

# Over a barrel

## Addressing Australia's Liquid Fuel Security

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*Australia is precariously dependent on imported fuel. Demand-side solutions, particularly electrifying transport, should be adopted to improve Australia's fuel security and increase energy independence.*

Discussion paper

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April 2022

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ISSN: 1836-9014

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# Summary

In 2021 the National Resilience project led by Air Vice-Marshal John Blackburn highlighted our fuel security in a paper titled *Australia – A Complacent Nation*. The dangers of that complacency have been shown by the Ukrainian War and Western Europe's (particularly Germany's) reliance on Russian oil and gas. The War has dramatically highlighted the linking of economic security and international security.

Australia is almost entirely reliant on imports of refined fuels and crude to meet consumption. In FY2021, 91 per cent of all fuel consumed in Australia was imported. This includes 68 per cent imported as refined crude, while 71 per cent of fuel refined in Australia is imported as crude and condensate.

Fuel security has decreased over the last decade. Five Australian refineries have closed over the last decade leaving only two Australian refineries in operation - Ampol's Lytton refinery and Viva's Geelong refinery.

The International Energy Agency (IEA) guidelines require Australia to hold 90 net import days worth of fuel. We currently hold only 68 'IEA days' of reserve, but average daily consumption over the last year means current stocks are only expected to last 32 days. The Australian Government tries to bolster this by including some 21 days of fuel in transit to Australia or onboard ships docked in foreign ports – the majority of which are foreign vessels. There is no guarantee that this fuel would reach Australia in the event of a crisis. Our strategic fuel supply is particularly vulnerable as our two remaining refineries are set up to produce largely petrol rather than aviation fuel and diesel.

In March 2020, Energy Minister Angus Taylor announced that Australia would have access to the US Strategic Petroleum Reserve in the event of an emergency. If Australia needed to access US-based fuel reserves, the fuel would take around three weeks to get to Australia. In the event of a global emergency, there is no guarantee that the oil that Australia has been promised access to in the US would be practically accessible from across the Pacific or otherwise.

Three quarters (73 per cent) of Australia's total liquid fuel demand is consumed by the transport sector and over half (54 per cent) is consumed by road transport alone. Previous government approaches to fuel security have focused on supply-side issues - rarely have demand-side solutions been considered. However, it is only through moving to electric vehicles and increasing mode shift to public transport, cycling and walking that our reliance on imported fuel will decrease significantly. The sooner this happens, the more secure Australia will be.

If every passenger vehicle in the Australian car fleet today was a pure electric vehicle, 33 per cent of Australia's imported oil could be replaced with domestic electricity. Even if only a quarter were electric, 8 per cent of total imports would not be needed. Additionally, in the event of oil supply disruption, a significant portion of Australian vehicles would still be moving.

Australia significantly lags the developed world in adopting electric vehicles. At least 19 countries have introduced targets to completely phase out internal combustion engine (ICE) vehicle sales - some as early as 2025 (Norway) and 2030 (Iceland, Ireland, Israel, Netherland, Sweden, and the UK). For the year 2020, EVs accounted for 0.8 per cent of new vehicle sales in Australia, compared to the global average of 4.2 per cent, and 75 per cent in Norway.

Recommendations:

- Release the final Liquid Fuel Security Report. Include an assessment of how electric vehicle uptake and transport mode shifts can impact fuel security.
- Create a national energy security strategy that specifically considers demand-side solutions to oil dependency. Set a target for the reduction of oil imports and include separate targets for petrol, diesel and aviation fuel, noting that petrol should be the initial focus for reduction.
- Publish a stand-alone electric vehicle strategy, underpinned by:
  - Fuel efficiency (CO<sub>2</sub>) standards
  - Financial incentives to assist uptake of electric passenger vehicles and freight vehicles
  - A target to ban ICE passenger vehicle sales by 2030
- In all future electric vehicle policy reports, such as an electric vehicle strategy, include an assessment of oil displacement impacts.
- Set a target for the reduction of transport emissions by 2050, underpinned by 5-yearly interim targets.

The best way to improve Australia's liquid fuel security in the medium term would be to reduce petrol consumption by switching to electric passenger vehicles. This would give us more capacity to address diesel and aviation fuel insecurity.

# Introduction

The Ukrainian War and Western Europe's (particularly Germany's) reliance on Russian oil, gas and coal have dramatically highlighted the linking of economic security and international security. As Australia's Director General of Intelligence, Andrew Shearer, said recently, "We tended to regard economics and security in sort of separate lines, never the two shall meet. We need to completely reconceptualise that and recognise that security and economics are completely integrated and interdependent."<sup>1</sup>

In late 2021 Australia had a small taste of what Germany now faces. In late 2021, a global shortage of urea threatened to stop Australia's transport in its tracks. Urea is a chemical compound used in the diesel fuel additive, AdBlue, used by most diesel trucks in Australia. The AdBlue shortage threatened to impact not only the transport sector, but all sectors of the economy reliant on road transport, with fears of grocery shortages on supermarket shelves across Australia.<sup>2</sup>

The Government response to the AdBlue crisis was swift. An AdBlue taskforce was established including the chair of Manufacturing Australia and Australia's Chief Scientist, and local manufacturing capabilities were bolstered through agreements reached between the Australian Government and local manufacturers.<sup>3</sup>

The AdBlue was a firsthand warning about Australia's fuel security. The vast majority of Australia's liquid fuel (petrol and diesel) is imported, and – like Adblue – is reliant on fragile supply chains to make its way to Australia. As the Adblue crisis demonstrated, the impacts of fuel supply chain disruptions are far-reaching, due to the reliance on imported fuels by industries including construction, agriculture, forestry, fishing and mining.

In contrast to the Australian Government's response to the Adblue crisis, the response to wider fuel security issues in Australia is stagnant. The final review into Australia's Liquid Fuel

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<sup>1</sup> Burton (2022) *Putin's tactics will become 'even more brutal': intelligence adviser*, <https://www.afr.com/business-summit/putin-s-tactics-will-become-even-more-brutal-intelligence-adviser-20220309-p5a30n>

<sup>2</sup> Franks (2021) *Expert warns Australia's AdBlue supply could run out within weeks causing major supply chain issues*, <https://www.news.com.au/finance/economy/australian-economy/expert-warns-australias-adblue-supply-could-run-out-within-weeks-causing-major-supply-chain-issues/news-story/ec3ddff25b3b03ce5b2f7659289dab56>

<sup>3</sup> Taylor (2021) *Increasing AdBlue supplies and protecting Australia's transport industry*, Joint media release with Minister for Trade, Tourism and Investment the Hon Dan Tehan MP, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/increasing-adblue-supplies-and-protecting-australias-transport-industry>

Security is long overdue with the interim report released in April 2019. Little attention has been given to demand-side solutions that would reduce Australian reliance on imported fuel.

While the Adblue crisis was averted in part by bolstering domestic manufacture of the additive, Australia's fuel security could be improved by reducing fuel demand. Replacing conventional Internal Combustion Engine (ICE) vehicles with electric vehicles is a major way to do this. Increasing the fuel efficiency of ICE vehicles and shifting to public transport, walking and cycling would also help. This would reduce risk and divert revenue to Australian energy producers rather than overseas.

Electrification of transport is missing within Australia's fuel security framework, and fuel security implications are rarely considered within Australia's electric vehicle policy framework – there are significant opportunities to change this.

# The precarious state of Australia's oil

Australia is heavily reliant on imports of liquid fuel (both crude oil and refined products) from the Middle East and Asia that transit through potential maritime chokepoints and conflict zones, such as the Persian Gulf and the Straits of Malacca. Crude oil cannot be used as fuel without processing at a refinery.

Australia imports the vast majority of its oil. In the financial year to 2021, 91 per cent of all refined product consumed in Australia was imported.<sup>4</sup> This includes imported refined oil and imported crude and condensate that is refined domestically. Around 71 per cent of oil refined in Australia is imported as unrefined product. Imported refined fuel makes up 68 per cent of fuel sales in Australia.<sup>5</sup>

Australia's total oil imports are sourced primarily from Asia, as shown in Figure 1, however these nations are not necessarily the producers of that oil, with the Middle East and North Africa retaining an important role in primary production.

