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Mr Stephen Boyd  
Committee Secretary  
Standing Committee on Economics  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600

Dear Mr Boyd

**Submission to the Parliamentary Inquiry into Australia's Oil Refinery Industry**

The Department of Resources, Energy and Tourism (RET) welcomes the opportunity to provide the attached submission to the House of Representative's Standing Committee on Economics' Inquiry into Australia's Oil Refinery Industry.

Please also note that we expect two recent reports prepared for the Department – National Energy Security (NESA) Identified Issues: Competitive Pressures on Domestic Refining; and NESA Identified Issues: Strait of Hormuz – will be available on the RET website early next week.

Yours sincerely

Brendan Morling  
Head of Division  
Energy



**Department of Resources, Energy and Tourism**

**Submission to the Parliamentary Inquiry into  
Australia's Oil Refinery Industry**

**23 November 2012**

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## 1. Introduction

Australia's refining industry is undergoing structural change in response to strong competitive pressure from larger, more cost-effective and newer Asian refineries.

The 2012 Energy White Paper (EWP) notes that structural change in this highly capital and infrastructure-linked industry tends to follow a very orderly transition over a long timeframe. This approach allows markets to respond accordingly to ensure that supply security is maintained.<sup>1</sup>

The Australian Government believes that efficient, transparent and open domestic, regional and global markets that create clear incentives for timely investment and efficient operation and end use are the best means for ensuring Australia's energy security at the least cost to consumers. The Australian Government is committed to pursuing ongoing improvements in the liquid fuels sector with a view to improving productivity and competition and ensuring that these markets are operating in the long-term interests of consumers and are subject to regular monitoring and comprehensive reporting.<sup>2</sup>

The Department of Resources, Energy and Tourism's (the Department) role in implementing the Government's liquid fuels policies that relate to the oil refining and downstream petroleum industries include:

- administration of the *Liquid Fuel Emergency Act 1984*, chairing the National Oil Supplies Emergency Committee (NOSEC) and maintaining the National Liquid Fuel Emergency Response Plan (NLFERP).
- policy oversight of the *Competition and Consumer (Industry Codes – Oilcode) Regulation 2006*
- preparation of the biennial *National Energy Security Assessment*
- implementation of the *Strategic Framework for Alternative Transport Fuels*.

This submission has been prepared in consultation with the Department of Prime Minister and Cabinet, the Treasury, the Department of Foreign Affairs and Trade, the Attorney-General's Department, the Department of Defence, the Department of Education, Employment and Workforce Relations (DEEWR), the Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE), and the Department of Sustainability, Environment, Water, Population and Communities.

Substantive input to this submission was provided by DEEWR for sections 4.3 (direct and indirect employment impacts) and 6 (implications for associated workforce), and by DIISRTE for section 4.4 (impact on downstream activities).

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<sup>1</sup> Australian Government, *Energy White Paper 2012 – Australia's Energy Transformation*, [http://www.ret.gov.au/energy/Documents/ewp/2012/Energy\\_20White\\_Paper\\_2012.pdf](http://www.ret.gov.au/energy/Documents/ewp/2012/Energy_20White_Paper_2012.pdf), pp 125

<sup>2</sup> Australian Government, *Energy White Paper 2012*, pp 116.

## 2. Background

The purpose of this section is to provide:

- a brief overview of the liquid fuels sector in Australia; and
- an outline of the Australian refining sector, including the historical context to the development of the sector in Australia and its current structure and capacity.

### 2.1. Overview of the liquid fuels sector

Australia's liquid fuel market is a critical component of our energy system, fuelling our transport system, feeding industrial processes and generating electricity, particularly in remote areas of Australia.

Products in the Australian liquid fuel market include a wide range of feedstock and fuels, including crude oil, condensate, liquefied petroleum gas (LPG), refined petroleum products used as fuels (such as petrol, diesel and jet fuel), and alternative transport fuels such as biofuels (ethanol and biodiesel), compressed natural gas (CNG), and liquefied natural gas (LNG).

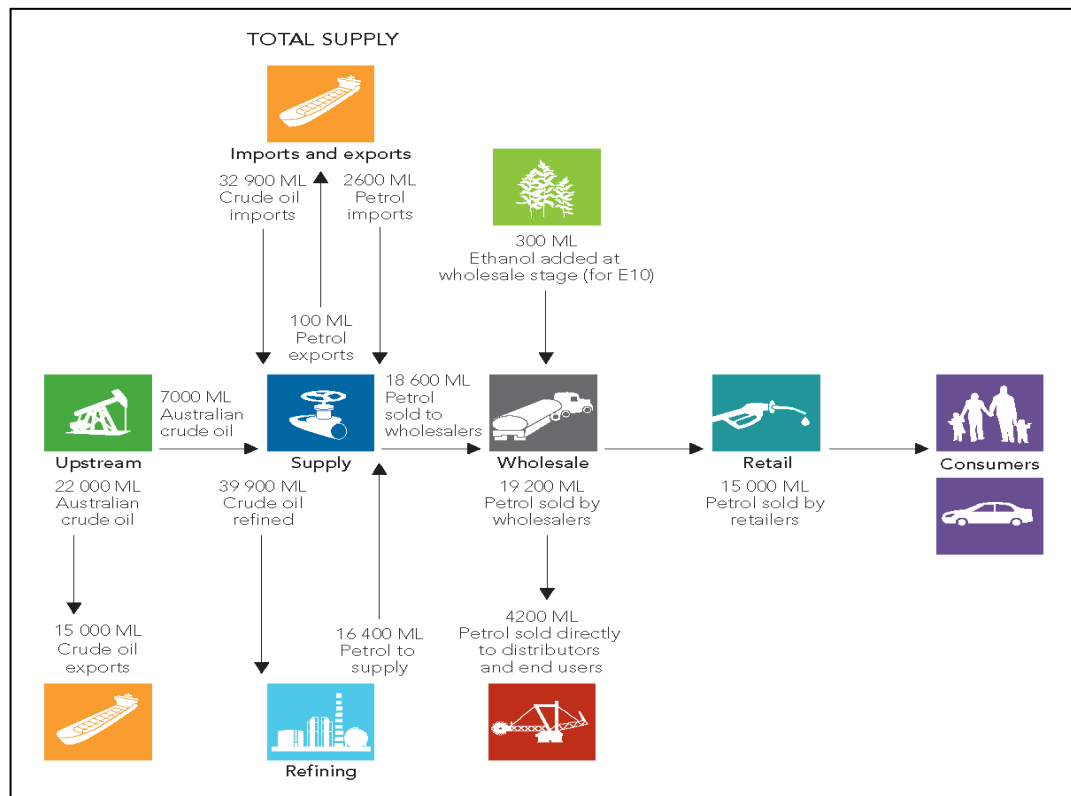
Australian demand for liquid fuels has risen steadily over the past decade, and consumption of refined petroleum products is projected to continue to grow. In 2011-12, sales of petroleum products totalled over 53,800 mega litres (ML) rising from 44,746 ML in 2002-03, equating to an annual average growth rate of around 1.9% over the last 10 years.<sup>3</sup> The transport sector is the largest final consumer of liquid fuels, accounting for around three-quarters of Australia's final fuel use. The remainder is used in industrial processes, electricity generation in remote off-grid locations and other non-transport applications.

Australia's liquid fuels are largely supplied through a mix of imported and domestically produced crude oil, refined products and alternative fuels. Figure 1 illustrates the petrol supply chain in Australia.

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<sup>3</sup> Bureau of Resources and Energy Economics, *Australian Petroleum Statistics Issue No. 192*, July 2012.

Figure 1: Australian petrol flows, 2010-11



Source: ACCC, 2011

In 2011–12, Australia imported over three quarters of its crude oil and other refinery feedstock (sourced from nearly 20 different countries, with key sources including the United Arab Emirates, Malaysia, Indonesia and Nigeria) and exported around 77% of Australia's crude oil and condensate production<sup>4</sup>.

Each crude oil has its own characteristics and Australia uses domestic and imported crude oils (and other refinery feedstocks) that are suitable for the technology used in our refineries. Australian refineries are generally set up to use predominantly light-sweet crudes, although some refineries can process a proportion of heavier, sour crudes and refineries often use a blend of crude grades to produce a suite of products best suited to local demand. Australia exports a large proportion of our domestically produced crude oil and condensate as its physical characteristics make it more suitable for higher-value products elsewhere and the proximity of production sources in the north-west to export markets.

### *The Oilcode*

The *Competition and Consumer (Industry Codes - Oilcode) Regulation 2006* is a mandatory industry code under the *Competition and Consumer Act 2010*. It regulates the conduct of suppliers, distributors and retailers in the downstream petroleum retail industry and provides:

- standard terms and conditions for fuel reselling agreements for franchise and commission agency arrangements

<sup>4</sup> Bureau of Resources and Energy Economics, *Australian Petroleum Statistics Issue No. 192*, July 2012.

- a consistent national approach to terminal gate pricing arrangements and improved transparency in wholesale pricing, which allows access by all customers (including small businesses) to petroleum products at the terminal gate price
- an independent dispute resolution scheme, including a dispute resolution adviser, to give the industry a cost-effective alternative to taking action in the courts.

### *Emergency Response and the Liquid Fuel Emergency (LFE) Act*

The LFE Act provides the authority for Commonwealth action to prepare against and manage available liquid fuel resources during a national LFE.

In the event of an actual or likely fuel shortage with national implications, the Governor-General may, when circumstances require, declare a national liquid fuel emergency under the *LFE Act 1984*. The declaration of a national liquid fuel emergency requires prior consultation with State and Territory governments.

