The Senate

Rural and Regional Affairs and Transport References Committee

Australia's transport energy resilience and sustainability

June 2015

ISBN 978-1-76010-252-4

This document was prepared by the Senate Standing Committee on Rural and Regional Affairs and Transport and printed by the Senate Printing Unit, Department of the Senate, Parliament House, Canberra.

Membership of the committee

Members

Senator Glenn Sterle, Chair	Western Australia, ALP
Senator the Hon Bill Heffernan, Deputy Chair	New South Wales, LP
Senator Joe Bullock	Western Australia, ALP
Senator Sue Lines	Western Australia, ALP
Senator John Williams	New South Wales, NATS
Senator Peter Whish-Wilson	Tasmania, AG

Other Senators participating in this inquiry

Senator Chris Back	Western Australia, LP
Senator Matthew Canavan	Queensland, NATS
Senator Sean Edwards	South Australia, LP
Senator Jackie Lambie	Tasmania, IND
Senator John Madigan	Victoria, IND
Senator Ricky Muir	Victoria, AMEP
Senator Janet Rice	Victoria, AG
Senator Nick Xenophon	South Australia, IND

Secretariat

Mr Tim Watling, Secretary
Dr Jane Thomson, Principal Research Officer
Ms Erin East, Principal Research Officer (from 27 October 2014)
Ms Bonnie Allan, Principal Research Officer (from 2 January 2015)
Ms Trish Carling, Senior Research Officer
Ms Kate Campbell, Research Officer
Ms Lauren Carnevale, Administrative Officer

PO Box 6100
Parliament House
Canberra ACT 2600
Ph: 02 6277 3511
Fax: 02 6277 5811
E-mail: rrat.sen@aph.gov.au
Internet: www.aph.gov.au/senate_rrat

Table of contents

Abbreviations

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ATSE	Australian Academy of Technological Sciences and Engineering
BREE	Bureau of Resources and Energy Economics
CNG	Compressed Natural Gas
IEA	International Energy Agency
LNG	Liquid Natural Gas
LPG	Liquid Petroleum Gas
NRMA	National Roads and Motorists' Association

List of recommendations

Recommendation 1

6.8 The committee recommends that the Australian Government undertake a comprehensive whole-of-government risk assessment of Australia's fuel supply, availability and vulnerability. The assessment should consider the vulnerabilities in Australia's fuel supply to possible disruptions resulting from military actions, acts of terrorism, natural disasters, industrial accidents and financial and other structural dislocation. Any other external or domestic circumstance that could interfere with Australia's fuel supply should also be considered.

Recommendation 2

6.14 The committee recommends that the Australian Government require all fuel supply companies to report their fuel stocks to the Department of Industry and Science on a monthly basis.

Recommendation 3

6.17 The committee recommends that the Australian Government develop and publish a comprehensive Transport Energy Plan directed to achieving a secure, affordable and sustainable transport energy supply. The plan should be developed following a public consultation process. Where appropriate, the plan should set targets for the secure supply of Australia's transport energy.

Chapter 1

Introduction and background

1.1 On 3 September 2014, the following matters were referred to the Senate Rural and Regional Affairs and Transport References Committee for inquiry and report by the last sitting day in March 2015.

> Australia‘s transport energy resilience and sustainability, with particular reference to:
>
> a. options for introducing mandatory oil stockholdings;
>
> b. the role of Government in ensuring Australian energy for Australians, including maintaining refinery capability; and
>
> c. Australia's role and responsibility regarding energy security as a member of various multilateral fora.

1.2 On 12 February 2015, the Senate granted an extension of time for reporting to the committee. The extension provided for the committee to report by 25 June 2015.

Conduct of the inquiry

1.3 The inquiry was advertised in *The Australian* and on the committee webpage. The committee also wrote to government departments, organisations and individuals to invite submissions. Details of the inquiry and associated documents are available on the committee's webpage.

1.4 The committee received 41 public submissions and 1 confidential submission which are listed at Appendix 1. The public submissions are also published on the committee's webpage.

1.5 The committee held public hearings in Sydney on 2 February and Melbourne on 9 April 2015. A list of witnesses who appeared at the hearings is at Appendix 2.

Acknowledgement

1.6 The committee acknowledges the organisations and individuals that made contributions to the inquiry through submissions and appearances at the hearings.

Background and inquiry focus

1.7 On 8 April 2015, during the course of the committee's inquiry, the Australian Government released the 2015 Energy White Paper. The paper recognised that Australia's current oil stockholdings do not currently meet its obligations under the International Energy Agency (IEA) treaty.[1] As a member of the IEA, Australia is obliged to hold oil stocks equivalent to 90 days of its prior year's net imports.[2]

---

1 Australian Government, *Energy White Paper: Increasing competition to keep prices down*, Department of Industry and Science, April 2015, p. 27.

2 International Energy Agency, Closing Oil Stock Levels in Days of Net Imports, January 2015, https://www.iea.org/netimports/ (accessed 5 May 2015).

1.8 In January 2015, the IEA reported that, Australia fell short of this 90 day requirement with 51 days of industry stockholdings.[3] IEA data on closing oil stock levels of net imports reveals that Australia's stocks had progressively declined from 88 days in January 2010 to 83 days in January 2012 to 60 days in January 2014.[4] According to the University of Queensland (UQ), Australia's stocks have progressively declined from 2002 when there were over 300 days of stock.[5]

1.9 In the Energy White Paper, the Australian Government noted that meeting its 90 day IEA obligations would require an investment of billions of dollars in stocks and storage infrastructure over a decade. It further noted that:

> A decision on how to address this compliance issue will be made by the Government in 2015.[6]

1.10 In light of this evidence, this report considers Australia's liquid fuel supply and stockholdings, with a focus on the challenges and opportunities to Australia in meeting its IEA obligations. However, it also recognises that Australia's energy security entails more than simply IEA compliance.

1.11 As part of this review, the report lays out the current context in terms of Australia's energy consumption, production, importation and exportation. It explores the implications of Australia's declining reserves and production of petroleum. It also considers the role of government in relation to energy security with a particular focus on Australia's approach of relying heavily on market forces to deliver energy security.

---

3 International Energy Agency, Closing Oil Stock Levels in Days of Net Imports, January 2015, https://www.iea.org/netimports/ (accessed 5 May 2015).

4 International Energy Agency, Closing Oil Stock Levels in Days of Net Imports, April 2012, http://www.iea.org/netimports/?y=2012&m=04 (accessed 5 March 2015).

5 University of Queensland, *Submission 12*, p. 4.

6 Australian Government, *Energy White Paper: Increasing competition to keep prices down*, Department of Industry and Science, April 2015, p. 27.

Chapter 2

Australia's energy consumption, production, imports and exports

2.1 This chapter provides an overview of Australia's energy consumption, imports and exports, as well as energy production and storage capacity.

Australia's energy consumption

2.2 According to the Bureau of Resources and Energy Economics (BREE), Australia's energy consumption has consistently risen over the past ten years at an average annual rate of 1.1 per cent.[1]

2.3 Fossil fuels (coal, oil and gas) dominate Australia's primary energy consumption.[2] In 2012–13, of the 5885 petajoules of energy consumed in Australia, 94 per cent was derived from fossil fuel sources.[3]

2.4 In 2012–13, of Australia's total energy consumption, approximately:

- 38 per cent comprised oil – including crude, condensate and liquefied petroleum gas (LPG);
- 33 comprised coal – both black and brown;
- 24 per cent comprised natural gas; and
- 6 per cent was made up in renewable resources – wind, solar, geothermal, hydro, wave, tidal and bioenergy.[4]

Energy consumption within the transport sector

2.5 Australia's demand for oil has risen steadily over recent decades, largely driven by increasing transport sector demand.[5]

2.6 In 2012–13, the transport sector was Australia's second largest energy consumer (behind the electricity sector), accounting for 26 per cent of all energy consumption or 1545 petajoules of energy.[6] Increased energy use in road, rail and air transport resulted in a marginal increase in energy consumption in the transport sector

---

1 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 2.

2 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 26.

3 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 24.

4 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 26.

5 Department of Industry and Science, *Submission 41*, p. 3.

6 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 30.

from the previous year.[7] The agricultural sector accounted for 1.7 per cent or 99 petajoules of total energy consumption.[8]

2.7 The Australian economy is dependent on extensive transport networks to move people, goods and resources domestically and offshore. Conventional transport fuels such as petrol, diesel and jet fuel are derived from crude oil and comprise the largest component of fuel sales in Australia.[9] Evidence to the committee highlighted that the country's transport sector is almost totally reliant on refined liquid fuels (oil, refined petroleum products and gaseous transport fuels).[10] The sector consumes 73 per cent of all Australia's liquid fuel supplies (including LPG and refined products).[11] In 2012–13, road transport accounted for 74 per cent of this.[12]

2.8 Alternative transport fuels include biofuels (ethanol and biodiesel), gaseous fuels and synthetic fuels.[13] In 2011–12, over 95 per cent of energy used for all transport modes was crude oil-derived liquid fuels with LPG the most significant alternative fuel comprising 2.7 per cent.[14] Over that period, most of the 32 billion litres of petrol, diesel and LPG used by cars, buses and trucks in Australia was imported.[15]

2.9 Evidence to the committee suggested that energy diversification has taken place in all industries (including agriculture, industry, residential and commercial sectors) except that of transport.[16] While there been some uptake of electric vehicles in the light passenger sector and some electrification in the passenger rail and bulk rail freight sectors, most transport sectors and particularly heavy road freight, maritime and aviation transport are likely to remain wholly or largely oil dependent for decades to come.[17] Therefore, as noted in the 2014 Energy White Paper Issues Paper, changes

---

7 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 30.

8 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 31.

9 Department of Industry and Science, Transport fuels, http://www.industry.gov.au/Energy/EnergySecurity/fuels/Pages/default.aspx (accessed 5 March 2015).

10 University of Queensland, *Submission 12*, p. 4; National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 3.

11 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p.8; Bureau of Resources and Energy Economics, *Energy in Australia 2012*, p. 99.

12 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 119.

13 Department of Industry and Science, Transport fuels, http://www.industry.gov.au/Energy/EnergySecurity/fuels/Pages/default.aspx (accessed 5 March 2015).

14 AGL Energy Limited, *Submission 8*, p. 1.

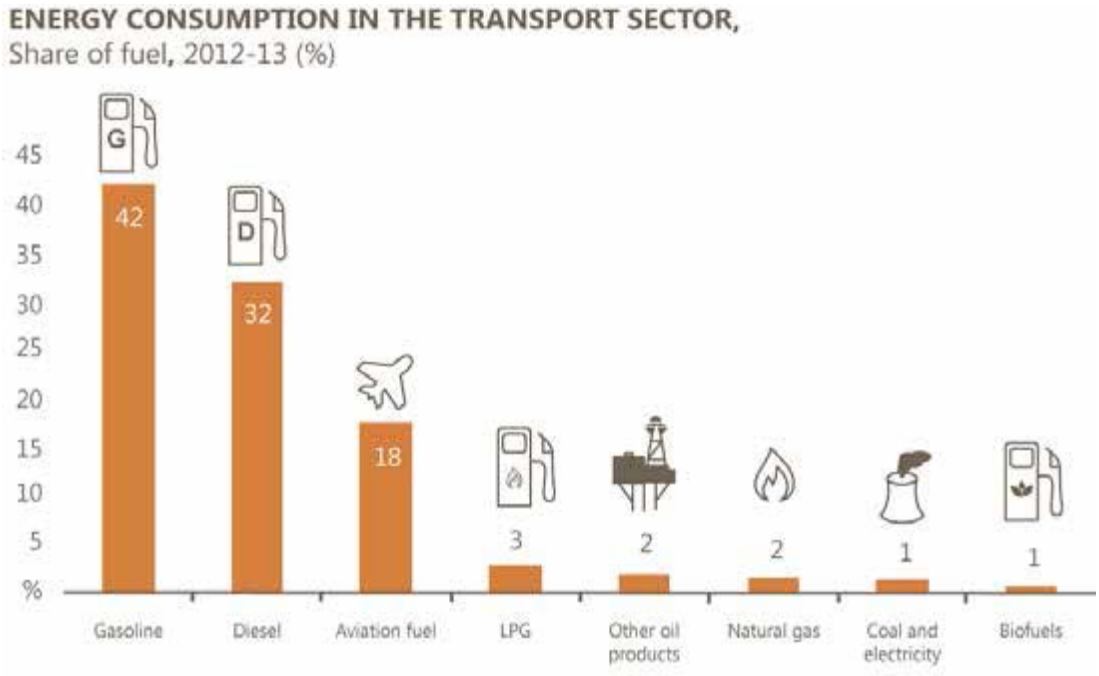
15 Associate Professor Philip Laird, *Submission 3*, p. 1.

16 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 6.

17 University of Queensland, *Submission 12*, p. 4.

in energy sources offer the potential to both increase the productivity of energy use and reduce reliance on petroleum-based liquid fuels.[18]

Diagram 2.1: Energy consumption in Australia's transport sector 2012–13 [19]



Australia's energy imports

2.10 Australia is a net importer of crude oil and refined petroleum products. In 2013–14, 82 per cent of the crude and other feedstock required for domestic refining was imported, with the balance supplied from indigenous production.[20]

2.11 Almost all of Australia's transport needs are met by oil-derived products including petrol, diesel, jet fuel and LPG.[21] An estimated 91 per cent of Australia's transport fuel (petrol and diesel) is imported either as oil to be refined in Australia or

18 Department of Industry, *Energy White Paper Issues Paper*, December 2013, p. 37.

19 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 120.

20 Department of Industry and Science, *Submission 41*, p. 5. In 2012, Australia imported 83 per cent of its crude oil and other refinery feedstock as well as 43 per cent of its refined petroleum products.

21 Department of Industry and Science, *Submission 41*, p. 3.

as refined fuel products.[22] In 2000, Australia imported 60 per cent of its transport fuel.[23]

2.12 As one of the largest consumers of liquid fuels in Australia, the Qantas Group spent a record $4.5 billion on aviation fuel in 2013–14, despite a reduction in fuel consumption by 5.4 per cent.[24]

2.13 In 2013–14, Australia's total petroleum imports comprised the majority of energy imports, amounting to almost $42.8 billion, up on the previous year's $40.15 billion.[25]

Diagram 2.2: Australian Petroleum Statistics – Imports of petroleum by product [26]

Year	Crude oil & other refinery feedstock	TOTAL petroleum imports[27]
2010-11	31,773.9 ML	6,574,906.3 ML
2011-12	29,504.9 ML	5,861,947.5 ML
2012-13	29,519.8 ML	6,569,689.9 ML
2013-14	27,677.7 ML	6,990,150.4 ML

22 National Roads and Motorists' Association, *Submission 18*, p. 7; Engineers Australia, *Submission 2*, p. 1; Mr David G. Lamb, *Submission 4*.

23 National Roads and Motorists' Association, *Submission 18*, Attachment 2, p. 3; Heath Aston, Al Qaeda threatens Australian fuel supply, *Sydney Morning Herald*, 1 November 2014, http://www.smh.com.au/national/al-qaeda-threatens-australian-fuel-supplies-20141031-11f4t2.html (accessed 4 December 2014). The Department of Industry defines transport fuels as fuels used to power cars, heavy machinery, aircraft, trains and marine vessels and can come from conventional sources including petrol, diesel and jet fuel or alternative transport fuels including biofuels, gaseous fuels and synthetic fuels. Department of Industry, Transport fuels, http://www.industry.gov.au/Energy/EnergySecurity/fuels/Pages/default.aspx (accessed 4 December 2014).

24 Qantas Airways Limited, *Submission 25*, p. 1.

25 Department of Industry and Science, *Australian Petroleum Statistics*, December 2014 and December 2013, Table 4BB: Origin of petroleum imports, by product, by value, by financial year, Australia.

26 Department of Industry and Science, *Australian Petroleum Statistics*, Table 4: Imports of petroleum by product, Australia, Issue 221, December 2014. ML refers to megalitres.

27 Total petroleum imports includes LPG, natural gas originating from International Waters exclusively from the Bayu-Undan field, automotive gasoline, aviation gasoline, aviation turbine fuel, kerosene and heating oil, fuel oil, lubricating oils, greases and basestocks, bitumen and 'other products'. Department of Industry and Science, *Australian Petroleum Statistics*, Table 4: Imports of petroleum by product, Australia, Issue 221, December 2014.

2.14 AGL Energy Limited stated that:

> Australia's quarterly imports of fuels and lubricants reached $10.9 billion in December 2013, more than a 300 per cent increase since 2003 and represented 13 per cent of the value of Australia's total imported goods and services. With the projected rises in petroleum import volumes and oil prices, the value of imported fuels could increase in real terms by over 20 per cent by 2025 and 40 per cent by 2030.[28]

2.15 Australia's largest export markets for crude oil and other refinery feedstock are Singapore, Thailand and Korea.[29] Of total imports, up to 58 per cent of product supply comes from Singapore.[30] However, Australia also imports crude oil and other refinery feedstock from a wider range of countries including Malaysia, United Arab Emirates, Vietnam and Nigeria while refined products are imported from countries including South Korea, Japan and Indonesia.[31]As a case in point, 58 per cent of crude oil imported by ExxonMobil Australia comes from the Asia-Pacific market, 21 per cent from west Africa and approximately 13 per cent from the Middle East while 85 per cent of its finished product comes from the Asia-Pacific region.[32]

Australia's energy production, refining and exports

2.16 Australia produces a range of liquid fuels including crude oil, condensate and LPG. In 2013–14, approximately 75 per cent of Australia's oil production was exported with crude oil exports alone earning an estimated $11.1 billion.[33]

2.17 The majority of Australia's crude oil production is exported because the qualities and characteristics of Australian oil are more suited to export markets than the Australian refinery market.[34] For example, most of the liquid fuels production from the North West Shelf (Western Australia) is in the form of condensates, which are not suited to the existing infrastructure of Australian refineries.[35]

---

28 AGL Energy Limited, *Submission 8*, p. 2.

29 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 111.

30 According to the 2014 Green Paper, the figure was 53 per cent. See Department of Industry, *Energy White Paper – Green Paper 2014*, p. 52. AIP informed the committee that it was 58 per cent. Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 9 April 2015, p. 16.

31 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 109.

