

# BLACK SWAN

## STRATEGY PAPER

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### FULL TANKS, FULL BATTERIES: ENHANCING AUSTRALIA'S SHORT- AND LONG-TERM ENERGY SECURITY

Authored by James Bowen



DEFENCE AND SECURITY THROUGH AN INDO-PACIFIC LENS



## Black Swan Strategy Paper #15

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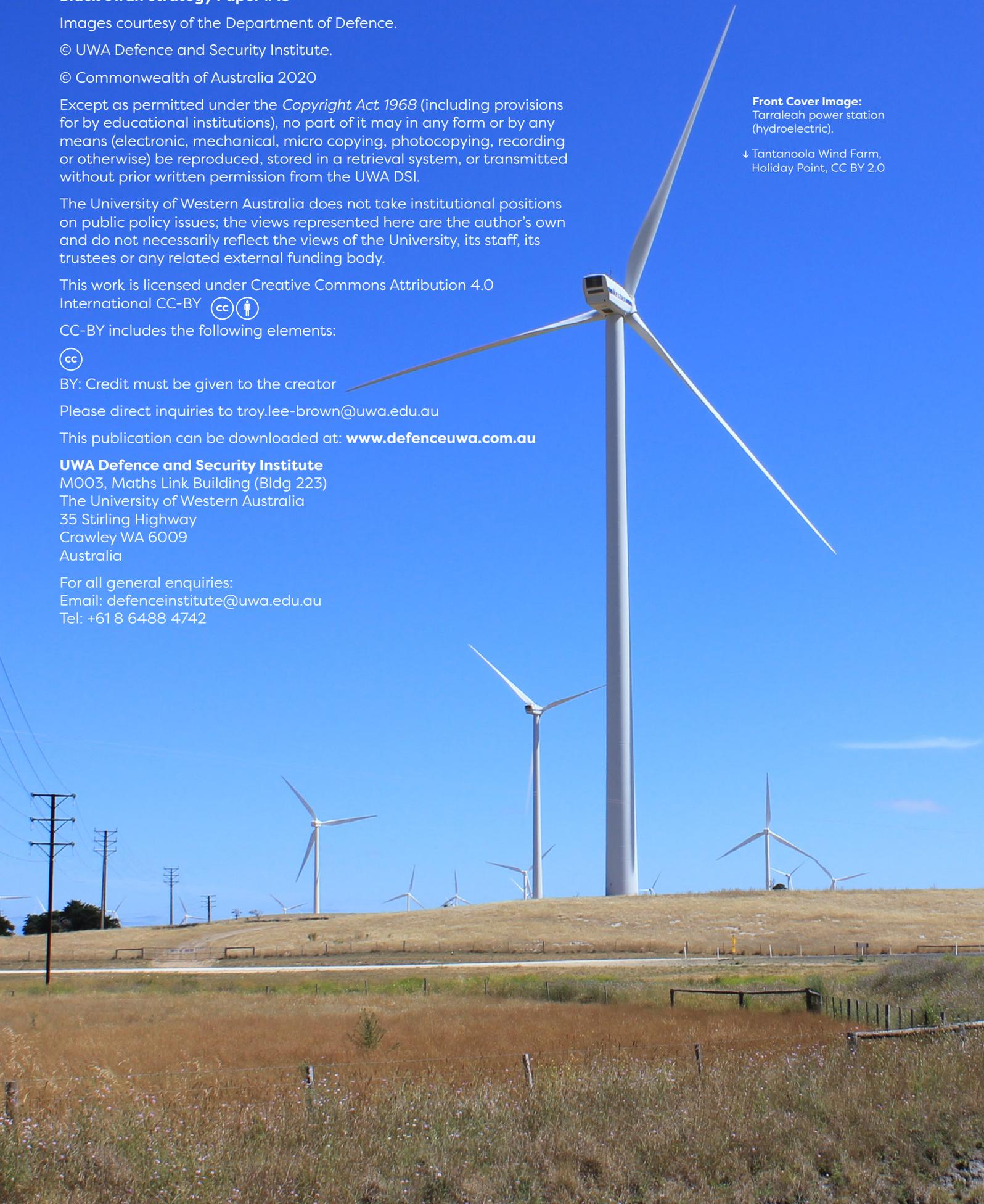
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Tarraleah power station  
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↓ Tantanoola Wind Farm,  
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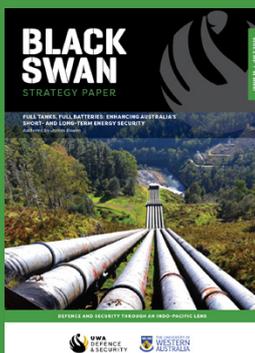


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## About the Black Swan Strategy Papers

The *Black Swan Strategy Papers* are the flagship publication of the UWA Defence and Security Institute (DSI). They represent the intersection between Western Australia and strategic studies – both of which are famous for their black swans. The series aims to provide high-quality analysis and strategic insights into the Indo-Pacific region through a defence and security lens, with the hope of reducing the number of 'black swan' events with which Australian strategy and Indo-Pacific security has to contend. Each of the Black Swan Strategy Papers are generally between 5,000 and 15,000 words and are written for a policy-oriented audience. The Black Swan Strategy Papers are commission works by the UWA DSI by invitation only.



↑ The fuel probe from USNS John Lewis is guided to HMAS Sydney during a Replenishment at Sea, Defence Imagery.

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## Executive Summary

**Australia has profound energy security challenges. The oil sector's reliance on fragile international supply chains and volatile markets is the most prominent and pressing.**

But Australia also has considerable vulnerabilities related to gas, the power sector, and clean energy supply chains. The most significant risk in each sector is a sudden and major supply disruption. This could arise from various combinations of factors and undermine key interests and values, including Australian Defence Force abilities. Baseline energy insecurity, in the form of exposure to high or volatile prices, is also a significant national concern.

Policymakers have failed to adequately respond to ongoing changes in Australian patterns of energy production and consumption, including declining oil self-sufficiency, the need to more rapidly transition away from fossil fuels, and a surrounding context of rising geopolitical,

geoeconomic, environmental, and other instability. Efforts to resolve Australia's energy security challenges must begin with better acknowledgement and understanding, including identifying energy security's relationship to other key issues such as climate change. Australian policymakers must abandon flawed perspectives, such as their 'market fundamentalist' approach to energy sector development. Policymakers should prioritise improved liquid fuel security, but locate this in a wider, systems thinking-inspired approach to enhancing energy security and its contributions to overall national resilience and security.

## Policy Recommendations

**This report recommends six principles to guide improved energy security decision-making, starting at the Commonwealth level but ideally extending to sub-national levels.**

In summary, these are: better align Australian energy security policies with peer country commitments; prioritise Australian needs over trading partner energy security; embrace a mix of market forces and strategic defences against market forces; adopt a systems-thinking approach to energy; better prepare for short-term shocks while building long-term resilience; and better recognise and work to realise how energy security and transition can be mutually reinforcing.

The report also makes concrete Commonwealth-level policy recommendations, including:

- On liquid fuels, significantly improve stockholding and other short-term shock absorbing capacity, alongside accelerated energy transition and efficiency;
- On gas, implement east coast reservation and monitor Western Australian developments, while again pursuing long-term demand reduction;
- On electricity, pursue sustained bipartisan support for a renewables-heavy grid and ensure cost savings are passed on to consumers;
- On clean energy supply chains, continue to monitor and invest in areas of newfound economic and strategic ability and balance between ties with China and strategically aligned partners;
- In a cross-cutting sense, improve strategic assessments of energy and its broader relations, including potential development of a national energy security strategy, and enhance energy diplomacy.

## Introduction

Energy security—most simplistically, uninterrupted access to affordable energy—is a vital concern of states and communities. Without it, critical interests and values are compromised. Australia’s aggregate energy resources, both fossil and clean, far exceed its aggregate demand; but it has key vulnerabilities that, left unattended, could undermine national security and resilience.

Oil poses Australia’s most profound energy security challenge. Falling domestic production has led to maritime imports supplying more than 90% of liquid fuel needs.<sup>1</sup> These liquid fuels meet half of Australia’s final energy demand.<sup>2</sup> They underpin critical interests, including food production and distribution, transport of medicines and other key goods, important economic sectors such as mining, and Australian Defence Force (ADF) operations. There is growing concern around Australia’s ability to manage a major fuel supply disruption. It has limited emergency stocks, diminishing refining capacity, little control over shipping, and inflexibilities around fuel substitution and distribution. Even discounting a major shock, Australia’s economy is overexposed to volatile oil prices.

Australia also faces formidable energy security challenges in other sectors. Despite Australia’s status as a major gas exporter, regulatory settings have led to consumers facing high prices and threats of shortages. Despite the country’s wide range of generation options and its broader economic and political capacity, partisan divides have hampered the necessary transformation of Australia’s electricity system, introducing an unnecessary risk of profound, or persistent low-level, system failure. Australia also faces complex choices around contributing to and maintaining access to clean energy mineral and technology supply chains, with important repercussions for future economic development and greenhouse gas emissions.