The Commonwealth Minister for Resources and Energy administers the LFE Act. The powers of the LFE Act primarily focus on periods of declared national liquid fuel emergencies and give the Minister and delegates wide-ranging powers to control the drawdown, transfer and sale of industry stocks of crude oil and liquid fuels, to control the range of products produced by Australian refineries, and to control bulk and retail sales of fuel across Australia. The Act also contains contingency powers that may be exercised at any time. This includes the ability to direct the collection of statistics, the development of bulk allocation procedures and the maintenance of reserves.

The Act is supported by the *Liquid Fuel Emergency Guidelines* which were issued in 2008, an *Essential Users Determination* (also 2008) and an *Inter-Governmental Agreement 2006* (IGA). The IGA sets out the parameters for the cooperative response of the Commonwealth, States and Territories in the event of an emergency and also endorses the National Liquid Fuel Emergency Response Plan (NLFERP) as the agreed response plan

The *National Oil Supplies Emergency Committee* (NOSEC) is the main executive channel through which Australian governments, in co-operation with industry, formulate the overall management response to a widespread fuel shortage. NOSEC reports to the Standing Council on Energy and Resources (SCER) and comprises officials from the Australian Government, state and territory governments and the petroleum industry. NOSEC meets on a regular basis. Should a national LFE appear likely, NOSEC will convene as often as required to assist with the effective implementation of the NLFERP.

The NLFERP is administered by NOSEC and aims to ensure that, during a liquid fuel shortage, available fuel supply is managed and allocated in the most efficient way to help minimise the impacts of the shortage on fuel users and customers. However, in an emergency, the legislative powers contained in the LFE Act reside with the Commonwealth Minister for Resources and Energy.

## **2.2. The Australian Refining Sector**

Following the cessation of operations at Shell's Clyde refinery on 30 September 2012, Australia now has six refineries which are owned by the four major refiner-marketers operating in Australia – BP, Caltex, Mobil and Shell. These six refineries



are located in Brisbane (Bulwer Island – BP & Lytton – Caltex), Sydney (Kurnell – Caltex),<sup>5</sup> Melbourne (Altona – Mobil), Geelong (Corio – Shell) and Perth (Kwinana – BP).

### 2.2.1. History of the Sector

While the Clyde refinery was built in Sydney in the 1920s, the majority of Australia's refineries were built in the early to mid-1950s and mid-1960s, by the major International Oil Companies (IOCs) that dominated the Australian retail market at that time.

The Australian Competition and Consumer Commission's (ACCC) 2011 *Monitoring of the Australian petroleum industry* report provides an overview of the likely factors behind the IOCs' decisions to build refineries in Australia.

The decisions were likely a result of a very favourable external environment, both domestic and international. Contributing factors included:

- limited competitive pressures from other refineries in the region at the time;
- IOCs' access to supplies of low-cost crude, often from the parent companies' upstream oil fields in the Middle East and other regions;
- significant levels of assistance offered by state governments, while the Australian Government provided tariff protection (for both defence and industry development purposes); and
- international and domestic price and demand stability. With control of the retail sector, increases in demand could be predicted with relative confidence and refineries could make the necessary incremental extensions using readily available capital.<sup>6</sup>

By international standards of the time, the refineries built in Australia in the 1950s and 1960s were small, likely as a consequence of each being designed to serve a local, usually state-based, market. The decisions to build small, geographically dispersed refineries partly explain the current structure of the refining sector, and the economic challenges that they are presently facing.<sup>7</sup>

Despite this, size is not the only factor that determines the viability of individual refineries. The overall efficiency of a facility, its access to competitively priced feedstocks and an ability to process a wide variety of crude oils can all contribute to the profitability and competitiveness of a refinery.

In 2003, ExxonMobil decided to mothball the Adelaide Refinery at Port Stanvac, South Australia. In 2009, Exxon Mobil announced that it would not re-open the refinery and would pursue demolition and remediation of the site.<sup>8</sup> Demolition works are expected to be completed in mid-2013, followed by remediation to prepare the site for future industrial use.<sup>9</sup>

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<sup>5</sup> Caltex has announced that it plans to cease operations at the Kurnell refinery in the second half of 2014.

<sup>6</sup> ACCC, *Monitoring of the Australian petroleum industry*, December 2011, p.47.

<sup>7</sup> ACCC, p.47.

<sup>8</sup> See Exxon Mobil, [http://www.exxonmobil.com.au/Australia-English/PA/about\\_what\\_rs\\_adelaiderefinery\\_history.aspx](http://www.exxonmobil.com.au/Australia-English/PA/about_what_rs_adelaiderefinery_history.aspx)

<sup>9</sup> Exxon Mobil media release, *Adelaide refinery demolition underway*, 5 September 2012, online at [http://www.exxonmobil.com.au/Australia-English/PA/news\\_releases\\_20120905.aspx](http://www.exxonmobil.com.au/Australia-English/PA/news_releases_20120905.aspx)

On 27 July 2011, Shell announced its decision to cease refining at the Clyde Refinery in Sydney and convert the Gore Bay and Clyde facilities into a fuel import facility.<sup>10</sup> On 7 June 2012, Shell announced that refining operations would cease from 30 September 2012.<sup>11</sup>

On 28 September 2012, Caltex announced it would proceed with plans to cease refining at the Kurnell refinery in Sydney in the second half of 2014 and convert it into a major import terminal.<sup>12</sup>

There are no refineries operating in South Australia, Tasmania, the Northern Territory or the Australian Capital Territory. These states and territories source their petroleum products from refineries in other states or through imports.

### **2.2.2. Current Capacity and Production**

The current total capacity of Australian refineries (not including the Clyde refinery) is 40,440 mega litres per annum (ML pa) – around 698 kilo barrels per day (kb/d). The capacities of each of Australia's six existing refineries are listed in Table 1 below.

A refinery's capacity is the volume of fuel that could be produced through distillation of crude oil operating non-stop at an optimum utilisation rate. Generally capacity is not achieved, due to shutdowns and inherent difficulties in balancing crude inputs with demand for outputs. In some cases capacity can actually be exceeded—for example, by increasing the use of blend components, which do not need to be distilled.<sup>13</sup> Total production of petroleum products in 2011-2012 was 36 192 ML and this included 15 390 ML of automotive gasoline, 12 212 ML of automotive diesel oil and 5 452 ML of jet fuel.<sup>14</sup>

Following closure of the Clyde and Kurnell refineries there will be no refining facilities in Sydney. However, there will be multiple import points - namely Gore Bay (Shell), Kurnell (Caltex) and the bulk liquids berth at Port Botany (Sydney Ports Corporation) which is connected to the VOPAK terminal. The Department notes that Sydney Ports Corporation anticipates the operation of its new, second bulk liquids berth to commence in mid-2013.<sup>15</sup>

<sup>10</sup> Shell media release, *Shell to cease refining at Clyde*, 27 July 2011, [http://www.shell.com.au/home/content/aus/aboutshell/media\\_centre/news\\_and\\_media\\_releases/archive/2011/clyde\\_cease\\_refining\\_27072011.html](http://www.shell.com.au/home/content/aus/aboutshell/media_centre/news_and_media_releases/archive/2011/clyde_cease_refining_27072011.html)

<sup>11</sup> Shell media release, *Date of Clyde Conversion Confirmed*, 7 June 2012, [http://www.shell.com.au/home/content/aus/aboutshell/media\\_centre/news\\_and\\_media\\_releases/2012/date\\_for\\_clyde\\_conversion\\_07062012.html](http://www.shell.com.au/home/content/aus/aboutshell/media_centre/news_and_media_releases/2012/date_for_clyde_conversion_07062012.html)

<sup>12</sup> Caltex media release, *Caltex announces supply chain restructure*, 26 July 2012, <http://www.caltex.com.au/Media%20Items/26%20July%202012%20-%20Caltex%20announces%20supply%20chain%20restructuring.pdf>

<sup>13</sup> ACCC, *Monitoring of the Australian Petroleum Industry*, December 2009, p.25.

<sup>14</sup> Bureau of Resources and Energy Economics, *Australian Petroleum Statistics Issue No. 192*.

<sup>15</sup> Sydney Ports, [http://www.sydneyports.com.au/projects\\_and\\_planning/bulk\\_liquids\\_berth\\_2](http://www.sydneyports.com.au/projects_and_planning/bulk_liquids_berth_2).

**Table 1 - Australian Refinery Capacity**

Refinery	Capacity ML pa (kb/d)
Bulwer Island (BP – Brisbane)	5,910 (102)
Lytton (Caltex – Brisbane)	6,300 (109)
Kurnell (Caltex – Sydney)	7,820 (135)
Altona (Mobil – Melbourne)	4,640 (80)
Geelong (Shell – Geelong)	7,470 (129)
Kwinana (BP – Kwinana, WA)	8,300 (143)
<b>Total</b>	<b>40,440 (698)</b>

**Source:** Australian Institute of Petroleum, *Downstream Petroleum 2011*, and Department of Resources, Energy and Tourism.

### 3. Terms of Reference 1 - International and Domestic Trends and Pressures

This section highlights some of the key international and domestic trends impacting on the competitiveness of the Australian refining industry. Issues highlighted include:

- the size of Australia's refining sector in regional and global context;
- the change in global liquid fuel demand by region;
- the shift in global refining capacity expansion to Asia and the Middle East;
- the pressure on refining globally from an increase in supply sources that bypass the refinery;
- the subsequent competitive pressures that these trends are placing on OECD refineries, leading to industry rationalisation; and
- the pressure these and other trends are placing on Australian refineries.