32 Mr Andrew Warrell, ExxonMobil Australia and Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, pp 21–22.

33 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 6; Australian Government, *Energy White Paper: Increasing competition to keep prices down*, April 2015, p. 26.

34 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 8.

35 Department of Industry and Science, *Submission 41*, p. 5.

2.18 Primary energy (coal, crude oil, natural gas and wood) production in Australia amounted to 19,318 petajoules in 2012–13. Of the total energy produced during this period for both domestic use and export:

- 59 per cent was coal;
- 22 per cent was uranium;
- 13 per cent was natural gas;
- 5 per cent was oil and LPG; and
- 2 per cent was derived from renewable energy (primarily bioenergy and hydro).[36]

2.19 According to the Australian Petroleum Statistics (APS), Australia's production of crude oil and condensate declined from 25,772 megalitres (ML) in 2010–11 to 20,405 ML in 2013–14.[37] BREE noted that this fall in output continued a long term decline in Australia's production of primary petroleum.[38] In this regard, Australia's production of oil and condensate is forecast to decline from 147 million barrels in 2014 to 83 million barrels in 2030.[39]

Diagram 2.3: Australian Petroleum Statistics – Petroleum production, Australia [40]

Year	Total crude oil & condensate	LPG (naturally occurring)	Ethane	Natural gas
2010-11	25,772 ML	3,906 ML	407 Mm^3	47,558 Mm^3
2011-12	24,068 ML	3,813 ML	416 Mm^3	45,173 Mm^3
2012-13	21,267 ML	3,627 ML	419 Mm^3	52,299 Mm^3
2013-14	20,405 ML	3,912 ML	445 Mm^3	52,692 Mm^3

2.20 Australia has significant volumes of natural gas reserves that are increasingly being developed for domestic use and for liquefied natural gas (LNG) exports.[41] In 2012–13, Australia produced 2439 petajoules (or around 62 billion cubic metres) of

36 Crude oil and condensate accounted for 4.1 per cent and LPG 0.5 per cent. Bureau of Resources and Energy Economics, *Energy in Australia 2012*, pp 1–3.

37 Department of Industry and Science, *Australian Petroleum Statistics*, Issue 221, December 2014, Table 1A: Petroleum production, Australia.

38 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, pp 6 & 100.

39 Australian Coal to Liquids Association, *Submission 33*, p. 13.

40 Department of Industry and Science, *Australian Petroleum Statistics*, Issue 221, December 2014, Table 1A: Petroleum production, Australia.

41 International Energy Agency, *Oil and Gas Security – Australia*, 2011, p. 15.

natural gas, representing a rise in production of 14 per cent from the previous year.[42] BREE noted that, over the past decade, Australia's natural gas production had expanded by 5 per cent a year on average.[43]

2.21 Around 48 per cent of Australia's gas was produced for the domestic market in 2013–14, with the remainder exported as LNG.[44] According to BREE, the share of production consumed by the domestic market fell from 71 per cent a decade ago, with exports increasing at a faster rate than domestic consumption.[45] As the world's third largest exporter of LNG behind Qatar and Malaysia, Australia accounts for 10 per cent of the world LNG trade.[46] In 2013–14, Australian LNG exports amounted to 24.1 million tonnes, an increase from 23.9 million tonnes in 2012–13.[47] In 2013–14, LNG exports were valued at more than $16 billion.[48]

Domestic refining

2.22 The refining industry in Australia produces a range of petroleum products including gasoline, diesel oil, aviation turbine fuel, fuel oil and LPG.[49] According to BREE, in 2013–14, Australian refineries produced 34,187 ML of marketable refined petroleum products, down from 36,891 ML in 2012–13.[50]

2.23 In 2010, total refinery intake of the then seven refineries in Australia averaged 666,000 barrels per day (of which 605,000 barrels was crude and condensates). According to IEA, at that time, over two-thirds (or about 66 per cent) of Australia's refinery input requirements came from imports.[51] This figure rose to 80 per cent in 2014 as noted by BREE:

> Just over 80 per cent of the feedstock for Australia's five domestic refineries, which are largely based on the east coast, is sourced from imports. Imports also account for a significant share of Australia's consumption of refined products. In 2013–14 imports of refined products equalled 44 per cent of domestic consumption.[52]

2.24 The five petroleum refineries currently operating in Australia have a combined capacity of 32.6 gigalitres a year.[53] By mid–2015 when BP's refining

---

42 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 82.

43 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 82.

44 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 85.

45 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 85.

46 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, pp 82 & 91.

47 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 91.

48 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 91.

49 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 104.

50 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 104.

51 International Energy Agency, *Oil and Gas Security – Australia*, 2011, p. 8.

52 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 100.

53 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 105.

operations at the Bulwer Island refinery in Brisbane close, Australia will only have four refineries – Vitol in Geelong, BP at Kwinana, Western Australia, Caltex in Lytton, Brisbane and ExxonMobil in Altona, Melbourne.[54]

2.25 With the reduction in Australia's refining capacity, a larger percentage of refined product will have to be imported.[55] NRMA noted that between mid–2012 and mid–2015, Australia is expected to lose 40 per cent of its oil refining capacity.[56]

2.26 Since 2002, the proportion of refined petroleum, oils and lubricants sourced from overseas rose from 11 per cent to 37 per cent in 2012 and was expected to reach 43 per cent in 2014 with the closure and conversion of the NSW refineries.[57] Evidence to the committee suggested that without discovery and commercialisation of substantial new oil reserves, this supply-demand imbalance will become more pronounced. In fact, projections suggest that by 2035, Australian production will be equivalent to only 12 per cent of consumption.[58]

Australia's storage capacity

2.27 All storage capacity in Australia is held commercially within the supply chain, with no capacity for emergency reserves in the form of government-held or compulsory industry stocks.[59]

2.28 In response to Australia's growing dependence on imported oil, petroleum companies have responded by converting existing oil refineries into fuel storage facilities for finished fuel products sourced from international refineries. The conversion of the Caltex Kurnell refinery was the most recent of these conversions.[60] AIP made the point that the conversion of refineries to import terminals led to a substantial increase in the availability of finished product tankage.[61] Similarly, the Department of Industry and Science (department) noted that:

> While product imports are increasing, crude oil imports are decreasing, gross import dependency remains similar. Each refinery closure has been accompanied by conversion of these facilities to product import terminals to provide the necessary infrastructure for maintaining domestic supply.[62]

---

54 Engineers Australia, *Submission 2*, p. 2.

55 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 9 April 2015, p. 12.

56 National Roads and Motorists' Association, *Submission 18*, p. 2.

57 Engineers Australia, *Submission 2*, p. 3.

58 Bureau of Resources and Energy Economics cited in AGL Energy Limited, *Submission 8*, p. 2.

59 International Energy Agency, *Energy Policies in IEA Countries – Australia 2012 Review*, p. 145.

60 Australasian Convenience and Petroleum Marketers Association, *Submission 37*, p. 3.

61 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 29.

62 Department of Industry and Science, *Submission 41*, p. 6.

2.29 A 2009 study by ACIL Tasman commissioned by the then Department of Resources, Energy and Tourism estimated that the storage capacity of the main storage facilities across Australia was just over 42 million barrels (6.7 million cubic metres). This figure did not, however, take into account all storage capacity across the country as information from smaller industry participants and independent importers was not included in the study.[63]

2.30 The central argument of many submitters to this inquiry was that Australia's growing inability to comply with the IEA 90 day requirements is a consequence of a progressive decline in Australia's oil production coupled with growing oil demand. They argued the point that this decline and corresponding dependence on oil imports exposes Australia's fuel supply to considerable risk of interruption and insecurity. The following chapter explores the evidence regarding Australia's supply security.

63 ACIL Tasman, *Petroleum Import Infrastructure in Australia*, prepared for the Department of Resources, Energy and Tourism, August 2009, cited in International Energy Agency, *Oil and Gas Security – Australia*, 2011, p. 10.

Chapter 3

Australia's liquid fuel stockholdings and supply chain

3.1 This chapter considers Australia's current liquid fuel supply chain, stockholdings, IEA requirements, and market-based approach to fuel security. It considers the fundamental question of whether Australia's current liquid fuel supply system, stockholdings and domestic refining and storage capacity provide fuel security.

3.2 Australia's liquid fuel supply is maintained by way of domestic refineries, crude oil and refined product import terminals, as well as through other stockholding facilities. The fuels are distributed through complex transport system and retail supply arrangements. As retail prices are not regulated, effective competition is the basis for securing the best price for consumers.[1]

Australia's fuel stockholdings

3.3 Stocks of fuel can be expressed in either days of net imports or in terms of historical average daily consumption.[2]

3.4 As of December 2014 and based on the Australian Petroleum Statistics (APS), Australia had 4,275 kilo tonnes crude oil equivalent in terms of stocks, representing 52 days cover of daily net imports.[3] In terms of historical average daily consumption, the department informed the committee that Australia has 34 days of fuel stocks. The 34 day figure is calculated on the average daily consumption of fuel in Australia divided by what is believed to be the volume of fuel available to the market.[4]

3.5 The department informed the committee in an answer to a question on notice that while the APS complies with IEA reporting obligations, the data does not represent all fuel in the Australia fuel supply chain. It explained that:

> Petroleum en route to Australia by ships is excluded whilst fuel moving around the coast is included in the APS. In addition, all petroleum in pipelines, in transit by tanker (road and rail) and held at retail fuel sites and military stocks are excluded from the APS. These exclusions are required as part of the IEA reporting requirements for any country.[5]

---

1 Department of Industry, *Energy White Paper – Green Paper*, 2014, p. iv.

2 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, (answer received 24 February 2015).

3 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, (answer received 24 February 2015).

4 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 96.

5 Department of Industry and Science, *Submission 41*, p. 11.

3.6 Therefore, when taken together, Australia's stockholdings include:

- IEA-eligible stocks which correspond to 34 days of consumption;
- stocks on water in transit to Australia which amount to 15–20 days of consumption; and
- stocks held at retail sites which equate to about 3 days of consumption.[6]

3.7 According to Engineers Australia, at any one time, Australia's total stockholding of oil and liquid fuel comprises of two weeks of stocks at sea, 5 to 12 days of supply at refineries, 10 days of refined stock at terminals and 3 days of stocks at service stations.[7]

3.8 In terms of the types of stock available in the country, the 2013–14 APS revealed that at the end of July 2014, monthly industry stocks were as follows:

- 20 days of automotive gasoline;
- 17 days of aviation turbine fuel; and
- 16 days of diesel oil (including automotive diesel oil, industrial and marine diesel oil).[8]

3.9 Noting these stockholding figures, NRMA suggested that Australia's total stocks of fuel and oil held within the country were not only precariously low but also set to decline.[9] However, the Australian Government does not mandate any minimum levels of fuel stock to be held by industry in the country or mandate the reporting of the actual industry fuel stockholding levels.[10] Therefore, fuel companies are not required to meet any fuel storage level but rather, concentrate on fuel delivery for reliability. Their focus is on just-in-time security of supply to keep their costs down.[11] For this reason, Australia is reliant on market forces to ensure secure access to transport fuel.[12]

3.10 The lack of mandated stockholdings was a concern raised by a number of submitters, particularly in light of Australia's growing dependence on liquid fuel

---

6 Department of Industry and Science, *Submission 41*, p. 13.

7 Engineers Australia, *Submission 2*, p. 1.

8 Australian Petroleum Statistics, Issue 221, December 2014, Office of the Chief Economist, table 7.

9 National Roads and Motorists' Association, *Submission 18*, p. 6.

10 National Roads and Motorists' Association, *Submission 18*, p. 6; Truck Industry Council, *Submission 23*, p. 1.

11 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 70.

12 National Roads and Motorists' Association, Benchmarking Australia's Transport Energy Policies, December 2014, p. 2, Document tabled at 2 February 2015 public hearing.

imports and declining domestic refining capacity.[13] Some estimates suggested that, with further closures of domestic refineries, Australia's reliance on imported transport fuels may shift towards 100 per cent in the near future.[14]

3.11 In terms of the accuracy and reliability of available stockholding figures set out above, NRMA asserted that it was not known exactly how much fuel is available within existing commercial stockholdings and where those stocks are held, because the fuel companies are not mandated to report their fuel stocks to the department.[15]

3.12 The department informed the committee that, on a monthly basis, it collects statistics through a voluntary data collection system which gives it a 'sense of how much fuel is in the system'.[16] Such data is used to make an assessment of how much fuel is coming into the country.[17] It further noted that, while data was provided by the four major companies (which collectively provide up to 90 per cent of Australia's fuel supply), some independent fuel companies do not report their stockholding.[18]

3.13 A review of Australia's emergency response measures undertaken by the IEA in February 2011 recommended that Australia take action to establish a mandatory reporting regime for petroleum statistics.[19] An October 2011 ACIL Tasman assessment of liquid fuel vulnerability commissioned by the Australian Government supported the recommendation to introduce a mandatory reporting mechanism for APS.[20] Furthermore, in its 2012 review of Australia, the IEA stated the following in relation to oil and gas data:

> Oil and gas data are collected on a voluntary basis. However, in common with other IEA countries, data quality needs to be improved markedly. Australia is to become a growing oil importer; therefore, better data collection should be encouraged so that market participants are able to take

13 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 3.

14 Australian Pipeline Trust Group, *Submission 10*, p. 2.

15 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 71.

16 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 90.

17 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 92.

18 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 91.

19 International Energy Agency, February 2011 cited in ACIL Tasman, *Liquid Fuel Vulnerability Assessment*, Department of Resources Energy and Tourism, 2011, p. 122.

20 ACIL Tasman, *Liquid Fuel Vulnerability Assessment*, Department of Resources Energy and Tourism, 2011, p. 122;

> informed decisions and so as to provide a sound platform for public policy development and implementation.[21]

3.14 BP Australia noted its support for the introduction of a mandatory reporting regime to ensure that Australia's stockholdings are reported accurately.[22]

3.15 However, in February 2015, the department informed the committee that a process was underway to improve fuel stock data collection through the use of existing mandatorily collected data obtained by the Australian Tax Office (ATO) and the Australian Customs and Border Protection Service (Customs).[23] The department also noted that the Office of the Chief Economist considered the APS to be 'accurate within a five per cent margin of error'.[24]

3.16 The department explained that, while work had initially been carried out to set up a discrete mandatory data collection scheme, the decision was later made to 'reduce the burden on industry' by sharing existing data across agencies.[25] Dr Ross Lambie, Acting General Manager, Resources and Energy Economics Branch, informed the committee that the department had taken an approach of using existing arrangements through the ATO and Customs rather than introduce a regulatory reporting regime on industry. He explained the approach:

> At the moment, what we have chosen to do is draw upon the data provided by the Australian Taxation Office, Customs and Border Protection and the national offshore petroleum titles management to give us data based on fuel excise and imports and exports of liquid fuels at the firm level and also production of oil and gas offshore. Because they require mandatory reporting, if we can tap into their data, we think we are going to achieve some very robust data figures compared to the basis we have been using up till now, which has been largely based on voluntary reporting.[26]

3.17 In April 2015, Mr John Ryan, Associate Secretary informed the committee that the IEA had expressed satisfaction with the way in which the department was now reporting on stockholdings to the international body.[27]

---

21 International Energy Agency, *Energy Policies of IEA Countries – Australia 2012 Review*, p. 151, http://www.iea.org/publications/freepublications/publication/Australia2012_free.pdf (accessed 5 March 2015).

22 BP Australia, *Submission 30*, p. 12.

23 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 91; Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, (answer received 24 February 2015).

24 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, (answer received 24 February 2015).

25 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 9 April 2015, p. 64.

26 Dr Ross Lambie, Department of Industry and Science, *Committee Hansard*, 9 April 2015, p. 61.

27 Dr John Ryan, Department of Industry and Science, *Committee Hansard*, 9 April 2015, p. 61.

International Energy Agency 90 day stockholdings requirement

3.18 The IEA regulations were created in 1974 following the Organisation of the Petroleum Exporting Countries (OPEC) oil embargo. The agreement commits IEA members to hold stocks and contribute oil to the global market during declared IEA emergency action. In instances of oil supply disruption likely to cause considerable economic damage, member nations can make their stocks available to offset the oil shortage. According to the IEA, the most common reasons for the release of stockpiled fuel included unforseen technical problems, weather and civil unrest.[28]

3.19 In terms of membership obligations, the IEA noted that member states are:

> …all committed to taking joint measures in the event of oil supply emergencies in order to avoid economic damage to their countries. They have all agreed to share energy information, co-ordinate their energy policies and co-operate in the development of rational energy programmes. Each of the IEA's 28 member countries is also required to hold oil stocks equivalent to 90 days of its prior year's net imports.[29]

3.20 Therefore, in addition to stocks for domestic use, as a member of the IEA, Australia is required to hold oil reserves that can be used to respond to a global oil supply emergency.[30] Australia is obliged to maintain reserves of crude oil and/or product equivalent to sustain consumption for 90 days, based on the prior year's average net oil imports which the government could access in a national emergency. IEA put the 90 day requirement in place to assist member nations in ameliorating global oil shocks.[31] At a 2014 Asia-Pacific Economic Cooperation (APEC) Energy Ministers Meeting, Executive Director of the IEA, Ms Maria van der Hoeven stated that APEC economies 'must be well-prepared for supply crises'.[32]

3.21 The IEA explains the requirement upon Australia and other IEA member nations as follows:

> The 90-day commitment of each IEA member country is based on average daily net imports of the previous calendar year. This commitment can be met through both stocks held exclusively for emergency purposes and stocks held for commercial or operational use, including stocks held at refineries, at port facilities, and in tankers in ports.

---

28 International Energy Agency, 'How does the IEA respond to major disruptions in the supply of oil?', http://www.iea.org/topics/energysecurity/respondingtomajorsupplydisruptions/ (accessed 20 January 2015).

29 International Energy Agency, How does the IEA respond to major disruptions in the supply of oil?, http://www.iea.org/topics/energysecurity/respondingtomajorsupplydisruptions/ (accessed 20 January 2015).

30 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 9.