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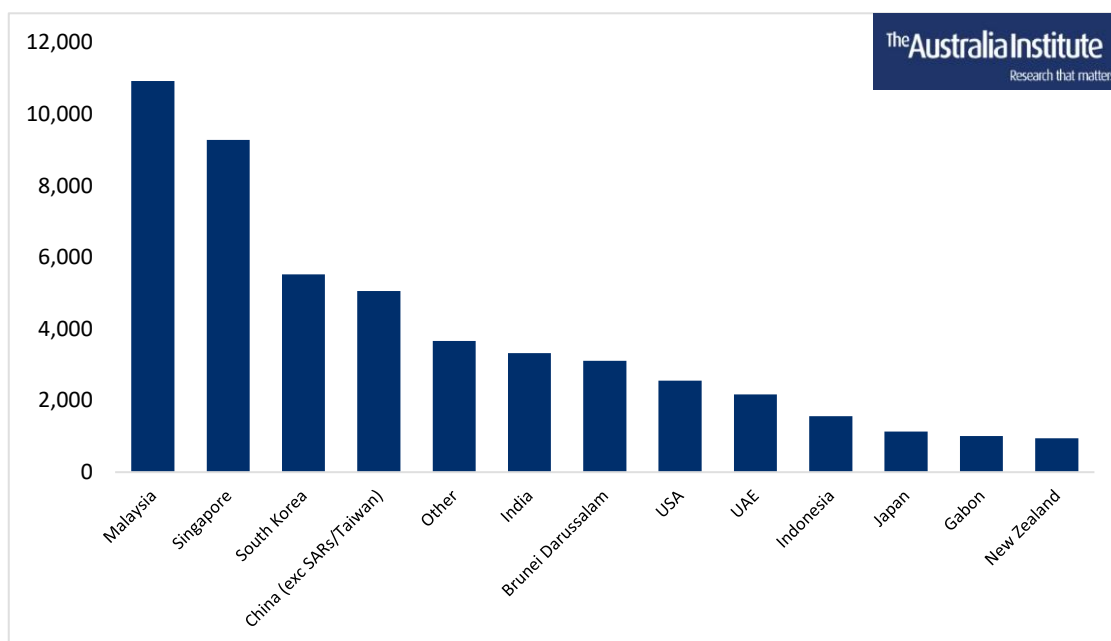
<sup>4</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021*, <https://www.energy.gov.au/publications/australian-petroleum-statistics-2021>

The amount of consumed oil that came from imported products is the amount of consumed fuel that did not come from Australian refineries, plus the amount of Australian refinery output that was originally imported crude. The above calculation used 'sales of petroleum products' data as consumption and assumes that exported refined fuel was indigenous crude, not imported crude. Raw production and sales data do not reconcile because some crude input to domestic refineries is used to run the refineries; products also have different mass densities, impacting reconciliation of volumes. As a result, the above calculation is considered conservative.

<sup>5</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021*



**Figure 1: Total oil imports to Australia in 2020-21, by source country, megalitres**



Source: Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics Issue 299 June 2021*

## REFINERIES AND DOMESTIC PRODUCTION CAPABILITY

Australia's domestic refining capacity has declined substantially, going from 20 operating oil refineries to two in the space of the two decades. Since 2012, five of Australia's seven refineries closed or announce their closure:

- 2012: Shell's Clyde refinery announced closure.
- 2014: Kurnell refinery closed.
- 2015: Bulwer Island refinery announced closure.
- 2020: BP's Kwinana Refinery announced closure.
- 2021: ExxonMobil's Altona Refinery announced closure.

All of Australia's currently operating refineries are ageing and small by international standards, having been commissioned between the late 1940s and early 1960s.

Ampol's Lytton refinery and Viva's Geelong refinery will be the final domestic facilities capable of refining oil for use as transport fuels. These two remaining refineries will have the capacity to produce less than a quarter of the volume of petroleum products that Australia consumed in 2018-19.<sup>6</sup>

<sup>6</sup> Sadler (2021) *National Energy Emissions Audit February/March 2021*, <https://australiainstitute.org.au/wp-content/uploads/2021/05/NEEA-Report-Feb-March-2021-WEB.pdf>

The two remaining refineries are set up to produce more petrol than other products (diesel and jet fuel). Petrol will likely see the fastest displacement of any transport fuel type with the rise of electric vehicles.<sup>7</sup>

Even if the planned closure of refineries were cancelled, and the existing capacity of the two remaining refineries were to be maintained, Australia would still be overwhelmingly reliant on imports for its liquid fuel security.

Domestic fuel production has a marginal impact on overall consumption of refined fuels in Australia. Domestic crude oil production is likely to continue to decline, with production levels for 2020-21 at 42 per cent of the production levels seen in 2010-11.<sup>8</sup> Even if Australia drastically increased its production levels it would still be unable to refine enough crude to address demand. For Australia to adequately address fuel security, liquid fuel demand must be considered alongside supply.

## LIQUID FUEL STOCKS AND CONSUMPTION COVER

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### IEA 90 Day Requirement

The International Energy Agency (IEA), an international body set up in response to the 1970s oil crisis, requires its 31 member countries to maintain emergency fuel reserves equivalent to at least 90 days of net oil imports in accordance with the Agreement on an International Energy Program.<sup>9</sup> This is to ensure that if global or regional oil supply should face a severe shock, member countries are able to mitigate the security – and economic – impacts of disruption.

However, Australia is currently in breach of the IEA stockholding obligation. The last time Australia complied with the minimum 90 day requirement was in 2012.<sup>10</sup> According to the IEA, as of January 2022 Australia has just 68 net import days of liquid fuel in reserve.<sup>11</sup> Three days are held by the government rather than industry and three days worth of fuel are held overseas by foreign governments, which the IEA permits under bilateral agreements.<sup>12</sup> The

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<sup>7</sup> Ibid.

<sup>8</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics Issue 299 June 2021*

<sup>9</sup> International Energy Agency (2019) *Oil Security: The global oil market remains vulnerable to a wide range of risk factors*, <https://www.iea.org/areas-of-work/ensuring-energy-security/oil-security>

<sup>10</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021*

<sup>11</sup> IEA (2022), *Oil Stocks of IEA Countries – Net Imports for January 2022*, <https://www.iea.org/articles/oil-stocks-of-iea-countries>

<sup>12</sup> IEA (2021), *Oil Stocks of IEA Countries – Net Imports for November 2020*, <https://www.iea.org/articles/oil-stocks-of-iea-countries>

Government has committed to returning to compliance with the IEA's 90 day oil stockholding obligation by 2026.<sup>13</sup>

## Consumption Cover

Net import days are different from the length of time that our supplies would last at normal consumption rates. These are called consumption cover days.

In 2020-21 Australia had an average of only 32 days of consumption cover of refined (petrol, diesel and aviation) fuel.<sup>14</sup> This means if all oil supply to Australia were to cease immediately, consumption at current rates would continue for only 32 days on average across fuel types. This has been consistent over the last decade, with consumption cover ranging historically from 17 to 32 days cover.<sup>15</sup>

Consumption cover days are only a guide for risks of more complex system disruptions. It is nonetheless clear that the consequences of any significant impact on oil supply could be substantial to both the Australian economy and fuel security. Consumption cover days of fuels that are essential for industry and defence such as aviation fuel and diesel are particularly significant.

## Liquid Fuels Emergency Act

Australia's response to a fuel supply crisis is governed under the *Liquid Fuels Emergency Act 1984* (the LFE Act).<sup>16</sup> Under section 16 of the LFE Act, the Government may declare a liquid fuel emergency. Australia does not have a central reserve or stockholding agency, but rather relies on private fuel corporations who hold the majority of reserves. However, the Energy Minister can direct these corporations to maintain certain levels of reserves in order to mitigate any potential crisis under contingency planning measures of the LFE Act.

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<sup>13</sup> Department of Industry, Science, Energy and Resources (2021) *Australia's fuel security package*, <https://www.energy.gov.au/government-priorities/energy-security/australias-fuel-security-package#:~:text=Australia%20is%20committed%20to%20returning,Agency%20stockholding%20obligation%20by%202026>.