#### 3.1. Australian refining capacity in Regional and Global Context

Australian refineries are small by international standards, and total Australian refinery capacity represents a very small proportion of global and regional capacity.

The 2012 BP *Statistical Review of World Energy* listed Asia-Pacific refining capacity in 2011 at 29,135 kb/d which was equal to 31.3% of a total global capacity of 92,961 kb/d. Australian capacity of in the same year was equal to 2.6% of Asia-Pacific capacity and only 0.8% of total global capacity.<sup>16</sup>

Asia-Pacific refining capacity by country in 2011 is shown in Table 2 below.

**Table 2 – Asia-Pacific Refining Capacity in 2011 (kb/d)**

	2010
Australia	742*
China	10834
India	3804
Indonesia	1141
Japan	4274
Singapore	1395
South Korea	2783
Taiwan	1197
Thailand	1298
Other Asia Pacific	1667
<b>Total Asia Pacific</b>	<b>29,135</b>

**Source:** BP, *Statistical Review of World Energy*, June 2012. \*Prior to closure of the Clyde refinery.

<sup>16</sup> BP, *BP Statistical Review of World Energy*, June 2012, p.16 available at <http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481>

Total global refining capacity by region in 2011 is shown in Table 3 below

**Table 3 – Global Refining Capacity by Region in 2011 (kb/d)**

Asia Pacific	29,135
North America	21,382
Europe & Eurasia	24,570
Middle East	8,011
South & Central America	6,590
Africa	3,317
<b>Total World</b>	<b>93,004</b>

Source: BP, *Statistical Review of World Energy*, June 2012

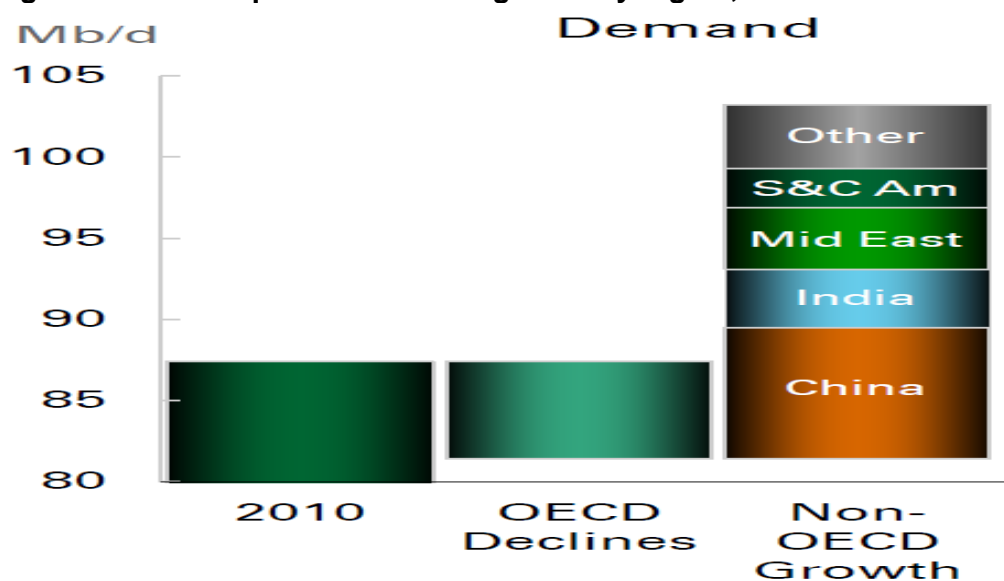
### 3.2. Liquid fuel demand by region

As depicted in Figure 2 below, growth in global liquid fuel demand over the coming decades is expected to come entirely from rapidly-growing non-OECD economies.

BP's long term energy outlook sees non-OECD Asia accounting for nearly three-quarters of the net global increase to 2030, dominated by China (+8 million barrels per day, mb/d) and India (+3.5 mb/d). The Middle East and South and Central America are also expected to grow significantly.

In comparison, OECD demand is expected to have peaked in 2005 and is forecast to decline by 6 mb/d by 2030.<sup>17</sup> The most recent long term projections for Australia see consumption of refined petroleum products growing at an average rate of 1.2% a year out to 2034-35.<sup>18</sup>

**Figure 2- Global liquid fuel demand growth by region, 2010-2030**



Source: BP, *Energy Outlook 2030*, January 2012, p.22

<sup>17</sup> BP, *Energy Outlook 2030*, January 2012, p.23.

<sup>18</sup> BREE, *Australian Energy Projections to 2034-35*, December 2011, p.43.

Expected OECD declines are initially concentrated outside the transport sector, in sectors where oil can be substituted or displaced by gas and renewables. However, post-2015, OECD transport demand is also expected to fall as technology developments and policy changes lead to improved engine efficiency.<sup>19</sup>

As discussed below, these trends are a major factor behind the expansion of refining capacity in the non-OECD, heavily focused in the Asia-Pacific and the Middle East, which is in turn placing competitive pressures on all OECD refiners and not just Australia.

### **3.3. Capacity expansion in Asia and the Middle East**

Large expansions in refining capacity are expected in Asia and the Middle East in the coming years. This represents both a potential competitive threat to Australia's relatively small scale refineries, as well as a potential valuable source of competitively priced supply which is expected to be able to meet forecast growth in consumption in Australia, and provide adequate additional supplies in the event of any future reductions in Australian refining capacity.

The International Energy Agency's (IEA) medium term forecasts see global refinery capacity increasing by close to 7.0 mb/d from 2011 to 2017, with yearly expansions from 2013 onwards exceeding annual oil demand growth.<sup>20</sup>

Capacity expansions are expected to come entirely from outside of the OECD, and are partly offset by further expected contractions in the OECD. This continues what the IEA has described as "the reallocation of refining capacity from mature markets to emerging and newly industrialised economies." This is particularly evident in non-OECD Asia which accounts for over 50% of new additions. China alone is expected to account for over 40% of global growth, or 2.9 mb/d over the period 2011 to 2017. Other parts of Asia, dominated by India, are expected to add a further 1.4 mb/d.<sup>21</sup>

Substantial investment is also occurring in the Middle East, with at least two mega projects in Saudi Arabia and one in the United Arab Emirates contributing to an expected increase in regional refining capacity of 1.9 mb/d over the IEA's projection period of 2011 to 2017. The IEA also notes that, in addition to the 1.9 mb/d of incremental capacity expansion included in their current medium term forecast, there are "a plethora of other projects" proposed in the region that could be completed before the end of the decade. Ambitious additional large scale expansion plans in countries such as Saudi Arabia, Kuwait, Bahrain and others are excluded from the IEA's current forecast due to uncertainty around start up and completion dates. Nevertheless, in aggregate, committed and planned expansions in the Middle East have the potential to add significantly to the region's refined product export capability over the next decade.<sup>22</sup>

### **3.4. Pressures on Refining Globally**

Globally, refiners are also facing pressure from an increase in supply sources that bypass the refinery.

<sup>19</sup> BP, *Energy Outlook*, p.25.

<sup>20</sup> IEA, *Medium Term Oil Market Report 2012*, p.100.

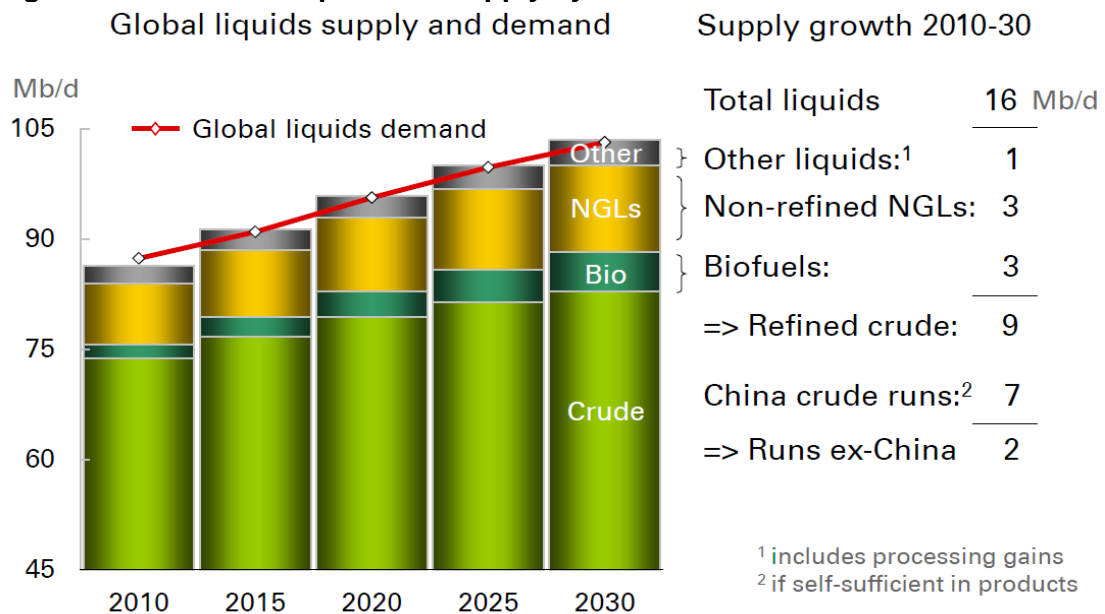
<sup>21</sup> IEA, *Medium Term Oil Market Report 2012*, pp.100-102.