Policy failures over multiple decades have most contributed to Australia’s energy predicament. A ‘market fundamentalist’ perspective, which entrusts economic actors and



↑ Truck Fuel Tank, Michael Coghlan, CC BY-SA 2.0

their interactions with the task to safeguard the national interest, is the main culprit. This perspective is out-of-step with international norms. It is also ill-suited to an Australian contemporary environment characterised by rising geopolitical and geoeconomic competition, climatic and environmental instability, and likelihood of pandemics and other threats. Australia has also consistently struggled to adapt its energy policies to meet the challenges and seize the opportunities of the transformation of global energy systems to respond to the climate crisis. Prominent voices have often successfully, but erroneously, argued there is an unavoidable tension between significantly reduced fossil fuel use and the maintenance of energy security.

Australian policymakers have begun to shift energy perspectives in recent years. But reform has often been slow, inconsistent, subject to unwarranted contestation, and lacking in transparency and inclusion. Australia lacks numerous international peer commitments to energy security. This includes failing to maintain up-to-date and comprehensive assessments of energy security risks or introduce accompanying resilience frameworks.

More energy security-conscious thinking must take hold among diffuse actors across government, industry, defence, and the community. These actors must consider both short- and long-term concerns and take a cohesive view of differing energy sectors’ needs and abilities, their interactions with one another, and with other interests and values. A ‘systems thinking’ approach should extend to paying more attention to the intimate connection between energy security and other pressing security concerns, including climate change.

The report begins by exploring the energy security concept and its key dynamics. Section 2 considers the nature and implications of Australia’s profound liquid fuel insecurity. Section 3 applies a similar lens to interrelated Australian challenges on gas, electricity, and clean energy supply chains. Section 4 considers new policy principles and individual commitments Australia should adopt in response to these findings. A case study considers the ADF’s specific energy security considerations.

## CHAPTER 1

# What is energy security?

Energy security is vital but lacks a universally agreed definition.<sup>3</sup> The ‘classical’ formulation is the International Energy Agency’s (IEA) “uninterrupted availability of energy sources at an affordable price”.<sup>4</sup> The IEA also distinguishes between short- and long-term security. The former concerns “ensuring the ability of the energy system to react promptly to sudden changes in the supply-demand balance”, while the latter concerns “making timely investments to supply energy in line with economic developments and environmental needs”.<sup>5</sup> These are key distinctions for this report.

The Australian Government defines energy security as “the adequate, reliable and competitive supply of energy and energy services to support the nation’s economic and social development”.<sup>6</sup> This represents an important evolution from an earlier definition that simply referenced affordability, reliability, and adequacy in the electricity, gas, and liquid fuel sectors.<sup>7</sup> Yet Australia still appears to lack definitions of short- vs long-term energy security or appreciation of the attendant need for careful planning to meet evolving needs.

Energy security can theoretically be a purely domestic matter. In

practice, however, few (if any) states possess even geophysical ability for self-sufficiency across all energy forms. Despite significant support for ‘energy independence’—particularly in the United States following the devastating 1970s oil shocks, led by the 1973 Arab oil embargo of exports to major advanced economies<sup>8</sup>—states have also found it largely uneconomical to isolate from trade in resources or goods and services that underpin complex energy systems.

The initial wave of energy security concern was largely a function of the uneven distribution of the most affordably developed oil supplies.



↑ Oil tanker, Sydney Harbour.

Oil has dominated the post-World War II global energy mix, and related dynamics have empowered and disempowered many states. The concentration of oil market power in authoritarian-led regions in the late 20<sup>th</sup> century caused import-dependent countries considerable anxiety, with implications such as sustained US oversight of Middle Eastern stability, to ensure the smooth flow of oil to global markets.<sup>9</sup>

Oil still dominates energy markets and related security framing. However, the oil fortunes of many states have changed in recent decades. The US, for example, has become the world's leading oil producer following its fracking boom of the past two decades. This has led to a noted increase in national confidence, though not always sound policymaking. President Trump, for example, established a National Energy Dominance Council in February 2025, seeking maximum leverage of US hydrocarbon wealth.<sup>10</sup> Trump has, however, simultaneously abrogated American clean energy leadership, and also damaged fossil fuel industry prospects with his oil price-lowering tariff war.<sup>11</sup>

The rise of other energy forms and new energy concerns, led by climate change, has also changed the security calculus. Gas has helped diversify energy mixes and dependencies while also helping to weaponise European-Russian ties, culminating in its strong contribution to the ongoing Ukraine crisis.<sup>12</sup> The transition to clean energies such as renewables and electric-powered clean technologies will reduce fossil fuel-linked insecurities. However, new anxieties have arisen, including around overconcentration of clean technology and mineral supply chains in authoritarian countries, led by China.<sup>13</sup>

Despite its direct roots in geopolitical crises such as the Arab oil embargo, there is a frequent tendency to treat energy security as distinct from national security, including, as noted below, in the Australian context. Yet these are intrinsically linked concerns. Energy security is critical to economic growth and development, health and wellbeing, social cohesion, and resulting resilience. It also directly



↑ HMAS Toowoomba's Marine Engineering Officer Lieutenant Commander Mitchell Batty, RAN checks probe connection during a dual replenishment at sea with HMAS Stalwart, and HMAS Brisbane as part of regional presence deployment 2023.

Defence forces require energy security for operational success. They engage in ensuring or restoring energy security, including protecting infrastructure and supply lines, and they provide emergency responses to communities impacted by energy crises.

Energy security policymaking is heavily concerned with enhancing access to affordable resources. However, the only assured route to sustainable security is reduced use of energy resources through efficiency, fuel or technology switching, or behavioural change. Energy security policy intersects with wide-ranging fields, from geology, to demographics, and

consider a multitude of inadvertent and deliberate threats. This extends to dis- and mis-information from actors who benefit from status quo dynamics. Russia has, for example, been credibly accused of funding past European climate and environmental campaigns as a means of maintaining its stranglehold on the continent's fossil fuel supply.<sup>14</sup> Fossil fuel industry members and supporters have also seeded doubts about the need and—following widespread acceptance of climate change—ability of countries to transition away from fossil fuels in a timely and efficient manner.<sup>15</sup>

## CHAPTER 2

# Australia's acute oil vulnerability: origins, implications, and emerging solutions

### Australia has been called an 'energy superpower'.<sup>16</sup>

This refers to its aggregate capacity for energy supply far exceeding its aggregate demand, leading to significant export strength. But, where Australia is a major net exporter of coal and gas, it has had net imports of combined oil and oil products for several decades.<sup>17</sup> Declining domestic production and continued strong consumption have led to imports now meeting over 90% of demand.<sup>18</sup>

Most remaining Australian oil production—about two-thirds of which comes from offshore Western Australia, tied to gas production—is exported, because this is more economical and better suited to Asian refineries. Australia's own refining capacity has significantly decreased in recent years.<sup>19</sup> Just two refineries now remain, from seven in 2010 and eight in 2000.<sup>20</sup> Only 22% of refinery feedstock is domestic, and 85% of Australia's imports are finished products.<sup>21</sup> Australia's lopsided oil profile has made it the world's third largest importer, and largest net importer, of petroleum products by value.<sup>22</sup> Asian countries are the dominant sources of Australia's imports (see Table 1).<sup>23</sup>

The Australian economy is, in turn, highly oil-dependent. Liquid fuels meet the largest share of national primary energy supply, at 35%, and final energy demand, at more than 50% (these figures differ due to changes in energy content from source across the supply chain).<sup>25</sup> Diesel is in turn Australia's most important oil product, meeting 53% of consumption in 2024 (see Table 2).<sup>26</sup> Liquid fuels help produce and deliver key materials including foods and medicines and sustain economically important industries such as mining. Oil is also key to defence needs and strategic concerns (see case study on page 16).<sup>27</sup>

A baseline condition of energy abilities outweighing needs is inherently beneficial. High import dependence is no fundamental impediment to achieving energy security, but it still brings vulnerabilities. The globalised oil market and its self-interested participants have traditionally guarded against severe physical disruption of Australia's fuel supply. However, this does not justify what might be called a 'market fundamentalist' perspective on meeting oil needs. This has been advanced by the likes of industry lobby Australian Institute of Petroleum, and

urges firm separation of economic and strategic actors and interests.<sup>29</sup>

Recent events, led by energy market chaos linked to the Russia-Ukraine war, have confirmed the inescapable interactions between energy and geopolitics. Ostensibly market-embracing countries have also always sought to shape and, where appropriate, shield from markets, if only to address countervailing forces. The IEA was formed in the wake of the 1970s oil shocks, largely to protect the interests and consolidate the power of advanced economy oil importers. Arguments that the IEA has since lost some relevance are valid, because the locus of energy demand has shifted to developing countries.<sup>30</sup> However, failed attempts to significantly grow IEA membership are testament to politics still often trumping markets.