<sup>14</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021 Table 7*

<sup>15</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021, Table 7*

<sup>16</sup> Commonwealth of Australia (1984) *Liquid Fuel Emergency Act 1984*, <https://www.legislation.gov.au/Details/C2012C00171>

While these measures provide the Government with some degree of control in the event of a crisis, the LFE Act is considered by the IEA to take a more generalist and minimal approach to regulation in contrast with other IEA member nations.<sup>17</sup>

The emergency powers to ration fuel stocks, established under the LFE Act, could take up to three weeks to be implemented.<sup>18</sup> The long timeframe for implementing the rationing and direction powers could exhaust much of the total consumption coverage. As the COVID-19 pandemic has repeatedly demonstrated, there are also risks of panic buying and hoarding in the intervening period, reducing stocks available for rationing.

The Australia Institute has previously supported the review of the LFE Act, as announced by the Minister for Energy.<sup>19</sup>

## SUPPLY CHAIN DISRUPTIONS AND NATIONAL SECURITY

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Dependency on imported liquid fuel and lack of reserves makes Australia ill-prepared to deal with a disruption to supply, particularly with the heightened geopolitical risks the nation currently faces.

### Foreign flagged ships

While the government has committed to returning to IEA fuel stockholding compliance by 2026, current inadequate levels of fuel reserves are bolstered not with oil but with arithmetic. Barrels of liquid fuel currently in transit to Australia or onboard ships currently in dock in foreign ports are included in the Australian Government's fuel reserve calculations (as the oil is owned by companies in Australia intent on importing it). These stocks are not eligible to be included in the IEA stockholding requirement but are included in Australian Government petroleum statistics regardless. In the year to June 2021, these additional stocks equated to an average additional 21 net import days of fuel reserves ultimately destined for Australia.<sup>20</sup>

In a potential crisis, Australia's access to oil may come under threat and there is no guarantee of these oil supplies reaching Australia within any particular time frame. The

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<sup>17</sup> IEA (2020) *Australia's legislation on oil security*, <https://www.iea.org/articles/australia-s-legislation-on-oil-security>

<sup>18</sup> Department of the Environment and Energy (2021) *Liquid Fuel Security Review – Interim Report*

<sup>19</sup> Taylor (2019) *Public consultation opens on fuel security*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/public-consultation-opens-fuel-security>

<sup>20</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 299 June 2021, Table 7B*

ships currently servicing oil demand for Australia are not Australian ships – all sail under foreign flags and call foreign ports home. The exceptions to this are small tankers servicing ports, and some vessels servicing LNG fields offshore. In late 2018 the Royal Australian Navy acquired two supply-class auxiliary oiler replenishment vessels to replace older ships – but these vessels will service the Australian Defence Force, not Australian domestic commercial demand.<sup>21</sup>

The initial hoarding of COVID-19 vaccines, which prevented doses ordered by the Australian Government from reaching Australia in the early days of production,<sup>22</sup> suggests that there is no guarantee that fuel held overseas would reach Australia during a shortage.

The assumption that foreign-flagged oil tankers will sail through potential crises in order to deliver their cargo is unfounded and drives home the need for Australia to develop its own merchant fleet capabilities. The Federal opposition Labor Party has proposed the creation of a strategic fleet of a dozen Australian-flagged commercial vessels to secure supply chains for fuel and other essential imports.<sup>23</sup>

## Vulnerable sea lines of communication

The global oil market is highly dependent on key waterways, or Sea Lines of Communication (SLOCs). To secure the safe passage of energy supply through popular maritime routes, several waterways and regions are of critical importance: the Strait of Hormuz; the Malacca Strait; and the South China Sea.

In 2018, about one in three barrels of oil traded globally passed through the Strait of Hormuz between Oman and Iran, averaging 21 million barrels per day.<sup>24</sup> Closer to Australia, the Malacca Strait between Malaysia, Singapore, and Indonesia saw around one third of global oil trade passing through its waters, or 19 million barrels per day in 2018.<sup>25</sup> In addition, trade passing through the South China Sea accounts for over a third of all shipped global trade – and is also the site of one of the world’s most contested waters.

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<sup>21</sup> Navantia Australia (n.d.) *Replenishment Vessels*, <https://navantia.com.au/capabilities/replenishment-vessels/>

<sup>22</sup> BBC (2021) *Covid: Italy blocks AstraZeneca vaccine shipment to Australia*

<sup>23</sup> Curtis (2022) *Labor promises strategic shipping fleet to secure supplies for Australia*, <https://www.smh.com.au/politics/federal/labor-promises-strategic-shipping-fleet-to-secure-supplies-for-australia-20220102-p59lby.html>

<sup>24</sup> US Energy Information Administration (2019) *The Strait of Hormuz is the world’s most important oil transit chokepoint*, <https://www.eia.gov/todayinenergy/detail.php?id=39932>

<sup>25</sup> IEA (2019) *Oil and gas trade volumes via major chokepoints in the Stated Policies Scenario, 2018-2040*, <https://www.iea.org/data-and-statistics/charts/oil-and-gas-trade-volumes-via-major-chokepoints-in-the-stated-policies-scenario-2018-2040>

Australia is reliant on each of these SLOCs, making access to stable, secure and affordable supplies of oil risky - US\$47 billion worth of general imports to Australia traversed the South China Sea in 2016.<sup>26</sup> The possibility of a blockade, military action, terrorist act or other scenarios could potentially impact Australia's access to large portions of the international liquid fuel market. Alternatively, even if access to these SLOCs was not cut off but faced other problems – such as piracy or minor conflict – this could have a serious impact on Australia's ability to secure liquid fuel supply. In 2008 the Gulf of Aden was declared a war risk area due to rising rates of piracy, causing risk premiums to leap from US\$500 to US\$150,000 per voyage.<sup>27</sup> These costs may well be prohibitive, or at least an additional burden on shipping companies and their customers. The Australian Government is also concerned about maintaining open sea lines, having spent considerable time, money and assets to deploy a Royal Australian Navy helicopter frigate – HMAS Toowoomba – to patrol the Strait of Hormuz alongside the United States in 2020.<sup>28</sup>

## Reliance on imports of strategic fuels

Australia is reliant on imports for around 91 per cent of all fuel products consumed, and while this is cause for concern, certain fuels can have greater strategic value.

In 2019-20, Australia imported 4,848 megalitres of aviation turbine fuel. Of those imports, around 25 per cent was imported from the People's Republic of China.<sup>29</sup> This presents a worrying proportion for defence planners – aviation fuel is critical to the proper functioning of the Australian Defence Force (ADF), and while the majority of import sources are nations with which Australia enjoys strong levels of cooperation or partnership, a significant reduction in the availability of aviation fuel from China could be difficult to replace. Australia has no serious capacity to refine large amounts of oil into aviation fuel, meaning that supply chain security is currently the only option in lieu of alternatives. The establishment of a new fuel storage facility outside of Darwin to service ADF and US Air Force needs is a welcome development.<sup>30</sup>

Aviation fuel security should be carefully considered by policy makers and defence planners, however at present there are limited opportunities for alternative or sovereign aviation fuel

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<sup>26</sup> CSIS China Power Team (2021) *How Much Trade Transits the South China Sea?*, <https://chinapower.csis.org/much-trade-transits-south-china-sea/>

<sup>27</sup> UNCTAD (2014) *Part 1: An Overview of Trends, Costs and Trade-related Implications* p. 18, [https://unctad.org/system/files/official-document/dtltlb2013d1\\_en.pdf](https://unctad.org/system/files/official-document/dtltlb2013d1_en.pdf)

<sup>28</sup> Reynolds (2020) *HMAS Toowoomba Departs for Middle East*, <https://www.minister.defence.gov.au/minister/lreynolds/media-releases/hmas-toowoomba-departs-middle-east>

<sup>29</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Petroleum Statistics – Issue 294 January 2021*, <https://www.energy.gov.au/publications/australian-petroleum-statistics-2020>

<sup>30</sup> Mackay (2022) *Work begins on \$270 million US fuel storage facility on Darwin's outskirts*, <https://www.abc.net.au/news/2022-01-19/work-begins-on-us-jet-fuel-facility-outside-darwin/100764194>

sources. Road transport, which alone accounts for 54 per cent of all liquid fuel consumption in Australia,<sup>31</sup> is an area where alternatives to liquid fuel imports are widely available and would have the most impact on reducing Australia's oil imports. Diversifying and reducing demand for road transport fuels would allow more focus on diesel and jet fuel supplies as the main energy security challenge.