31 Engineers Australia, *Submission 2*, p. 3.

32 APEC Energy Ministerial Meeting cited in National Roads and Motorists' Association, *Submission 18*, p. 3.

> The obligation specifies several types of stocks that cannot be counted toward the commitment, including military stocks, volumes in tankers at sea, in pipelines or at service stations, or amounts held by end-consumers (tertiary stocks). It also does not include crude oil not yet produced.[33]

3.22 In September 2014, the Energy Green Paper explained that, in terms of trying to meet its treaty obligations, Australia 'relies solely on the commercial stockholdings of the industry, which currently stands at less than 60 days of net imports'.[34] As noted earlier, Australia now has 52 days.[35] The point was made in evidence that the continual decline in domestic production and increased demand for liquid fuel has placed pressure on Australia's IEA commitments. The department noted that Australia has not met its 90 day obligations since March 2012 while, according to current projections, Australia may average below 45 days of reserves by 2024.[36]

3.23 The department explained in its submission that Australia's plan to 'participate in an IEA collective action' has always relied on market responses to price changes in the first instance, and industry mechanisms such as:

- 'bulk allocation' – a form of contractual wholesale rationing;
- voluntary demand restraint; and
- use of the strong regulatory powers available under the *Liquid Fuel Emergency Act 1984* (LFE Act), including possible rationing and redirection of commercial cargoes.[37]

3.24 A number of submitters raised concern about Australia's declining stockholdings and non-compliance with the 90 day liquid fuel stockholdings obligations under the IEA agreements.[38] NRMA and UQ noted that Australia is the only country amongst the 28 member states that fails to meet its IEA net oil import stockholding level obligations.[39] NRMA expressed the view that, while Australia is a member of a number of multi-lateral organisations with energy security/energy

---

33 International Energy Agency, Explanation of the Closing Oil Stock Levels in Days and Net Imports Table, http://www.iea.org/topics/oil/oilstocks/ (accessed 4 December 2014).

34 Department of Industry, *Energy White Paper – Green Paper 2014*, September 2014, p. 54, http://ewp.industry.gov.au/files/egp/energy_green_paper.pdf (accessed 4 December 2014).

35 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, (answer received 24 February 2015).

36 Department of Industry and Science, *Submission 41*, p. 7; Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 12.

37 Department of Industry and Science, *Submission 41*, p. 7.

38 Gas Energy Australia, *Submission 6*, p. 6; National Roads and Motorists' Association, *Submission 18*, p. 7; APA Group, *Submission 10*, p. 3; University of Queensland, *Submission 12*, p. 2; Maritime Union of Australia, *Submission 21*, p. 4; Mr Christopher Blackburn, *Submission 24*.

39 National Roads and Motorists' Association, *Submission 18*, p. 7; University of Queensland, *Submission 12*, p. 4.

resilience as a focal area, it is out of step with the IEA position regarding member countries and baseline obligations.[40]

3.25 In its 2014 assessment of Australia, the IEA noted that:

> Australia does not impose minimum stockholding requirements on oil companies, nor does it have public stocks; all oil stocks in Australia are held by industry on a commercial basis. Until 2000, the year in which its domestic crude production peaked, Australia was either a relatively marginal oil importer or an occasional net oil exporter. As such, Australia's commercial stockholdings more than adequately met the requirement of the International Energy Agency (IEA). Since 2000, declining domestic oil production coupled with oil demand growth has resulted in a steady rise in net imports, and thus the amount of oil stocks necessary to meet Australia's IEA obligation.[41]

3.26 Evidence to the committee suggested that when the supply chain is broken down further into specific fuel types, the supply risks become more apparent. As a case in point:

> Australia currently imports 38 per cent of diesel as a refined product. The remaining 62 per cent is produced domestically and depends largely on imported oil; only 12 per cent of diesel is sourced from Australian oil processed in Australian refineries. By 2014, domestic production of diesel could reduce to only 45 per cent of domestic demand.[42]

Achieving IEA compliance

3.27 AIP argued that IEA stockholding obligations relate to international emergencies and therefore focus on balancing 'global supply' rather than specific supply imbalances or disruptions in individual countries.[43] Mr Andrew Warrell, Chairman of the AIP and Director of ExxonMobil Australia explained that:

> So if you we were holding stocks here in accordance with that treaty then those stocks could be used for each of the member countries within a global environment and it would be done in a coordinated fashion. So when we are sitting here talking about Australian fuel supply security, do not think that that suddenly gives us access to this overwhelming pool of international stocks to draw from if there is an Australia-specific issue that comes up.[44]

---

40 National Roads and Motorists' Association, *Submission 18*, p. 7.

41 International Energy Agency, *Energy Supply Security 2014: Australia*, p. 70, http://www.iea.org/media/freepublications/security/EnergySupplySecurity2014_Australia.pdf (accessed 8 December 2014).

42 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 10.

43 Australian Institute of Petroleum, *Submission 17*, p. 18.

44 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 27.

3.28 AIP further noted that when the IEA treaty was drafted, the Asian region was not the extensive trading hub that it has now become. As a case in point, Australia's primary source of fuel – Singapore – is not a member of the IEA.[45] AIP explained that the treaty was signed at a time when the global market was heavily centralised in Europe and came about under a different set of economic circumstances. It further noted that the supply chains into Europe are not as diverse as those coming into Australia, which is on the doorstep of Asia with ships arriving almost daily.[46]

3.29 ACIL Tasman also made the point in its 2011 assessment that a high proportion of crude oil and product is being shipped to Australia at any one time. These stocks are fully committed to the Australian market for commercial and shipping logistics reasons. It emphasised that this situation differs with that in Europe where cargoes can be destined for more than one country.[47] Notwithstanding this point, NRMA emphasised that Australia remained at the end of a long supply chain.[48]

3.30 According to ACIL Tasman, the method of calculating deductions for unrecoverable petroleum in storage tanks is not appropriate to the Australian situation. It argued that if these 'inconsistencies' were recognised in the calculation, the resulting stock cover would have exceeded 90 days in 2011.[49]

Stocks at sea

3.31 The Australian Trucking Association (ATA) and AIP argued that Australia should recommend that the IEA review the 90 day requirement given that it was originally set in 1974 and does not allow the inclusion of 'stocks at sea' which account for more than a quarter of Australia's oil stocks.[50] While acknowledging that inclusion of stocks at sea would not be adequate to achieve compliance with the 90 day requirement, AIP stated that stocks at sea represent more than 30 per cent of the stock in the supply chain of the four AIP member companies, who together provide 90 per cent of the transport fuel supply into the Australian market.[51]

---

45 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 27.

46 Mr Nathan Dickens, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 28.

47 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 121.

48 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 71.

49 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 121.

50 Australian Trucking Association, *Submission 7*, p. 3; Australian Institute of Petroleum, *Submission 17*, p. 18.

51 Mr Nathan Dickens, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 28; Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 19.

3.32 However, Engineers Australia argued that such an approach was tantamount to one of 'the cheque's in the mail'.[52] Furthermore, NRMA noted that the IEA has warned that a 'high risk of supply disruption could have greater economic consequences for IEA member countries', and that Australia has no government control over oil/fuel infrastructure, mandated industry stockholdings or government-owned stocks.[53]

Cost impost

3.33 The 2013 Energy White Paper – Issues Paper noted that the costs involved in investing in strategic reserve stocks of fuel to protect against the long run risk of severe disruption in the global trade would be high.[54] It suggested that building strategic reserve stock to maintain compliance with the IEA treaty would add around 40 extra days of forecast daily consumption cover over the next decade. However:

> A build program for this significant level of stockholding via either Government-funded stockholding, Government-funded ticketing for overseas stocks, or legislated mandatory industry stockholdings (funded by passing costs onto consumers) requires an estimated $6.8 billion investment to provide both stock and storage infrastructure.[55]

3.34 AIP questioned the logic of a substantial investment of $6.8 billion when there was no evidence of disruption to the market – despite the fact that the market has been tested by a number of global events – and there have never been any significant widespread outages.[56] Mr Warrell suggested that:

> It becomes a judgement of a perceived risk rather than any kind of demonstration of actual risk that people can point to in the marketplace over the last several decades.[57]

3.35 Caltex indicated that the $6.8 billion outlay required for strategic reserve fuel stocks would be met by either increased fuel prices or the diversion of public funds.[58] It was suggested in the Energy White Paper – Issues Paper that there were opportunities to grow Australia's liquid fuel supplies with new oil discoveries in

52 Engineers Australia, *Submission 2*, p. 3.

53 National Roads and Motorists' Association, *Submission 18*, p. 8.

54 Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 12.

55 Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 12.

56 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, pp 25–26.

57 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 25.

58 Caltex, *Submission 26*, p. 2.

proven areas and in under-explored frontier basins including the deep-water Great Australian Bight.[59]

3.36 The department highlighted the following three options to address Australia's non-compliance with the IEA treaty stockholding obligation:

- government-owned strategic stocks – estimated to cost $5.7 billion over nine years and funded via a direct levy on fuel users or indirectly from government revenue via the taxation system;
- government purchased oil/product 'ticket' contracts sourced from the international market and equivalent to the total treaty compliance gap – estimated to cost $2 billion to 2020; or
- industry-obligated stockholdings maintained by way of building physical stocks and holding stocks through ticket contracts – estimated to cost $6.6 billion to 2027.[60]

3.37 However, a number of submitters made the point that consideration of whether to increase Australia's oil stocks should take into account the costs and effectiveness in improving Australia's liquid fuel security compared to other options, rather than simply meeting IEA obligations as an end in itself.[61] UQ suggested that actual strategic stocks need to be determined from risk assessments and supply interruption scenarios.[62]

3.38 NRMA, the Truck Industry Council (TIC) and Engineers Australia warned that while increased stockholdings were part of the solution, it did not amount to fuel security as it would not address Australia's supply chain vulnerabilities.[63] NRMA held the view that fuel security could be achieved if part of the supply chain was controlled from the source, whether it is Australian oil, biofuels, gas, liquids or coal.[64]

3.39 However, AIP emphasised that, as a significant widespread outage has not taken place in Australia despite a number of global events that have tested the supply chain, the matter came down to a judgement of the likelihood of an extreme economic event.[65] Mr Nathan Dickens, General Manager – Policy for AIP further explained that

---

59 Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 12.

60 Department of Industry and Science, *Submission 41*, p. 9.

61 Gas Energy Australia, *Submission 6*, p. 9.

62 University of Queensland, *Submission 12*, p. 2.

63 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 10; Truck Industry Council, *Submission 23*, p. 2; Engineers Australia, *Submission 2*, p. 3.

64 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 70.

65 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 26.

economic modelling estimated that the economic impact on Australia of the total closure of the Singapore market over a 30-day period was 0.1 per cent of GDP.[66]

3.40 AIP held the view that, while Australia's compliance position had fallen below 90 days because of a decline in domestic crude production, commercial stocks of fuel held in the domestic supply chain (that is, stocks of petrol, diesel and jet fuel) had increased as a response to demand growth and increasing product imports following refinery closure. It suggested that as a consequence, the decline in the 90 day requirement did not raise the supply risk for the domestic fuels market or for fuel users. AIP concluded that:

> Indeed, there is a strong case that significant commercial stocks plus a robust, dynamic supply chain and competitive and efficient market obviate the need for any mandatory stockholding.[67]

3.41 AIP argued that the National Energy Security Assessment (NESA) and other reviews have found current levels of commercial stockholdings and their management by industry to be fundamentally sound. According to AIP, such reviews have upheld the view that Australia has adequate commercial stocks in the supply chain for supply security and that this situation will continue into the future with recent and planned increases in overall storage capacity in key locations and demand centres.[68]AIP concluded that:

> There is no evidence that the substantial cost of an emergency stockpile is justified on energy security grounds, given industry's efficient and reliable performance to date with no widespread or prolonged fuel shortages being experienced in Australia for decades. Even during international crude oil and petroleum product supply disruptions, such as in the aftermath of Hurricane Katrina in 2005, Australian fuel supplies have not been disrupted.[69]

ASEAN regional energy framework

3.42 NRMA informed the committee that while Australia sources the majority of its refined fuel from Singapore and other Asian countries, the Association of Southeast Asian Nations (ASEAN) itself has been moving towards a regional energy framework which is expected to include a voluntary oil stockpiling. In 2008, the ASEAN +3 group including Japan, China and South Korea agreed to jointly prepare a

66 Mr Nathan Dickens, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 26.

67 Australian Institute of Petroleum, *Submission 17*, p. 18.

68 Australian Institute of Petroleum, *Submission 17*, p. 12.

69 Australian Institute of Petroleum, *Submission 17*, p. 12.

regional oil-stockpiling plan to prevent shortages and reduce the impact of future oil price surges.[70]

3.43 According to the IEA, energy ministers of the +3 group recognised the necessity of oil stockpiling initiatives in light of the persistent risk of supply disruptions and highly volatile oil markets. The IEA further noted that, while most ASEAN countries rely on industry stockholding obligations, Myanmar and Vietnam hold a certain amount of government oil stocks. Thailand, Lao PDR and Indonesia have also been discussing the possibility of establishing government held stocks.[71]

3.44 NRMA suggested that the Australian Government play an activist and interventionist role akin to that of G7 governments and ASEAN +3 groupings to ensure energy security for Australia. The three areas it identified for consideration in this regard – energy policy, agriculture/food supply, and refinery capability are examined further in the following chapter.

3.45 In terms of regional initiatives, Australia is also a signatory to the *Cebu Declaration on East Asian Energy Security 2007* which commits member nations to a range of measures to ensure energy security for the region. One of the key areas of ASEAN engagement is that of renewables and to intensify the search for new and renewable energy sources and technologies. However, the NRMA questioned Australia's commitment to renewables transport fuels, which it argued must be part of any agenda for Australia's future energy security and resilience.[72]

3.46 NRMA also upheld the view that Australia lacks an energy security framework and would appear to be content with outsourcing the country's energy security to the market and thereby contributing to the degradation of Australia's domestic refining capacity. Under such circumstances, NRMA suggested that it was difficult to understand how Australia could assist less developed nations of the region to address their energy security needs.[73]

3.47 Gas Energy Australia expressed the view that Australia's membership of various multilateral bodies including the IEA should entail clear objectives which are underpinned by an assessment of whether those objectives could be achieved more effectively in other ways.[74]

---

70 National Roads & Motorists' Association, Benchmarking Australia's Transport Energy Policies, December 2014, p. 3, Document tabled at 2 February 2015 public hearing.

71 International Energy Agency, *Energy Supply Security 2014*, pp 508–509.

72 National Roads and Motorists' Association, *Submission 18*, p. 13.

73 National Roads and Motorists' Association, *Submission 18*, p. 14.

74 Gas Energy Australia, *Submission 6*, p. 9.

Reliance on market forces

3.48 As previously noted, Australia currently relies on market forces to deliver fuel security. This approach has come into sharp focus in recent years in light of Australia's growing dependence upon fuel imports. In fact, while some submitters including the department, AIP and oil companies, provided evidence which supported the view that this approach remains viable, others including NRMA, Engineers Australia and the Queensland Government contended that changes to the way in which Australia meets its fuel demands required, at the very least, an examination of the appropriateness of such a policy.[75]

3.49 The department stated in its submission that:

> The Australian liquid fuel market is well served by current commercial market arrangements and international supply chains, and existing national liquid fuel emergency management arrangements. This is supported by observed experience over the past two decades of the performance of oil markets in the face of specific disruptions. A report commissioned by the department found that there is no evidence to suggest crude oil and refined product markets would not swiftly respond to unexpected interruptions to supply.[76]

3.50 However, NRMA highlighted that Australia's market-driven approach stood in direct contrast to 74 other fuel importing countries which mandate stockholdings. It noted that Australia is the only 'developed' oil/fuel importing country in the world that has no mandated industry stockholdings, no government-owned stocks or government control over any part of the oil/fuel infrastructure.[77] Other countries mandate industry stocks and/or government stocks as detailed in the graph below.

Diagram 3.1: Government-mandated stockholdings of fuel/oil [78]

Country	Government-mandated industry stocks	Government-owned stocks
Korea	40 days	123 days
Japan	70 days	85 days
France	98 days	73 days

75 Queensland Government, *Submission 22*, p. 3.

76 Department of Industry and Science, *Submission 41*, p. 6.

77 National Roads and Motorists' Association, Benchmarking Australia's Transport Energy Policies, December 2014, p. 3, Document tabled at 2 February 2015 public hearing; Mr Graham Blight, National Roads & Motorists' Association, *Committee Hansard*, 9 April 2015, p. 20.

78 National Roads and Motorists' Association, Benchmarking Australia's Transport Energy Policies, December 2014, p. 2, Document tabled at 2 February 2015 public hearing.

Italy	90 days	-
Sweden	90 days	-
UK	67 days	-

3.51 The lack of mandatory oil stockholdings in Australia was questioned by a number of submitters.[79] Gas Energy Australia suggested that the options before the government for introducing such a system included:

- encouraging or mandating the private sector to increase its stockholdings of refined fuel;
- establishing a state-owned oil stockpile similar to the Strategic Petroleum Reserve in the United States; and/or
- mitigating the size of the required oil holdings by ensuring greater substitution of imported oil through domestically-sourced alternative fuels.[80]

3.52 UQ made the point that, while the government cannot create reserves, it can facilitate the release of acreage, undertake precompetitive exploration and incentivise new private-sector oil exploration.[81] It argued that the government must intervene to assure transport energy resilience through mitigation and contingency strategies.[82]

3.53 While supporting consideration of mandatory stockholdings, the Queensland Government made the point that any such enforcement on international fuel companies would be problematic:

> Refinery closures in Queensland could result in additional fuel product being sourced from overseas refineries, with the largest being located at Singapore, in which case attempting to impose production and supply conditions onto overseas countries is likely to be problematic. For example, should the companies currently involved in oil refining in Queensland choose to close, then the possibility of compelling international companies to commit to mandatory stockholdings is difficult under international trade agreements (Australia has a Free Trade Agreement with Singapore).[83]

3.54 In contrast, Mobil Oil Australia warned that any unnecessary regulation of the fuels industry for national security or other reasons would adversely impact industry competiveness and the commercial viability of fuel supply activities in Australia. It argued that mandatory stockholdings were not justified given the 'efficient and reliable

---

79 National Roads and Motorists' Association, *Submission 18*, p. 8; Gas Energy Australia, *Submission 6*, p. 6; Biofuels Association of Australia, *Submission 32*, p. 3.