<sup>22</sup> IEA, *Medium Term Oil Market Report 2012*, pp.118-119.

This is depicted in Figure 3 below, taken from BP’s *Energy Outlook 2030*, which shows that growth in the call on refinery throughput is expected to be affected by the growth in supply of biofuels (3.5 Mb/d) and non-refined Natural Gas Liquids (3 Mb/d). In addition, anticipated increases in processing gains and growth in supplies of liquid fuels derived from gas and coal are likely to add another 1 Mb/d to product supplies.

All of these supply sources will compete directly with refineries to meet total liquid fuel demand growth, suggesting that the call on refinery throughput may grow by only 9 Mb/d over the next 20 years compared with forecast growth in liquid fuel demand of 16 Mb/d. In addition, BP expects that existing spare capacity will accommodate some of the future growth in refinery throughput.<sup>23</sup>

**Figure 3 - Growth in Liquid Fuel Supply by Fuel Source**



**Source:** BP, *Energy Outlook 2030*, January 2012, p.28

Over the medium term, the IEA sees planned additions to refinery capacity and an increase in supplies that by-pass refineries leading to a net increase in global spare refinery capacity of 3 mb/d in the period 2011 to 2017.<sup>24</sup> As a result, global refinery utilisation rates are projected to fall to 79% by 2017, down from 81% in 2011 and an average of 83% in 2006-2008.

**3.5. Competitive pressures on OECD Refineries**

Over the long term, the major refining capacity expansions taking place in Asia and the Middle East, and the increase in supplies that by-pass refineries, places intense competitive pressures on OECD refineries. In many cases, although not in Australia, this is exacerbated by the trend towards declining liquid fuel demand.

In addition, the IEA expects many non-OECD refiners to sustain higher utilisation rates than the OECD due to both growing local demand and exports of refined products. The IEA notes that newly built plants in Asia and the Middle East are often large and highly sophisticated, and therefore generally more profitable than “older legacy assets in mature markets.”<sup>25</sup>

<sup>23</sup> BP, *Energy Outlook*, p.29

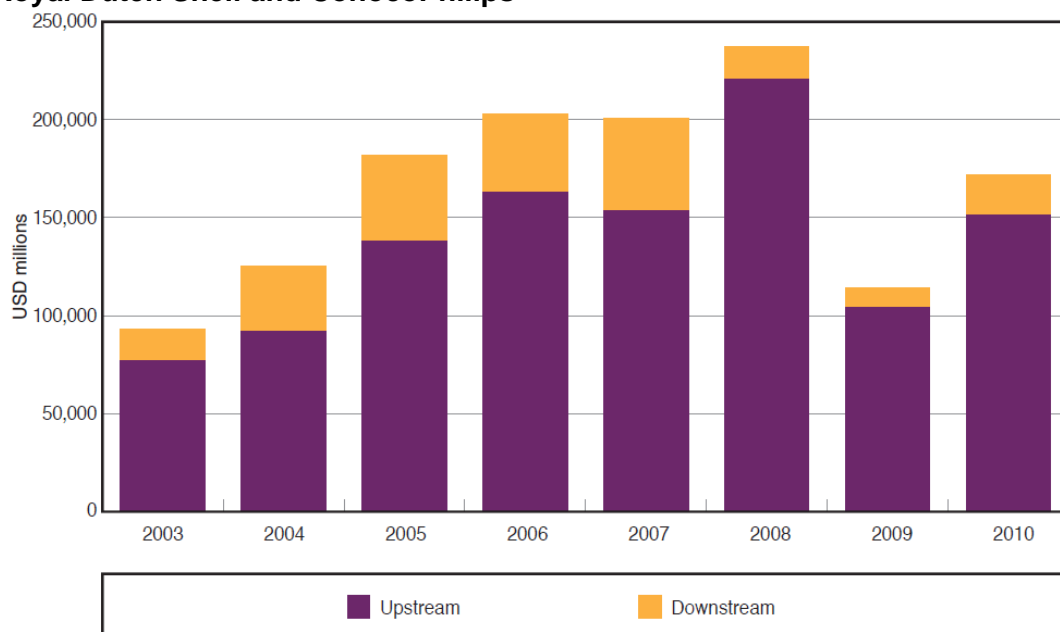
<sup>24</sup> IEA, *Medium Term Oil Market Report 2012*, p.103.

<sup>25</sup> IEA, *Medium Term Oil Market Report*, p.103.

These pressures are leading to a restructuring of the oil refining industry across the OECD. The IEA recently noted that OECD refinery rationalisation has intensified in 2012, with completed and committed shutdowns reducing capacity by 1.3 mb/d since its last update in December 2011. This means that total refinery closures now amount to 4 mb/d since the economic downturn of 2008, led by a 1.7 mb/d capacity reduction in Europe.<sup>26</sup>

Finally, major companies in the global petroleum industry are increasingly refocusing their businesses away from downstream refining-marketing activities towards their upstream businesses<sup>27</sup>. Figure 7 shows ACCC analysis of comparative earnings from upstream and downstream activities of five global integrated petroleum companies and highlights the higher returns from upstream activities.

**Figure 4– Upstream and downstream net earnings, BP, Chevron, ExxonMobil, Royal Dutch Shell and ConocoPhillips**



Source: ACCC calculations based on data from companies' annual reports

### 3.6. Competitive pressures on Australian Refineries

Australian refineries are subject to the same pressures outlined above and media statements made by both Shell and Caltex when announcing the closures of the Clyde and Kurnell refineries explicitly noted the competitive disadvantage their refineries face when compared to the modern, more efficient Asian mega-refineries.<sup>28</sup>

<sup>26</sup> IEA, *Medium-Term Oil Market Report 2012*, p.100.

<sup>27</sup> ACCC report *Monitoring of the Australian petroleum industry*, p.365, December 2011.

<sup>28</sup> See Shell Australia, 'Shell to cease refining at Clyde', media release, 27 July 2011, available at [www.shell.com.au/home/content/aus/aboutshell/media\\_centre/news\\_and\\_media\\_releases/2011/clyde\\_cease\\_refining\\_27072011.html](http://www.shell.com.au/home/content/aus/aboutshell/media_centre/news_and_media_releases/2011/clyde_cease_refining_27072011.html) and Caltex Australia, 'Caltex announces supply chain restructuring', 26 July 2012 available at <http://www.caltex.com.au/InvestorCentre/Pages/ASXAnnouncements.aspx.aspx>



Australian refineries must price their output to be competitive with the landed price of imports from the Asia-Pacific region (discussed further in Section 4.2). Profitability of the Australian refining industry is therefore largely determined by refined product prices in Asia, and viability of individual refineries depends on their competitiveness with imports from Asian refiners.<sup>29</sup>

In 2011 the ACCC noted that it is likely that refineries in Asia are able to operate at a lower cost unit than Australian refineries, imposing pressure on domestic refineries to be operationally and economically viable at the import parity price. The cost to Australian refineries of not being price competitive is the risk of being bypassed for alternative supplies of petroleum products in the region.<sup>30</sup>

Recent trends in independent imports are considered to provide an example of this. Imports by independent wholesalers increased in 2009-10 to over 10 per cent of total imports. Imports by independents then increased again in 2010-11 and, because of a fall in refiner-marketer imports in the same year (due to a lower incidence of refinery outages and unplanned shutdowns in Australian refineries), accounted for around 40 per cent of total imports.<sup>31</sup>

Caltex's recent media releases highlight some of the additional problems faced by Australian operators. A media release from 26 July 2012 announcing the closure of the Kurnell refinery noted that the competitive disadvantage Caltex's refineries experience due to their relatively small size has been exacerbated in recent times by the ongoing strength of the Australian dollar, increased operating costs and lower Caltex refiner margins.

An earlier media release from 16 December 2011 noted that a wider light-heavy crude oil price spread had also contributed to a decline in profits in 2011. As noted in Section 2.1, Australian refineries are generally set up to use predominately light-sweet crudes. Light sweet crudes traded at a higher premium in 2011 due to the loss of high quality crude from Libya. Light sweet crudes also generally trade at a premium to heavier crudes due to the lower levels of global supply for these crudes, and the fact that light-sweet crudes are typically in higher demand as they produce a higher product yield and less fuel residuum.

An emerging theme in the global refinery sector is that most new refineries are set up to be able to process heavy sour Middle Eastern crudes. For this reason, many of the so-called 'fully complex' refineries built in Asia in recent years are able to produce refined products to Australian standards from all types of crudes,<sup>32</sup> thus providing a further competitive advantage over Australian refineries.

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<sup>29</sup> Australian Institute of Petroleum, *Downstream Petroleum 2009*, p.5.

<sup>30</sup> ACCC, *Monitoring of the Australian petroleum industry*, December 2011, p.368.

<sup>31</sup> ACCC, *Monitoring of the Australian petroleum industry*, 2011, p.29 and p.368.

<sup>32</sup> ACCC, *Monitoring of the Australian petroleum industry*, 2009, p.31. Refineries are typically categorised into five broad types, ranging from 'simple' to 'highly complex', based on the type of equipment they have for extracting refined products from crudes. Australia's refineries are generally considered 'complex' refineries as they lack a coker unit that would allow them to refine the heaviest crudes.

## 4. Terms of Reference 2 – Impact of Declining Refinery Capacity in Australia on Economy

### 4.1. ToR 2(a) – effectiveness of current supply chains in meeting Australia's liquid fuel requirements

The National Energy Security Assessment (NESA) 2011 found Australia's current supply chains to be highly effective in meeting Australia's liquid fuel requirements. The liquid fuel industry has consistently performed well in meeting consumer demand with minimal disruptions to supply. The NESA concluded that this was due to continued access to well-functioning markets which have helped create robust and flexible supply chains with a high degree of diversity of supply.