## GOVERNMENT RESPONSES TO LIQUID FUEL INSECURITY

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Australia's first National Energy Security Assessment in 2009 found that:<sup>32</sup>

Australia's level of energy security has decreased in the face of mounting challenges... However, Australia remains a country well-endowed with energy resource options and is therefore able to address many of the issues identified here with appropriate policy settings and market responses.

Subsequent reports have been less optimistic. Further assessments by or for the Australian Government include the second (and last) National Energy Security Assessment in 2011 which identified the high risk of import dependency,<sup>33</sup> and the 2011 Liquid Fuel Vulnerability Assessment, which assessed the risks of a product supply shock that could occur if refineries went offline in Singapore.<sup>34</sup>

Two 2012 reports examined the risks of a crude supply shock from an interruption to exports through the Strait of Hormuz,<sup>35</sup> and an examination of competitive pressures on Australia's domestic refining capabilities that found that increasingly efficient and competitive Asian refineries are a key challenge for Australia.<sup>36</sup>

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<sup>31</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Energy Update 2021*, Table H3, <https://www.energy.gov.au/publications/australian-energy-update-2021>

<sup>32</sup> Department of Resources, Energy and Tourism (2009) *National Energy Security Assessment*, <https://www.energy.gov.au/sites/default/files/national-energy-security-assessment-2009.pdf>

<sup>33</sup> Department of Resources, Energy and Tourism (2011) *National Energy Security Assessment*, [https://www.energy.gov.au/sites/default/files/national-energy-security-assessment-2011\\_0.pdf](https://www.energy.gov.au/sites/default/files/national-energy-security-assessment-2011_0.pdf)

<sup>34</sup> ACIL Tasman (2011) *Liquid fuels vulnerability assessment*, <https://www.energy.gov.au/sites/default/files/liquid-fuels-vulnerability-assessment.pdf>

<sup>35</sup> ACIL Tasman (2012) *NESA Identified Issues: Strait of Hormuz*, <https://www.energy.gov.au/sites/default/files/nesa-identified-issues-strait-hormuz-2012.pdf>

<sup>36</sup> Hale & Twomey (2012) *National Energy Security Assessment (NESA) Identified Issues: Competitive Pressures on Domestic Refining*, <https://www.energy.gov.au/sites/default/files/nesa-competitive-pressures-domestic-refining-2102.pdf>

## 2018-19 Liquid Fuel Security Review

In 2018, the Department of the Environment and Energy (now Department of Industry, Science, Energy and Resources) conducted a Liquid Fuel Security review,<sup>37</sup> incorporating public consultations and submissions. The Liquid Fuel Security Interim Report, released in April 2019, showed that Australia is ill-equipped to deal with a liquid fuel security crisis. It concludes:

Other countries comparable to Australia have taken a range of actions to enhance their fuel security. These include increased stockholdings by industry or government; greater oversight and monitoring of the liquid fuel market; and steps to reduce dependency on liquid fuels by shifting to other forms of transport energy.

In response to the Interim Report, the Government committed to four 'initiatives' to be undertaken prior to the release of the final liquid fuel security report:<sup>38</sup>

- Work with key stakeholders to review the *Liquid Fuel Emergency Act* with a view to reducing the time taken to respond to potential emergencies.
- Convince the International Energy Agency (IEA) to 'modernise' the IEA's rules that require 90 net import days of fuel to be stored in reserves.
- Work with stakeholders to understand Australia's fuel supply chains.
- "Enact these and future changes in a manner that does not impact the price of petrol at the pump and put more pressure on household budgets."

Of the four initiatives outlined, one appears to be a slogan about household budgets. Another is a commitment to change the IEA rules on responsible reserves rather than comply with them. None of the initiatives relate to shifting to other forms of transport.

The Government has not released the final Liquid Fuel Security Report, which was due in late 2019.

## Texas: A Crude Policy Fix

In March 2020, Energy Minister Angus Taylor visited Texas and announced that Australia would have access to the US Strategic Petroleum Reserve in the event of an emergency. The Minister referred to this solution as "increasing our oil stockholdings" and improving Australia's resilience to fuel disruptions.<sup>39</sup>

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<sup>37</sup> Department of the Environment and Energy (2021) *Liquid Fuel Security Review – Interim Report*

<sup>38</sup> Taylor (2019) *Public consultation opens on fuel security*,  
<https://www.minister.industry.gov.au/ministers/taylor/media-releases/public-consultation-opens-fuel-security>

<sup>39</sup> Taylor (2020) *Visit to the United States of America*,  
<https://www.minister.industry.gov.au/ministers/taylor/media-releases/visit-united-states-america>



The Texas arrangement allows Australia to access fuel from the US Strategic Petroleum Reserve in the event of a global emergency, which Minister Taylor described as a deal that “shows the Australian Government is taking practical action to enhance our fuel security by boosting Australia’s oil stockholdings.”<sup>40</sup>

If Australia needed to access US-based fuel reserves, the fuel would take around three weeks to get to Australia. In the event of a global emergency, there is no guarantee that the oil that Australia has been promised access to in the US would be practically accessible from across the Pacific or otherwise. Similarly, if the US itself is suffering from a fuel shortage emergency, their own national interest is likely to take precedence.

## Onshore Storage Capability

In 2020, the Australian Government flagged \$200 million to tender 780ML of onshore diesel storage.<sup>41</sup> The same policy was re-announced in January 2021.<sup>42</sup> The Australian Government also announced minimum stockholding requirements for petrol and jet fuel stocks ensuring that holdings are maintained at levels equal to or higher than current commercial levels.

As a medium-term policy solution, increasing onshore storage capability is sensible and particularly welcome for both diesel and aviation fuel. But this cannot be the only policy response – demand and consumption are areas that must be tackled in the medium to long term.

## Fuel Security Service Payment

In May 2021 the Government announced further funding to entice liquid fuel companies to continue production in Australia as part of a ‘Fuel Security Service Payment’ designed to ensure ongoing fuel security in the face of a rapidly declining domestic refinery capacity.<sup>43</sup> In addition, the Government also committed \$302 million to fast track upgrades to Australia’s two remaining refineries from 2027 forward to 2024, as well as \$50.7 million to implement monitoring of both the direct payments to refineries and broader minimum stockholding obligations. These costs are accounted for in the 2020-21 Federal Budget, however the total

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<sup>40</sup> Taylor (2020) *Australia strengthens fuel security with new US Arrangement*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/australia-strengthens-fuel-security-new-us-arrangement>

<sup>41</sup> Morrison and Taylor (2020) *Boosting Australia’s fuel security*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/boosting-australias-fuel-security>

<sup>42</sup> Taylor (2021), *Boosting Australia’s diesel storage*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/boosting-australias-diesel-storage>

<sup>43</sup> Taylor & Morrison (2021) *Locking in Australia’s fuel security*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/locking-australias-fuel-security>

cost of payments and upgrades was labelled 'not for publication' due to commercial sensitivities.

The Fuel Security Service Payment will subsidise oil refineries and comes into effect in economic conditions that limit profits. Refineries will be paid a maximum of 1.8 cents per litre when the margin falls to or below \$7.30 per barrel, which will reduce as margins increase through to \$10.20 per barrel at which point the payments stop.<sup>44</sup> Direct payments are budgeted to cost a maximum of \$2.05 billion to 2030 under worst-case economic conditions, which the Treasury indicates is unlikely to occur. This program has been implemented through legislation introduced to Parliament in the form of the *Fuel Security Act 2021*,<sup>45</sup> with direct payment beginning with the 2021-22 financial year and minimum stockholding obligations coming into effect in 2022.

This \$2 billion subsidy is a significant cost to Australia, building on the 1c per litre interim subsidy offered in late 2020, and industry figures have indicated that it may not be enough to entice their companies to continue to operate in Australia.<sup>46</sup> While the Prime Minister has argued that the subsidies will lower fuel prices for consumers, Australian Competition and Consumer Commission chair Rod Sims has said that subsidies could disincentivise competition from international importers.<sup>47</sup> The more likely scenario is that petrol prices remain relatively unaffected. However, the opportunity exists for Australia to address a different core issue, firmly within our capacity – demand.

