it would increase the rate of resupply and make sustained air operations from Australia’s north less reliant on spare and scalable industry capacity. Defence faces a similar problem with RAAF Base Tindal. Road transport of fuel becomes a supplementary path to increase capacity and add alternative supply sources, instead of being Plan A, B and C, as it is now. While Defence’s plans will increase on-base storage, its unwillingness to invest in constructing a rail spur onto the base, let alone ensuring access to rail rolling stock, and the limited spare trucking capacity make any increase in the volume of resupply of Tindal problematic.

So, how can this project be funded, and by whom? Any discussion on supply chains and resilience, especially for fuel, quickly comes down to who will cover the costs. And that’s why, in a time of increasing strategic uncertainty, the government needs to consider stepping up to make the nation-building investments in Australia’s north required for our national security.

There’s been an overreliance on the Defence organisation meeting critical infrastructure and resilience costs in Australia’s north. However, Defence isn’t necessarily the best decision-maker on northern development. Setting aside Defence’s increased capital expenditure on major acquisitions, it then faces the challenge of spreading the remainder of its budget to meet the multiple priorities it needs to fund. Northern Australia is just one of those and it isn’t always close to the top of the list.

Defence is just one component of national security, so this isn’t an issue for Defence to resolve on its own, but one that requires the federal government to think in terms of national security through nation building.

The Our north, our future: White Paper on developing northern Australia identified the need for greater public–private partnership in the development of Australia’s north. The White Paper established two major northern funding programs: the NAIF and the NT Infrastructure Development Fund. Unfortunately, the NAIF is under parliamentary review for lack of capital allocation and the NT Infrastructure Development Fund has been closed down due to a lack of capital allocation. The debt-based model of both failed to contribute to a sovereign investment model.

Unfortunately, one of the challenges faced is a lack of coherent leadership in the national security sphere at the federal level. In 2013, Prime Minister Tony Abbott abolished the position of National Security Adviser, and there hasn’t been clear public service leadership on whole-of-government national security issues since.

Without government intervention and investment, whether in the form of a willingness of customers to pay more for fuel or equity investment from the Australian Government, northern Australia’s jet-fuel supply will remain in the state that it’s in today: vulnerable and not resilient.

Covid-19 has already shown that market forces don’t always promote adequate national resilience in multiple areas, from broadband bandwidth to the capacity to produce essential medical supplies. Until now, long-term Australian funding of national resilience and responsiveness has often seemed economically inefficient. Little surprise, then, that policymakers regularly looked to the market to provide such resilience, especially in critical infrastructure investments. However, the creation of spare capacity is often not a commercially viable prospect.

In contrast, Japan’s massive investment in energy resilience through the INPEX liquefied natural gas plant near Darwin—highlighted by Japanese Prime Minister Shinzo Abe’s visit to Darwin in 2018—and Sun Cable’s proposal to build a $20 billion solar farm to supply power to Singapore illustrate the kind of strategic thinking that Australia needs for nation building in the north. Forward-leaning countries view energy resilience as critical to their national security. They also recognise that such activities are long-term investments that need to be nurtured rather than left to the whim of market forces.

The Covid-19 pandemic has made it increasingly clear that Australia’s current model for nation-building infrastructure investment is far too narrowly focused. The notion that such investments should be funded mainly by those who directly benefit from them rather than also considering who benefits from the increased capacity and resilience more broadly is reducing the country’s resilience. This is even more obvious in the north, where Defence so often wears the cost of developing infrastructure that ought to be funded as part of more comprehensive national security or nation-building programs.
The debt-based NAIF and user-pays nation-building efforts are unlikely to result in anything more than passing peaks of economic activity. Unfortunately, those arrangements aren’t supporting the kinds of massive nation-building efforts needed in Australia’s north, where the Australian Government should be considering ambitious investments. Private–public partnerships focused on providing national and regional energy resilience should be given priority. For example, the development of condensate plants in the Northern Territory could provide us with the capacity to meet some of our liquid-fuel requirements, with the added benefit of diversifying supply.

National security and resilience need to be a far more significant consideration in northern development policymaking.
RECOMMENDATIONS

The wake-up call of Covid-19 has given Australia’s governments an unprecedented opportunity not just to review policy but to check the validity of the assumptions that underpin their thinking. The pandemic is being rightly considered a national issue rather than just a health issue. Consequently, the response is one that encompasses the entire nation—the population, business and all tiers of government—and led at the federal level. Similarly, this case study provides an example of the kind of holistic examination of the policy challenges of the day and how national security, defence and nation building are intertwined. With that approach in mind, the following recommendations are made:

1. Defence needs to revisit its underlying assumption of the capacity of the private sector to meet its jet-fuel needs, especially considering cascading risks.
2. Defence should undertake an annual series of closed-door jet-fuel supply-chain simulations with representatives from the oil and aviation sectors and airfield operators. This activity should be focused on testing the health and capacity of supply chains using real data.
3. The federal government should work with northern Australia’s territory and state jurisdictions to improve liquid-fuel security in the north.
4. The federal government should examine alternative mechanisms to Defence meeting the costs of improving jet-fuel reserves and supporting infrastructure (storage, roads, rail spurs and transfer stations) in Australia’s north, with a specific focus on fast-tracking additional storage.
5. Investment in additional liquid-fuel storage in Australia’s north should be a national priority, and that investment should be made as part of nation building and northern development.
6. National security and resilience need to be a central consideration in northern development policymaking. This should be an element in Australia’s post-Covid-19 recovery efforts.
7. The federal government should identify a new investment framework to replace the NAIF that can be used to make investments in critical national security infrastructure. The funding allocations and priority for northern Australia of the two previous initiatives can be turned to good use in the rebuilding of our economy in the post-Covid-19 environment.
CONCLUSION

Successive governments have made strategic commitments to Australia’s north. They now need to take concerted action to assure our national resilience. This will require a paradigm shift in Australia’s policy thinking. Without this kind of investment, Australia might not be as lucky facing future national challenges as we’ve been so far with Covid-19, or we may find ourselves being reliant on the efforts of other governments for our national resilience.