Domestically produced crude oil, LPG, biofuels and refined petroleum products produced by Australian refineries are well integrated with crude oil and refined products sourced from a wide variety of international suppliers.

Highly diversified supply has combined with pro-active supply chain management by companies to mitigate the effects on reliability of short-term events such as refinery outages, shipping delays or unexpected spikes in demand.

In 2011-12, Australia's consumption of petroleum products (measured in terms of sales) was equal to 53 800 ML. In this same year, Australian refineries produced 36 192 ML of petroleum products.<sup>33</sup>

At the same time, Australia imported 21 043 ML of petroleum products (39 per cent of total annual sales ML). Key supply sources were Singapore (11 080 ML or 21 per cent of total sales), Japan (2 796 ML or 5.2 per cent of sales) and South Korea (2 597 ML or 4.8 per cent of sales).<sup>34</sup>

In 2011–12, Australia's total refinery input was 38 720.3 ML and imports of crude oil and other refinery feedstocks were 29 498.1 ML (around 76 per cent of refinery input). These imports were sourced from around 20 different countries, with no heavy reliance on one particular country or region.<sup>35</sup>

Key sources of crude oil and other refinery feedstocks included Malaysia (4 990.4 ML or 12.9 per cent of total refinery input), United Arab Emirates (4 598.6 ML or 11.9 per cent), Nigeria (3 709.3 ML or 9.6 per cent), Indonesia (3 320.1 ML or 8.6 per cent), New Zealand (2 195.3 ML or 5.7 per cent), Brunei (1 826.6 ML or 4.7 per cent), Vietnam (1 788.2 ML or 4.6 per cent), and Papua New Guinea (1 475.3 ML or 3.8 per cent). Only 4 814.6 ML or 12.4 per cent of Australia's refinery input was sourced from the Middle East.<sup>36</sup>

Australia's total petroleum imports (crude oil and refined products) have increased significantly in the last decade, rising by around 53 per cent from 33 195 ML in

<sup>33</sup> Department of Resources, Energy and Tourism, *Australian petroleum statistics*, issue no. 192, July 2012.

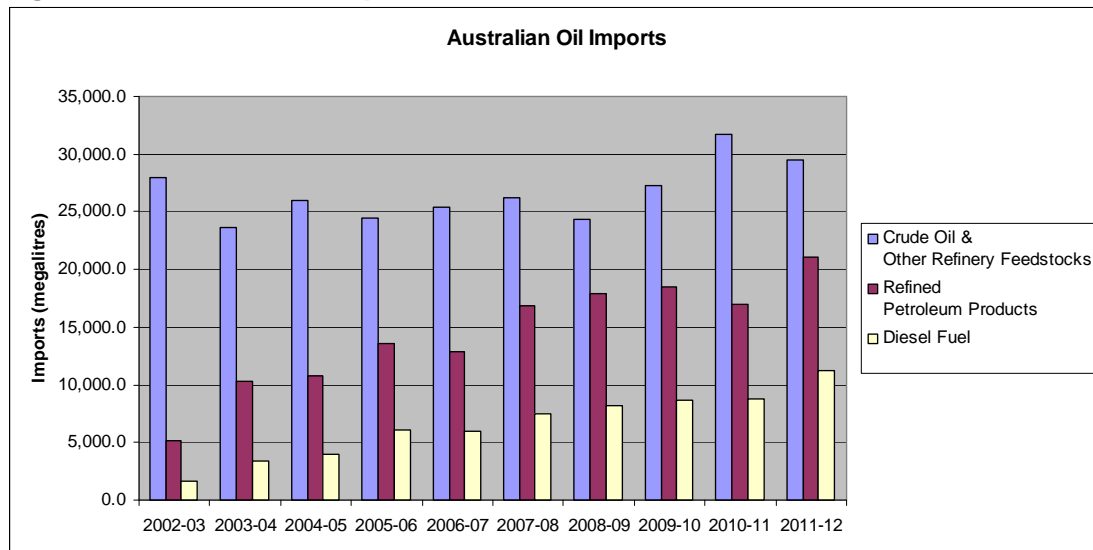
<sup>34</sup> Department of Resources, Energy and Tourism, *Australian petroleum statistics*, issue no. 192, July 2012.

<sup>35</sup> Department of Resources, Energy and Tourism, *Australian petroleum statistics*, issue no. 192, July 2012.

<sup>36</sup> Department of Resources, Energy and Tourism, *Australian petroleum statistics*, issue no. 192, July 2012.

2002–03 to 50 541.3 ML in 2011–12. As shown in Figure 4, this growth has largely been driven by growth in refined products, in particular diesel, although imports of crude oil have also risen in recent years.<sup>37</sup>

**Figure 5: Australian oil imports, 2002–03 to 2011–12**



Source: Department of Resources, Energy and Tourism, *Australian Petroleum Statistics*, Commonwealth of Australia, Canberra, June 2004 - July 2012.

The NES 2011's assessment was that this increase in imports was not having an impact on reliability of supply due to the highly diversified nature of these imports and the ability to source alternative supplies from a growing number of suppliers when required.

Consultations with industry undertaken by the Department in preparing the NES 2011, as well as analysis conducted by the ACCC,<sup>38</sup> indicate that the availability of Australian-specification unleaded petrol and diesel from regional refiners has increased in recent years. This was an improvement since the last assessment made in 2009 and adds to the resilience of Australia's liquid fuel supply chains.

The current volume of alternative transport fuels in the broader Australian transport fuel sector is approximately 5 per cent with LPG accounting for the majority. In terms of market share, approximately 16 per cent of the volume of petrol sold is ethanol blends, and biodiesel blends account for approximately 2.4 per cent of diesel sales.<sup>39</sup>

LPG consumption has remained relatively steady over the last 11 years, supported by demand side measures adopted by the Australian Government and maintenance of an effective excise-free regime for alternative transport fuels (see section 5 for discussion of changes to concessional taxation arrangements made in December 2011). The consumption of ethanol/petrol blends has increased markedly (albeit

<sup>37</sup> Department of Resources, Energy and Tourism, *Australian petroleum statistics*, Commonwealth of Australia, Canberra, June 2004 – June 2011.

<sup>38</sup> See ACCC, *Monitoring of the Australian petroleum industry: report of the ACCC into the prices, costs and profits of unleaded petrol in Australia 2010*, ACCC, Canberra, 2010, p. 66.

<sup>39</sup> Ethanol blend and biodiesel blend figures derived from *Australian Petroleum Statistics*. Biodiesel blend figure assumes the 90 ML of biodiesel supply in 2009–10 was processed into and consumed as a B20 blend.

from a lower base) since 2007 and can be largely attributed to the effective excise-free status of ethanol and the New South Wales Government ethanol mandate.<sup>40</sup>

#### **4.2. ToR 2(b) – Import price outcomes for consumers**

Crude oil and petroleum fuels are internationally traded commodities with prices determined by market forces. The Department does not anticipate that refinery closures in Australia would lead to price increases as import parity pricing is already used in the market and domestic competition influences fuel pricing. The Department notes that Caltex has announced it has entered into an arms-length, long-term agreement with Chevron for the procurement and supply of petrol, diesel and jet fuel.<sup>41</sup>

The 2012 Energy White Paper (EWP) notes that Australia's liquid fuel market has operated on the principle of import price parity since 1977. The international benchmark price is a base price for Australian suppliers and differs for petrol, diesel and LPG. The benchmarks are:

- petrol—Singapore Mogas 95 Unleaded
- diesel—Singapore Gas Oil 10 parts per million (ppm)
- LPG—Saudi Contract Prices (Saudi CP)

As these benchmarks are priced in US dollars, changes in the value of the Australian dollar also affect the domestic price of fuel. The final domestic price also includes the wholesale and retail margins and costs such as freight, wharfage and insurance.

There is generally a time lag of one to two weeks between Singapore price movements and changes in Australian wholesale prices. This is a result of Australian refineries using a delayed rolling average of Singapore prices, which tends to smooth price volatility. Saudi CP prices and automotive LPG prices in Australia also tend to increase each year during the winter months in Europe in large part because LPG is used as a heating fuel.

The Australian Government does not regulate the market price of petrol, diesel and liquefied petroleum gas LPG (autogas). However, the Office of the Petrol Commissioner (OPC) within the Australian Competition and Consumer Commission (ACCC) has been given full powers under the *Competition and Consumer Act 2010* to formally monitor and investigate petrol prices, which can include the use of information from the public.

Since December 2007, the ACCC has been directed to monitor unleaded petrol products and report to the Minister in December each year between 2007-08 and 2010-11. The annual report is titled *Monitoring of the Australian Petroleum Industry - Report of the ACCC into the prices, costs and profits of unleaded petrol in Australia*<sup>42</sup> and is available for download from the ACCC website. In 2011, the Hon David

<sup>40</sup> Commonwealth of Australia, *Strategic Framework for Alternative Transport Fuels*, December 2011, pp16, [http://www.ret.gov.au/energy/Documents/Energy-Security/transport-fuels/Strategic\\_Framework\\_for\\_Alternative\\_Transport\\_Fuels.pdf](http://www.ret.gov.au/energy/Documents/Energy-Security/transport-fuels/Strategic_Framework_for_Alternative_Transport_Fuels.pdf)

<sup>41</sup> Caltex media release, *Caltex announces supply chain restructure*, 26 July 2012, <http://www.caltex.com.au/Media%20Items/26%20July%202012%20-%20Caltex%20announces%20supply%20chain%20restructuring.pdf>

<sup>42</sup> The December 2011 ACCC report is available at <http://www.accc.gov.au/content/index.phtml/itemId/1020827>.