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<sup>44</sup> Taylor & Morrison (2021) *Locking in Australia's fuel security*,  
<https://www.minister.industry.gov.au/ministers/taylor/media-releases/locking-australias-fuel-security>

<sup>45</sup> Commonwealth of Australia (2021) *Fuel Security Act 2021*,  
<https://www.legislation.gov.au/Details/C2021A00065>

<sup>46</sup> Macdonald-Smith (2021) *'Big if' on subsidy package for Ampol's refinery*,  
<https://www.afr.com/companies/energy/big-if-on-subsidy-package-for-ampol-s-refinery-20210513-p57rgg>

<sup>47</sup> Elmas (2021) *'Absurd': Petrol prices could rise, thanks to \$2.3 billion oil refinery handout*,  
<https://thenewdaily.com.au/finance/finance-news/2021/05/17/petrol-prices-oil-subsidies/>

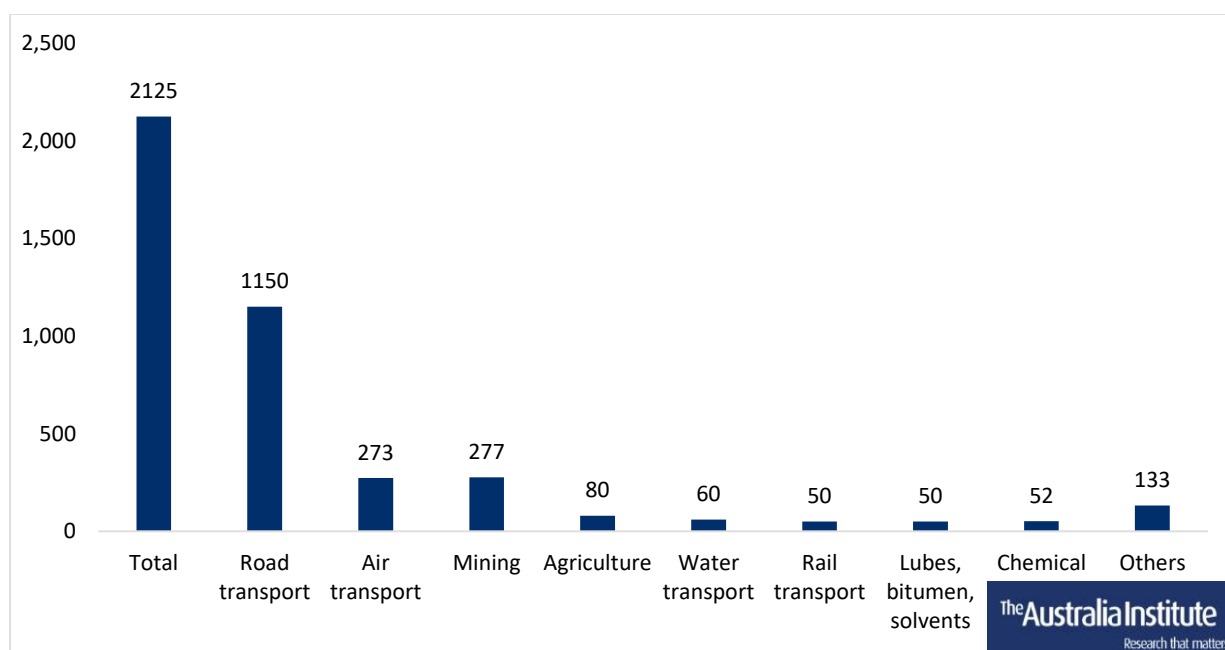
# Decreasing Demand

As discussed, recent fuel security measures in Australia have focused on securing supply of liquid fuels and supporting inefficient and aging domestic fuel refineries. Rarely has the demand-side of the fuel-security equation been adequately considered.

Transport accounts for the largest share of Australian energy consumption and is almost entirely dependent on refined liquid fuels. Three quarters (73 per cent) of Australia's total liquid fuel demand is consumed by the transport sector (including aviation, rail and water transport, and road transport), and over half (54 per cent) is consumed by road transport alone - more than four times the consumption of the aviation sector.<sup>48</sup>

Road transport includes passenger carrying vehicles (passenger vehicles, motorcycles and buses), freight vehicles and non-freight carrying trucks.<sup>49</sup>

**Figure 2: Australian consumption of refined petroleum products by sector, petajoules, 2019-20**



Source: Department of Industry, Science, Energy and Resources (2021) *Australian Energy Update 2021*, Table H3, <https://www.energy.gov.au/publications/australian-energy-update-2021>

<sup>48</sup> Department of Industry, Science, Energy and Resources (2021) *Australian Energy Update 2021*, Table H3, <https://www.energy.gov.au/publications/australian-energy-update-2021>

<sup>49</sup> Australian Bureau of Statistics (2020) *Survey of Motor Vehicle Use, Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

While the transport sector is an important industry in its own right, transport is also an integral component of many other industries in Australia. Road transport is the predominant mode of transport used by the construction, agriculture, forestry and fishing and mining industries. The 2021 AdBlue shortage (used as diesel exhaust fluid additive) highlighted the economy-wide ramifications of disruptions to Australia’s trucking industry, with concerns the disruption would see grocery shelves empty.<sup>50</sup>

Diversifying Australia’s transport energy mix and improving fuel efficiency would improve energy security by reducing the overall demand for imported oil as well as increasing the number of vehicles that would be unaffected by oil supply chain disruptions. Diversification and reduction measures include shifting to non-oil-based transport, including electric passenger vehicles and busses, rail, cycling and walking – and increasing the fuel efficiency of Australian passenger vehicles.

The role of electric vehicles in Australian fuel security was recently highlighted by the National Resilience Project report, co-authored by Air Vice-Marshal John Blackburn AO (Retd) and Anne Borzycki with contributions from multiple national resilience experts:

“Electric vehicles (both battery and hydrogen fuel cell based) will have to be a major component of our transport energy mix in the future if we wish to have a degree of sovereign transport energy control, and to address the significant emissions reduction goals which will either be accepted by a future Government or, more likely, imposed upon us by “tariffs” such as the European Union’s Carbon Border Adjustment Mechanism.”<sup>51</sup>

## Liquid fuel displacement from EV uptake

More than half the total refined petroleum products consumed in Australia are used in road transport.

In 2020, the Australian fleet of road registered vehicles consisted of 74.5 per cent passenger vehicles, with the remainder being busses and motorcycles (5%), freight vehicles (20.4%) and non-freight carrying trucks (0.1%).<sup>52</sup> Passenger carrying vehicles consumed 14,455 megalitres of petrol and 3,128 megalitres of diesel – a total of 17,583 megalitres of oil product.<sup>53</sup>

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<sup>51</sup> National Resilience Project (2021) *Australia – A Complacent Nation*, [https://globalaccesspartners.org/wp-content/uploads/2021/10/GAP\\_IIERA\\_NationalResilienceProject\\_Report\\_Oct2021.pdf](https://globalaccesspartners.org/wp-content/uploads/2021/10/GAP_IIERA_NationalResilienceProject_Report_Oct2021.pdf)

<sup>52</sup> ABS (2020) *Survey of Motor Vehicle Use, Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

<sup>53</sup> ABS (2020) *Survey of Motor Vehicle Use, Australia*

If passenger carrying vehicles in the Australian car fleet today was a pure electric vehicle, 33 per cent of Australia's imported oil could be replaced with domestic electricity. Even if only a quarter were electric, 8 per cent of total imports would not be needed to fulfill passenger vehicle demand. Additionally, in the event of oil supply disruption, a significant portion of Australian vehicles would be relatively unaffected.

Increasing the proportion of electric vehicles in Australia's passenger fleet alone (excluding all trucks and commercial vehicles) would reduce Australia's reliance on imported liquid fuels. Transitioning from petrol and diesel freight vehicles to zero-emission alternatives would further decrease demand for foreign oil, although non-oil alternatives are less advanced in the freight vehicle market.