80 Gas Energy Australia, *Submission 6*, p. 6.

81 University of Queensland, *Submission 12*, p. 7.

82 University of Queensland, *Submission 12*, p. 7.

83 Queensland Government, *Submission 22*, p. 1.

performance of the industry and continued investment in supply infrastructure'. Mobil Oil Australia continued:

> We oppose any future requirement to fund and hold additional stockholding to meet Australia's international compliance obligations, especially a scheme which imposed further (unjustified) cost on local industry. If stockholdings were to be mandated, the system should be structured in such a way as to ensure (a) zero or minimal cost to local industry, and (b) any unrecoverable costs to industry are equally borne by all market operators (including refiners, manufacturers and importers).[84]

3.55 Similarly, Viva Energy Australia argued that any additional stockholdings over and above what is required for commercial reasons would come at a working capital cost.[85] Furthermore, Qantas suggested that mandatory stockholdings were only effective for immediate supply reliability. It suggested that a re-supply capability was required in order to provide security in the event of a short or longer term disruption of supply from overseas. In addition, Qantas emphasised the diversity of supply as a critical consideration in delivery fuel security and supported the development of alternative fuels.[86]

Risks and vulnerabilities

3.56 Australia has transitioned from operating as a major producer of transport fuels to become a major importer of transport fuels. The argument was repeatedly put to the committee that this change has exposed Australia to a range of risks emanating from its oil dependence including interruptions in the importation of its fuel supply. The point was made by Engineers Australia that, despite apparent and growing oil dependence, there are no current alternatives to substitute fossil liquid fuels used for transportation.[87] Its view that Australia's liquid fuel supply 'poses an enduring risk to Australia's economic security, national security, food security, and social stability' was supported by other submitters.[88]

3.57 The Australian Automobile Association (AAA) made the point that a major disruption to transport fuel supplies would be felt across society and in every sector of the economy.[89] It was suggested that even a 20 or 40 per cent cut in the fuel supply, brought about by factors such as conflict, would quickly lead to a situation whereby the country would start running out of food and medicines while the economy would

84 Mobil Oil Australia, *Submission 27*, p. 5.

85 Viva Energy Australia, *Submission 34*, p. 4.

86 Qantas Airways Ltd, *Submission 25*, p. 2.

87 Engineers Australia, *Submission 2*, p. 1.

88 Engineers Australia, *Submission 2*, p. 1; National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 3.

89 Australian Automobile Association, *Submission 14*, p. 1.

start to shut down.[90] Evidence to the committee from the Biofuels Association of Australia (BAA) highlighted that, as Australia's agricultural and transport sectors are almost totally reliant on liquid fuels, they would be particularly vulnerable in the event of supply disruption.[91]

3.58 NRMA argued that without an adequate supply of liquid fuels, Australians would not be able to access health services while food production and distribution would be curtailed, many businesses and the transport system would cease to function, and the Defence Forces would not be able to operate.[92] It was noted that the food supply chain, Australia's retail pharmacy supplies and utilities are all potentially vulnerable to large-scale events such as a national fuel shortage. It provided the following estimates of Australia's stockholdings at the point of sale to make the point:

- Chilled/frozen goods – 7 days' supply;
- Dry goods – 9 days' supply;
- Hospital pharmacy supplies – 3 days' supply;
- Retail pharmacy supplies – 7 days' supply; and
- Petrol stations – 3 days' supply.[93]

3.59 A number of submitters raised concern that one month's supply of fuel should be regarded as an absolute minimum requirement. Noting Australia's reliance on imported refined fuel, Mr Ken Grundy, who supported this view, questioned how long it would take to bring tanker loads of fuel to suitable points around Australia during a crisis period.[94] Similarly, in highlighting the need to build up a stockpile of emergency fuel, Mr David Lamb suggested that a minimum level of self-sufficiency for each type of liquid fuel should be established.[95]

3.60 However, in direct contrast to these views, AIP argued that a month's disruption of all fuel supplies would be an unprecedented circumstance. Mr Warrell emphasised to the committee that the fuel supply market actually constituted a large number of separate markets rather than one homogenous one. He continued:

> So the coincident disruption of all fuel supplies to every capital city in Australia, and then the distribution through the vast network that goes out to supply fuel to the rest of the country given our geographic scale—to say that we would then be without a fuel supply to all those locations and all

90 Fusion Australia, *Submission 19*, p. 2; National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 2.

91 Biofuels Association of Australia, *Submission 32*, p. 2.

92 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 5.

93 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 7.

94 Mr Ken Grundy, *Submission 1*.

95 Mr David G. Lamb, *Submission 4*.

> those shipping lanes would be disrupted, resulting in a month of a complete stock-out in Australia—I think is a very, very extreme case.[96]

3.61 Caltex suggested that Australia does not have a fuel security problem and that fuel suppliers have demonstrated the capability to optimise stockholdings so as to minimise costs (and therefore consumer prices) while ensuring a high level of supply reliability.[97] This view was supported by a 2011 ACIL Tasman assessment which found that the declining ratio of stocks to net imports was not a concern for supply security reasons in the short to medium term. According to ACIL Tasman:

> This is because of the nature of the petroleum market in the Asia-Pacific region, where supply security depends on being able to source product from a diverse range of refineries that can meet Australian standards, and the fact that a high proportion of cargoes bound for Australia are pre committed and under contract to Australian buyers.[98]

3.62 AIP's Mr Warrell informed the committee that, in terms of supply security, integration into the Asian product trading market was more important than self-sufficiency. He emphasised the importance of ensuring supply diversity given that there was no path to 100 per cent self-sufficiency.[99] This position was also supported by the 2011 ACIL Tasman assessment which noted that, in the longer term, the adequacy of Australian stocks will depend on the structure and operation of the Asian market, and in particular the role of the Singapore trading hub. However, the assessment did note that, while this structure was not expected to change in the longer term (2020–25), 'any change would justify a re-evaluation of this conclusion'.[100]

3.63 The department informed the committee that, in terms of assessing fuel security risks, it assessed how much storage was available in Australia together with the country's supply lines before assessing the risks associated with any disruption that might be encountered.[101] This evidence raised the question of how accurate these assessments have been in light of the fact that the department was not provided data from independent fuel companies.[102]

---

96 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 26.

97 Caltex, *Submission 26*, p. 2.

98 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 120.

99 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 31.

100 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 120.

101 Mr John Ryan, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 89.

102 Dr Gino Grassia, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 91.

Chapter 4

Threats to Australia's liquid fuel security

4.1 Australia's growing dependence on oil imports and declining refining capacity raised questions regarding the security of Australia's' fuel supply and the continued feasibility of Australia's market-based approach. This chapter considers the threats to Australia's liquid fuel security including external threats to the international supply chain as well as internal supply, storage and distribution considerations.

Geopolitical factors

4.2 Caltex and other fuel suppliers argued that so long as Australia has well established and secure flows of oil and petroleum products as a consequence of multiple ports and shipping routes connecting the refineries, it is not vulnerable to supply shortages.[1] Caltex noted in this regard that sources of crude oil are diverse and include Australia, New Guinea, Malaysia, West Africa and Vietnam. Sources of petroleum products are also diverse. While much of the bulk comes from Singapore, product is also available from South Korea, Japan, India and if necessary, Europe.[2] Caltex estimated that 30,000 crude oil and product tanker voyagers are taken globally each year through major shipping routes. Therefore, it argued that, 'we don't see that a terrorist attack on shipping routes would have any material impact on Australian fuel supply'.[3]

4.3 The 2011 NESA identified geopolitical risks and long global supply chains as two areas of risk to our liquid fuel security. The liquid fuels shock scenario considered disruptions to supply from our largest importing source for refined petroleum products – Singapore. The modelling demonstrated that the global market and international supply chain could provide Australia with adequate and reliable supplies, albeit at higher prices. An immediate interruption to the Singaporean supply chain is estimated to increase global product prices by around 18 per cent on average in the first month, while prices decline somewhat from this spike in the second and third months.[4]

4.4 These views were supported by a 2011 liquid fuels vulnerability assessment undertaken by ACIL Tasman. The study found that a shutdown of Singapore for a period of 30 days would result in a short term rise in petroleum product prices but that there would still be sufficient availability of petroleum products to support economic activity.[5] The study did note, however, that the impact on affordability would be more

---

1 Caltex, *Submission 26*, p. 5; Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 9 April 2015, p. 7.

2 Caltex, *Submission 26*, p. 5.

3 Caltex, *Submission 26*, p. 5.

4 Department of Resources, Energy and Tourism, *National Energy Security Assessment 2011*, p. vii.

5 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 119.

significant for sectors heavily dependent upon petroleum fuels or road transport including agriculture, which would likely be worse off.[6]

4.5 NRMA made the point that, even though the government has confidence in the resilience of the fuel supply chain, it has not published any evidence that there are sufficient Australian-controlled sources of fuel to support essential needs in the event of overseas supply interruptions. It noted that the NESA, upon which this confidence is based, only considered two scenarios in reaching that assessment and none of them involved regional conflict or interruption of the supply chain such as infrastructure failure.[7] NRMA concluded that:

> Given the lack of publicly-owned fuel stocks, the lack of mandated industry stocks, the lack of mandated reporting on industry stocks and the very limited public analysis of supply chain risks, it is difficult to see how Government could currently provide us with that evidence.[8]

4.6 Many other submitters emphasised the potential impacts of Australia's growing oil import dependence on the country's fuel security, future investment and economic growth.[9] They highlighted the risks of geopolitical upheaval, including conflicts and natural disasters in oil producing and refining countries as well as along shipping routes, on the security of Australia's liquid fuel supply chains.[10] In this regard, the point was made that Australia's vulnerability has been identified by terror group, Al Qaeda, which has published a map of critical petroleum shipping routes.[11]

4.7 NRMA noted that political instability in the Middle East, dwindling domestic fuel stocks and Australia's capacity to produce specialist fuels for its Defence Forces has been eroded. As a case in point, NRMA explained that F44, which is a type of fuel required by the Australian Navy, will cease to be produced in Australia when the planned closure of the BP refinery in Brisbane takes place.[12]

4.8 According to Defence Magazine, in terms of securing a sustainable and secure fuel supply, Defence is engaged in the development of an integrated energy security policy in coordination with the public service. Defence acknowledged the security challenges brought about by growing reliance on commercial supply chains as well as the consequences for capability and technology choices in the report. As the combined

---

6 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 120.

7 National Roads and Motorists' Association, *Submission 18*, p. 7; Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 73.

8 National Roads and Motorists' Association, *Submission 18*, p. 7.

9 Australian Workers' Union, *Submission 20*, p. 2; Biofuels Association of Australia, *Submission 32*, p. 2.

10 Engineers Australia, *Submission 2*, p. 1; Mr David G. Lamb, *Submission 4*; Queensland Resources Council, *Submission 15*, p. [2].

11 Biofuels Association of Australia, *Submission 32*, p. 2.

12 National Roads and Motorists' Association, *Submission 18*, p. 2.

cost of Defence's liquid fuels comprise the second largest component of its sustainment budget and is set to increase, such reliance raised serious budgetary as well as security questions.[13]

4.9 NRMA noted that a significant supply disruption to Australia's shipping lanes or trade routes such as a natural disaster, accident, commercial failure, act of terror or war, could imperil Australia's ability to provide for essential services and its military forces.[14] Similarly, Engineers Australia argued that:

> Liquid fuel in transit to Australia through some of the world's geopolitical hotspots is not fuel security, it is wishful thinking.[15]

4.10 Another concern raised in evidence in relation to the supply chain was that of the growing dominance of national oil companies such as Petro China and Saudi Aramco over both the production and refining of oil at the expense of private oil companies.[16] Engineers Australia noted that national oil companies or their host governments control almost 80 per cent of the world's proven-plus-probable reserves of convention and unconventional oil.[17]

4.11 Engineers Australia explained the potential consequences of these global dynamics for Australia:

> Australia's persistent faith in global supply chain stability could be sorely tested in the future if such national oil companies make decisions based on national energy security interests rather than commercial interests.[18]

Contaminated fuel and internal fuel supply disruptions

4.12 In terms of fuel supply, the attention of the committee was drawn to the consequences of contaminated fuel supply. On 30 May 2014, Perth experienced a temporary diesel shortage when BP received a shipment of imported diesel that had slight discolouration.[19] According to Mr Graham Blight, NRMA Fuel Security and Alternate Fuel Ambassador, the fuel shortage that eventuated 'upset the running of the transport industry' until another shipment arrived. Mr Blight further noted that more recently, aircraft at Melbourne Airport had to be rescheduled and refuelled at another airport as a consequence of the late arrival (by three days) of fuel ships.[20]

---

13 Michael Brooke, 'Energy security fuel for thought', *Defence Magazine*, Issue 114, 2014, pp 3-4.

14 National Roads & Motorists' Association, Benchmarking Australia's Transport Energy Policies, December 2014, p. 2, Document tabled at 2 February 2015 public hearing.

15 Engineers Australia, *Submission 2*, p. 3.

16 Engineers Australia, *Submission 2*, p. 1.

17 Engineers Australia, *Submission 2*, p. 2.

18 Engineers Australia, *Submission 2*, p. 2.

19 'Short term diesel fuel shortage in Perth after BP import query, *Perth Now*, 30 May 2014.

20 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 70.

4.13 The committee was informed of two other incidents in Victoria whereby motorists and the trucking industry ran out of fuel within a week. The Truck Industry Council (TIC) explained the circumstances:

> Firstly in December 2012, when the refinery at Altona was closed for scheduled maintenance, while at the same time the state's second refinery in Geelong was unexpectedly shut down due to electrical problems arising from a storm. Then in October 2013 issues surrounding safety grounded many fuel delivery tankers. In both cases many retail outlets in regional Victoria ran out of fuel quickly and were without diesel for up to a week, as well many Melbourne outlets were similarly affected.[21]

4.14 BAA made the point that such disruptions are likely to worsen as Australia's reliance on the import supply chain grows.[22] It further noted that the combined effect of Australia's reliance on imports coupled with a lack of local liquid fuel storage infrastructure revealed the depth of Australia's vulnerability to supply disruptions.[23]

4.15 In states and territories with no refineries (South Australia, Northern Territory, Tasmania and NSW (by 2014) all liquid fuels must be imported. However, ports can be subject to disruption from a range of incidents including accidents, equipment failures, industrial action, natural disasters and terrorist attacks.[24]

4.16 NRMA also raised questions about fuel supply in the event of a container ship running aground. Air Vice Marshal Blackburn (Retired) informed the committee that government analysis of the Port of Adelaide revealed that were a container ship to run aground at the entry to the port, off-loading the ship and its removal would take up to 14 weeks. The port retains up to 12 days of fuel stocks. The report revealed that, while the port remained blocked, only 10 per cent of Adelaide's fuel demand would reach Adelaide City after the first two weeks of supply ran out. Therefore, the state would have to survive on 10 per cent of its demand for up to 10 weeks.[25] Air Vice Marshal Blackburn (Retired) explained the consequences:

> If you lose 90 per cent of your fuel to a capital city for eight to 10 weeks, I have got to tell you that that is absolute chaos. It is not war. That is because there are single points of failure through our supply system.[26]

4.17 Mr Mark McKenzie, CEO of the Australasian Convenience and Petroleum Marketers Association (ACAPMA) highlighted the flow-on consequences of supply disruptions. He informed the committee that recently, a large transport fleet was grounded because of safety concerns. Mr McKenzie explained the consequences:

---

21 Truck Industry Council, *Submission 23*, p. 2.

22 Biofuels Association of Australia, *Submission 32*, p. 2.

23 Biofuels Association of Australia, *Submission 32*, p. 2.

24 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 14.

25 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 73.

26 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 73.

> That resulted in short supply in a number of regional areas, because they are effectively a virtual pipeline. So, when you consider supply from port to pump, you have actually got rolling pipelines that are there all the time. Therefore, issues associated with how that fleet is managed and the controls in and interruption to that fleet can interrupt supply. In some areas, it can be fewer than five days that we are talking about where you then get to the situation where you run very short of product.[27]

4.18 According to Caltex, where supply disruptions have been experienced they have generally been related to refinery failures or natural events such as cyclones. It argued, however, that market forces ensure reliability, as a fuel supplier who can't assure supply will lose business to local or overseas competitors.[28] Despite acknowledging the occurrence of recent disruptions, Caltex concluded that Australia does not have a fuel security or fuel reliability problem.[29] It suggested that, to ensure that the fuel supply chain suffers least impact from an extreme event, adequate flows of oil, not stocks, was required. Caltex continued:

> Robustness would be maximised by many alternative shipping routes from many sources. If international trade on fuel was disrupted by military action, having a strong domestic supply chain of this kind would be an important safeguard. We are fortunate that Australia has well-developed domestic supply chains and supporting emergency response plans. These supply chains work very well in normal commercial circumstances and can cope with a variety of disruptions such as refinery breakdowns, cyclones, product contamination and global incidents (such as Libyan supply disruption).[30]

4.19 However, NRMA argued that fuel security could be achieved if Australia controlled part of its supply from the source through to that of refining and processing, with some storage. Noting that Australia is at the end of long supply chains, Air Vice Marshal Blackburn (Retired) explained that:

> Fuel security is when you have a problem you have a percentage of your supply from the start to the end that you can control in Australia. That is security. Just one week extra or two weeks extra storage of your fuel means you are going to starve or your crops are going to fail two weeks later than was going to happen. That is what the whole argument misses. It is not storage; it is about end-to-end supply continuity.[31]

4.20 Furthermore, while much of the evidence to the committee focused on suggested vulnerabilities and risks in relation to Australia's supply chain from

---

27 Mr Mark McKenzie, Australasian Convenience and Petroleum Marketers Association, *Committee Hansard*, 9 April 2015, p. 33.