Bradbury MP, Assistant Treasurer, directed the ACCC to monitor the prices, costs and profits of unleaded petrol products for one year and report to him by 17 December 2012.

ACCC analysis confirms that the international benchmark price is the largest component of domestic petrol, diesel and automotive LPG prices; that Australian fuel prices are primarily determined by the international price of refined petrol (which itself is driven by the price of crude oil) and the AUD—USD exchange rate. The 2011 report also notes that in the June quarter of 2011, Australian retail prices were the fourth lowest in the OECD region.<sup>43</sup>

#### **4.3. ToR 2(c) – Direct and indirect employment impacts**

Approximately 5,500 people were employed in the Petroleum Refining and Petroleum Fuel Manufacturing sector in 2011. This was an increase of 240 workers between 2006 and 2011 (an increase of 4.6 per cent). The majority of employment is clustered around capital city port areas (see Table 4).<sup>44</sup>

**Table 4: Main Petroleum Refining and Petroleum Fuel Manufacturing locations, 2011**

<b>Local Government Area (LGA)</b>	<b>State</b>	<b>Number employed</b>	<b>Region's share of employment (%)</b>
Brisbane (C)	Qld	1090	19.7
Greater Geelong (C)	Vic	680	12.3
Sutherland Shire (A)	NSW	520	9.5
Kwinana (T)	WA	490	8.9
Hobsons Bay (C)	Vic	350	6.3
Parramatta (C)	NSW	310	5.7
Sydney (C)	NSW	260	4.7
Greater Dandenong (C)	Vic	110	1.9
Knox (C)	Vic	80	1.4
Melbourne (C)	Vic	70	1.2
All other LGAs	-	1560	28.3
<b>Total all LGAs</b>	-	<b>5500</b>	<b>100.0</b>

The largest occupation groups in the Petroleum Refining and Petroleum Fuel Manufacturing sector in 2011 were higher skilled occupations, namely Technicians and Trades Workers (2100 or 39 per cent), Professionals (1100 or 19 per cent) and Managers (800 or 15 per cent). Table 5 lists the most common individual occupations in this sector in 2011.<sup>45</sup>

<sup>43</sup> ACCC, *Monitoring of the Australian Petroleum Industry – Report of the ACCC into the prices, costs and profits of unleaded petrol in Australia*, 2011, pp xix-xliii.

<sup>44</sup> Australian Bureau of Statistics, *2011 Census of Population and Housing, Place of Work*.

<sup>45</sup> Australian Bureau of Statistics, *2011 Census of Population and Housing, Place of Work*.

**Table 5: Main employing occupations in the Petroleum Refining and Petroleum Fuel Manufacturing sector, 2011**

Occupation	Number employed	Employment share of occupation (%)
Chemical, Gas, Petroleum and Power Generation Plant Operators	1100	20.0%
Metal Fitters and Machinists	310	5.5%
Production Managers	180	3.2%
Industrial, Mechanical and Production Engineers	130	2.3%
Other Building and Engineering Technicians	120	2.1%
Electricians	110	1.9%
Mining Engineers	100	1.7%
Structural Steel Construction Workers	100	1.7%
Chemists, and Food and Wine Scientists	90	1.7%
Engineering Professionals (not further defined)	90	1.6%

Further information on the profile of Australia's oil refining industry is provided at Section 6.

The Department notes the following public announcements made in reference to the potential reduction in employees at the Clyde and Kurnell refineries.

#### *Clyde refinery*

On 7 June 2012, Shell announced that *“around 30 employees impacted by this decision have found other jobs, including a number who have been redeployed to Shell's Prelude floating liquefied natural gas project”*.<sup>46</sup>

On 27 June 2012, Shell advised Greenwich community members that *“staffing will be reduced from around 270 to approximately 50 employees”*.<sup>47</sup>

#### *Kurnell refinery*

On 26 July 2012, Caltex announced it anticipated that the number of employee positions at Kurnell would reduce *“from around 430 to less than 100”* following the completion of its supply chain restructure.<sup>48</sup>

<sup>46</sup> Shell media release, *Date of Clyde Conversion Confirmed*, 7 June 2012, [http://www.shell.com.au/home/content/aus/aboutshell/media\\_centre/news\\_and\\_media\\_releases/2012/date\\_for\\_clyde\\_conversion\\_07062012.html](http://www.shell.com.au/home/content/aus/aboutshell/media_centre/news_and_media_releases/2012/date_for_clyde_conversion_07062012.html)

<sup>47</sup> Shell-Gore Bay Community Liaison Group, *Minutes of meeting 27 June 2012*, [http://www-static.shell.com/static/aus/downloads/clyde/gore\\_bay\\_comm\\_liaison\\_grp\\_mins\\_27\\_june\\_2012.pdf](http://www-static.shell.com/static/aus/downloads/clyde/gore_bay_comm_liaison_grp_mins_27_june_2012.pdf)

*Australian Government support for affected workers*

The Australian Government will conduct a Jobs Market to support workers at risk of being made redundant as a result of the planned closure of Caltex's refinery in Kurnell, New South Wales. The Jobs Market in Kurnell will bring jobs seekers together with employers, training, educational organisations and other local service providers to discuss job opportunities in the region.<sup>49</sup>

The Australian Government also runs the Australian JobSearch website which assists job seekers to look for work in their local area or according to their particular skills or occupation. Redundant workers can visit the JobSearch website directly to look for work.

There is also a new Resources Sector Jobs Board, funded by the Government, to help job seekers find employment opportunities in that sector. A wide range of job opportunities are available for Australians in that sector, from trades and transport to safety, administration and financial services. The Resources Sector Jobs Board website makes it easier for people to find current and expected resource sector job vacancies.

Any workers who are made redundant are eligible for employment support with a Job Services Australia provider based on their level of need and personal circumstances. This employment support is tailored to the needs and circumstances of each individual and can include help with résumé preparation, job applications, interview skills and career advice. In addition to this support, any redundant workers aged 45 years and over have access to free, professional career counselling through the Experience+ Career Advice service. Career Advisers can help mature age workers make informed decisions about their future career and become more confident to achieve their workforce goals and prepare a plan of action to help them find a job.

Redundant workers who are worried about their finances can contact Centrelink who can provide free, unbiased financial information about their redundancy package and Government assistance. Centrelink have Financial Information Services Officers who can talk to workers about managing their finances after redundancy. Centrelink will also assess workers' eligibility for income support which may depend on their individual circumstances, including income and assets.

In order to ensure that Australian workers are able to maintain relevant skills that allow them to keep pace with the changing nature of Australia's workforce, the *Australian Government Skills Connect* initiative helps industry to access funding for its current and future skills needs and ensures that training is driven by the workforce development needs of business.

The Australian Government is also investing over \$3 billion in skills and training initiatives to assist job seekers into work under the Building Australia's Future Workforce package. This package includes a range of measures to provide a new approach to delivering the skilled workers the economy needs and ensuring more Australians have the opportunity to share in the nation's prosperity.

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<sup>48</sup> Caltex media release, *Caltex announces supply chain restructure*, 26 July 2012, <http://www.caltex.com.au/Media%20Items/26%20July%202012%20-%20Caltex%20announces%20supply%20chain%20restructuring.pdf>

<sup>49</sup> Australian Government, *Mid-Year Economic and Fiscal Outlook 2012-13*, [http://www.budget.gov.au/2012-13/content/myefo/html/09\\_appendix\\_a\\_expense-06.htm](http://www.budget.gov.au/2012-13/content/myefo/html/09_appendix_a_expense-06.htm)

#### **4.4. ToR 2(d) – impact of refinery closures on downstream activities**

The orderly closure of refineries is not expected to have a major impact on wholesale and retail supply activities downstream of the refinery. As discussed in sections 4.1, 4.2, and section 5 below, refinery closures are not expected to have an impact on the price of fuel and alternative supplies are readily available from the international market.

##### *Jet fuel*

Prior to its use, jet fuel is tested and certified to ensure it meets specification. The Department understands that from time-to-time jet fuel can be 'on-spec' when it is loaded for export to Australia but upon arrival to Australia it is 'off-spec'; and jet fuel quality changes can also occur during pipeline transfers.<sup>50</sup> The Department further understands that the industry has a number of options to return the fuel to 'on-spec' condition including batching (blending) with 'on-spec' jet fuel in storage tanks at the Joint User Hydrant Installation (JUHI) facilities at the airport, adding Static Dissipator Additive, sourcing alternative supplies and reprocessing the jet fuel at a local refinery as appropriate.

##### *Petrochemical Industry*

Petroleum refiners supply various key raw material inputs to ethylene, propylene and other organic industrial chemical manufacturers.

The chemical and plastics sector is part of a complex, interlinked supply chain. Basic Chemical Manufacturing consumes only 3.1 per cent (\$980 million) of the Petroleum and Coal Product Manufacturing<sup>51</sup>; however that share represents a significant input into the chemicals and plastics industry.