**Table 1: Estimate of imported oil displacement from EV passenger fleet scenarios**

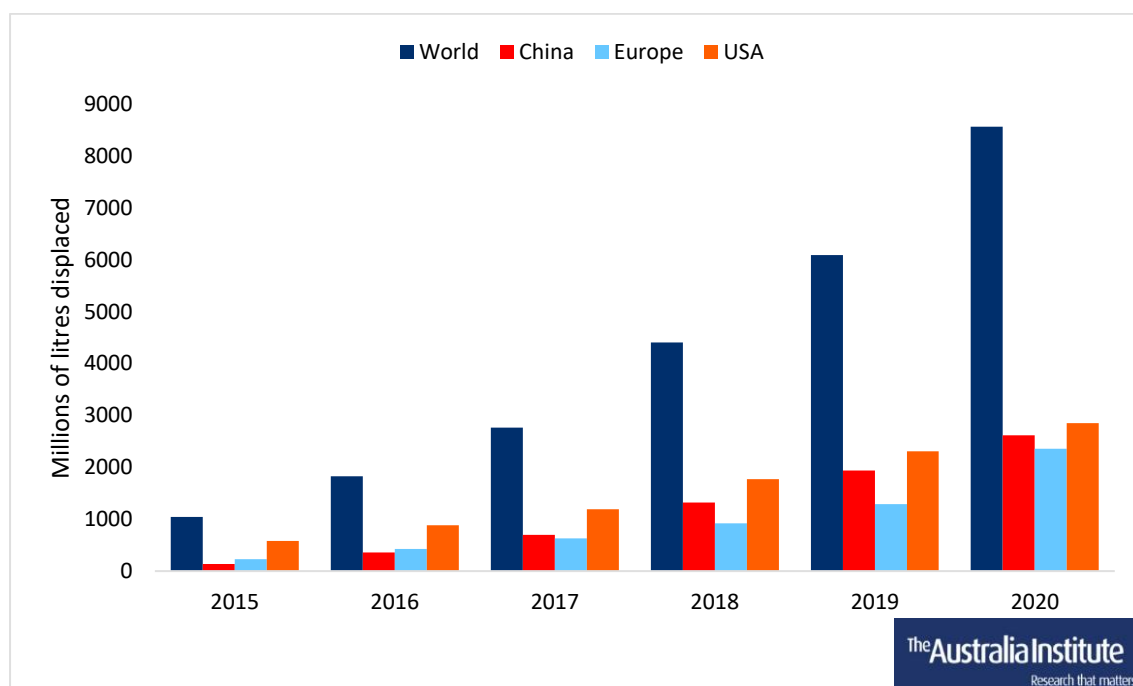
<b>Domestic oil demand 2019-20</b>		<b>Megalitres</b>
Total oil imported		53,986
Total refined product imported		36,011
Passenger vehicles petrol use		14,455
Passenger vehicle diesel use		3,128
Total passenger vehicle oil product use		17,583
<b>EVs % of Australian passenger vehicle fleet</b>	<b>Oil import displacement rate</b>	
25% of Australian passenger vehicle fleet		8%
50% of Australian passenger vehicle fleet		16%
75% of Australian passenger vehicle fleet		24%
100% of Australian passenger vehicle fleet		33%

Sources: Department of Industry, Science, Energy and Resources (2020) *Australian Petroleum Statistics Issue 293 December 2020*, <https://www.energy.gov.au/publications/australian-petroleum-statistics-2020>; ABS (2020) *Survey of Motor Vehicle Use, Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

These figures are rough estimates only. Several variables would affect actual oil displacement, including the fact that unrefined crude does not produce the same amount of refined product due to refinery consumption and additives. However, these figures give an indication of how increasing the proportion of electric vehicles in the Australian passenger fleet alone would affect the extent to which Australia is reliant upon oil imports.

IEA data shows vehicle electrification has affected oil demand internationally. Global oil displacement from electric vehicle uptake has increased steadily over the last five years, as shown in Figure 3.

**Figure 3: Liquid fuel displacement by electric vehicles**



Source: International Energy Agency (2021) *Global EV Data Explorer*, <https://www.iea.org/articles/global-ev-data-explorer>

In 2019, global oil demand was around 100 million barrels per day.<sup>54</sup>

The 2017 World Oil Outlook, produced by the Organisation of the Petroleum Exporting Countries (OPEC), predicted a decline in road transportation sector oil demand within the OECD of 7 million barrels per day by 2040. This is a relatively conservative estimate, based on a 12 per cent global EV fleet share by 2040.<sup>55</sup>

The IEA estimates EVs displaced 0.5 million barrels per day globally of petrol and diesel in 2020, and projects an increase in oil displacement to over 2 million barrels per day by 2030, with a 12 per cent global EV fleet share.<sup>56</sup>

A report commissioned by the World Wildlife Fund finds that 1 million barrels per day of crude oil could be displaced by the end of the 2020s, rising to between 2-4 million barrels per day by 2035 and 4-6 million by 2045.<sup>57</sup>

Some estimates predict the pace of oil displacement to radically increase over the next two decades. BloombergNEF projects 17.6 million barrels of oil per day will be displaced by

<sup>54</sup> IEA (2021) *Oil 2021*, <https://www.iea.org/reports/oil-2021>

<sup>55</sup> OPEC (2017) *World Oil Outlook 2040*, [https://www.ief.org/\\_resources/files/events/ief-lecture---world-energy-outlook-weo-2017-and-world-oil-outlook-woo-2017/opec---world-oil-outlook-2040.compressed.pdf](https://www.ief.org/_resources/files/events/ief-lecture---world-energy-outlook-weo-2017-and-world-oil-outlook-woo-2017/opec---world-oil-outlook-2040.compressed.pdf)

<sup>56</sup> International Energy Agency (2021) *Global EV Outlook 2021*, <https://www.iea.org/reports/global-ev-outlook-2021/prospects-for-electric-vehicle-deployment#abstract>

<sup>57</sup> Tsai & Champagne (2016) *No Middle Road: The growth of electric vehicles and their impact on oil*, [https://d3q9070b7kewus.cloudfront.net/downloads/wwf\\_ev\\_report\\_sp\\_final.pdf](https://d3q9070b7kewus.cloudfront.net/downloads/wwf_ev_report_sp_final.pdf)

electric vehicles in 2040.<sup>58</sup> Analysis by RethinkX suggests that global oil demand will peak at around 100 million barrels per day in 2020 and decline to around 70 million barrels by 2030 due to the uptake of EVs and a departure from the current model of individual car ownership.<sup>59</sup>

These projections indicate that there is strong potential for Australia to improve its transport energy security and reduce its dependence on oil by transitioning to electric vehicles, as well as transport mode switching.

## Electric passenger vehicles

Despite the fuel security benefits of transitioning vehicles – particularly passenger vehicles – to electric alternatives, Australia has done little to support this transition.

Internationally, the electric vehicle transition is well underway. Consumers and vehicle manufacturers are already moving away from fossil-fuelled vehicles, assisted by ambitious government policies to stimulate electric vehicle roll-out and decarbonise the transport sector.

According to the IEA, to be on track to net-zero emissions by 2050, internal combustion engine (ICE) vehicle sales must end by 2035. Under the IEA's net-zero emissions scenario, global oil demand falls by 75 per cent between 2020 and 2050.<sup>60</sup>

An increasing number of national and sub-national governments have announced plans to phase out the sale of new ICE vehicles. At least 19 countries have introduced targets to completely phase out ICE sales - some as early as 2025 (Norway) and 2030 (Iceland, Ireland, Israel, Netherland, Sweden, and the UK).<sup>61</sup> For a detailed list of electric vehicle deployment polices and measures globally (including legislation, targets, ambitions and proposals) see the International Energy Agency's Global EV Policy Explorer.<sup>62</sup>

However, Australia lags behind other developed nations in EV uptake and policy development. For the year 2020, EVs (battery and plug-in electric vehicles) accounted for 0.8 per cent of new vehicle sales in Australia, compared to the global average of 4.2 per

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<sup>58</sup> Bloomberg New Energy Finance (2021) *Electric Vehicle Outlook 2020*, <https://about.bnef.com/electric-vehicle-outlook/#:~:text=EVs%20across%20all%20segments%20are,oil%20demand%20growing%20until%202031>

<sup>59</sup> RethinkX (2017) *Transportation*, <https://www.rethinkx.com/transportation-executive-summary>

<sup>60</sup> IEA (2021) *Net Zero by 2050- A Roadmap for the Global Energy Sector*, p 101, <https://iea.blob.core.windows.net/assets/4482cac7-edd6-4c03-b6a2-8e79792d16d9/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf>