Australia's own experience of past oil shocks has heavily influenced its subsequent policymaking. Due to its net export status and domestic pricing controls then in place, Australian consumers continued to pay less than half the average global oil price during the 1970s.<sup>31</sup> Australia did respond to the 1970s oil crises with new commitments such as the *Liquid Fuels Emergency Act 1984* (LFE Act). Yet it also subsequently

**Table 1. Main origins of Australia's oil imports, by value (2023, USD)**

Product import destinations	Crude import destinations
South Korea \$11.1 billion	Malaysia \$2.33 billion
Singapore \$8.23 billion	United States \$886 million
Malaysia \$5.57 billion	Vietnam \$698 million
Taiwan \$2.46 billion	Brunei \$616 million
China \$1.92 billion	New Zealand \$223 million

Source: OEC<sup>24</sup>

**Table 2. Australian consumption by oil product (ML, 2024)**

Petrol	Diesel	Jet fuel	LPG	Other	Total
16,245.5	33,418.4	9353.6	1526.0	1861.6	62,405.1

Source: APS<sup>28</sup>

unwound pricing controls to better embrace market forces, even as its transition to net importer status was underway.<sup>32</sup> Australia has not yet needed to trigger the emergency powers of the *LFE Act*, but this legislation provides less assurances than many international counterparts. It contains no specific regulations around levels, availability and locations of fuel reserves, or arrangements for emergency fuel switching, for example.<sup>33</sup>

Australia retains high trust in the market's ability to avoid severe oil emergencies. Yet the free operation of market forces has also actively contributed to Australia's insecurity. Lost refining capacity, most prominently, has resulted from competition from cheaper and more innovative Asian mega-refineries.<sup>34</sup> Without intervention, Australia's two remaining refineries, in Geelong and Brisbane, face the same fate. This brings clear downsides. An Australia with less refining capacity has less capacity to process domestic feedstocks and imports. Australia's transition to product-based import dependence has come alongside, and helped consolidate, an increasing trend of 'just-in-time' delivery of oil products, with less inventory management, including storage of much longer shelf-life feedstocks. These facts could matter greatly in an emergency. Refining losses have also significantly reduced Australia's engineering capacity and resulting economic complexity and resilience.

Australia's uninsulated embrace of markets is inconsistent with peer countries. Australia is one of few developed economies with no mandated minimum emergency oil reserves.<sup>35</sup> It is the only IEA member not meeting a requirement that net importers hold stocks equivalent to 90 days of net imports—an arrangement with origins in the 1970s oil shocks as a means of ensuring collective response to supply-demand imbalances—and has been since 2012.<sup>36</sup> The *Liquid Fuel Security Review*, begun by the government in 2017 (see below), summarised:

Australia is an outlier in the global community in the way that we think about liquid fuel security. When we consider countries of similar economies, most see fuel security as part of their strategic capability and take steps to manage fuel security with that in mind. Australia, by comparison, has chosen to apply minimal regulation or government intervention in pursuit of an

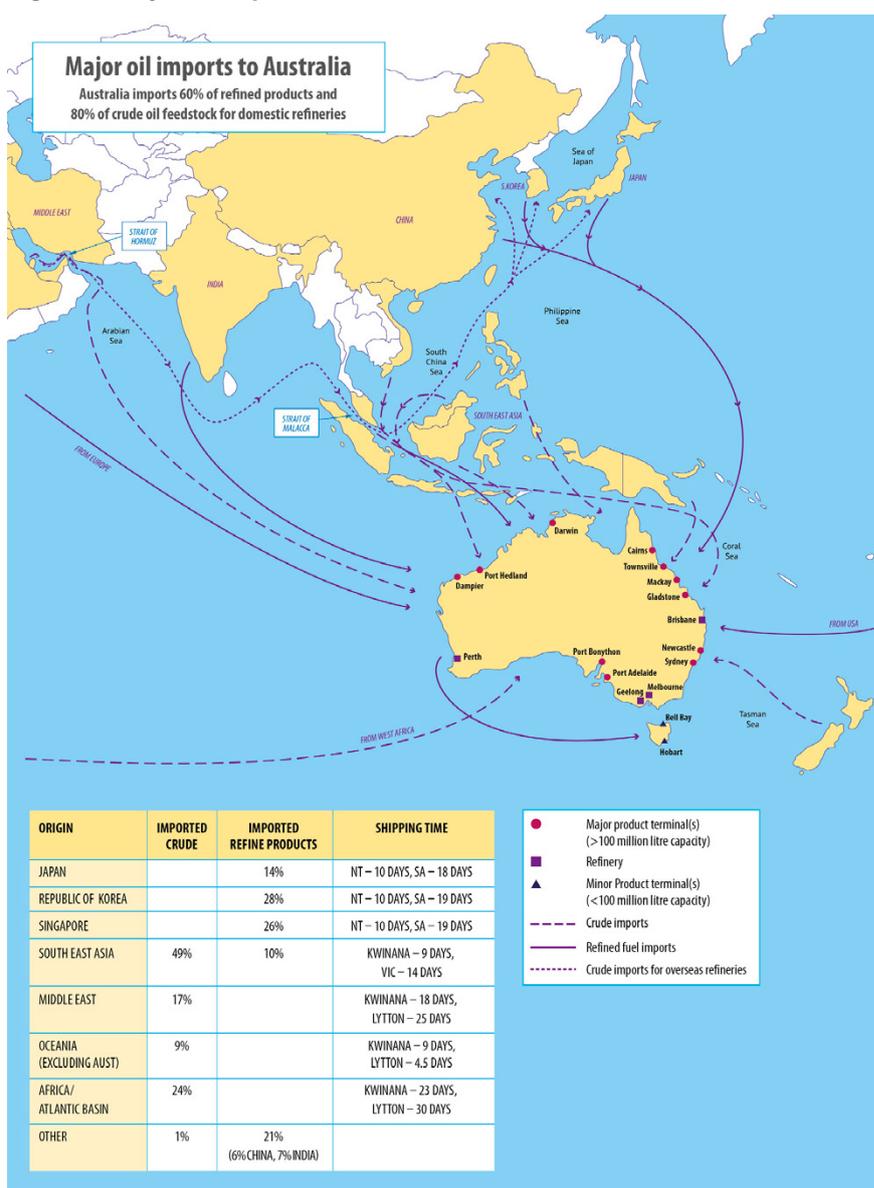
efficient market that delivers fuel to Australians as cheaply as possible.<sup>37</sup>

Australian fuel stocks have traditionally also been privately held, while most countries have a public-private mix. Private stocks can limit transparency as well as compliance and coordination abilities. Australia currently has 54 days' worth of IEA-compliant stocks.<sup>38</sup> The government's Australian Petroleum Statistics also records Australia's stock coverage against recent consumption levels. These currently are 27 days of diesel, 23 days of jet fuels, and 30 days of petrol.<sup>39</sup> In summary, Australia has below-average ability to manage being cut off from the global market, contribute to

collective global market rebalancing, and, some have argued, potentially diminished emergency access to others' stockholdings due to perceptions of free riding on international commitments.<sup>40</sup>

The petroleum industry and government have long argued there is little chance of major sustained fuel disruption due to Australia's tight integration into oil markets and supply lines. A redacted version of the *Liquid Fuel Security Review* released under a freedom of information (FoI) request in 2020 noted 70 countries provided Australia's fuel, the significant flexibility of shipping routes to Australia (see Figure 1), and numerous oil entry points.<sup>41</sup>

**Figure 1. Major oil import routes to Australia**



Source: Australian Government<sup>42</sup>



↑ Diesel fuel storage tanks, Pembina Institute, CC BY-NC-ND 2.0.

There is truth to these arguments, but also important counterpoints. Defending an existing system's ability to manage novel challenges suggest a strong normalcy bias. This fails to take account of changing circumstances, including the erosion of Australia's domestic oil equation and geopolitical environment, and the implications of the energy system transformation.

Economic integration is also a well-established double-edged sword. Efficient supply chains, sophisticated technologies, and financial instruments can easily spread contagion, including levelised high prices, and create openings for cyber-attack and mis- and disinformation. Unavoidable concentration of critical activities, market power, and trading routes in specific geographies brings additional risk. Australia also implicitly relies on the US Navy to provide its maritime fuel security. While Washington has long viewed this umbrella as serving its own interests, American commitment may have

diminished in recent times, increasing the potential for piracy and other potential forms of energy supply interdiction.

Many apparent oil security assets also appear less robust on closer inspection. One major source of Australian oil products, China (see Table 1), also causes its most significant strategic anxiety. The diversity of Asian refiners and adaptability of shipping routes similarly obscures more constrained and contested feedstock origins. A 2022 analysis found 80% of crude imports to refiners in Singapore, South Korea, and Japan come from the Middle East, passing through the Strait of Hormuz chokepoint before the equally troubled Malacca Strait and South China Sea.<sup>43</sup>

The salience of Australia's diverse oil sources, trading routes and entry points would also diminish in times of general market chaos, including any linked to conflict. Credit and

insurance to shipping companies could be reduced and trade subject to blockade, embargo, or financial sanctions. Australia's reliance on exclusively foreign-flagged and -crewed oil tankers is another vulnerability.<sup>44</sup> Risks of shipping firms and countries acting in their own interests and failing to honour contracts and alliances are rising following President Trump's chaotic geopolitical and economic decisions.