Approximately 80 per cent of all outputs from the chemicals and plastics industry currently become inputs to other industry sectors in the economy. Manufacturing is the biggest user of inputs from the chemicals and plastics industry, using 39 per cent of chemicals and plastics production as intermediate inputs in 2007-2008.<sup>52</sup>

Historically, petrochemicals have been an industry where the importation of chemicals and intermediate products such as polypropylene beads is less competitive, due to the cost of shipping low-density product. A range of organic industrial chemicals are also used as chemical inputs into other chemical manufacturing processes, which makes identifying the indirect impact of a refinery's closure difficult to map or assess in a precise way.

The petrochemical industry tends to locate itself next to its feedstocks due to the complications associated with the transport of the feedstock gases. For this reason, historically, petrochemical processing has co-located with refineries to supply domestic markets.

<sup>50</sup> Sydney Jet Fuel Infrastructure Working Group, *Infrastructure for the provision of jet fuel at Sydney Airport for the period to 2029*, 30 April 2010.

<sup>51</sup> ABS Catalogue No. 5209.0.55.001 Input Output Tables 2008-09: Table 8 - Industry by Industry Flow Table

<sup>52</sup> Australian National Accounts: Input-Output Tables, 2008-09. Catalogue Number 5209.0.55.001. Canberra: Australian Bureau of Statistics.



The Department is aware that, LyondellBasell, a polypropylene manufacturer, has operations co-located at Shell's Geelong Refinery in Victoria and Shell's Clyde Refinery in New South Wales.<sup>53</sup> The Department understands that LyondellBassell's Clyde operation sources refinery grade propylene feedstock from the Clyde refinery, the Kurnell refinery and other sources.

Oil refinery closures in Australia are therefore likely to have flow on effects on downstream manufacturing activity through reduced availability of feedstock for the chemicals and plastics industry. While many of the final products could be imported, and some inputs could be replaced with imports, there are likely to be adjustment pressures on the chemicals industry.

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<sup>53</sup> <http://www.lyondellbasell.com>

## 5. Terms of Reference 3 – Issues for Australia’s Energy Security

The Australian Government’s Energy White Paper (EWP) 2012 outlined key principles of Australia’s energy security policy framework, namely that:

- energy security is best delivered through well-functioning markets supported by established and diversified supply chains;
- Australia’s energy resource base underpins our energy security, but access to global energy markets, such as open and well-functioning global oil markets, is also critical; and
- self-sufficiency as an energy policy goal is costly and likely to be misplaced, given the proven ability of international markets to respond to changing circumstances.<sup>54</sup>

The EWP’s overall assessment of liquid fuel security was based on the NESAs 2011. The NESAs concluded that Australia’s liquid fuel security was high in the short to medium term, trending to moderate<sup>55</sup> in the long term, as Australia has continued access to adequate and reliable supplies of liquid fuels at prices that are manageable within the broader economy. The long-term moderate assessment recognised that Australia’s rising imports of petroleum products will lead to greater reliance on international supply chains and a consequent need for investment in import and storage infrastructure.

The assessment also recognised a likely trend of continued high crude oil prices driven by increasing global demand and greater reliance on more expensive sources of supply, the significant global investment challenge in meeting rising demand, and continued risks of geopolitical uncertainty in key oil-producing countries.

### *Refinery closures and Australia’s energy security*

The EWP concluded that the decline in Australia’s domestic refining capacity (following announcements of the Clyde and Kurnell refinery closures) is not considered to impair the Government’s assessment of Australia’s liquid fuel security. The closures will occur over a phased period, and will be complemented by an expansion of import terminal capacity to ensure that market supply is maintained. Substituting imports of crude oil for imports of refined fuel at this scale does not pose any additional risk to market security.<sup>56</sup>

Furthermore, the NESAs 2011 assessed adequacy and reliability of Australia’s liquid fuel supply as high over the medium term despite the risk of further rationalisation in the Australian refining industry. This was due to the significant surplus in regional refining capacity expected over the medium term. While this excess capacity places competitive pressures on Australian refineries, it also provides substantial supply alternatives for Australia, as well as acting as a buffer against unexpected demand or supply shocks.

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<sup>54</sup> Australian Government, *Energy White Paper*, p.48.

<sup>55</sup> ‘High energy security’ is defined as meeting Australia’s economic and social needs. ‘Moderate energy security’ means that needs are being met but that there could be a number of emerging issues that will need to be addressed to maintain that level of security. ‘Low energy security’ means that needs are not being, or might not be, met.

<sup>56</sup> Australian Government, *Energy White Paper*, p.50.

The excess regional refining capacity outlook has not changed substantially since the release of the NESAs 2011. As discussed in section 3.3, the International Energy Agency's medium term outlook sees global refinery capacity expansions outpacing growth in demand for refined products over the period to 2017.

A recent report commissioned by the Department tested supply capacity in the region under two hypothetical refinery rationalisation scenarios in Australia and considered the following key questions:

- What is the likely outlook for refining in the Asia Pacific region and for the availability of Australian quality refined product;
- What are the likely structural changes to Australian import/export supply chains for refined products; and
- What is the nature of any potential energy security impacts.

The methodology for this analysis included modelling Australian supply chains and the impact of hypothetical structural changes to refining on supply based on forecasts of global refining and fuel supply and consultation with the Australian refiner-marketers.

In relation to issues of regional capacity, supply chain reliability and supply contingency the report found that:

- Refinery closures in Australia would have no significant impact on the wider Asian system as higher demand in Australia and the region for diesel and jet fuel in particular is easily absorbed within spare capacity. While the petrol market is more fractured, the Asian system would adjust to meet additional demand from an orderly refinery closure.
- Australian supply chains would adjust to new sources and commercial trading strategies. No new choke points are anticipated as most product imports will come from similar regions as the crude it replaces; however adequate import infrastructure remains a watch point. It is likely that any closed refinery would be converted to an import terminal to ensure the market remains well supplied. While overall stock holding falls, crude oil feedstock is replaced by more valuable finished products.
- Supply chain diversity and flexibility is retained which provides continued security of supply. Only in the unlikely scenario of no refining sector in Australia coupled with a failure of physical oil markets does Australia lose the flexibility to redirect and refine some crude oil.<sup>57</sup>

#### *Support for alternative transport fuels*

The NESAs 2011 found that, in general, supplies of alternative fuels are likely to increase to the extent that they become commercially competitive. Over the medium term, there is not expected to be a significant change in the fuel mix, as the advanced technologies and infrastructure required for alternative transport fuels are unlikely to be readily available at competitive prices. However, advanced alternative fuel and technology options, including electric vehicles, are emerging and are likely to have an increasing role over the long term.

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<sup>57</sup> See Hale and Twomey, *National Energy Security Assessment (NESAs) Identified Issues: Competitive Pressures on Domestic Refining*, 29 June 2012 available online at [http://www.ret.gov.au/energy/energy\\_security/national\\_energy\\_security\\_assessment/Pages/NationalEnergySecurityAssessment.aspx](http://www.ret.gov.au/energy/energy_security/national_energy_security_assessment/Pages/NationalEnergySecurityAssessment.aspx).

The Australian Government supports the development of alternative transport fuels. However, the Australian Government does not support the use of mandates for alternative fuels as it may reduce energy security where there is lack of adequate supply sources.<sup>58</sup>

The Government released its *Strategic Framework for Alternative Transport Fuels* in December 2011. The Framework establishes a long term strategic policy approach for the market-led development of alternative transport fuels in the context of maintaining Australia's transport fuel security while moving toward a lower carbon economy by 2030.

The focus of the Framework is on removing barriers to the uptake of alternative transport fuels through actions by government, industry and other stakeholders. The Framework includes 20 actions that are grouped under the themes of Leadership and Certainty; Research, Development and Demonstration; Commercialisation; and Information and Verification. An implementation advisory group has been established to assist in progressing these issues under the Framework.

Alternative transport fuels also enjoy concessional taxation treatment. On 1 December 2011, new taxation rates for gaseous fuels (LPG, LNG and CNG) took effect. Table 6 illustrates the new taxation rates which reflect the five-step process for introducing gaseous fuels into the taxation regime and the Australian Government's decision to maintain a 10-year moratorium on the current taxation and grant arrangements for ethanol, biodiesel, renewable diesel and methanol.

**Table 6: Alternative transport fuels excise and excise-equivalent customs duty rates from 1 December 2011**

Fuel type	From 1 Dec 2011	From 1 Jul 2012	From 1 Jul 2013	From 1 Jul 2014	From 1 Jul 2015 (final rate)
LPG cents per litre (cpl)	2.5	5.0	7.5	10.0	12.5
LNG cents per kilogram (c/kg)	5.22	10.45	15.67	20.9	26.13
CNG c/kg	5.22	10.45	15.67	20.9	26.13
Ethanol cpl <sup>59</sup>	38.143	38.143	38.143	38.143	38.143
Biodiesel cpl <sup>60</sup>	38.143	38.143	38.143	38.143	38.143

Under the Ethanol Production Grants (EPG) Program, grants of 38.143 cents per litre are provided for domestic production of ethanol. The Australian Government has provided \$590 million via the EPG Program to five ethanol producers in Australia since the introduction of the program in September 2002. During this period over 1.5 billion litres of ethanol has been produced and supplied for use as transport fuel in Australia. Almost all of this ethanol has been sold as E10 (up to 10% ethanol and the rest petrol) by service stations to Australian motorists.

<sup>58</sup> Australian Government, *Energy White Paper*, p.50

<sup>59</sup> Domestic ethanol producers will continue to receive grants of 38.143cpl under the Ethanol Production Grants program. These grants are subject to compatibility with the relevant program's eligibility criteria and will continue until at least 30 June 2021.