<sup>61</sup> Quicke (2021) *Submission on the Future Fuels Discussion paper*, p 20, <https://australiainstitute.org.au/wp-content/uploads/2021/04/The-Australia-Institute-FFDP-Submission.pdf>

<sup>62</sup> IEA (2021) *Global EV policy Explorer*, <https://www.iea.org/articles/global-ev-policy-explorer>.

cent, and 75 per in Norway.<sup>63</sup> While 2021 saw Australian electric vehicle sales increase dramatically – up 191% on 2020 figures – Australian still lags comparable countries on EV uptake.<sup>64</sup>

The Australia Government does not provide direct financial incentives to reduce the cost of purchasing an EV. Affordability is a major factor influencing EV uptake, and is largely determined by how quickly EVs can reach price parity with their fossil fuelled counterparts and the extent to which governments provide financial incentives. Recent research suggests EVs will reach price parity with ICE vehicles in Europe between 2025 and 2027.<sup>65</sup> Until that time, many countries and jurisdictions have introduced financial incentives to reduce the sticker price of EVs. These include rebates or grants, tax breaks, and conversion bonuses for trading in old diesel or petrol vehicles, among other incentives.<sup>66</sup>

Australia also has no national target or policy to end ICE vehicle sales, despite calls from organisations including the National Roads and Motoring Association (NRMA) to set a date to ban petrol and diesel car sales.<sup>67</sup>

In 2019, a Senate Select Committee on Electric Vehicles put forward 17 recommendations, including the development of “a national EV strategy to facilitate and accelerate EV uptake and ensure Australia takes advantage of the opportunities, and manages the risks and challenges, of the transition to EVs”.<sup>68</sup> The energy security benefits of EV uptake were discussed in length during the Senate Committee process, with the final report highlighting the ‘Fuel security - national security and resilience’ implications of Australia’s current reliance on imported oil.<sup>69</sup>

While ignoring the majority of the Committee’s recommendations, the Australian Government did agree to deliver an EV strategy. The promised strategy was consistently

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<sup>63</sup> Electric Vehicle Council (2021) *State of Electric Vehicles 2021*, <https://electricvehiclecouncil.com.au/wp-content/uploads/2021/08/EVC-State-of-EVs-2021-sm.pdf>

<sup>64</sup> Federal Chamber of Automotive Industries (2022) *FCAI releases VFACTS 2021 new vehicle sales figures*, <https://www.fcai.com.au/news/index/view/news/750>

<sup>65</sup> BloombergNEF (2021) *Hitting the EV Inflection Point*, [https://www.transportenvironment.org/sites/te/files/publications/2021\\_05\\_05\\_Electric\\_vehicle\\_price\\_parity\\_and\\_adoption\\_in\\_Europe\\_Final.pdf](https://www.transportenvironment.org/sites/te/files/publications/2021_05_05_Electric_vehicle_price_parity_and_adoption_in_Europe_Final.pdf)

<sup>66</sup> The Driven (2021) *Explainer: Six ways to drive down the up-front cost of buying an EV*,

<sup>67</sup> March, Mcgregor & Selvaratnam (2019) NRMA calls for ban on sale of gas guzzlers by 2030, <https://www.abc.net.au/news/2019-04-01/nrma-calls-for-diesel-and-petrol-car-ban-by-2030/10949414>

<sup>68</sup> Senate Select Committee on Electric Vehicles (2019) *Recommendations*, [https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Electric\\_Vehicles/ElectricVehicles/Report/b02](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Electric_Vehicles/ElectricVehicles/Report/b02)

<sup>69</sup> Senate Select Committee on Electric Vehicles (2019) *Recommendations*, p 39.



delayed – postponed from 2019 to mid-2020,<sup>70</sup> to late-2020,<sup>71</sup> and taking the form of a ‘consultation paper’, The Future Fuels Strategy (FFS) Discussion Paper, in early 2021.<sup>72</sup>

In November 2021, the Government delivered the final paper —the *Future Fuels and Vehicles Strategy* (FFVS). The FFVS contains no new funding commitments, no EV uptake targets, and no vehicle emissions standards.<sup>73</sup> It rules out incentives for EV uptake, despite most G20 countries offering incentives that have shown to successfully drive early-stage adoption of electric vehicles.<sup>74</sup>

Australia’s EV policy framework rarely considers the fuel security benefits of electrifying transport. For example, the FFS Discussion Paper includes a graph of estimated electricity demand from EVs at different levels of fleet penetration.<sup>75</sup> Although the increase in electricity demand due to EV uptake would be accompanied by a decrease in oil demand, no such corresponding graph or discussion is included in the FFVS.

According to the FFVS, the Government is funding research to model Australia’s future mix of transport fuels, due in 2022.<sup>76</sup> This is a welcome measure, and should include modelling and discussion of fuel demand and oil displacement under different EV uptake scenarios as well as targets for reduced liquid fuel consumption.

For Australia to fully capitalise on the fuel security benefits of the EV transition, a government EV strategy and supporting policies are needed. The Australia Institute’s Climate of the Nation report shows the vast majority of Australians support EV policies, including subsidies for new vehicle purchases and fuel efficiency standards. More than two-

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<sup>70</sup> Schmidt (2020) *Coalition says no plans for electric vehicle strategy until mid-2020*, <https://thedriven.io/2019/03/26/coalition-says-no-plans-for-electric-vehicle-strategy-until-mid-2020/>

<sup>71</sup> Angus Taylor MP (2020) *Supporting new technology to drive uptake of electric vehicles*, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/supporting-new-technologydriveuptake-electric-vehicles>

<sup>72</sup> Department of Industry, Science, Energy and Resources (2021) *Future Fuels Strategy: Discussion Paper*, [https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a39d33af5b13588c25ea/public\\_assets/Future%20Fuels%20Strategy%20-%20Discussion%20Paper.pdf](https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a39d33af5b13588c25ea/public_assets/Future%20Fuels%20Strategy%20-%20Discussion%20Paper.pdf)

<sup>73</sup> DISER (2021) *Future Fuels and Vehicles Strategy*, <https://www.industry.gov.au/data-and-publications/future-fuels-and-vehicles-strategy>

<sup>74</sup> BloombergNEF (2021) G20 Zero-Carbon Policy Scoreboard, <https://assets.bbhub.io/professional/sites/24/BNEF-G20-Zero-Carbon-Policy-Scoreboard-EXEC-SUM.pdf>

<sup>75</sup> Department of Industry, Science, Energy and Resources (2021) *Future Fuels Strategy: Discussion Paper*, [https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a39d33af5b13588c25ea/public\\_assets/Future%20Fuels%20Strategy%20-%20Discussion%20Paper.pdf](https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a39d33af5b13588c25ea/public_assets/Future%20Fuels%20Strategy%20-%20Discussion%20Paper.pdf)

<sup>76</sup> DISER (2021) *Future Fuels and Vehicles Strategy*, p. 24.

thirds (68%) of Australians believe the Federal Government should be doing more to increase EV uptake in Australia.<sup>77</sup>

Additionally, many Australians recognise the energy security benefits of EV uptake, with 45% ranking ‘reduced dependence on foreign oil’ as one of the largest benefits of EV uptake in Australia (behind ‘reduced greenhouse gas emissions’ – 60%, and ‘improved local air quality’ – 56%).<sup>78</sup>

## Electric freight vehicles

One in five (20 per cent) road registered vehicles in Australia are freight vehicles, including light commercial vehicles and trucks (both rigid and articulated).<sup>79</sup> Although fewer in number, freight vehicles travel further than passenger vehicles. In FY2020, on average, light commercial vehicles travelled 15,300 kilometres, rigid trucks travelled 21,000 kilometres, and articulated trucks travelled 78,300 kilometres– compared to 11,100 kilometres on average travelled by passenger vehicles.<sup>80</sup>

In total, freight vehicles consumed 14,158 megalitres of fuel in FY2020 (around 90 per cent diesel) compared to 18,094 megalitres consumed by passenger vehicles (around 80 per cent petrol).

Given the significant consumption of liquid fuel by Australia’s freight vehicle sector, diversifying the fuel consumption of trucks and heavy vehicles is an opportunity to improve national security as well as climate and health benefits.