Optimal international conditions must intersect with domestic equivalents to ensure energy security. Retired Air Vice-Marshal John Blackburn has noted additional challenges arising from a complex system being built in individual stovepipes rather than through intelligent design and systems thinking. The result has been disjointed and underdeveloped energy infrastructure—mostly under private and/or foreign ownership—and transit routes, often with overreliance on 'single points of failure'.<sup>45</sup> Much of Australia's population is far from



↑ British Petroleum (BP) Oil Co, Kenworth Prime Mover on Stuart Highway, Adelaide River, Northern Territory, Australia, John Ward, CC BY-NC-SA 2.0.

maritime entry points and the country heavily depends on a single form of transportation—trucking—for fuel distribution, with comparatively limited pipeline or rail networks. Trucking, itself a significant fuel user, is particularly critical to moving Australian non-bulk goods, with about 80% market share, compared to about 17% for rail and 4% for coastal shipping.<sup>46</sup>

Australia has few oil-substituting options in transportation and economic sectors. As the *Liquid Fuel Security Review* acknowledged, high oil prices have generally muted impact on demand compared to other countries.<sup>47</sup> This is already a form of energy insecurity and more evidence of how exogenous factors can shape market effectiveness. Industry members have still argued that fuel shortages during periods of global unrest can be addressed through natural changes in the supply-demand balance—for example, grounded civilian aircraft

freeing up fuel for defence.<sup>48</sup> This may be true; but success is only guaranteed so long as access to well-functioning international markets is restored relatively quickly. Willingness to pay higher prices will not guarantee energy access if rationing is enforced under the *LFE*.<sup>49</sup>

Severe disruption of Australia's liquid fuels likely still depends on a series of intersecting crises and cascading failures at home and abroad. But appreciation of the risk is rising. Qantas board chief John Mullen reminded a corporate audience in March 2025 of Australia's slender fuel reserves and noted that “even a regional conflict could choke this off overnight and Australia would simply stop”.<sup>50</sup>

The 2019 Exercise Catalyst simulation by the National Oil Supplies Emergency Committee (NOSEC)—a grouping of Defence, federal and state and territory energy agencies, and petroleum industry

representatives established in 2022—considered the potential for severe disruption in more granular detail. Also released under *FoI*, the scenario saw Australian crude and product imports fall to 35% of normal levels. This followed major disruptions to Strait of Hormuz and South China Sea shipping linked to conflict and cessation of insurance, attacks on Middle Eastern oil production, Asian refiners shuttering capacity, IEA members hoarding emergency stocks, Australia struggling to process domestic crude, and a 21-day period before *LFE Act* rationing was triggered.<sup>51</sup> Such a crisis would impose immense costs on lives and livelihoods.

Widespread fuel disruption continues to be a low probability, high impact event. Yet, if anything, Australia's resilience to such shocks has fallen, as the likelihood has risen. There are also clear benefits to reduced exposure to oil pricing volatility, even absent disruption.

## Emerging responses and ongoing priorities

Recent Australian governments have started to pay more attention to liquid fuel security. But commitments thus far have not drawn dramatic turnaround in fortunes. Governments have generally sought to minimise potential crisis impacts and ensure quick recovery, rather than address structural causes. They have, in summary, focused mostly on short-rather than long-term energy security. Transformational change requires a far larger and multi-faceted effort and, concerningly for some, less trust in markets and more state intervention. This will bring significant additional costs, but they could ultimately be lower than continued investment in a status quo that sustains massive risk and baseline energy insecurity.

The 2019 Exercise Catalyst scenario suggested that government, through bodies such as NOSEC, has privately considered fuel crisis scenarios in which markets offer inadequate protection, even before Covid-19 and Ukraine. This, however, contrasts with continued public pronouncements of faith in markets and the similar impression given by the incomplete *Liquid Fuel Security Review*. It is disappointing that the Morrison and Albanese Governments both refused to release the full final version of this review. It also took another FoI request to secure the 2024 public release of the *National Liquid Fuel Emergency Response Plan* developed in 2019.<sup>52</sup> Increased transparency and public inclusion in assessing and responding to energy security crises would be an asset.

The publicly released *Liquid Fuel Security Review* did still make useful recommendations to government, while providing significant room for interpretation on the implementation. The four main pieces of advice were:

- maintain stocks at or above current levels for petrol and jet fuel and increases to diesel stocks
- maintain a domestic refining capacity to support Australia in major disruption scenarios
- ensure adequate information on fuel stocks and supply issues
- ensure legislation allows resolution of disruption and effective industry, government, and fuel user coordination

The Morrison Government's *Fuel Security Act 2021* (FSA) introduced several new commitments in line with these recommendations, including new minimum stockholding obligations (MSO) for major importers or refiners (see Table 3 for schedule). The Department of Climate Change, Energy, Environment and Water reported that MSO levels in January 2025 were compliant with the applicable threshold at the time.<sup>53</sup> However, MSO accounting is more generous than IEA or Australian Petroleum Statistics methodologies, which have seen little recent improvement in true security terms. MSO allows counting of stock on ships inside Australia's exclusive economic zone and bound for the country, for example.

The Morrison government's *Boosting Australia's Diesel Program* also offered \$200 million in grants to construct 780ML additional storage, and the *Fuel Security Services Payments* system was established to help Australia's remaining refineries maintain production in unprofitable periods, alongside grants for upgrades for higher quality fuel production.<sup>55</sup> There has, however, reportedly been little construction of new government-assisted storage facilities thus far.<sup>56</sup> The subsidy regime for refineries is yet to be properly tested.

Prior to the FSA release, the Morrison government also secured 10-year access to store Australia's first-ever government-owned stocks in the massive salt caverns of the US Strategic Petroleum Reserve (SPR). This, along with purchases of 'tickets' of ownership of private stocks held in other countries, was designed to help Australia improve its compliance with IEA obligations, rather than directly respond to Australian needs.<sup>57</sup>

Australia remains nominally committed to regaining IEA stockholding compliance by 2026, which is a fast-approaching date.<sup>58</sup> But private-led progress has been slow, and appetite for publicly held stocks on Australian soil seems low. Australia's SPR experience was still informative. Critics noted the distance between Australia and the US Gulf Coast location of the SPR, but the improved IEA contribution culminated in Australia participating in a collective sell-off to help rebalance the Ukraine-linked oil market.<sup>59</sup> Owing to this market's global nature, Australian consumers still benefited from the action. Australia reportedly also made a significant profit. It purchased the oil for US\$59 million in the Covid downturn and sold it for US\$186 million.<sup>60</sup> The sale also had geopolitical utility in worsening Russia's bargaining position vis-à-vis major oil buyers. Still, the Exercise Catalyst simulation suggested neither collective action nor safe transit can be counted on in extreme scenarios.

The efficacy of greater investments in stocks, refining, and protection of supply lines should still be kept in perspective. These efforts all target short-term energy security. They do not target long-term energy security by tackling the structural challenge sustaining oil insecurity: overreliance on fuels which Australia has diminishing ability to produce affordably.

**Table 3. Minimum stockholding obligation schedule**

Product	Threshold between 1 July 2022 and 30 June 2024	Threshold from 1 July 2024
Gasoline – Importing	24 days	27 days
Gasoline – Refining	24 days	24 days
Diesel – Importing	20 days	32 days
Diesel – Refining	20 days	20 days
Kerosene – Importing	24 days	27 days
Kerosene – Refining	24 days	24 days

The Albanese government has made additional commitments outside the main *Liquid Fuel Security Review* recommendations. These include seeking to develop an Australian-flagged strategic shipping fleet with potential oil tanker inclusion. A taskforce advising government recommended the initial 12 vessels include “liquid bulk vessels configured to carry multiple grades of fuel and chemical products in independent tanks”.<sup>61</sup> A construction tender of three pilot ships was completed at the end of 2024, but the composition of successful applicants is not yet known.

The fleet taskforce recommended any strategic oil tankers be confined to coastal shipping between Australian ports. Meanwhile, Defence Minister Richard Marles has prominently spoken of AUKUS nuclear submarines as having a key role to play in protecting transit of Australia’s fuel sources further from home.<sup>62</sup>

It will be important to monitor progress of what are very long-term commitments in the maritime protection space. The strategic shipping fleet, and particularly AUKUS, have more expansive mandates than ensuring energy security, and both face considerable hurdles to future progress. It is also important to note that the nature of Australia’s energy systems and interdependencies should already be dramatically less maritime-dependent in coming decades due to the shift away from fossil fuels reliance. Expedited commitment to this energy shift could further lessen the oil burden on future maritime assets.

The Albanese government’s energy policies have also been notable for better recognising the climate imperative in energy policy, alongside the security one. The government has offered \$250 million in grants from its *Future Made in Australia* program to production of biofuels and other low-carbon fuels.<sup>63</sup> This could spark some small revival in domestic fuel supply, particularly for sustainable aviation fuel (SAF), as the only near-term alternative to conventional jet fuel. The government has already presided over small victories in this regard. In 2023, for example, VIVA Energy signed an ADF contract to allow resumption of Australian jet fuel production at VIVA’s Geelong refinery. In 2025, VIVA and the ADF also signed a small-scale deal for SAF supply (see case study).<sup>64</sup>



† The Hon. Richard Marles MP, Deputy Prime Minister and Minister for Defence, Australia and the Right Honourable John Healey MP, Secretary of State for Defence, United Kingdom (UK) signed the bilateral Nuclear-Powered Submarine Partnership and Collaboration Treaty (the Geelong Treaty) at the UK- Australia Defence Ministers’ Meeting in Geelong, Victoria.