28 Caltex, *Submission 26*, p. 4.

29 Caltex, *Submission 26*, p. 4.

30 Caltex, *Submission 26*, p. 5.

31 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 71.

producer to port, ACAPMA made the point that there were also vulnerabilities in relation to Australia's internal fuel supply from port to pump.[32]

4.21 ACAPMA noted that there were eight importers and providers beyond the four major oil companies which import fuel into Australia. However, it suggested that the current ownership and access structures serve as a barrier to independent importers from importing fuel into Australia at reasonable cost. ACAPMA argued that this situation should change and that the market should be opened up as:

> The only opportunity to bring fuel into this country, unless you are servicing United, is to actually utilise the Holden dock here at Port Melbourne. But that dock is not sufficient to bring in large-scale vessels to be able to offload fuel. So, in that first instance, we have got a situation where we do not have a key piece of gateway infrastructure to be able to offload seaside and then put in a pipeline and put the storage in place.[33]

4.22 ACAPMA further suggested that there are various factors blocking investment in internal supply and storage. Mr Mark McKenzie, CEO of ACAPMA noted in this regard that the current infrastructure for receiving imported fuel supplies in Australia is limited, particularly in capital cities. He continued:

> Therefore someone looking to actually create an investment in storage not only has to invest in the storage but they have got to invest in the terminal receiving—that is, the seaside infrastructure designed to receive those volumes. As a result, there are very significant barriers at the moment to investment in that area. It becomes uneconomic for someone who is, effectively, concentrating in terminal facilities to then also start to look at developing port facilities.[34]

4.23 ACAPMA made the point that meeting IEA obligations would imply bringing about an increase in Australia's oil storage and terminal infrastructure. It noted, however, that any decision to expand existing fuel storage and terminal infrastructure should not be premised on extending national storage volumes to the point of IEA compliance but rather on opportunities to reduce current vulnerabilities in the internal supply chain.[35] In this regard, ACAPMA noted that:

> The absence of a comprehensive audit of the architecture and performance of Australia's internal fuel supply chain makes it difficult to draw definitive conclusions about the nature and extent of current vulnerabilities in the supply of transport fuel between Australia’s fuel storage terminals and the more than 6400 retail fuel outlets that operate in Australia.[36]

---

32 Australasian Convenience and Petroleum Marketers Association, *Submission 37*, pp 1–2.

33 Mr Mark McKenzie, Australasian Convenience and Petroleum Marketers Association, *Committee Hansard*, 9 April 2015, p. 30.

34 Mr Mark McKenzie, Australasian Convenience and Petroleum Marketers Association, *Committee Hansard*, 9 April 2015, p. 29.

35 Australasian Convenience and Petroleum Marketers Association, *Submission 37*, pp 3–4.

36 Australasian Convenience and Petroleum Marketers Association, *Submission 37*, p. 4.

4.24 In calling for such an audit, ACAPMA argued that the exercise should consider the resilience of supply in the face of potential interruption by various events including the deferral of oil tanker delivery, grounding of road transport fleets, and repair of critical oil transmission and storage infrastructure.[37]

Australia's domestic refining capacity

4.25 The 2011 NESA acknowledged that increased competition from large-scale Asian refineries will continue to pose a risk of further rationalisation in the domestic refinery sector. However, it suggested that access to regional markets for refined products is expected to provide ample supply to meet any domestic refinery shortfall and concluded that:

> Therefore, over the long term, Australia is likely to have a greater reliance on imported oil and long global supply chains, a decrease in diversity of supply (due to the decline in domestic production of crude oil) and increased exposure to international factors such as geopolitical tensions and events, and the investment decisions of international and state-owned oil companies.[38]

4.26 This view was echoed in the 2012 Energy White Paper which stated that:

> Our lack of oil self-sufficiency and the prospect of further refinery rationalisation does not in itself compromise or reduce our energy security. Our liquid fuel security is expected to remain high because of our access to reliable, mature and highly diversified international liquid fuel supply chains.[39]

4.27 However, UQ argued that such statements appear not to consider the crucial role of resilient infrastructure. It further argued that to achieve sustainability and resilience of Australia's liquid fuel supplies required consideration and address of the supply risks across all parts of the supply chain from upstream production to shipping, refining, storage and distribution.[40]

4.28 In response, Caltex argued against market intervention to either subsidise or protect the manufacturing industry, including oil refining, on the grounds that local manufacturing was not necessary for supply security or reliability.[41] As an alternative, Caltex suggested that Australia should pursue competitive markets in Australia and overseas and promote a free trade agenda. While recognising that manufacturing is under pressure from global forces and the resultant transformation of the Australian market, Caltex argued that a better approach would be to ensure that the economic

---

37 Australasian Convenience and Petroleum Marketers Association, *Submission 37*, p. 5.

38 Department of Resources, Energy and Tourism, *National Energy Security Assessment 2011*, p. 25.

39 Department of Resources and Energy, *Energy White Paper 2012*, p. 43.

40 University of Queensland, *Submission 12*, p. 5.

41 Caltex, *Submission 26*, p. 9.

settings for manufacturing were as favourable as possible, consistent with deregulated markets and free trade.[42]

4.29 Australia's declining domestic refining capability reflects the growth of large, more cost-efficient refineries in the Asia-Pacific region and the comparative disadvantages of Australian refineries including age, size, labour and construction costs.[43] Viva Energy Australia noted that prior to its closure in 2012, the Clyde Refinery, (which produced 70,000 barrels a day), was not able to compete with regional refineries which produce 1.2 million barrels a day.[44] According to Engineers Australia, the cost pressures on Australia's refineries are likely to continue as Asia expands its oil refining capacity and super refineries are developed in the Middle East. Engineers Australia concluded that:

> Without renewal, Australia's aging refineries cannot compete effectively against these newer, more technically advanced and large scale refineries. The ongoing decline in domestic refining capability will continue to increase Australia's reliance on imported refined products.[45]

4.30 Caltex noted that, based on its own analysis regarding the closure of its Kurnell refinery in late 2014, the factors which disadvantage Australian refineries include:

- small scale due to population and geographically dispersed markets;
- technology that is oriented towards the wrong fuel (petrol, rather than diesel);
- inability to use substantial amounts of lower cost, high sulfur crude oil;
- increased shipping costs associated with more distant crude oil supply;
- distance from markets, so exports are generally not competitive;
- high capital and operating costs; and
- a high Australian dollar in recent years.[46]

4.31 Mobil Oil Australia made the point that Australian refineries are also subject to generally higher (and growing) levels of environmental and OH&S regulation than competing refineries in the region. In some cases, such as that of Altona, local refineries may face additional pressures from continuing encroachment of residential and other higher value land use close to their site of operations.[47] Mobil Oil noted that, in light of the commercial challenges face by Australian refineries, policy settings must strike the right balance in addressing environmental and community needs without adding unnecessary costs, such as port fees and major input costs such as

---

42 Caltex, *Submission 26*, p. 10.

43 Department of Industry, *Energy White Paper – Green Paper 2014*, p. 52.

44 Viva Energy Australia, *Submission 34*, p. 9.

45 Engineers Australia, *Submission 2*, p. 2.

46 Caltex, *Submission 26*, p. 11.

47 Mobil Oil Australia, *Submission 27*, p. 3.

utilities, which threaten the long term viability of the industry. To this end, it argued that governments should guard against the introduction of any regulatory requirement that imposes additional cost on local refineries which is not borne by international competitors.[48]

4.32 A 2011 study by ACIL Tasman on liquid fuel vulnerability acknowledged that the potential closure of refinery capacity in Australia 'reduces the diversity of supply options for the Australian market'.[49] Yet, the point was made by Viva Energy Australia that as Australian domestic crude production (including condensates) is clearly in decline (with only 14.9 per cent of the crude diet met by local Australian crude in 2012–13), and most local refineries are now reliant on a large percentage of imported crude oil, it is 'difficult to argue that local refineries reduce exposure to disruption to import supply chains'.[50]

4.33 The department informed the committee that there is no government policy directed at maintaining any onshore refining capacity for Australia's oil production. When asked whether a lack of an onshore refining capacity would leave the country at risk, the department's Mr Ryan informed the committee that:

> We assess the risk in terms of where we are going to get our supply of refined oil from and that is a mixture of imports and refining that we do locally. At this point in time, we have a mixture of both and we continue to do our assessments on that basis. We do not have a target for the minimum refining we might require in this country.[51]

4.34 The department further noted that refinery closures were a commercial decision for the determination of the owners/operators of refineries. It explained that the 2009 and 2011 NESA identified risks associated with Australia's declining refining capacity while a 2012 commissioned report which assessed those risks found that:

> Australia was well placed to maintain domestic energy security through access to the large Asian refining system with significant excess capacity and producing Australia specification fuels in the next decade. The current excess refinery capacity in the Asia Pacific is around 16-18%. Australia's current total refining capacity would represent around 1% of this surplus refinery capacity in the Asia Pacific.[52]

4.35 The 2014 Energy White Paper Issues Paper observed that, in light of the high proportion of imported crude used in domestic refineries, a policy which supports

---

48 Mobil Oil Australia, *Submission 27*, p. 5.

49 ACIL Tasman, *Liquid fuels vulnerability assessment*, Department of Resources Energy and Tourism, October 2011, p. 120.

50 Viva Energy Australia, *Submission 34*, p. 11.

51 Mr John Ryan, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 89.

52 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing (answer received 24 February 2015).

domestic refineries would likely only make a marginal impact on energy security, while adding substantial costs for the taxpayer and/or fuel consumer. It also noted the high costs involved in investing in strategic fuel reserve stocks to protect against the long run risk of a sudden severe disruption of global trade. It was suggested in the issues paper that such costs would need to be met by either increased fuel prices or the diversion of public funds.[53]

4.36 However, in direct contrast, a number of submitters raised serious concerns about Australia's declining refining capacity. NRMA noted that from 2003 to mid–2015, Australia would have lost 50 per cent of its refining capacity. It highlighted that there is no government policy to maintain any refining capacity in Australia, and yet, a total loss of Australia's refining capacity would imply 100 per cent import dependency and no ability to refine Australian-produced oil. Of the situation, NRMA expressed the view that:

> Some level of refining capacity will not only protect Australia from a total dependency of imported liquid fuels, but will be required as alternative fuels become economically viable. It will not be practical or feasible to encourage an alternative fuels industry if there is no refinery capacity in Australia.[54]

4.37 Similarly, NFF made the point that the supply chain is made more vulnerable to supply shortages where there are a limited number of domestic refineries and greater dependence on imported fuels. It noted that currently, one-third of Australia's point-in-time fuel supply is at sea. NFF suggested that any further increases in imports would create potential supply issues resulting from factors such as shipping delays, changing trade arrangements and geopolitical developments.[55]

4.38 Southern Oil Refining (SOR) argued that retaining some level of refining capacity would not only protect Australia from total dependence on imported liquid fuels but would inevitably be required as alternative fuels become more economically viable.[56] SOR cited a 2014 BREE report, Australian Energy Resource Assessment to make the point. According to BREE, second generation biofuels 'show promise for making a greater contribution to transport fuel supply', but this is dependent on sustainable production of biomass at a competitive cost.[57] SOR concluded that without government support to maintain and build this production capacity, Australia would not be able to achieve an economically viable industry sector to maximise alternatives in the total transport fuel mix.[58]

---

53 Department of Industry, *Energy White Paper Issues Paper*, December 2013, p. 12.

54 National Roads and Motorists' Association, *Submission 18*, p. 10.

55 National Farmers' Federation, *Submission 9*, p. 2.

56 Southern Oil Refining, *Submission 28*, p. [3].

57 Bureau of Resources and Energy Economics, *Australian Energy Resource Assessment*, 2014, p. 328, http://www.industry.gov.au/industry/Office-of-the-Chief-Economist/Publications/Documents/GA21797.pdf (accessed 5 March 2015).

58 Southern Oil Refining, *Submission 28*, p. [3].

4.39 The Queensland Government expressed concern that both major oil refineries in Brisbane have indicated potential closure within the next two years as a consequence of perceived inefficient operations and financial loss. It explained the possible ramifications:

> Refinery closures in Queensland could result in additional fuel product being sourced from overseas refineries, with the largest being located at Singapore, in which case attempting to impose production and supply conditions onto overseas countries is likely to be problematic. For example, should the companies currently involved in oil refining in Queensland choose to close, then the possibility of compelling international companies to commit to mandatory stockholdings is difficult under international trade agreements (Australia has a Free Trade Agreement with Singapore).[59]

4.40 The Queensland Government argued that if no new refineries with increased capacities are established in Australia, the community, industry and essential services will be reliant upon either increased imports or reducing demand for petroleum-based transport fuels.[60]

4.41 The Australian Workers' Union (AWU) and Engineers Australia made the point that the closure of refineries not only negatively impacts fuel security in Australia but also jobs and specialist skills.[61] AWU noted in this regard that once the refining workforce has gone, like the plants themselves, it is unlikely that they will return without significant investment in recruitment and training.[62] Mr Neil Greet, Fellow of the Institution of Engineers, Engineers Australia, made the point that, if engineering skills, training and knowledge erode, it would not be possible to understand future challenges, and that Australia's security would consequently be degraded.[63] AWU argued that the total economic benefits associated with investment in the refining workforce should be considered when measuring the costs and benefits of any further loss of refining capacity in Australia.[64]

4.42 Other evidence highlighted the risks that emanate from a declining refining capacity. According to Engineers Australia, since 2002, the proportion of refined petroleum, oils and lubricants sourced from overseas has risen from 11 percent to 37 percent in 2012, and it is estimated that this will reach 43 percent in 2014 with the closure and conversion of the NSW refineries. It argued that these dynamics have increased Australia's vulnerability to the influences of the global market in terms of availability of refined products.[65] This concern was echoed in the evidence of other

---

59 Queensland Government, *Submission 22*, p. 1.

60 Queensland Government, *Submission 22*, p. iv.

61 Australian Workers' Union, *Submission 20*, p. 6; Dr Brent Jackson, Engineers Australia, *Committee Hansard*, 2 February 2015, p. 2.

62 Australian Workers' Union, *Submission 20*, p. 6.

63 Mr Neil Greet, Engineers Australia, *Committee Hansard*, 2 February 2015, p. 2.

64 Australian Workers' Union, *Submission 20*, p. 6.

65 Engineers Australia, *Submission 2*, p. 3.

submitters. Australian Pipeline Group (APA Group) noted that Australia's limited domestic refining capacity for transport fuels and any disruption to the imported fuel supply chain could have significant implications for the Australian economy, potentially restricting the transport sector for extended periods.[66]

4.43 AWU argued that relying solely on the international market in the absence of a local refining capability in times of a national emergency was not an adequate response. It suggested that, given such circumstances, Australia must retain domestic refining capacity in order to fuel the local economy, sustain living standards and to provide scope to contribute to its own defence.[67]

4.44 While arguing that the closure of an additional one or more local refineries should not pose a threat to reliable domestic fuel supply in the longer term, Mobil Oil Australia recognised that 'some level of domestic refining capacity is highly desirable to provide additional flexibility to cope with the short term product supply interruptions or imbalances which can occur'.[68]

Stockpiling imported fuels

4.45 The Queensland Government made the point that increased stockpiling of imported fuels will create new challenges in relation to shelf life and changes in the risk and safety management profiles of such storage. Storing refined fuel has different technical safety requirements to crude oil which has a longer storage life and lower volatility. Furthermore, the Queensland Government put the view that, should mandatory stockpiling be introduced, refinery closures raised questions of ownership arrangements: should the two Queensland refineries close, the state would be dealing with mandatory stockpiling of refined fuel product rather than crude oil.[69] The Queensland Government continued:

> If refined fuel is stockpiled in the state, this can potentially provide a short-term buffer against any significant price increases. The import of refined product however, will not benefit from this effect and result in possibly more expensive prices for fuel products in the long term. However, more competition may be facilitated if multiple players enter the retail fuels and distribution market.[70]

4.46 As a first step, NRMA recommended that the Australian Government undertake a public analysis of the country's refining capacity with a view to determining the implications of ongoing closures, and the loss of local capacity, on both near-term and longer-term resilience and security.[71]

---

66 APA Group, *Submission 10*, p. 2.

67 Australian Workers' Union, *Submission 20*, p. 8.

68 Mobil Oil Australia, *Submission 27*, p. 3.

69 Queensland Government, *Submission 22*, p. 1.

70 Queensland Government, *Submission 22*, p. 1.

71 National Roads and Motorists' Association, *Submission 18*, p. 15.

Shipping

4.47 The Maritime Union of Australia (MUA) suggested that the closure of Australian refineries affected NSW and the Australian Capital Territory (ACT) in particular given that since September 2014, they no longer have any operational refineries. As a consequence, ships are now critical to the fuel supply for transport, aviation, industry and mining in both jurisdictions. Fuel supply to these two locations is dependent upon tankers importing fuel to only three ports – Sydney, Port Botany and Newcastle.[72] MUA explained that as one fuel tanker carries the equivalent fuel of 1000 truck tankers, it was not possible to transport replacement supplies by road from refineries in Brisbane or Melbourne in the event of a disruption to these ports or ships.[73]

4.48 Furthermore, international petroleum imports, and an increasing amount of domestic shipping, are undertaken on international-flag and crewed tankers. From 2011–12 to 2013, there was a 47 per cent increase in domestic voyages by international-flag ships and a 67 per cent increase in the tonnage of refined petroleum carried by these ships.[74] According to MUA, in contrast to the record of Australian-crewed ships, international-flag tankers have been found to have hundreds of deficiencies that are so serious that they have been detained an average of 12 times per year by the Australian Maritime Safety Authority (AMSA).[75] In 2013, most of these ships were detained because of deficiencies in relation to International Safety Management compliance, fire safety, lifesaving appliances, pollution prevention, and emergency systems.[76] In contrast, according to MUA, the five (but soon to be three) Australian-crewed tankers were never detained in 36 years of service.[77]

4.49 MUA put the argument that greater use of international-flagged and crewed tankers over the Australian alternative would further weaken Australia's already fragile fuel security.[78] It suggested that Australian companies and the Australian Government would not have the capacity to take control of and re-direct these tankers in the event of a fuel emergency in Australia.[79] Dr Penny Howard, National Research Officer of MUA suggested that it was unclear what would happen if there was a disruption to the fuel supply and Australia was reliant upon international flagged ships that have 'no particular obligation to Australia' and which may have contracts with a

72 Maritime Union of Australia, *Submission 21*, p. 4.

73 Maritime Union of Australia, *Submission 21*, p. 4.

74 Maritime Union of Australia, *Submission 21*, p. 10.

75 Maritime Union of Australia, *Submission 21*, p. 7.

76 Maritime Union of Australia, *Submission 21*, p. 7.

77 Mr Ian Bray, Maritime Union of Australia, *Committee Hansard*, 2 February 2015, p. 38.

78 Maritime Union of Australia, *Submission 21*, p. 10.

79 Maritime Union of Australia, *Submission 21*, p. 16.

number of countries during the course of a year. Dr Howard noted that such a scenario had not been considered in the risk assessments conducted by the department.[80]