Although alternatives for heavy vehicles are not as developed as passenger vehicle alternatives, the Australian trucking industry expects zero emissions freight vehicles to evolve faster than originally expected. Battery electric truck technology is already deployable, particularly for urban use, and hydrogen fuel cell vehicles may play a role in heavier vehicle and long-haul cases.<sup>81</sup>

In March 2021, Australian-founded company SEA Electric began production of locally-assembled electric trucks. The SEA 300 and SEA 500 can be customised for a range of

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<sup>77</sup> Quicke (2021) *Climate of the Nation*,

<https://australiainstitute.org.au/wp-content/uploads/2021/10/211013-Climate-of-the-Nation-2021-WEB.pdf>

<sup>78</sup> Ibid.

<sup>79</sup> ABS (2020) *Survey of Motor Vehicle Use, Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

<sup>80</sup> ABS (2020) *Survey of Motor Vehicle Use, Australia*, <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

<sup>81</sup> Electric Vehicle Council (2022) *Electric trucks: Keeping shelves stocked in a net zero world*,

[https://electricvehiclecouncil.com.au/wp-content/uploads/2022/01/ATA-EVC-Electric-trucks\\_Keeping-shelves-stocked-in-a-net-zero-world-1.pdf](https://electricvehiclecouncil.com.au/wp-content/uploads/2022/01/ATA-EVC-Electric-trucks_Keeping-shelves-stocked-in-a-net-zero-world-1.pdf), p. 10.

applications including tippers, garbage trucks, cherry pickers and more.<sup>82</sup> Electric garbage trucks are currently used and trialled by local councils around Australia including in South Australia,<sup>83</sup> Victoria,<sup>84</sup> and NSW.<sup>85</sup>

The Electric Vehicle Council and Australian Trucking Association have recommended a number of government policies to support the uptake of electric freight vehicles – including regulatory policies, investing in public charging infrastructure, providing financial incentives, setting sales goals and providing skills and training to the trucking industry.<sup>86</sup> The Australian Trucking Association has called for ‘targeted government investment and clear action’, specifically – a zero and low emissions heavy vehicle purchase incentive, and early investment in charging stations and hydrogen refuelling stations.<sup>87</sup>

## Fuel Efficiency Standards

Australia is one of the only OECD nations with no fuel efficiency standards.<sup>88</sup> Fuel efficiency standards regulate carbon dioxide emissions intensity, which is directly related to vehicle fuel consumption. The 2020 average emissions intensity for passenger cars and light SUVs in Australia was 149.5g/km, and for heavy SUVs and light commercial vehicles was 216.7 g/km. While over 90% of new European passenger vehicle registrations were below 160g/km – in Australia, less than half of new passenger vehicles had an emissions intensity of 160g/km or less.<sup>89</sup>

A Ministerial Forum on Vehicle Emissions was established in 2015 to coordinate a whole-of-government approach to addressing emissions from road vehicles in Australia. It found that

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<sup>82</sup> The Driven (2021) *Australia’s first mass-made electric trucks go into production*, <https://thedriven.io/2021/03/24/australias-first-mass-made-electric-trucks-go-into-production/>

<sup>83</sup> Solarquotes (2020) *SA’s First Electric Garbage Truck Doing The Rounds*, <https://www.solarquotes.com.au/blog/electric-garbage-truck-mb1420/>

<sup>84</sup> The Driven (2018) *First electric waste trucks go into service in Victoria*, <https://thedriven.io/2018/10/04/waste-trucks/>

<sup>85</sup> The Driven (2020) *Electric garbage truck ‘on trial’ in western Sydney*, <https://thedriven.io/2020/08/26/electric-garbage-truck-on-trial-in-western-sydney/>

<sup>86</sup> [https://electricvehiclecouncil.com.au/wp-content/uploads/2022/01/ATA-EVC-Electric-trucks\\_Keeping-shelves-stocked-in-a-net-zero-world-1.pdf](https://electricvehiclecouncil.com.au/wp-content/uploads/2022/01/ATA-EVC-Electric-trucks_Keeping-shelves-stocked-in-a-net-zero-world-1.pdf)

<sup>87</sup> Australian Trucking Association (2021) *Future Fuels Strategy: Discussion paper*, <https://www.truck.net.au/sites/default/files/submissions/20210408ATAFutureFuelsStrategy.pdf>

<sup>88</sup> Mortimore (2019) *Labor’s plan for transport emissions is long on ambition but short on details*, <https://theconversation.com/labors-plan-for-transport-emissions-is-long-on-ambition-but-short-on-details-114592>

<sup>89</sup> National Transport Commissions (2021) *Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2020*,

<https://www.ntc.gov.au/sites/default/files/assets/files/Carbon%20dioxide%20emissions%20intensity%20for%20new%20Australian%20light%20vehicles%202020.pdf>, p. 2-3.

the introduction of fuel efficiency targets would result in fuel savings that outweighed the production costs associated with supplying vehicles with the necessary technology to meet those requirements.<sup>90</sup> In short, fuel efficiency standards would result in less fuel being used to achieve the same outcome, reducing consumption and flowing on to marginally improve Australia's vulnerability to imported fuels. Despite this, no fuel efficiency standards have been introduced, leading to Australia having one of the least efficient fleets in the OECD.

Fuel efficiency standards are set using the average fuel efficiency across the whole fleet of vehicles sold in a country by a manufacturer. A manufacturer has an incentive to sell more EVs because this lowers the average fuel efficiency across their fleet. Introducing fuel efficiency CO2 standards in line with global best-practice would help ensure liquid fuels are consumed more efficiently, reduce transport emissions and support EV uptake.

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<sup>90</sup> Australian Government (2016) *Improving the efficiency of new light vehicles*, p. 6.  
[https://www.infrastructure.gov.au/vehicles/environment/forum/files/Vehicle\\_Fuel\\_Efficiency\\_RIS.pdf](https://www.infrastructure.gov.au/vehicles/environment/forum/files/Vehicle_Fuel_Efficiency_RIS.pdf)

# Rethinking fuel security

There are several steps that could be taken to improve Australia's liquid fuel security. These steps address demand as well as supply.

- Release the final Liquid Fuel Security Report. Include an assessment of how electric vehicle uptake and transport mode shifts can impact fuel security.
- Create a national energy security strategy that specifically considers demand-side solutions to oil dependency. Set a target for the reduction of oil imports and include separate targets for petrol, diesel and aviation fuel, noting that petrol should be the initial focus for reduction.
- Publish a stand-alone electric vehicle strategy, underpinned by:
  - Fuel efficiency (CO<sub>2</sub>) standards
  - Financial incentives to assist uptake of electric passenger vehicles and freight vehicles
  - A target to ban ICE passenger vehicle sales by 2030
- In all future electric vehicle policy reports, such as an electric vehicle strategy, include an assessment of oil displacement impacts
- Set a target for the reduction of transport emissions by 2050, underpinned by 5 yearly interim targets.

The best way to improve Australia's liquid fuel security in the medium term would be to reduce petrol consumption by switching to electric passenger vehicles. This would give more capacity to address diesel and aviation fuel insecurity.

# Conclusion

Liquid fuel security is a serious economic and national security issue for Australia. Policy measures have centred on the supply-side through policies such as increasing Australia's oil stocks and securing domestic refining capability, with little consideration for demand-side solutions. Despite government efforts, our fuel security has not significantly improved over recent years.

Australia faces numerous challenges to its liquid fuel security. The Ukrainian War has shown the world the danger of poor fuel security.

Australia is reliant on imports for 91 per cent of its fuel, including refined and unrefined fuel imports. Three quarters (73 per cent) of Australia's total liquid fuel demand is consumed by the transport sector and over half (54 per cent) is consumed by road transport alone. This liquid fuel demand can be significantly reduced by EV uptake. The main barrier to the uptake of electric vehicles is a lack of policy.

The Australia Government has no plan to electrify Australia's vehicle fleet and does not provide direct financial incentives to reduce the cost of EV purchase. Policies such as rebates or grants, tax breaks, and conversion bonuses for trading in old diesel or petrol vehicles are among the incentives that should be considered, alongside introducing fuel efficiency standards and incentivising transition for heavy diesel vehicles. Australia Institute research shows that the majority of Australians support policies to support EV uptake. Demand-side solutions to liquid fuel security, such as moving to EVs, are needed to significantly reduce our vulnerability.

Australia's energy security policy should consider demand for oil and seek to reduce demand through the uptake of electric vehicles.