Other Albanese government commitments could work to reduce aggregate fuel demand. These include new vehicle efficiency standards—overcoming another previous Australian deficit—and forthcoming fuel standard improvements. Development of a National Electric Vehicle (EV) Strategy has also been accompanied by EV purchase tax concessions and investment in charging and hydrogen refuelling infrastructure.<sup>65</sup> Most of these commitments were challenged by the opposition Coalition, but they will survive and perhaps be consolidated following Labor’s 2025 re-election.

There is considerable further work to be done. But Australia’s national debate at least now recognises there are two key ways to address its structural oil problem. One is to dramatically revive some domestic production, matched to domestic refining. The other is to dramatically reduce consumption. Both rely on significant government intervention.

Hard geological constraints preclude cheaper Australian crude production and numerous other barriers prevent replicating the US fracking-assisted boom in expensive low-permeability rock.<sup>66</sup> Low-emissions liquid fuels have some potential. Building an industry ecosystem and lowering prices—up to three times higher than conventional fuel<sup>67</sup>—will take time and resources, but could be an important first step in a broader philosophical shift.

Expedited reduction of total oil consumption could play a more major, more cost-effective, and more climate-positive role in reducing oil insecurities. Existing electrification

and efficiency commitments could be significantly expanded. Stronger financial support for EV purchases would be beneficial, as would a phase-out target or ban on internal combustion energy vehicle sales, matching more than 60 countries or territories.<sup>68</sup> Further reform of fuel and transportation taxation regimes and investment in mass transit and alternative freight networks, such as rail, could also be useful and have co-benefits of reducing stress on trucking fuel distribution.

An accelerated buildout of Australian renewables to charge Australian EV batteries could further benefit energy security, by helping the country decouple from pricing volatility for coal and gas. Oil use could also be reduced in diesel power generation in remote locations via off-grid renewables and storage. This could play a critical site-specific resilience role. These are examples of a much-needed comprehensive view of energy security, which accounts for interactions between different energy sources, end uses, and transformations.

Australia needs a systems thinking approach to oil and energy security, with top-down design and capacity for bottom-up technological innovation. Delivering this will certainly be difficult. It will need to overcome challenges posed by incumbent industries and interests, in addition to cost, technical, and social acceptance barriers. And, while the transition from oil and broader fossil fuel dependence could bring significant energy security benefits, it could also bring some new complications that will need to be adequately managed.

## Case study: Energy security and the ADF

While AUKUS is bringing nuclear power to the fore, the ADF runs on oil. It consumes up to one per cent of Australian liquid fuel.<sup>69</sup> This is comparatively large considering regular and reserve service members are 0.4% of Australia's population<sup>70</sup> and defence contributes 0.44% of gross value-added economic activity.<sup>71</sup> The ADF has significantly different fuel needs than the broader economy, with aviation accounting for almost three-quarters of demand (see Table).<sup>72</sup>

Outside joint US or other operations, the ADF uses private markets and just-in-time supply chains to meet its fuel needs, but it does store about 35% of its fuel in more than 100 installations, which had a 150ML total capacity as of 2020-21.<sup>74</sup> A US Department of Defense-funded facility with 300ML of jet fuel storage at Darwin's East Arm is also nearing completion, though the level of Australian access is unclear.<sup>75</sup> The A\$1.7 billion Defence Fuel Resilience Program (formerly Defence Fuel Transformation Program) commits to some modest ADF storage upgrades, but mainly targets improved quality and responsiveness of storage and delivery.<sup>76</sup>

Implementation of two key recommendations from the 2023 *Defence Strategic Review* (DSR) also target improved fuel and broader energy security. A National Fuel Council of defence, government, and industry representatives was established and meets three times a year to address ADF needs.<sup>77</sup> Several commitments also seek to accelerate Defence's energy transition, to (as the DSR advised) "increase national resilience".<sup>78</sup>

The Defence Renewable Energy and Energy Security Program is rolling out solar power and

### ADF liquid fuel mix (2020-21)

Fuel category	Consumption (ML)	Proportion
Jet fuel	227.3	72.5%
Marine diesel	66.2	21.1%
Automotive diesel	18.4	5.9%
Unleaded petrol	0.7	0.2%
Other fuel grades	1.1	0.3%
<b>Total</b>	<b>313.7</b>	<b>100%</b>

Source: ADF<sup>73</sup>

battery storage to replace diesel generation at ADF sites across Australia.<sup>79</sup> The new Defence Energy Transition Office has also overseen delivery of the *Defence Future Energy Strategy* (DFES) and *Defence Net Zero Strategy* (DNEZ). The DFES argues that "transition to alternative energy types presents opportunities to enhance supply security for warfighting capabilities, interoperability, and to reduce price volatility".<sup>80</sup>

As well as continued offsite renewables, the DNEZ pledges Defence to achieve 100% renewables procurement from the grid, which could add resilience to Australia's broader grid buildout.<sup>81</sup> The DFES helpfully notes Defence opportunities to influence establishment of alternative energy industries through its sizeable energy demand, investment capacity, and existing partnerships. It has identified SAF and other low-emissions liquid fuels, hydrogen, and electrification as near-term options for significantly reducing oil use.<sup>82</sup> In this respect, Defence could replicate the former Biden Administration's use of the *Defense Production Act* (DPA) to accelerate US clean energy technology manufacturing, as well as investment in Australian critical minerals.<sup>83</sup>

Defence efforts that can enhance both its own and Australia's broader energy security would have compound strategic benefits. They would increase shared resilience and lessen Defence's obligations to respond to energy emergencies, including the potential drawdown of its own energy stocks. As well as *LFE Act* obligations, Defence is included in the Government Energy Action Response Protocol, which provides a framework for reduced government power usage when needed.<sup>84</sup>

As already noted, Defence has a major role to play in protecting energy transportation and infrastructure. Energy security boosting commitments, such as significantly reduced military and civilian reliance on imported oil, would lessen these. The ADF is exempt from complying with Australian net zero goals in ways that might compromise its operational success. This would appear a long-term benefit in freeing up fuel use for energy dense-ADF applications. The inverse and greater risk is, however, that it would likely coincide with structural decline in the global oil market and comparatively quicker and operationally beneficial transitions in other militaries, leaving the ADF tied to obsolete technologies and increasingly dysfunctional supply chains.

## CHAPTER 3

# Completing the picture: Australia's other energy insecurities and their potential solutions

**Liquid fuel is Australia's major energy security challenge; yet, it is not an isolated concern.**

Australia faces threats of shortages and high prices on gas due to an overly export-centric approach, partisan opposition to necessary power market transformation, and a range of complicated choices on emerging clean energy supply chains. Australia's responses to these collective challenges will also heavily influence overall national security and resilience.

Sector-specific factors heavily influence all Australian energy security challenges. But common threads also unite them. Australia's default position remains market fundamentalist, whether in oil or other sectors. Policymakers typically only adopt more strategic rationale where Australia has greater apparent abilities than needs. However, this generally involves prioritising the energy security of other economies, rather than guaranteeing Australia's long-term needs are met. It might thus be considered a post-hoc justification for an enduring market fundamentalist perspective. Australia's total energy system is also influenced by a long-standing national inability to accept that energy security and energy transition need not be in tension. Resolving this misconception is key to dramatically improving Australia's responses to climate change at a domestic and international level.

There are also important signs of evolution in energy security thinking in non-oil sectors. But there is still little indication Australia is seeking to formally recognise the depths of its energy security challenges and formulate commensurate responses. As one indication of this, Australia's energy specific risk and resilience assessments are significantly outdated, with the latest *National Energy Security Assessment* and *Energy White Paper* completed more than a decade ago. Australia also lacks a formal energy security strategy or, indeed, national security

or resilience strategies in which energy-specific commitments might be nested.

### Divided gas priorities

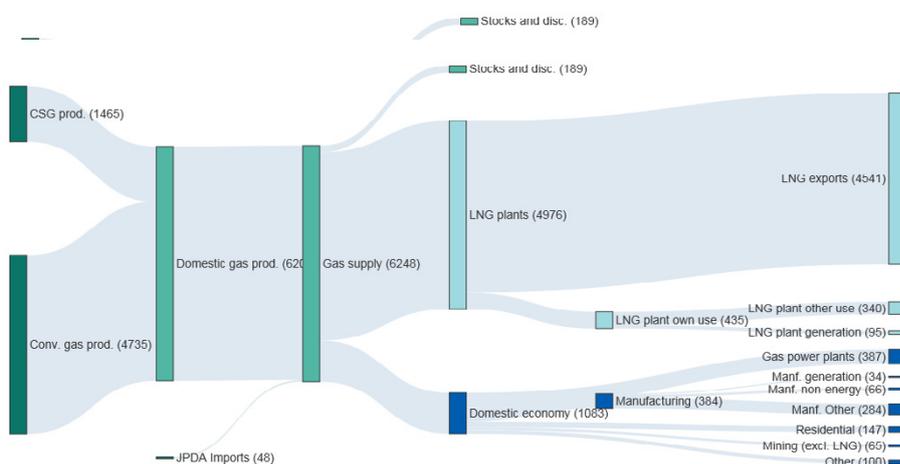
Somewhat counterintuitively, one of Australia's most profound non-oil energy insecurities is around gas. This is despite Australia being a top three exporter of liquefied natural gas and a major net exporter of gas in aggregate.<sup>85</sup> At a domestic level, gas is used in a quite diverse range of applications (see Figure 2). This includes power generation, heating, and industry, with the latter incorporating processing other gas for LNG exports.