Emergency fuel distribution system

4.50 The *Liquid Fuel Emergency Act 1984* (LFE Act) provides the Australian Government with the authority to prepare for and manage a national liquid fuel emergency. Under the Act, the Minister for Industry can control the industry's stocks of crude oil and liquid fuels, Australia's refinery production and the distribution of fuel stocks in an emergency. Similarly, each state and territory has arrangements in place to deal with liquid fuel emergencies within their respective jurisdictions.[81]

4.51 AIP explained that there were comprehensive response strategies in place to address or replace any lost supply including:

- numerous 'in-refinery' technical options;
- utilising of alternative supply infrastructure and supply and distribution routes;
- sourcing supply from other Australian refineries and fuel wholesalers;
- sourcing supplies from international sources and the spot market;
- equitably allocating bulk fuel to consumers; and
- drawing down industry stockholdings.[82]

4.52 Notwithstanding this evidence, the AIP pointed out that many larger fuel users hold only limited stocks on the expectations that stocks will be held by fuel suppliers or that government will intervene to protect the interests of fuel users if supplies are limited.[83]

4.53 Emergency services are recognised as 'essential users' in the Act and *Liquid Fuel Emergency (Activities – Essential Users) Determination 2008* and have 'priority' access to fuel in the event of a national liquid fuel emergency. The Guide Note on Essential Users emphasises that 'governments all agree' that those users who 'contribute to the provision of goods and services which, if reduced in supply or availability, would be likely to seriously damage the health, safety or welfare of the community', should have priority access to fuel. Declared essential users include:

- Defence of Australia;
- Ambulance service;
- Corrective service;
- Fire or rescue service;

---

80 Dr Penny Howard, Maritime Union of Australia, *Committee Hansard*, 2 February 2015, p. 43.

81 Engineers Australia, *Submission 2*, p. 3.

82 Australian Institute of Petroleum, *Submission 17*, p. 13.

83 Australian Institute of Petroleum, *Submission 17*, p. 13.

- Police service;
- Public transport service;
- State Emergency Service or an equivalent organisation;
- Taxi service.[84]

4.54 AIP noted that many business and industry fuel users incorrectly believe that they are 'essential users' for the purposes of the Act and will get preferential supplies during a supply emergency in the same way as police, ambulance and emergency services.[85]

4.55 At the core of considerations regarding fuel stocks was the role of fuel suppliers and the question of where the obligation to retain fuel stocks to deal with an emergency should lie. AIP members held the view that it was not the role of fuel suppliers to hold buffer stocks in the event of a disruption. AIP argued that:

> It is not the role for fuel suppliers to hold buffer stocks to guarantee the ongoing business operations of major fuel users and distributors during a major fuel supply disruption. Therefore, it is in the interests of all fuel users to understand their own fuel use and to consider how best to manage the potential impacts of reduced fuel supply.[86]

4.56 However, AIP noted that fuel supply patterns were consumer driven and that prior to harvest season, suppliers fill available storage facilities.[87]

4.57 Yet, AUSVEG made the point that while growers might be in a position to take some measures, it was not reasonable to expect them to put in place on their own measures sufficient to deal with a disruption.[88] It informed the committee that information derived from vegetable growers located around Australia of different farm sizes revealed that their fuel storage depended on the size of the farm – smaller growers had a few thousand litres of storage, with the larger growers having up to 33,000 litres.[89] Mr AJ White, Deputy CEO of AUSVEG made the point that, as many producers are now harvesting on a year-round basis, any such disruption in fuel supply would impact the entire agricultural sector.[90]

---

84 Section 4(4), *Liquid Fuel Emergency (Activities – Essential Users) Determination 2008*; Department of Industry, Essential Users under the Liquid Fuel Emergency Act, http://www.industry.gov.au/Energy/EnergySecurity/Liquid-fuels-security/Liquid-Fuel-Emergency-Act/Pages/default.aspx (accessed 12 February 2015).

85 Australian Institute of Petroleum, *Submission 17*, p. 13.

86 Australian Institute of Petroleum, *Submission 17*, p. 14.

87 Mr Andew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p.33.

88 Mr AJ White, AUSVEG, *Committee Hansard*, 2 February 2015, p. 15.

89 AUSVEG, Answer to question on notice taken at 2 February 2015 hearing, (received 13 February 2015).

90 Mr AJ White, AUSVEG, *Committee Hansard*, 2 February 2015, p. 15.

4.58 Another matter raised in relation to the issue of fuel security was whether there is an intersection between national security, energy and economic security. AIP argued that energy and economic security issues were distinct from national security issues. Therefore, national security issues are a matter for defence while energy security should be assessed through the energy white paper process.[91] However, NRMA challenged this approach by arguing that it was impossible to differentiate between national security, energy security and food security as they are all part of the country's base.[92] Air Vice Marshal Blackburn (Retired) noted in this regard that Defence was 'totally' dependent on industry and the civil supply base. He continued:

> If your civil supply base—food supply and everything else that happens—does not work then Defence cannot work either. So it is not a case of: if you had stocks the Defence then they could go off and operate; they cannot—they are totally dependent on the civil infrastructure. So you cannot actually separate energy security and defence security because they are actually married.[93]

Fuel security or insecurity?

4.59 In considering evidence regarding Australia's fuel stockholdings, the IEA stockholding requirement, Australia's liquid supply chain and domestic refining capacity, this chapter has revealed clear divisions in evidence on the question of whether Australia's current arrangements provide adequate fuel security.

4.60 Those who questioned the current arrangements and suggested that Australia should not be content to 'outsource our energy security to the market' made the following points: [94]

- Australia fails to meet its IEA stockholding obligations;[95]
- Australia holds no government controlled or mandated stocks in contrast to regional and global peers and has no control over any part of oil/fuel infrastructure;[96]
- despite an apparent dependence on oil, there are no current alternatives to substitute fossil liquid fuels used for transportation with other fuels;[97]

---

91 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p.19.

92 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 77.

93 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 77.

94 Truck Industry Council, *Submission 23*, p. 6.

95 Truck Industry Council, *Submission 23*, p. 2.

96 Truck Industry Council, *Submission 23*, p. 2; National Roads and Motorists' Association, *Submission 18*, p. 8.

97 Engineers Australia, *Submission 2*, p. 1.

- Australia's almost 100 per cent reliance on imported liquid fuels leaves the country's industries, including that of transport, extremely vulnerable to supply disruption and exposes Australia's economy to continually rising and volatile world spot prices for oil;[98] and
- the rising costs of fuel coupled with growing dependence on other nations for fuel supply (which implies greater susceptibility to delays in deliveries from foreign shipping) raised questions regarding Australia's energy resilience.[99]

4.61 The argument was put to the committee that these factors made Australia particularly vulnerable in the event of an interruption to the import supply chain.[100] To this end, the point was made that Australia's Energy Green Paper acknowledged that the combined effect of declining domestic refining capacity and increased dependent on fuel imports, particularly for specific fuel types, could 'enhance concerns about the level of risk to Australia's national security'.[101] As NRMA stated in its submission:

> Australia is moving towards a situation where by 2030 we could have:
>
> - No refineries;
> - Less than 20 days of liquid fuel; and
> - 100% imported liquid fuel dependency.[102]

4.62 Submitters concerned about the fuel supply status quo made the point that stockholdings alone would not guarantee Australia's transport energy security while increased storage was only part of the solution. They contended that a different approach is required whereby supply and demand aspects of Australia's transport fuel supply as well as stockholdings are considered.

4.63 NRMA made the point that what was required is a secure, reliable and ongoing flow of fuel. To this end:

> Rather than focus on stockholdings as an isolated endpoint or a stand-alone 'solution', the Government needs a comprehensive and multi-faceted approach to energy security…Australia's reliance on imported oil and fuel has grown from 60% in 2000 to over 90% in 2014, with further declines in indigenous oil and fuel production capacity foreshadowed.[103]

4.64 To address fuel security concerns, like-minded submitters pointed to the need for government to take a multi-faceted approach to transport energy security as a mechanism to achieve adequate fuel security.[104]

---

98 Biofuels Association of Australia, *Submission 32*, p. 2; National Roads and Motorists' Association, *Submission 18*, p. 7; Mobile LNG, *Submission 31*, p. 6.

99 Mobile LNG, *Submission 31*, p. 6.

100 National Roads and Motorists' Association, *Submission 18*, p. 7.

101 Department of Industry, *Energy White Paper – Green Paper*, 2014, p. 53.

102 National Roads and Motorists' Association, *Submission 18*, Attachment 2, p. 6.

103 National Roads and Motorists' Association, *Submission 18*, p. 8.

104 Truck Industry Council, *Submission 23*, p. 2.

4.65 In direct contrast, submitters who argued that Australia has adequate fuel security including the department and AIP, supported by various government commissioned reports and analysis, pointed to factors such as:

- the extensive supply network and shipping routes;
- the lack of severe disruption events to date;
- a need to tap further into regional markets rather than expensive domestic refineries;
- the cost implications of meeting IEA requirements which may have no bearing on fuel security per se; and
- the need to avoid the impost of additional costs on the industry and/or economy.[105]

4.66 At the heart of the debate regarding fuel security is that of the role of government and fuel security policy. The following chapter explores these questions.

105 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 9 April 2015, p. 19.

Chapter 5

Role of Government in fuel security

5.1 As stated previously, the 2011 NESA concluded that Australia's liquid fuel security will deteriorate from 2016 in the absence of a comprehensive liquid fuel security policy.[1] A number of submitters held the view that, to prevent any further deterioration, Australia should develop a liquid fuel security policy which provides for diverse and reliable transport energy sources and increases the uptake of alternative fuels.[2] This chapter considers the role of government and the growing importance of fuel diversity as well as diversity of fuel supply.

Policy approach

5.2 As previously noted, Australia does not have public stocks and does not impose a minimum stockholding requirement on oil companies operating in the country. As submitted by the department, Australia's demand for oil supply is met through full integration into the global market.[3] At the first sign of an oil disruption, market price mechanisms are allowed to operate in order to reduce demand. That is, to allow oil price increases to flow through to consumers. Under such circumstances, the government monitors the effect of price increases that flow from the supply disruption on patterns of demand without intervening in the market.[4]

5.3 The 2011 NESA recognised energy security as comprising three interrelated and largely mutually reinforcing dimensions – adequacy (provision of energy), reliability (minimal disruption), and competitiveness (including affordability and ongoing competiveness of the economy). In terms of Australia's future energy supplies, the NESA identified several watch-points, including:

- Australia’s declining oil refining capacity;
- uncertainties surrounding coal seam gas (CSG) developments;
- liquefied natural gas (LNG) developments on the east coast causing supply shortages;
- energy price pressures; and
- investment uncertainty, due to the carbon tax and related policies.[5]

---

1 Department of Resources, Energy and Tourism, *National Energy Security Assessment*, 2011, http://www.industry.gov.au/energy/Documents/Energy-Security/nesa/National-Energy-Security-Assessment-2011.pdf (accessed 9 December 2014).

2 Gas Energy Australia, *Submission 6*, p. 3; University of Queensland, *Submission 12*, p. 7.

3 Department of Industry and Science, *Submission 41*, p. 4.

4 International Energy Agency, *Oil and Gas Security – Australia*, 2011, p. 13.

5 National Energy Security Assessment 2011 cited in Department of Industry, *Energy White Paper – Green Paper*, September 2014, p. 48.

5.4 However, the 2012 Energy White Paper, which draws on the 2011 NESA, concluded that:

- the decline in Australia's domestic refining capacity that will follow the Clyde and Kurnell refinery closures will not impair Australia's liquid fuel security; and
- in particular, the substitution of imports of crude oil for imports of refined fuel as a result of the Clyde and Kurnell refinery closures does not pose any additional risk to market security.[6]

5.5 Furthermore, in an December 2013 issues paper for the Energy White Paper, it was noted that:

> Liquid fuel imports are sourced from a diversity of suppliers under stable market arrangements resulting in a high degree of confidence in Australia's liquid fuel security.[7]

5.6 AIP argued that the government's position was supported by a series of reviews including NESA, Liquid Fuel Vulnerability Assessments since 2008, the 2012 Energy White Paper and more recently the 2013 House of Representatives Standing Committee on Economics Report on Australia's oil refinery industry.[8] It argued that such reviews confirmed that Australia's liquid fuel supply is highly secure, competitively priced and reliable for reasons including a flexible, resilient and dependable supply chain. This supply chain is diverse, encompasses secure shipping routes, a significant volume of stock on the water owned by local companies, and entails a domestic refining capability which provides multiple supply options and the ability to convert domestic and imported crude oil into useable products.[9] According to the AIP, these reviews have also found supply to be reliable for reasons including:

- established and effective integration of the supply chain into the global crude oil and petroleum product market;
- domestic fuel pricing that relates directly to the global market price;
- expert and efficient management of the supply chain by industry;
- ongoing, substantial investment in new/expanding petroleum storage and handling facilities; and
- robust risk and emergency management frameworks at industry and government levels.[10]

5.7 AIP argued in favour of a market-based approach to liquid fuel supply and domestic infrastructure development. It noted in this regard that:

---

6 Gas Energy Australia, *Submission 6*, p. 7.

7 Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 11.

8 Australian Institute of Petroleum, *Submission 17*, p. 8.

9 Australian Institute of Petroleum, *Submission 17*, p. 8.

10 Australian Institute of Petroleum, *Submission 17*, p. 8.

> Efficient market-based signals will be the drivers for new infrastructure investment and the development of alternative liquid fuel supplies, and for consumer choices about how liquid fuels are used, particularly at lowest cost for consumers.[11]

Support for government intervention

5.8 NRMA and others made the point that Australia is now increasingly exposed to potential supply disruption under its market-reliant policy with potentially serious consequences for the economy and national security.[12] In light of this (growing) dependence and the prospect of an interrupted fuel supply, a number of submitters argued in favour of some form of market intervention. In this regard, TIC made the point that, while markets and industry can address many of the issues in the energy supply chain, the issue of supply security is a government responsibility.[13]

5.9 Gas Energy Australia saw a need to focus on the NESA's conclusion that Australia's liquid fuel security will deteriorate from 2016 as a result of continued rising oil prices as well as increased import reliance combined with decreased non-OPEC and conventional oil supplies. Gas Energy Australia noted that these factors were expected to lead to 'greater reliance on international supply chains and geopolitically and geologically difficult locations'.[14] As a first step towards addressing this problem, Gas Energy Australia suggested that the Australian Government seek to prevent any more oil refinery closures through industry assistance.[15]

Risk assessment

5.10 A number of submitters argued that a comprehensive risk assessment should be undertaken in the first instance to inform any possible government intervention or national policy development. Many argued that a risk assessment should be the basis on which to develop a national transport energy plan.

5.11 AAA argued that such a review should consider the risks and implications of current industry trends in the first instance, including Australia's growing dependence on oil imports, on the security and diversity of Australia's fuel mix, economic productivity and environmental outcomes.[16] As part of considering current trends, the review should analyse the country's refining capacity in order to understand the implications of ongoing refinery closures, and the loss of local capacity, on both near-term and longer-term resilience and security.[17]

---

11 Australian Institute of Petroleum, *Submission 17*, p. 9.

12 Australian Coal to Liquids Association, *Submission 33*, p. 24.

13 Truck Industry Council, *Submission 23*, p. 2.

14 Gas Energy Australia, *Submission 6*, p. 7.

15 Gas Energy Australia, *Submission 6*, p. 7

16 Australian Automobile Association, *Submission 14*, p. [2].

17 National Roads and Motorists' Association, *Submission 18*, p. 15.

5.12 UQ made the point that any such assessment should consider supply disruption scenarios along the supply chain and not limit itself to the Middle East. It suggested that the review should also examine the impact of system interruptions in Singapore as well as at Australian ports and import terminals.[18]

5.13 Submitters further recommended that such a review should explore options and the feasibility of a range of risk mitigation strategies. The risk assessment should also consider therefore:

- the cost of import fuel-interruption scenarios to inform the value of any intervention to improve supply resistance and sustainability;
- the costs, benefits and timelines for the redirection of currently exported Australian cruel oil to be refined domestically in periods of crisis;
- acceptable levels of emergency self-sufficiency in oil supplies in the context of an international agreement to maintain supplies of at least 90 days and implement the most effective ways to achieve these levels;[19]
- incentives such as a transport energy security levy to maintain a 'minimum strategic' Australian refinery capacity or ramp-up capacity;[20] and
- methods to ensure the sustainability of the domestic refining, storage and distribution industry so that it can supply essential civil and military needs in the event of a crisis.[21]

Transport energy plan

5.14 The Queensland Government argued that, in terms of government intervention, a national approach was required with the Australian Government 'well positioned to undertake specific actions to increase Australia's transport energy security and diversity into the future'.[22]

5.15 NRMA, Gas Energy Australia, AAA and others supported the development of a comprehensive transport energy plan for Australia which would include a strategy to improve Australia's liquid fuel security.[23]

5.16 Submitters in favour of a national transport energy plan argued that it should include the following:

- mitigation strategies which provide for the retention of emergency stock and an emergency fuel distribution system for periods of shortage;[24]

---

18 University of Queensland, *Submission 12*, p. 6.

19 Engineers Australia, *Submission 2*, pp 4–5.

20 University of Queensland, *Submission 12*, p. 2.

21 Engineers Australia, *Submission 2*, pp 4–5.

22 University of Queensland, *Submission 22*, p. iv.

23 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 9 April 2015, p. 20; Gas Energy Australia, *Submission 6*, p. 5; Australian Automobile Association, *Submission 14*, p. [2].