When it comes to development or, more explicitly, planning nation-building activities in Australia, the issue is often bogged down in two thematic conversations about who will pay and what are the valid economic drivers for such investment. So, while it’s possible to lift the discussion to one on nation building for national security, it’s far more challenging to establish who’s willing to invest and break through the persistent economic and social mythology of northern development.

The Australian Government’s current approach to nation building is focused on the construction of major projects, ‘to support growth in our cities and regions and enable our economy to thrive’.15 The predominant decision-making inputs for nation building are focused on funding sources—taxpayers and users.

Unfortunately for northern Australia, federal governments have applied a user-pays approach to funding capacity investment to the detriment of Australia’s northern development because of the north’s small population. It also ensures that private-sector activities in northern Australia face significant economic barriers to market entry. The government’s policy position that ‘the most appropriate and sustainable structural solution to the maintenance deficit in public infrastructure is a transition to a user-pays model’ isn’t helping to build a safe and secure northern Australia.

Covid-19 has provided the Australian Government with an enormous opportunity to review and reset its nation-building policies. Case studies such as the one presented in this report highlight the complexity of the challenge, but they also illustrate how post-covid-19 nation-building and economic stimulus packages could be used to build our national resilience.
APPENDIX: A LIQUID-FUEL SUPPLY IN AUSTRALIA

Today, most nations consider fuel security to be a key component of their national strategic capability. In stark contrast, according to the Department of Energy and Environment’s interim report to the Liquid Fuel Security Review in March 2019, Australia has adopted a market-driven approach with minimal regulation to deliver fuel to Australians as cheaply as possible. While that may increase profits in the short term for private enterprises, it exposes the supply chain to increased risk should there be any disruption or external shocks to Australia’s fuel imports.

The International Energy Agency (IEA), of which Australia is a member, requires all countries to hold at least 90 days of net oil stockholding levels. In a media release in April 2020, the federal Energy Minister, Angus Taylor, noted that at the end of February 2020 Australia held 81 days of oil supplies, including 25 days of stocks in overseas ports and in transit to Australia. Doing the maths, this means that there was only 56 days onshore. Australia is the only country out of 28 IEA member countries that fails to meet this obligation (Table 1, Figure 3). The good news is that this number had increased from 45 days in November 2017, and the government has committed to returning to compliance by 2026. The last time Australia met its IEA obligations was in 2012. However, stockholding levels for different types of fuels and oils remain unevenly distributed.

Table 1: Oil stocks of IEA countries as of January 2020, measured in days of net imports

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<tr>
<th>Country</th>
<th>Total</th>
<th>Industry</th>
<th>Public</th>
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<td>3</td>
</tr>
<tr>
<td>New Zealand</td>
<td>88</td>
<td>54</td>
<td>34</td>
</tr>
<tr>
<td>France</td>
<td>104</td>
<td>29</td>
<td>75</td>
</tr>
<tr>
<td>Germany</td>
<td>127</td>
<td>35</td>
<td>92</td>
</tr>
<tr>
<td>Japan</td>
<td>186</td>
<td>74</td>
<td>112</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>281</td>
<td>281</td>
<td>0</td>
</tr>
<tr>
<td>United States</td>
<td>697</td>
<td>423</td>
<td>274</td>
</tr>
</tbody>
</table>

Source: International Energy Agency (IEA), Oil stocks of IEA countries, 16 January 2020, online.
Currently, the government has no mandated industry stockholdings of oil or fuel, far below other comparable countries such as Japan, France and the UK, all of which have prescribed over 40 days minimum. Until Energy Minister Taylor’s 22 April national oil reserve announcement, Australia was the only fuel-importing country in the developed world that had no publicly owned fuel stocks or mandated commercial stockholdings, or government control or participation in the fuel markets in the country.

In 2015, Australia had four domestic refineries, down from seven in 2000. The number of days of domestically produced fuel held in stock has dropped from over 30 to just 22 over the same time frame. This drop has led to the current situation in which we rely on fuel imports for over 90% of our energy needs and, in the case of jet fuel, 100%. We could be utterly reliant on fuel imports by 2030 due to depleting reserves of crude oil resources and the shutdown of domestic refineries.

Table 2: Australian refineries, days of fuel stock and import dependency, 2000, 2015 and 2030

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2015</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of refineries</td>
<td>7</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Days of fuel stock</td>
<td>&gt;30</td>
<td>22</td>
<td>&lt;20</td>
</tr>
<tr>
<td>Oil/fuel import dependency</td>
<td>60%</td>
<td>90%+</td>
<td>100%</td>
</tr>
</tbody>
</table>
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ACRONYMS AND ABBREVIATIONS

ADF  Australian Defence Force
EAC  Enhanced Air Cooperation
IEA  International Energy Agency
MRF-D US Marine Rotational Force (Darwin)
NAIF Northern Australia Infrastructure Facility
RAAF Royal Australian Air Force
RAN  Royal Australian Navy
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