As a fossil fuel, the role of gas in the future energy mix is contested. Along with batteries and hydropower, gas is one means of backing up, or 'firming', intermittent renewables. It can also help in producing energy transition inputs such a critical minerals, green metals and other goods while lower emissions pathways are developed. However, many industry proponents have argued gas can play a more expansive and long-term role—even

as this contradicts Paris climate agreement-aligned economic pathways, such as that set out in the IEA's Net Zero Emissions scenario.<sup>87</sup> Assessing these various claims is beyond the scope of this report. However, it is clear that security of supply for gas is far more of a concern than for coal, which faces a far more certain decline in usage.

Australian gas markets, particularly those on the east coast, have witnessed a tightening supply-demand balance and rising prices in recent years. Regulator the Australian Energy Market Operator has regularly warned of looming shortfalls.<sup>88</sup> Various factors have helped sustain this threat, but the biggest by far has been rapid and inadequately regulated development of Queensland's LNG export industry. LNG producers have been able to divert excessive volumes of Australian gas to the international market in pursuit of higher profits. In contrast to the already heavily globalised oil market, this has created much sharper contractions in domestic volume and increases in prices. In the decade since Queensland's LNG sector began operating, east coast gas prices have tripled.<sup>89</sup>

**Figure 2. Australian natural gas flows, petajoules, 2022-23**



Source: Geoscience Australia<sup>86</sup>



↑ Storage tanks at the Port Bonython facility, Whyalla, UCL Engineering, CC BY-SA 2.0.

Gas is already a less consumed and more substitutable product than oil in Australia's economy. Sustained high prices will likely lead to continuation of the demand destruction already seen, which will help rebalance against supply and continue the avoidance of severe shortages. This trend will, nonetheless, bring significant ongoing economic and social pain, as gas-dependent industries—some of which are strategically important, such as metals, chemicals, fertilisers, and explosives production—shutter production and households face rising bills. Gas problems could also have some liquid fuel impacts. LNG has been used as a shipping fuel replacement, substituting for heavy fuel oil to lower pollution in line with tougher International Maritime Organization rules. However, gas faces competition from cleaner fuels, meaning price competitiveness remains a key factor.<sup>90</sup>

The gas situation confirms the need to ensure that markets do not just work, but work in Australia's favour. Australian gas policies have largely been geared towards export expansion and tapping the industrial opportunities associated with these. This was strongly reflected in Australia's 2015 *Energy White Paper*, which celebrated and sought to expand the country's role as an 'energy superpower' across gas and other energy sectors.<sup>91</sup>

The gas sector also best illustrates how strategic arguments have been used to argue Australia should sacrifice its own energy security for that of others. LNG-centric policymaking has often been predicated on advancing Australia's ability, and even obligation, to provide for other countries' energy needs. Documents such as the federal *Future Gas Strategy* of 2024 have perplexingly argued Australia

must maintain a largely *hands-off* approach to gas regulation because of the critical role that this resource plays in the very *hands-on* energy security strategies of countries such as Japan and Korea.<sup>92</sup>

The export-centric logic could be justified if returns for Australia's economy or national security were sufficiently large. But this seems doubtful. Royalty and taxation regimes for Australian gas or other commodities have traditionally failed to ensure significant returns for Australians, and most industry profits head offshore.<sup>93</sup> Some of the most prominent arguments in favour of Australia remaining a major gas exporter also appear to have been made on false pretences. Japanese officials have strongly criticised Albanese-era interventions in gas markets, even as these aimed to enhance Australia's own energy security and climate action. But

subsequent research and analysis has found Japanese importers re-sell as much or more Australian LNG to other Asian countries as they use domestically, underpinning the creation of new markets for these resources and related technologies.<sup>94</sup>

However, east coast energy users do have some Australian precedent to call on if seeking to strike a better gas security deal. Since 2006, Western Australia—a far larger LNG exporter than Queensland—has required industry to reserve the equivalent of 15% of exported gas for domestic users. WA has had consistently lower gas prices than international or east coast gas markets during this time. The noticeably pro-LNG WA government now in power has, however, started to relax some reservation requirements in recent years, which, to further prove the point, has led to increased prices.<sup>95</sup>

Policy responses to Australia's east coast gas challenges have thus far included providing the Federal Minister for Resources power to divert exports to domestic use during declared emergencies, and an industry code of conduct to avoid this necessity.<sup>96</sup> There have also been moves to revive some onshore production, while Victoria and the

Australian Capital Territory have implemented gas phaseout strategies. There are also plans for LNG imports to southern states, facilitated by new specialist terminals.<sup>97</sup> Though the notion of a net gas exporter planning imports appears perverse, this could be a better solution than investment in more costly and longer-lived infrastructure—such as additional north-south gas pipelines—which might only be completed after which time gas demand could and should be significantly lowered, rendering new infrastructure obsolete.

East coast gas challenges featured in the 2025 federal election campaign. The typically more market-embracing Coalition unveiled a new domestic reservation policy, while Labor hinted stronger commitments could come in its new term in office.<sup>98</sup> These are positive developments. Australia should not only give serious consideration to east coast gas reservation, but aim to ensure WA does not backslide. In line with climate commitments, this should be accompanied by a long-term, measured phase out of gas from the economy, starting where it does not play a key role in energy transition interests.

## Disjointed power sector transformation

Electricity is already an energy system pillar. It will become even more centralised through the energy transition, which promotes electrification of combustion-based applications and production of cleaner fuels and industrial feedstocks with renewable electricity. Australia faces inherent difficulties generating and distributing reliable and affordable power across a large landmass with rugged terrain, climatic extremes, and a sparse but concentrated population and economic base. Unlike in fuels, Australia is also disconnected from the benefits of cross-border electricity trade.

The Australian power system is currently undergoing major necessary reform to replace obsolescent infrastructure and meet the needs and the opportunities of the energy transition. This creates openings for poor security outcomes if the process is not well-managed. Next generation grid technologies are also a blessing and a curse from a security perspective. They allow new supply and demand management capabilities as well as new cyber vulnerabilities.



↑ LNG Tanker, Lens Envy, CC BY-NC-ND 2.0.



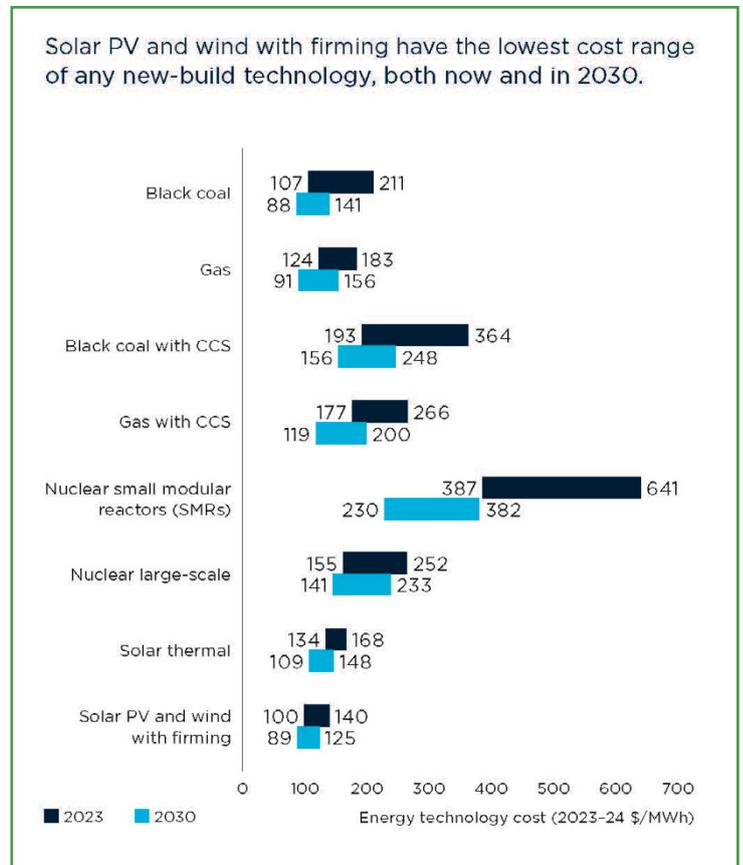
↑ Alan Levine, CC BY 2.0.