- methods to encourage diversification of import sources;[25]
- increased strategic reserve/stocking requirements of refined products and the security, spread and diversity of storage sites;
- strategies to provide for a secure and affordable fuel supply to the agricultural sector to ensure Australia's food supply;[26] and
- alternative transport fuels as a means of mitigating exposure to imported fuel supply disruptions.[27]

5.17 A number of submitters emphasised the importance of focusing on alternative transport fuels. APA Group argued for a transport energy roadmap which included a national approach to fuel excise across alternative fuel classes including that of LNG, LPG, compressed natural gas (CNG) and biomass.[28] Towards a comprehensive policy, AGL supported a review of the barriers, along the supply chain, to the development of alternative transport fuel projects in Australia.[29]

5.18 The NRMA's Jamison report of 2010 revealed that, at that time, more than 30 per cent of domestic transport energy demand could be met by secure supplies – secure from source through to delivery – through the use of biofuels, gas, electricity and more efficient vehicles as well as domestic oil production.[30] It noted that the application of such technologies could reduce the country's dependence on imported fuels by at least 30 per cent.[31] It suggested that with 30 per cent of transport supply secured, basic services would be able to function in Australia in the event of a major or sustained liquid fuel supply disruption.[32] Three years later, the NRMA noted that the absence of adequate policy or incentives in this area did not bode well for fuel demand diversity.[33]

Diverse energy sources and energy supply

5.19 According to Gas Energy Australia, when Australia joined the IEA in 1974, there were no widely available alternatives to oil-based fuels. However, it argued that the current situation is different. It drew on the findings of the Australian

24 Fusion Australia, *Submission 19*, p. 5; Engineers Australia, *Submission 2*, p. 1.

25 University of Queensland, *Submission 12*, p. 6.

26 AUSVEG, *Submission 11*, p. 2; National Farmers' Federation, *Submission 9*, p. 2.

27 APA Group, *Submission 10*, p. 2.

28 APA Group, *Submission 10*, p. 4.

29 AGL Energy Limited, *Submission 8*, p. 3.

30 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 68.

31 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 9 April 2015, p. 20.

32 National Roads and Motorists' Association, Submission 18, *Attachment 2*, p. 16.

33 National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 20.

Government's 2011 Strategic Framework for Alternative Transport Fuels which acknowledged that the emergence of a more diverse and layered transport fuels market may improve resilience in Australia's transport sector.[34]

5.20 The 2014 Energy Green Paper acknowledged that increasing cost competitive domestic production of alternative fuels could diversify the country's liquid fuel supply and strengthen fuel security.[35] It noted that alternative transport fuels are niche products in Australia which supply approximately five per cent of demand.[36]

5.21 These views were supported by a number of submitters to the inquiry, who highlighted the increasing importance of energy diversity and energy supply diversity for reasons including the need to reduce demand for and reliance on imported oil, energy security and reduced risks of supply disruptions, productivity gains for businesses and the wider economy, as well as improved environmental outcomes.[37]

5.22 Engineers Australia highlighted that energy security required a link to be forged between new opportunities, innovation, employment, and the engineering profession with that of diverse fuel supplies.[38] As Mr Greet from Engineers Australia, explained:

> You must support all types of energy and the way they are used not only across the transport sector but in the way we generate electricity. Once you get the diversity of fuels and energy techniques and types, you can keep different parts of the country working. You can keep regional Australia going through renewables and different types of energy. You can have jobs created and Australians actually being smart in what they do, taking advantage of a lot of these great technology advancements that are happening in the country. The secret is diversity.[39]

5.23 As a response to concerns regarding domestic production and Australia's liquid fuel security, the 2014 Green Paper stated that:

> Increased domestic production of cost-competitive alternative transport fuels could strengthen Australia's liquid fuel security by diversifying supply. The Government considers such strengthening will only come from alternative transport fuels that successfully integrate into the broader

---

34 Department of Industry and Science, *Strategic Framework for Alternative Transport Fuels*, December 2011, p. 21.

35 Department of Industry, *Energy White Paper – Green Paper 2014*, p. 3.

36 Department of Industry, *Energy White Paper – Green Paper 2014*, p. 52.

37 Gas Energy Australia, *Submission 6*, p. 8; Australian Trucking Association, *Submission 7*, p. 3; AGL Energy Limited, *Submission 8*, p. 3; University of Queensland, *Submission 12*, p. 6; Queensland Resources Council, *Submission 15*, p. [2]; Biofuels Association of Australia, *Submission 32*, p. 2; National Roads and Motorists' Association, *Submission 18*, Attachment 1, p. 3; Truck Industry Council, *Submission 23*, p. 4; Qantas Airways Limited, *Submission 25*, p. 2; Mobile LNG, *Submission 31*, p. 11.

38 Mr Neil Greet, Engineers Australia, Committee Hansard, *2 February 2015*, p. 3.

39 Mr Neil Greet, Engineers Australia, Committee Hansard, *2 February 2015*, p. 3.

> transport fuel market by being secure and reliable in supply, meet requisite fuel standards, and deliver on consumer needs.[40]

5.24 According to evidence before the committee, Australian-produced gaseous fuels offer the best prospect of improving Australia's liquid fuel security. A recent BREE study concluded that gaseous fuels offer the lowest production costs now and into the future, remain cost competitive and have lower cost renewable technologies out to 2050.[41] BREE's Energy in Australia 2014 report stated that renewable energy consumption rose by 12 per cent in 2012–13, with growth in all renewable energy sources except for biogas and biofuels.[42]

5.25 Coal-to-liquids (CTL) technology was also highlighted as a viable prospect as it can convert the low-grade portion of Australia's coal reserves. According to the Australian Coal to Liquids Association:

> The CTL solution can fill all of the gap from our conventional oil production, is not constrained by biological inputs, can produce the entire range of fuels and chemicals needed with supply security enhanced by plans distributed around the country. It will back out approximately $40 billion of annual fuel imports.[43]

5.26 Mobile LNG made the point that there is an opportunity to improve the energy resilience and security of Australia by using domestic LNG for domestic purposes.[44] Furthermore, Qantas argued that the commercialisation of a financially and environmentally sustainable advanced aviation biofuel would make an important contribution to the long-term sustainability of Australia's aviation industry.[45] It noted in this regard that:

> The development of an aviation biofuel industry would go some way toward reversing the decline in Australian refining capacity, maintain highly skilled jobs and support energy security by creating diversity of supply in reducing reliance on imported crude oil and finished product.[46]

5.27 Energy Supply Association of Australia (ESSA) argued that while Australia's heavy reliance on liquid fuelled internal combustion engines is likely to continue in the short to medium term, over the longer term, a shift to electric vehicles (EV) or natural gas vehicles (NGV) could reduce reliance on imported fuels and thereby improve Australia's fuel security. It noted in this regard that:

---

40 Department of Industry, *Energy White Paper – Green Paper 2014*, p. 54.

41 BREE cited in Gas Energy Australia, *Submission 6*, p. 6.

42 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 27.

43 Australian Coal to Liquids Association, *Supplementary Submission 33*, p. 2.

44 Mr Andrew White, Mobile LNG, *Committee Hansard*, 2 February 2015, p. 79.

45 Qantas Airways Limited, *Submission 25*, p. 1.

46 Qantas Airways Limited, *Submission 25*, p. 2.

> Significant advances in technology have created a new generation of EVs and NGVs that have the potential to surpass traditional petrol and diesel engine vehicles on performance, safety, design and running costs.[47]

5.28 The main alternatives to petrol and diesel for motor vehicles in Australia are LPG and biofuels (ethanol and biodiesel).[48] Unlike petrol and diesel which are made from non-renewable resources like crude oil, biofuels are derived from renewable materials such as vegetable and animal products. The main types of biofuels used as transport fuels in Australia are ethanol and biodiesel.[49] Mr Adam Pegg, Head of Environmental Development at APA Group informed the committee that natural gas in transport was a mature technology. He continued:

> It has many applications—road, rail and sea, and mining applications as well. It has long-term potential cost and environmental benefits. We have a very large gas resource. We have a very sophisticated pipeline and gas network through the country that can form the basis for infrastructure to support natural gas vehicles. And under the right market conditions there is an appetite for the private sector to invest in this area. So, in closing, we think gas in transportation should compete on a level playing field. We think that there are potential government incentives for market failure, such as security of supply.[50]

Liquefied Petroleum Gas

5.29 Liquefied petroleum gas (LPG) is a by-product of natural gas and crude oil refining. It is the most widely used alternative transport fuel in Australia.[51]

5.30 LPG enjoys approximately three per cent market share of transport energy use, mainly in light vehicles.[52] It fuels almost 500,000 mostly privately owned vehicles and is the predominant fuel used by the taxi industry, fleet as well as trade vehicles.[53]

5.31 Australia is not only completely self-sufficient in LPG but is also a net exporter of it with net exports equating to around 41 per cent of total production in 2010–11.[54] In 2013, Australia produced 2,317 kilotonnes of LPG, satisfying a local demand of 1,539 kilotonnes while exporting 815 kilotonnes.[55]

---

47 Energy Supply Association of Australia, *Submission 29*, p. 1.

48 Bureau of Resources and Energy Economics, *Energy in Australia 2014*, p. 114.

49 Australian Consumer and

50 Mr Adam Pegg, APA Group, *Committee Hansard*, 2 February 2015, p. 53.

51 Gas Energy Australia, *Submission 6*, p. 4.

52 Department of Industry, *Energy White Paper – Green Paper 2014*, p. 52.

53 Gas Energy Australia, *Submission 6*, p. 4.

54 Bureau of Resources and Energy Economics, *Energy in Australia 2012*, p. 79.

55 Gas Energy Australia, *Submission 6*, p. 8.

5.32 While it was acknowledged that self-sufficiency or adequacy alone does not guarantee energy security, Gas Energy Australia emphasised the extent of Australia's LPG industry. It includes seven natural gas processing plants, nine coastal terminals, 170 regional depots, 1000 local small business distributors. Of the approximate 6400 service stations across Australia, 4300 sell at least one alternative transport fuel with LPG the largest network with over 3700 Autogas refuelling stations across the country.[56]

5.33 The 2012 Energy White Paper estimated that Australia's vast natural gas reserves were equivalent to 184 years of supply at current production rates. Currently, 81 per cent of LPG produced in Australia is derived from processing natural gas from these reserves.[57] Gas Energy Australia concluded that substituting just 30 per cent of Australia's near total dependency on imported fuel would not only deliver improved fuel security but also retain local engineering skills and reduce carbon and other emissions. Moreover, it estimated that every 10 per cent substitution of imported diesel by Australian gaseous fuels saves $870 million in import costs.[58]

Compressed Natural Gas and Liquefied Natural Gas

5.34 Natural gas can be used as a fuel for vehicles when liquefied (LNG) or compressed (CNG). According to the APA Group, when used as a substitute for diesel fuel in transport applications, natural gas produces approximately 30 per cent less full lifecycle emissions and can be up to 50 per cent cheaper than imported diesel fuel on an equivalent per litre basis.[59] In terms of costs, according to Gas Energy Australia, every 10 per cent of imported diesel substituted by natural gas fuels and LPG would save import costs of approximately $80 million per year.[60] Mr Michael Carmody, CEO of Gas Energy Australia continued:

> Greater use of gas-powered vehicles is a low-cost way to improve Australia's fuel security, and there is both plentiful supply and, at least in regard to LPG, substantial infrastructure in place.[61]

5.35 According to Mobile LNG, LNG offers a fuel alternative to diesel which has shown to provide fuel cost savings, improved operational efficiencies and to deliver significant environmental benefits.[62] It argued that the wider use of Australia's own LNG within its own economy would put the country on the same path as the advances

---

56 Department of Industry and Science, *Strategic Framework for Alternative Transport Fuels*, December 2011, p. 15; Gas Energy Australia, *Submission 6*, p. 8.

57 Gas Energy Australia, *Submission 6*, p. 8.

58 Gas Energy Australia, *Submission 6*, p. 9.

59 APA Group, *Submission 10*, p. 3; Mr Andrew White, Mobile LNG, *Committee Hansard*, 2 February 2015, p. 84.

60 Mr Michael Carmody, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 52.

61 Mr Michael Carmody, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 52.

62 Mobile LNG, *Submission 31*, p. 6.

being made by leading international economies including that of China and the United States. It argued that:

> Each of these nations has implemented natural gas/LNG fuel use policy to displace diesel fuels towards an improved socio-economic outlook that is delivered with the associated benefits of significant environmental gains.[63]

5.36 Mobile LNG suggested that the correct policy settings would remedy current supply issues and provide a catalyst for greater use of Australia's own abundant supply of natural gas and LNG through the economy.[64] Instead, Australia continues to import expensive diesel/petroleum products while maintaining policies for a diesel/petroleum dependent economy and exporting the economic advantages of its own natural gas away in LNG form to the benefit of other countries.[65] Mobile LNG argued that, by using Australia's own resources and technology, the development of LNG facilities would provide for energy security by improving energy self-sufficiency for the country with local low-priced fuel supplies.[66]

Challenges and targets

5.37 Australia has rich resources available for the production of conventional and advanced biofuels and the biofuel industry is one of the fastest growing globally, predicted to move towards eight per cent of the global transport requirement. However, according to BAA, the lack of a clear policy framework to encourage its development has stifled the industry.[67] As a case in point, NRMA stated that over 62 countries have mandated biofuel use as part of their energy security policy while in Australia, only NSW has a mandate but said that it is 'weak and constantly undermined'.[68]

5.38 Various submitters saw the challenges to the industry as including lack of investor confidence and lack of incentives to help create demand for alternative fuels, difficulties associated with breaking into an entrenched fuel market, regulatory and taxation issues coupled with the absence of a strong and consistent market signal from government.[69] As a case in point, the absence of regulatory harmonisation across states and territories has made the prospect of driving an LPG truck from one end of the country to another extremely difficult.[70] ESAA made the point that better

---

63 Mobile LNG, *Submission 31*, p. 1.

64 Mobile LNG, *Submission 31*, p. 2.

65 Mobile LNG, *Submission 31*, p. 6.

66 Mobile LNG, *Submission 31*, p. 8.

67 Biofuels Association of Australia, *Submission 32*, p. 4.

68 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 69.

69 Biofuels Association of Australia, *Submission 32*, p. 5; Mr Michael Carmody, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 53; Mr David Moore, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 54; Qantas Airways Ltd, *Submission 25*, p. 2.

70 Mr David Moore, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 54.

utilisation of existing gas and electricity infrastructure through alternative-fuel vehicles such as plug-in electric and natural gas powered vehicles was required.[71]

5.39 BAA informed the committee that six (federal and state) policy changes over the past five years, reductions in industry support including the removal of the Ethanol Producers Grant and Cleaner Fuels Scheme and plans to impose excise on biodiesel from 2016 have contributed to destabilising investor confidence. It suggested that policy changes appeared to work against the stated aims of the government to increase the diversity and security of fuels on offer in Australia.[72] BAA argued that the industry needed strong signals from government to demonstrate its commitment to growing renewable fuels in Australia. To this end, it suggested that the government set a target that two billion litres of liquid transport fuels be produced from renewable sources by 2025.[73] This target would represent about five per cent of the total volume of liquid fuels used for transport in today's terms.[74]

5.40 A similar proposition from NRMA that the government set a target for alternative sources was supported by Gas Energy Australia.[75] NRMA recommended that the Australian Government work towards securing 30 per cent of Australia's transport energy from alternative sources by 2030.[76]

5.41 Mobile LNG argued that the greater use of LNG could be expedited by government if it were to offer to industry an accelerated depreciation schedule or similar taxation concession or inducement, on the new capital expenditure investments and on the new training costs that would be needed to make for the transition from diesel use to Australia's own LNG.[77]

5.42 However, in direct contrast, while AIP acknowledged that alternative fuels can play a role in a diversified transport fuels mix, it suggested that competitive market behaviour should determine that role – whereby the market will transition to other fuel types when they are economic.[78] Similarly, while BP Australia supported the market-led development of alternative fuels, it favoured an approach whereby any government assistance to these fuels would be transitional and gradually phased in so as to encourage their commercialisation and competitiveness. It noted in this regard that:

---

71 Energy Supply Association of Australia, *Submission 29*, p. 2.

72 Biofuels Association of Australia, *Submission 32*, p.1.

73 Biofuels Association of Australia, *Submission 32*, pp 1 and 5.

74 Biosecurity Association of Australia, *Submission 32*, p. 5.

75 Mr Michael Carmody, Gas Energy Australia, *Committee Hansard*, 2 February 2015, p. 52.

76 National Roads and Motorists' Association, *Submission 18*

77 Mobile LNG, *Submission 31*, p. 6.

78 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 20.

> Any national intervention to mandate biofuels under the guise of 'energy security' is misplaced and should be rejected.[79]

5.43 Viva Energy Australia suggested that any decision to promote alternative liquid fuels should be based on sound science and be subjected to rigorous cost benefit analysis. It further noted that alternative fuels can have the unintended consequence of adding complexity and cost to the supply chain, thereby reducing supply security.[80]

5.44 Air Vice Marshal Blackburn (Retired) argued that disruptions and related incidents highlighted the fact that fuel companies have no responsibility to meet any nominated storage level as their focus is on just-in-time, minimum cost fuel delivery rather than fuel security in the broader sense.[81] He continued:

> That secure system is a government job. So in Australia where the government does not mandate any minimum level of stock, unlike so many other regional and global countries, the fuel companies do what makes sense – just in time, keep the cost down…The issue is that we are the only fuel exporting developed country in the world that does not mandate something.[82]

5.45 Mr John Ryan, Associate Secretary of the department, clarified that it was the role of government to assess, from a national viewpoint, what risks may occur and how they can be mitigated.[83] The department further noted that such assessments have 'consistently shown that global markets would continue to supply Australia's requirement during supply disruptions albeit at higher prices'.[84] However, fuel shortages such as that referred to in Perth and at Melbourne Airport indicate possible failings in achieving this objective.

5.46 As AIP noted, the goal and core business of each fuel company is to 'safely and reliably supply high-quality fuel to users who want it when they need it'.[85] It is not, therefore, the role of these commercial companies to ensure that Australia has adequate reserves. That is a matter for government.

---

79 BP Australia, *Submission 30*, p. 11.

80 Viva Energy Australia, *Submission 34*, p. 4.

81 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 70.

82 Air Vice Marshal Blackburn (Retired), National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 70.

83 Mr John Ryan, Department of Industry and Science, *Committee Hansard*, 2 February 2015, p. 94.

84 Department of Industry and Science, Answer to question on notice at 2 February 2015 hearing, Answer provided

85 Mr Andrew Warrell, Australian Institute of Petroleum, *Committee Hansard*, 2 February 2015, p. 19.

Chapter 6

Committee view and recommendations

6.1 Evidence to the committee suggested that Australia is almost totally reliant on liquid fuels for transport and transportation services which underpin significant economic activity, utilities and essential services. Therefore, any substantial disruption to Australia's transport fuel supplies would have a significant impact on safety, national security, national productivity and society.[1]

6.2 Evidence to the committee regarding the question of whether Australia's fuel security will remain adequate, reliable and competitive into the foreseeable future was divided. Some submitters held the view that, in the absence of local capability, there are no guarantees that Australia would be able to access adequate alternate sources of supply in the event of a disruption to the supply chain.[2] Others, including the department and AIP, argued that Australia had adequate sources to maintain supply.