Unfortunately, Australia’s power system transformation has indeed been chaotic. A 2017 review of Australia’s power system by then Chief Scientist Alan Finkel found that ongoing uncertainty around the trajectory of the sector was undermining investor confidence and the reliable supply of electricity, while increasing consumer costs.<sup>99</sup> The worst impact of the continuation of this could be rising incidences of prolonged power outages or ‘black system events’. For example, the 2016 extended loss of electricity to 850,000 South Australian customers led to an estimated economic cost of \$367 million and significant social disruption.<sup>100</sup>

Australia’s power system is mainly evolving away from coal. Assets now reaching the end of their useful lives are largely being replaced with renewables, due to both climate drivers and cost advantages. The Albanese government has targeted 82% renewables generation in Australia’s main grids by 2030. It has supported this outcome through programs such as the Capacity Investment Scheme, which underwrites private investment, and Rewiring the Nation, which funds transmission and grid modernisation.<sup>101</sup>

A reliable high renewables grid can be achieved with sufficient firming (most likely through a mix of gas, batteries, and hydro), transmission, and other integration. If optimally designed, this could deliver significant cost savings. CSIRO now consistently finds solar and wind the cheapest forms of new Australian power, even with integration costs (see Figure 3).<sup>102</sup> Solar and wind are also free of the energy security-challenging dynamic most associated with fossil fuels—the uneven distribution of fuels that are constantly exhausted, creating unwanted market power and dependencies. Distributed and off-grid assets can reduce single points of failure and, as already noted, dependence on external fuel supply chains.

**Figure 3. Levelised cost of electricity by source for Australia**



Source: CSIRO<sup>103</sup>

There is room for some partisan disagreement within the main contours of Australia’s power sector transformation. But this has often risen to the level of fierce argument over what these contours should be. The latest example of this unhelpful distraction was the 2024 Coalition plan to pause Labor’s well-advanced renewables rollout in pursuit of nuclear power, which has never been developed in Australia.<sup>104</sup>

The broad context of the national nuclear debate is familiar. It reflects a common view that the most rapid pathway to a decarbonised energy system will inevitably compromise energy security. This has often been advanced by mis- and disinformation blaming renewables for energy system failures whose roots mainly lie elsewhere. Federal officials notably attributed the 2016 South Australian black system event on the state’s high renewables deployment, for example,<sup>105</sup> although the official investigation found unprecedented storm damage to transmission infrastructure was most to blame.<sup>106</sup>

More recently, critics have claimed higher renewables penetration is at fault for persistently high Australian electricity prices; but a far larger cause has been expensive gas, which most influences retail price under existing market rules.<sup>107</sup>

Meanwhile, most independent assessments have found that nuclear energy will be much more expensive and slower to deliver than renewables. It would have taken 10 years by Coalition estimates to build new plants, but much longer based on international examples.<sup>108</sup> Efforts to slow the renewables rollout would thus have created a capacity gap, which was likely to be filled with the retention of more expensive, less reliable coal in particular.

Continuing partisan divides increase the likelihood of undesirable electricity-linked outcomes for the community and critical industries. As in the oil sector, the biggest threat is major disruption of supply, in the form of future black system events. The Australian Energy Regulator has noted that factors which can contribute

to these events include “extreme weather; terrorism; a criminal act; technical failure; human error; human pandemic; and accidents”—many of which appear to be increasing in likelihood.<sup>109</sup> A continued expensive power sector and inability to keep pace with Australia’s emerging interests and values, including accelerated climate action, would also be damaging.

Bodies such as AEMO do maintain emergency plans to avoid and recover from significant disruptions. Australian policymakers have, indeed, had generally higher concern for avoiding major electricity shortfalls than fuel ones. But, again for largely political reasons linked to the energy transition, there has been a tendency to consider generation assets as sustaining the most risk, when, as in the South Australian case, transmission disruption is far more common.<sup>110</sup> This misconception (and a related, unjustified belief in the need for continued baseload—that is, constantly generating—power for reliability purposes) explain some of



↑ Australian Army soldiers from the 9th Force Support Battalion and Air Force aviators carry a fuel hose to a F/A-18F Super Hornet aircraft during Exercise Talisman Sabre 23 at RAAF Base Darwin, Defence Imagery.

the opposition to a high renewables pathway. There are certainly cost trade-offs to ensuring system reliability with increasing renewables generation. However, based on current estimates, these do not become apparent below 90% firmed renewables generation.<sup>111</sup>

Australia’s electricity sector debate has thus spent too long discussing the wrong short-term questions and too little time setting and pursuing long-term energy security strategy. That Australia’s power supply should be clean, as well as affordable and reliable, should not be controversial—the escalating climate crisis will, after all, pose a far larger security threat than energy shortfalls. But, even if applying the IEA’s classical definition of energy security, there is no apparent danger to Australian pursuing a high renewables grid and even some apparent benefits in terms of both cost and energy availability.

False impressions around energy security and transition trade-offs have unfortunately become something of a self-fulfilling prophecy. They have helped perpetuate disjointed, unnecessarily expensive, and risk-prone system planning. Correcting course will depend on all sides of politics agreeing on a general path forward and resisting the urge to overly politicise decision-making. Government could in turn empower agencies such as AEMO, and tools such as its Integrated Systems Plan, to provide more certainty around necessary power sector transformation and better assess and manage those risks—including black system events—that might still arise in this process.

### Fragile clean energy supply chains

The energy transition can deliver significant energy security benefits in Australia and elsewhere. Yet it will also bring new considerations and challenges that require carefully planned responses, including avoidance of new foreign entanglements. While renewable energy is freely available, it must be harnessed, distributed, stored, and utilised with tradeable technologies. These technologies in turn need high volumes of typically unevenly distributed critical minerals (see Figure 4). Increased trade in cleanly generated electricity or fuels, and other goods made with them, is also likely and adds new security considerations.

Australia has strong energy transition fundamentals. It has a world-leading endowment of critical minerals, and potential to produce renewable electricity and renewably made goods more competitively than many countries. Thinkers such as economist Ross Garnaut have promoted a vision of Australia as a “renewable energy superpower”.<sup>113</sup> This vision has been taken up by Albanese government commitments such as the \$22.7 billion *Future Made in Australia* (FMIA) package.<sup>114</sup>

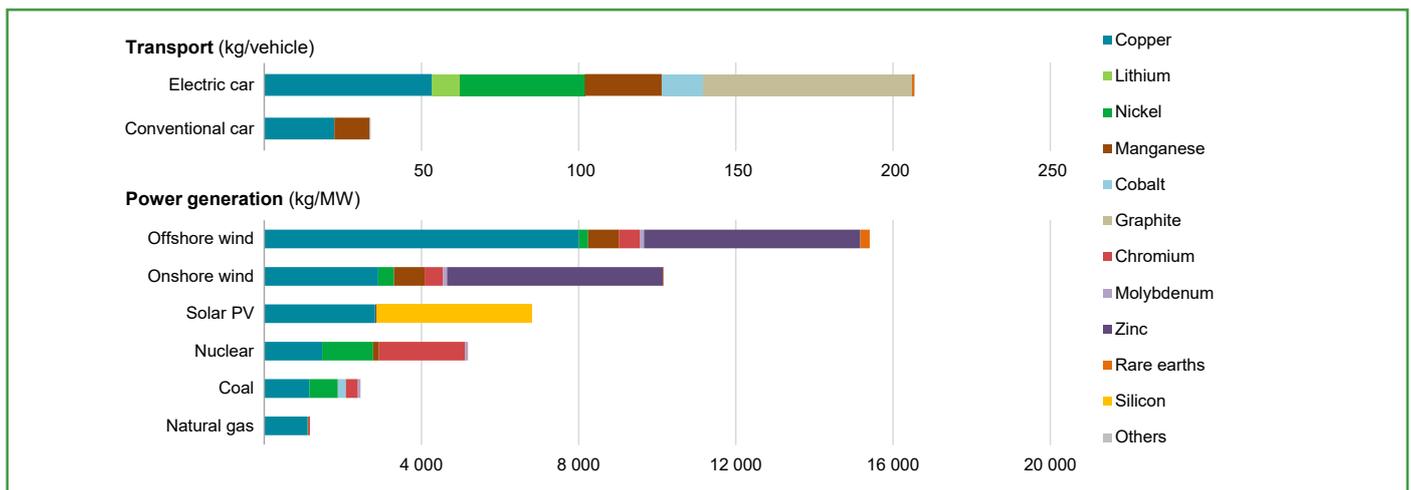
FMIA promotes targeted investment in clean energy and other sectors where Australia is expected to have future competitive advantage and where it can contribute to collective energy and/or economy security. The plan has attracted some criticism from economists concerned about risks from ‘picking winners’. Yet, it again

largely moves Australia from a position of international outlier to international consensus. Interventionist ‘green energy statecraft’ had been widely promoted in Asia, Europe, the US and elsewhere as essential to building nascent industries and guarding against others’ market manipulations.<sup>115</sup>

The renewable energy superpower vision celebrates Australia’s capacity to not only decarbonise its own but its trading partners’ economies. Australia could, for example, use its renewable energy abilities to onshore and decarbonise energy- and currently emissions-intensive activities such as metals production from less clean energy competitive countries. This, in effect, would also offshore these countries’ energy security concerns to Australia. Pursuit of this vision thus places even more pressure on the delivery of cheap, reliable, and clean Australian electricity. Some estimate Australia may ultimately need renewable generation up to 10 times that which is in the current National Electricity Market to meet its renewable superpower potential.<sup>116</sup>

Australia also needs secure access to affordable energy technologies for all aspects of its energy transition. Australia has some market power here because of its wealth in the minerals that underpin these technologies. This includes already producing half the world’s lithium for EV and grid batteries.<sup>117</sup> But Australia must weigh up some complex considerations around the best way forward, given complexities and complications in related global supply chains.

Figure 4. Minerals used in clean energy technologies



Source: IEA<sup>112</sup>



↑ Ivan Radic, Charging cable plugged into an electric car's charging port, CC BY 2.0.

China has a stranglehold over many clean energy sectors, including accounting for about 80% of solar panel and battery manufacturing and over 90% in some critical minerals processing and mining.<sup>118</sup> Much remaining mineral activity also occurs in areas of poor governance and high economic nationalism, such as Indonesia in the nickel sector.<sup>119</sup>

Chinese actions have helped dramatically lower global clean energy costs, which is an unequivocal energy security asset. China is also a key source of demand and investment in Australian critical minerals and a prospective major partner for other renewable superpower interests. But its supply chain dominance also introduces significant risk for the energy transition and Australia's place in it. Most directly, China has proven willingness to weaponise critical minerals, starting with cutting off rare earth exports to Japan in 2010 following a dispute.<sup>120</sup> Covid-19 also illustrated the less overt risks of contemporary supply chains. Issues such as corruption, environmental damage, poor labour standards, excessive government intervention, and monopolisation of economic opportunities tied to climate action also require attention.

Australia cannot easily decouple from Chinese or other clean energy supply chains; however, it can work with other countries to introduce much-

needed diversification, resilience, and sustainability, for communal benefit. Australia's most obvious and uncontroversial role is to increase production of key critical minerals. More challenging conversations begin at the minerals processing stage onwards.

Australian policymakers remain eager to diversify critical mineral ties with trusted partners, develop a global market that recognises sustainable production, and add more domestic value to minerals. The government has devoted considerable resources to such outcomes under its *Critical Minerals Strategy* and the FMIA, including production tax credits for minerals processing.<sup>121</sup> In late 2025, Australia even announced new public offtake and stockpiling arrangements for critical minerals.<sup>122</sup> Progress on these fronts could also benefit non-energy technology sectors, including critical mineral-consuming defence applications.

Supply chain diversification has been slow thus far. Volatility and profitability challenges—often linked to market flaws influenced by monopoly and, in China's case, monopsony activity—have hampered Australian companies' growth opportunities. Australia's supposedly trusted supply chain partners have also proven somewhat unreliable. US President Biden, for example, launched a landmark green industrial strategy with the Inflation

Reduction Act and 'friendshoring' processes such as the Minerals Security Partnership. But Biden's White House was often most concerned with advancing American opportunities. President Trump is confusingly pro critical minerals, but firmly anti-clean energy.<sup>123</sup>

Australia's best approach to clean energy supply chain challenges resembles its best approach on liquid fuel security. It begins by embracing existing market benefits by, for example, continuing trade with China in areas with limited scope to cost-effectively decouple, such as solar manufacturing. It extends to making strategic investments in shock-absorbing capacity, including continued public investment in especially concentrated and critically important stages of activity such as rare earths processing. It concludes with continued pursuit of long-term structural change, namely working with industry, international partners, and institutions to increase diversity, resilience, and sustainability of supply chains, as well as increase opportunities for Australia to add value to its economic base, where appropriate. This, indeed, is largely what the Australian government is already doing. Success will depend on sustained resourcing and attention to these outcomes through several terms of political leadership.



↑ The fuel probe from the Japan Maritime Self-Defense Force's JS Mashū is guided to HMAS Sydney, Defence Imagery.

## CHAPTER 4

# Principles and policies for enhancing Australia's energy security

Australian policymakers should take decisive energy security action. This is vital to ensuring comprehensive national security and resilience. Australia's liquid fuel challenges have most potential to inflict catastrophic damage and warrant prioritisation. But dynamics around gas, electricity, clean energy supply chains, and any future threats should not be ignored. Australia needs greater systems thinking and a greater respect for long-term, in addition to short-term, energy security.

Most of Australia's energy security issues can be blamed on ideational and ideological challenges. Many policy settings hail from a time

when Australia was relatively secure on oil. They reflect a view that Australia must pay little attention to transitioning away from fossil fuels to cleaner forms of energy, and overly emphasise Australia's status as an energy superpower that can safely put other countries' energy needs ahead of its own.

Australian policymakers have traditionally adopted a market fundamentalist perspective that rigidly opposes any government intervention in energy sectors. They have additionally suffered from a normalcy bias that assumes the probability of catastrophic events does not change, even as material

circumstances do, and have failed to recognise how various energy and other national and international systems and interests interact. Finally, Australian policymakers have had longstanding inability to conceive of energy security and energy transition as being simultaneously possible and even mutually reinforcing.

These perspectives have developed over decades and become conventional wisdom in policymaking circles. The net effect has been a lack of well-resourced, consistent, transparent, inclusive, and overall strategic energy security-linked decision-making. Some specific repercussions include: challenges

guarding against or responding to low-probability, high-impact energy shocks such as major fuel disruption or black system power events; inability to address structural causes of energy insecurity and consider the threat of low-level insecurity sustained by high prices; and a lack of a clear and consistent plan for transforming energy systems to meet new needs and abilities, particularly relating to climate change.

There is, then, a need for new principles to guide Australian energy security decisions. Broadly speaking, these could be:

- Ensure responses to energy security concerns are more in line with those of peer countries
- Ensure that providing for others' energy security needs does not compromise Australia's own energy security
- Continue to embrace beneficial market forces, but adopt a more strategic approach to shaping them, while protecting against failures and ill-effects
- Adopt more systems-thinking approaches to energy security and related planning
- Better prepare for energy shocks, while pursuing long-term structural reforms that minimise their frequency and severity and baseline levels of energy insecurity
- Better recognise, promote, and work to realise how energy security and energy transition can not only coincide with one another, but be mutually reinforcing

These principles should be adopted at the Commonwealth level, with the intention of also influencing state and local level decisions. Commonwealth policymakers should use these principles to guide development of sector-specific and cross-cutting policy commitments.

Australia has a pressing need to address its liquid fuel security challenge. It should:

- Continue seeking compliance with IEA stockholding requirements and growing in-country stocks, while considering tougher minimum stockholding obligations

- Gauge the success of programs to boost storage and support refining, and make any necessary reforms
- Give serious consideration to developing in-country, publicly owned oil stocks
- Seriously assess the need for publicly-owned oil tankers once the strategic shipping fleet pilot program concludes
- Enhance switching to low emissions fuels where electrification is not an option
- Accelerate liquid fuel demand reduction through energy efficiency, improved commitments to EVs and alternative freight, and off-grid renewables.

On gas, the government should implement some form of east coast gas reservation. It should also monitor WA gas developments to avoid similar challenges arising. It should consider power market reforms to lessen the gas impact on retail prices. It should pursue gas demand reduction, starting with a national roadmap for a measured phaseout, starting with areas where gas can be easily substituted without major loss of economic or social utility.

On electricity, Australia should introduce greater policy and investment certainty around the lowest-cost pathway to cheap, reliable, and clean power. The government should continue supporting a firmed renewables-heavy grid. As the inverse of gas market policies, it should reform power market settings to allow renewable cost savings to be passed to consumers. The larger task is for both sides of politics to remain committed to a unified, long-term vision.

On clean energy supply chains, policymakers should monitor Australia's ongoing economic development and, where appropriate, increase commitments to the renewable superpower vision. This could include making considerable additional grid investments and providing additional support under the FMIA and related strategies. Australia should also ensure trade, investment, and diplomatic commitments provide access to

technologies it requires for its energy transition needs. This includes managing ties with China, while continuing to work with likeminded countries to diversify supply chains. Australia should also continue to make strategic investments in key areas of diversification of the clean energy supply chain, including those that might enhance its own long-term economic development opportunities.

Australia should also make cross-cutting energy security commitments. This should start with providing more currency, clarity, and comprehensiveness to energy security planning, including the risks Australia faces and how it can enhance resilience. This could include undertaking a new *National Energy Security Assessment* and *Energy White Paper*. Australia could go further and develop a first-ever national energy security strategy, ideally tied to a new national security and resilience strategies. These documents should consider challenges and opportunities across numerous sectors, short- and long-term considerations, and the myriad actors and issues that can influence and be influenced by energy security. They should collectively advance a systems thinking approach tied to other national interests.

Australia should also overhaul its energy diplomacy, including its ties to institutions such as the IEA, sources of its oil imports, destinations for its energy exports, and current or prospective partners to its emerging energy transition-linked interests. Australia should also better contribute to collective energy security arrangements and better advocate for its own energy security needs and other national interests, such as climate action, in all ties.

Australian policymakers have long entrusted largely unregulated market forces to provide for national energy security needs. Historical circumstances have often justified this position, but it is increasingly ill-suited to managing changing energy and related economic and strategic dynamics. A dramatic shift in energy security perspectives and resulting policy is necessary if Australians wish to minimise the risk of grave threats to their future way of life.

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