6.3 While attention was drawn to contingency planning in the wake of fuel supply disruption brought about by an emergency, focus was also given to the wider question of the security and sustainability of Australia's fuel supply. In particular, the role of alternative energy sources in providing for the country's energy needs into the future was considered.

6.4 Historically, Australia has relied on a combination of domestic crude oil production, domestic refining and diversity in supply points to maximise reliability in supply. However, the point was made that Australia's declining crude oil production and refining capacity, coupled with its growing reliance on crude oil sourced from relatively unstable regions, is changing Australia's fuel risk profile.[3]

6.5 One of the central questions before the committee was whether reliance on the market is the best course of action in relation to energy security. Caltex and other fuel supply companies contend that it is.[4] Others, most notably NRMA and Engineers Australia argued that Australia's growing reliance on imported oil, together with declining refining capacity, warranted a comprehensive review of Australia's fuel security into the future.[5] Noting that Australia is at the bottom of a long supply chain, the committee was repeatedly reminded of the vulnerabilities to the supply chain that result, quite apart from Australia's continued inability to meet IEA stockholding requirement.

---

1 University of Queensland, *Submission 12*, p. 7.

2 Australian Workers' Union, *Submission 20*, p. 8.

3 Department of Industry and Science, *Strategic Framework for Alternative Transport Fuels*, December 2011, p. 21.

4 Caltex, *Submission 26*, p. 12.

5 Dr Brent Jackson, Engineers Australia, *Committee Hansard*, 2 February 2015, p. 4.

6.6 In light of its growing dependence on fuel imports, the committee questions whether leaving Australia's energy security to market forces remains the most feasible and tenable policy approach. Ultimately, it is not the role of the fuel supply companies to ensure that Australia has adequate reserves. That is a matter for government. In this regard, the fact that a substantial disruption in fuel supply would have serious consequences across the Australian community weighted heavily on the minds of committee members.

6.7 The committee takes the view that, as a first step, a comprehensive assessment should be undertaken to establish a sound understanding of the internal and external factors which pose as possible risks to Australia's fuel supply. The assessment should take into consideration both external and internal threats to supply and examine the feasibility of risk mitigation strategies.

Recommendation 1

6.8 The committee recommends that the Australian Government undertake a comprehensive whole-of-government risk assessment of Australia's fuel supply, availability and vulnerability. The assessment should consider the vulnerabilities in Australia's fuel supply to possible disruptions resulting from military actions, acts of terrorism, natural disasters, industrial accidents and financial and other structural dislocation. Any other external or domestic circumstance that could interfere with Australia's fuel supply should also be considered.

Compliance with the IEA 90 day holding requirement

6.9 The committee upholds the view that Australia's membership of the IEA is imperative and commends the Australian Government for its recent commitment to meet Australia's 90 day stockholding obligation.

6.10 The committee acknowledges that the continued decline in domestic production and increased demand for liquid fuel has placed pressure on Australia's IEA commitments. However, it is concerned that Australia has not met its 90 day stockholding obligations since March 2012. The committee is equally concerned that under current projections, Australia may average below 45 days of reserves by 2024.[6]

6.11 Therefore, the committee strongly encourages the Australian Government to set out its plan to achieve compliance as soon as practicable. Where appropriate, the plan should set targets and other measurable indicators of progress towards compliance.

Mandatory regular reporting on fuel stocks

6.12 At the start of the inquiry, the committee set out to identify the amount of fuel stocks available in Australia on any given day. It proved to be a complicated task. Considerable evidence to the committee emphasised the lack of details and knowledge regarding the availability of fuel supplies as well as the uncertainty of emergency management outcomes and the related consequences for Australian industries.

---

6 Department of Industry and Science, *Submission 41*, p. 7; Department of Industry, *Energy White Paper – Issues Paper*, December 2013, p. 12.

6.13 The committee acknowledges that the department has improved the reporting process in relation to fuel supplies. However, the committee firmly believes that fuel companies should be required to report their fuel stocks to the department on a regular basis. Evidence to the committee suggested that it would not be onerous for fuel supply companies to report regularly to the Department of Industry and Science on their fuel stocks.[7]

Recommendation 2

6.14 The committee recommends that the Australian Government require all fuel supply companies to report their fuel stocks to the Department of Industry and Science on a monthly basis.

Transport Energy Plan

6.15 The committee acknowledges the concerns raised by submitters during the inquiry regarding the sustainability of Australia's transport energy and the need for surety regarding alternative energy sources. The committee upholds the view that the Australian Government should develop a national transport energy plan which sets appropriate targets for the provision of a secure supply of Australia's transport energy.

6.16 The transport energy plan should consider all energy sources including that of alternative fuels. It should identify the obstacles and challenges to achieving an affordable and sustainable transport energy supply and provide short and long-term solutions to them.

Recommendation 3

6.17 The committee recommends that the Australian Government develop and publish a comprehensive Transport Energy Plan directed to achieving a secure, affordable and sustainable transport energy supply. The plan should be developed following a public consultation process. Where appropriate, the plan should set targets for the secure supply of Australia's transport energy.

Senator Glenn Sterle
Chair

7 Mr Graham Blight, National Roads and Motorists' Association, *Committee Hansard*, 2 February 2015, p. 76.

Australian Greens' Additional Comments

1.1 The Australian Greens are committed to ensuring reliable transport energy supplies that efficiently and effectively serve the needs for the community and industry, while eliminating our dependence on fossil fuels and our greenhouse gas emissions.

1.2 The committee report is a good summary of the varied issues at play with regard to securing Australia's transport energy supplies.

1.3 While we note that there were varied views on the key aspects of transport energy security, clear themes of serious concern have emerged from the evidence provided. These include our transport sector's vulnerability to low or insecure fuel supplies, and the environmental risks of fuel tankers with deficiencies posing threats to our marine environment.

1.4 The Greens note in particular, submissions to the inquiry that highlighted the energy resilience opportunities and emissions reduction potential of reducing fossil fuel dependence in our transport sector. For example, the Australian Academy of Technological Sciences and Engineering noted, "Countries around the world are taking steps to reduce transport emissions while accommodating growth in the economy and population by maximising energy efficiency, electrification and development of low carbon fuels. Additional benefits include greater energy security and independence from reliance on a single fuel source."[1]

1.5 Before the Senate is a private members bill from the Australian Greens that would replicate the European Union's fuel efficiency standards for motor vehicles and dramatically reduce fuel demand and the risks posed through energy security.

1.6 The committee examined issues related to gas as a fuel source and gas-powered vehicles as a way to increase Australia's fuel security. While we support the view of submitters that reducing reliance on diesel fuels is a favourable step, we note that CNG and LNG represent a continued reliance on fossil fuels. We note that a shift to CNG and LNG only reduces greenhouse gas emissions by around 25% and so does not constitute a long term solution to reducing transport carbon emissions to zero or near zero which will be required in the coming decades as part of a global commitment to avoid dangerous climate change.

1.7 There is also a small, but predictable revolution occurring in the field of battery storage and electric and hydrogen cars. As the charging infrastructure is rolled out globally and in Australia, and the economies of scale reduce the costs of fossil free vehicles, the pressures of liquid energy security will greatly ease.

---

1 Australian Academy of Technological Sciences and Engineering, Submission 5, November 2014, p1.

1.8 The Greens note that coal-to-liquids (CTL) technology was explored briefly in the report, but without expansion into the emissions intensiveness of the resulting product. It should be noted that this technology may offer a diversification of source for fossil fuels, but would be a backwards step with regard to transitioning Australia's transport energy supply to a zero carbon emissions footing.

1.9 While we support the recommendations contained in the report, the Australian Greens feel that stronger emphasis needs to be placed in order to take into account the issues noted in these comments. We propose the following recommendations in addition to those included in the report.

Recommendation 1

1.10 That the Australian Government develop and publish a comprehensive Transport Energy Plan directed to achieving a secure, affordable and sustainable transport energy supply. The plan should be developed following a public consultation process. The plan should set targets for the secure zero carbon supply of Australia's transport energy, and outline a transition to achieve this supply over the coming two decades.

Recommendation 2

1.11 That the government encourage and support the development of zero carbon and potential zero carbon transport energy sources and transport systems, including

- **comprehensive public transport systems across all capital and regional cities**
- **investment in infrastructure to support and facilitate greater use of walking and cycling**
- **the rollout of electric vehicles and the production of biodiesel produced from genuine waste products**

Recommendation 3

1.12 That the Senate pass the Motor Vehicles (Cheaper Transport) Bill 2014 to reduce fuel demand across the economy by requiring the importation of new motor vehicles complies with global standards.

Senator Janet Rice
Australian Greens

Appendix 1

Submissions received

Submission Number	Submitter
1	Mr Ken Grundy
2	Engineers Australia
3	Associate Professor Philip Laird
4	Mr David Lamb
5	Australian Academy of Technological Sciences and Engineering
6	Gas Energy Australia
7	Australian Trucking Association
8	AGL Energy Ltd
9	National Farmers' Federation
10	APA Group
11	AUSVEG
12	The University of Queensland
13	Tasmanian Department of State Growth
14	Australian Automobile Association
15	Queensland Resources Council
16	Premier Engineering Services Pty Ltd
17	Australian Institute of Petroleum
18	National Roads and Motorists’ Association
19	Fusion Australia Ltd
20	The Australian Workers' Union
21	Maritime Union of Australia
22	Queensland Government
23	Truck Industry Council
24	Mr Christopher Blackburn
25	Qantas Airways Limited
26	Caltex
27	Mobil Oil Australia
28	Southern Oil Refining
29	Energy Supply Association of Australia
30	BP Australia
31	Mobile LNG
32	Biofuels Association of Australia

33 Australian Coal To Liquids Association
34 Viva Energy Australia
35 Board of Airline Representatives of Australia
36 Mr Geoffrey Miell
37 Australasian Convenience and Petroleum Marketers Association
38 Australian Association for the Study of Peak Oil
39 Mr Matt Mushalik
40 Queensland Energy Resources Pty Ltd
41 Department of Industry and Science

Additional information received

- Received on 11 February 2015, from the National Road and Motorists' Association. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from Engineers Australia. Answer to a question taken on notice on 2 February 2015.
- Received on 13 February 2015, from Energy Supply Association of Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from AUSVEG. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from the Australian Institute of Petroleum. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from VIVA Energy Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from Gas Energy Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 13 February 2015, from Energy Supply Association of Australia. Additional information, Developing a market for Natural Gas Vehicles in Australia: Discussion Paper June 2014.
- Received on 13 February 2015, from Energy Supply Association of Australia. Additional information, Sparking an Electric Vehicle Debate in Australia.
- Received on 14 February 2015, from the Biofuels Association of Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 14 February 2015, from the Biofuels Association of Australia. Additional information.
- Received on 15 February 2015, from BP Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 16 February 2015, from Mobil Oil Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 19 February 2015, from Caltex Australia. Answers to questions taken on notice on 2 February 2015.
- Received on 20 February 2015, from Mr John Griffiths, Director Industry and Policy Development, Gas Energy Australia. Correspondence to the committee, clarifying a statement made at 2 February 2015 hearing.
- Received on 24 February 2015, from the Department of Industry and Science. Answers to questions taken on notice on 2 February 2015.
- Received on 27 March 2015, from the Australian Institute of Petroleum. Additional information, Petroleum Ships on the Water.
- Received on 25 May 2015, from the Australian Institute of Petroleum. Answers to questions taken on notice on 9 April 2015.

- Received on 9 June 2015, from the Maritime Union Australia. Answer to a question taken on notice on 2 February 2015.

Tabled documents

Monday, 2 February 2015, Sydney, NSW

- Tabled by Mr Andrew White, Deputy Chief Executive Officer, AUSVEG. Australian vegetable growing farms: An economic survey, 2012 – 13 and 2013 – 14
- Tabled by Mr Andrew Warrell, Chair, Australian Institute of Petroleum. Facts about the Australian transport fuels market.
- Tabled by Mr Ian Bray, Assistant National Secretary, Maritime Union of Australia.
    - Document outlining historical fuel prices.
    - The Wall Street Journal: World's largest traders use offshore supertanks to store oil.
- Tabled by Mr Michael Carmody, Chief Executive Officer, Gas Energy Australia. Opening statement.
- Tabled by Mr Andrew White, Founder and Managing Director, Mobile LNG.
    - Case studies.
    - Presentation.
- Tabled by Mr Graham Blight, Fuel Security and Alternative Fuels Ambassador, National Roads and Motorists' Association.
    - Joint statement in support of a comprehensive Transport Energy Plan for Australia.
    - A Roadmap for Alternative Fuels in Australia: Ending our Dependence on Oil.
    - Fuelling Future Passenger Vehicle Use in Australia.
    - Australia's Liquid Fuel Security: A Report for NRMA Motoring and Services, Part 1.
    - Australia's Liquid Fuel Security: Part 2.
    - Benchmarking Australia's Transport Energy Policies.

Thursday, 9 April 2015, Melbourne VIC

- Tabled by Dr Penny Howard, Nation Research Officer, Maritime Union of Australia. Australian Fuel Security and the Increasing Need for Clean Petroleum Tankers: An Overview of Maritime Issues Impacting the Security if Supply Chains.
- Tabled by Mr Graham Blight, Fuel Ambassador, National Roads and Motorists' Association. Three case studies: Israel, Finland and Norway.
- Tabled by Mr Mark McKenzie, Chief Executive Officer, Australasian Convenience and Petroleum Marketers Association. Petroleum Market in Australia and the APAC Region.
- Tabled by Mr Matt Mushalik. Additional Information to the Senate Inquiry on Transport Energy Resilience.

Appendix 2

Public hearings and witnesses

Monday, 2 February 2015, Sydney, NSW

- BARRETT, Mr Paul, Deputy Executive Director,
  Australian Institute of Petroleum Ltd
- BLACKBURN, Air Vice Marshal John (Retired), Consultant Adviser,
  National Roads and Motorists' Association
- BLIGHT, Mr Graham John, Fuel Security and Alternate Fuel Ambassador,
  National Roads and Motorists' Association
- BRAY, Mr Ian, Assistant National Secretary,
  Maritime Union of Australia
- BREWER, Mr Andrew Terence, General Manager, Supply Chain Operations,
  Caltex Australia Ltd
- CARMODY, Mr Michael, Director and Chief Executive Officer,
  Gas Energy Australia
- CARTER, Mr Rodney, Director, Communications Manager,
  Mobile LNG
- DICKENS, Mr Nathan, General Manager, Policy,
  Australian Institute of Petroleum Ltd
- DONOGHUE, Mr Kieran, General Manager, Policy,
  Energy Supply Association of Australia
- GRASSIA, Dr Gino, General Manager, Energy Security Branch, Energy Division, Department of Industry and Science
- GREET, Mr Neil David, Fellow of the Institution of Engineers,
  Engineers Australia
- HENDERSON, Hon Paul Raymond, Chairman,
  Mobile LNG
- HOWARD, Dr Penny McCall, National Research Officer,
  Maritime Union of Australia
- HUGHES, Mr Gavin Paul, Chief Executive Officer,
  Biofuels Association of Australia
- JACKSON Dr Brent Allistair, Executive General Manager, Public Affairs and Marketing, Engineers Australia
- LIVENS, Mr Stephen, Head of Government Affairs,
  APA Group
- MALLON, Mr Glen Patrick, Integrated Rating on an Australian General Licence product tanker and MUA delegate, Maritime Union of Australia

- MOORE, Mr David, Senior Advisor External Relations LNG and CNG, Gas Energy Australia
- PEGG, Mr Adam Stuart, Head of Environmental Development, APA Group
- RAZDAN, Mr Steve, Economist, AUSVEG Ltd
- RYAN, Mr John, Associate Secretary, Department of Industry and Science
- TYZACK, Mr Daniel, Vice President, Supply and Optimisation, Australia and New Zealand, BP Australia
- WARRELL, Mr Andrew Thomas, Director, Exxonmobil Australia Pty Ltd
- WHITE, Mr Andrew Lloyd, Founder and Managing Director, Mobile LNG
- WHITE, Mr Andrew, Deputy Chief Executive Officer, AUSVEG Ltd
- WYATT, Mr Scott Andrew, Chief Executive Officer, Viva Energy Australia
- ZELINSKY, Mr Michael (Misha), National Vice President, Australian Workers' Union

Thursday, 9 April 2015, Melbourne VIC

- ARCHIBALD, Mr David Colin, Chief Executive Officer, Australian Coal To Liquids Association
- BARRETT, Mr Paul Gerard, Deputy Executive Director, Australian Institute of Petroleum
- BLACKBURN, Air Vice Marshal John, AO (Ret'd), Consultant to National Roads and Motorists' Association
- BLIGHT, Mr Graham, Fuel Ambassador, National Roads and Motorists' Association
- BRAY, Mr Ian, Assistant National Secretary, Maritime Union of Australia
- BYGRAVE, Dr Stephen, Chief Executive Officer, Beyond Zero Emissions
- DREW, Mr Gerard, Research Director, Beyond Zero Emissions
- FRANCIS, Mr John Leslie Roose, Director, Ocean Freight Management Pty Ltd
- GRASSIA, Dr Gino, Branch Head, Department of Industry and Science

- GREIG, Professor Christopher Roy, Director, UQ Energy Initiative, University of Queensland
- HOWARD, Dr Penny McCall, National Research Officer, Maritime Union of Australia
- LAMBIE, Dr Ross, Acting General Manager, Resources and Energy Economics Branch, Department of Industry and Science
- McKENZIE, Mr Mark, Chief Executive Officer, Australasian Convenience and Petroleum Marketers Association
- MIELL, Mr Geoffrey John, Private capacity
- MUSHALIK, Mr Matt, Member, Australian Association for the Study of Peak Oil and Gas
- ROBINSON, Mr Bruce, Convenor, Australian Association for the Study of Peak Oil and Gas
- RYAN, Mr John, Associate Secretary, Department of Industry and Science
- SKINNER, Mr Philip, Government Affairs Advisor, Australasian Convenience and Petroleum Marketers Association
- WARRELL, Mr Andrew Thomas, Chairman, Board of Directors, Australian Institute of Petroleum