<sup>60</sup> Domestic producers and importers of biodiesel will continue to receive grants of 38.143cpl under the Energy Grants (Cleaner Fuels) Scheme. These grants are subject to compatibility with the relevant program's eligibility criteria.

The following amounts are allocated to the EPG Program over the forward estimates: \$170.5 million in 2012-13; \$173.6 million in 2013-14; \$200.3 million in 2014-15 and 2015-16.<sup>61</sup>

The Energy Grants (Cleaner Fuels) Scheme (managed by the Australian Taxation Office) provides 38.143 cents per litre grants for the domestic production and import of biodiesel and renewable diesel.

The taxation arrangements for gaseous fuels will be reviewed after 1 July 2015. The taxation arrangements for ethanol, biodiesel, renewable diesel and methanol are subject to review after 30 June 2021. The Productivity Commission also intends to conduct a review of fuel excise arrangements, including an examination of the merits of a regime based explicitly and precisely on the carbon and energy content of fuels.

In addition, the Australian Government provides support for alternative transport fuels through other grant programs including the Advanced Biofuels Investment Readiness (ABIR) Program and the Emerging Renewables Program.

A \$5 million foundation grant was provided to James Cook University under the \$20 million ABIR Program to support research, development and demonstration of biofuels from macroalgal feedstock. The Australian Renewable Energy Agency continues to assess applications for the remaining ABIR funding and may choose to provide a total funding envelope that is greater than the \$15 million originally allocated to the ABIR program, should there be a high number of meritorious projects.<sup>62</sup>

In April 2012, QANTAS received \$500,000 under the Emerging Renewables Program to help fund a study into the sustainable production and commercialisation of aviation biofuels in Australia.<sup>63</sup>

### *Storage capacity*

Bulk fuel terminals for refined products are located throughout Australia, servicing geographical regions where the demand for fuel is concentrated. In 2011, the ACCC observed that while the majority of import terminals are owned and operated by the four oil majors, there is a trend of increasing independent terminal ownership and operation<sup>64</sup>.

On 24 August 2009, the Minister for Resources and Energy released the Department's review of petroleum terminals suitable for importing crude oil and refined petroleum products into Australia<sup>65</sup>.

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<sup>61</sup> Department of Resources, Energy and Tourism, *RET Portfolio Budget Statements 2012-13*, <http://www.ret.gov.au/Department/Documents/budget/12-13/Portfolio-Budget-Statements-2012.pdf>

<sup>62</sup> Australian Renewable Energy Agency, <http://www.arena.gov.au/programs/initiatives/abir-support.html>.

<sup>63</sup> Minister for Resources and Energy media release, *QANTAS Receives Grant to Help Biofuels Take Off*, 13 April 2012, <http://minister.ret.gov.au/MediaCentre/MediaReleases/Pages/QantasReceivesGrantBiofuels.aspx>

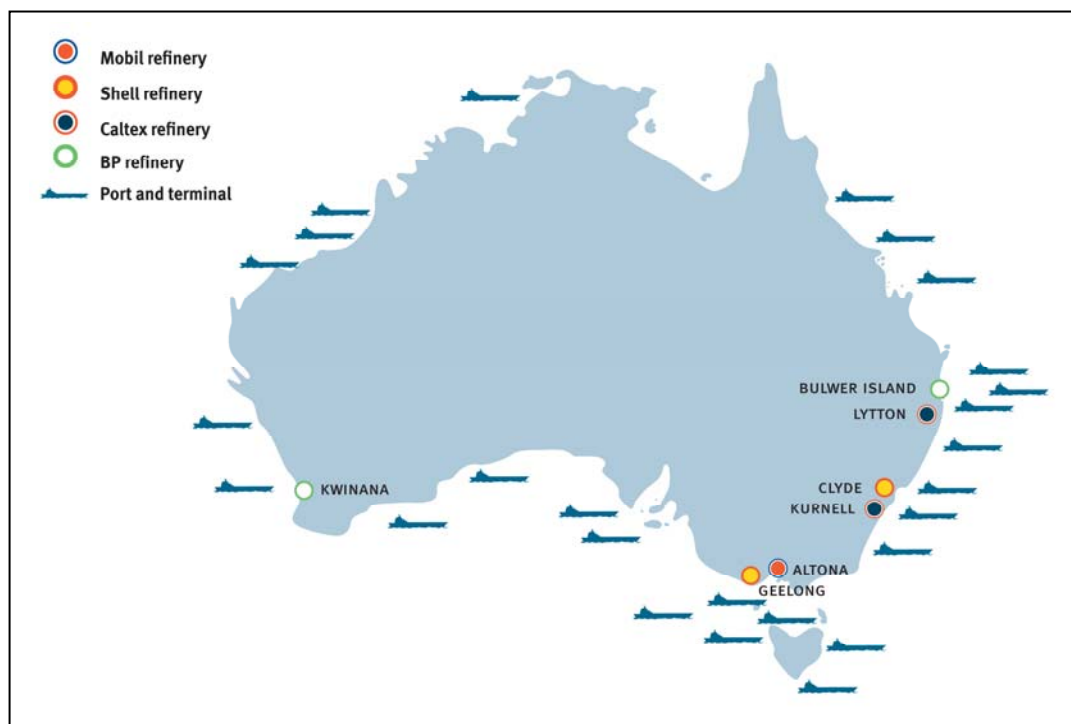
<sup>64</sup> ACCC, *Monitoring of the Australian Petroleum Industry – Report of the ACCC into the prices, costs and profits of unleaded petrol in Australia*, 2011

<sup>65</sup> [http://www.ret.gov.au/energy/energy\\_security/fuels/conventional/petrol-refining/import/Pages/review.aspx](http://www.ret.gov.au/energy/energy_security/fuels/conventional/petrol-refining/import/Pages/review.aspx)

The 2012 Energy White Paper notes that Australia's storage capacity at refineries and import terminals was reported as 6693 ML in August 2009 and since that time, an additional 588 ML of storage at terminals has become operational or is under construction. The Australian Government also committed to assessing Australia's liquid fuel vulnerabilities as part of the National Energy Security Assessment process – this will include consideration of import and refining infrastructure and critical supply linkages<sup>66</sup>.

In addition to the port facilities at the seven refineries, Australia has 64 refined product import terminals. Of those, 11 are major deepwater ports. Figure 6 provides an indicative location of Australian petroleum import ports.

**Figure 6: Key liquid fuel infrastructure in Australia**



Source: Australian Institute of Petroleum, *Downstream Petroleum 2011*, p.4.

Caltex<sup>67</sup> and Shell<sup>68</sup> have indicated that total storage capacity at Kurnell and Clyde will decrease – however, the capacity of finished product storage on site will increase in comparison to pre-closure levels as crude oil and other feedstocks tanks will be converted to finished product tanks. In Sydney, VOPAK owns and operates a terminal in Port Botany which has access to the Sydney Ports bulk liquids berth and a jet fuel pipeline to Sydney Airport.

<sup>66</sup> Australian Government, *Energy White Paper 2012 – Australia's Energy Transformation*, [http://www.ret.gov.au/energy/Documents/ewp/2012/Energy\\_%20White\\_Paper\\_2012.pdf](http://www.ret.gov.au/energy/Documents/ewp/2012/Energy_%20White_Paper_2012.pdf).

<sup>67</sup> Caltex fact sheet, *Information for the community about the proposed conversion of the refinery into a fuel import terminal*, [http://www.caltex.com.au/Media%20Items/Community\\_Information\\_October\\_2012.pdf](http://www.caltex.com.au/Media%20Items/Community_Information_October_2012.pdf)

<sup>68</sup> Shell fact sheet, *Clyde Refinery Terminal Conversion Project*, [http://www-static.shell.com/static/aus/downloads/clyde/shell\\_clyde\\_factsheet\\_sept-12.pdf](http://www-static.shell.com/static/aus/downloads/clyde/shell_clyde_factsheet_sept-12.pdf)

## 6. Terms of Reference 4 – Impact of Refinery Closures on Associated Workforce

As noted in Section 4.3, approximately 5500 people<sup>69</sup> were employed in the Petroleum Refining and Petroleum Fuel Manufacturing sector at the time of the 2011 Census. This represents a moderate increase of 4.6 per cent (or 240 workers) since 2006, considerably lower than the increase of 10.5 per cent for total employment over this period. A large proportion of workers in the sector are employed in higher skilled occupational groups, such as Technicians and Trades Workers (2100 or 39 per cent), Professionals (1100 or 19 per cent) and Managers (800 or 15 per cent).<sup>70</sup>

The Local Government Areas (LGAs) of Parramatta and Sutherland Shire account for approximately 15 per cent of employment in the sector, at 310 and 520 workers respectively. Among these workers, by far the most common individual occupation is Chemical, Gas, Petroleum and Power Generation Plant Operators (see Table 7).

**Table 7: Main employing occupations in the Petroleum Refining and Petroleum Fuel Manufacturing sector, Parramatta and Sutherland Shire Local Government Areas, 2011**<sup>71</sup>

Occupation	Parramatta LGA	Sutherland Shire LGA
Chemical, Gas, Petroleum and Power Generation Plant Operators	85	180
Metal Fitters and Machinists	20	35
Industrial, Mechanical and Production Engineers	10	20
Production Managers	10	20
Total, all occupations in sector	310	520

### *Age profile*

Nationally, Petroleum Refining and Petroleum Fuel Manufacturing workers have an older age profile compared to the total workforce. More than one in three workers (34.6 per cent) in the sector were aged 50 or over at the time of the 2011 Census, compared with 28.4 per cent for all workers.

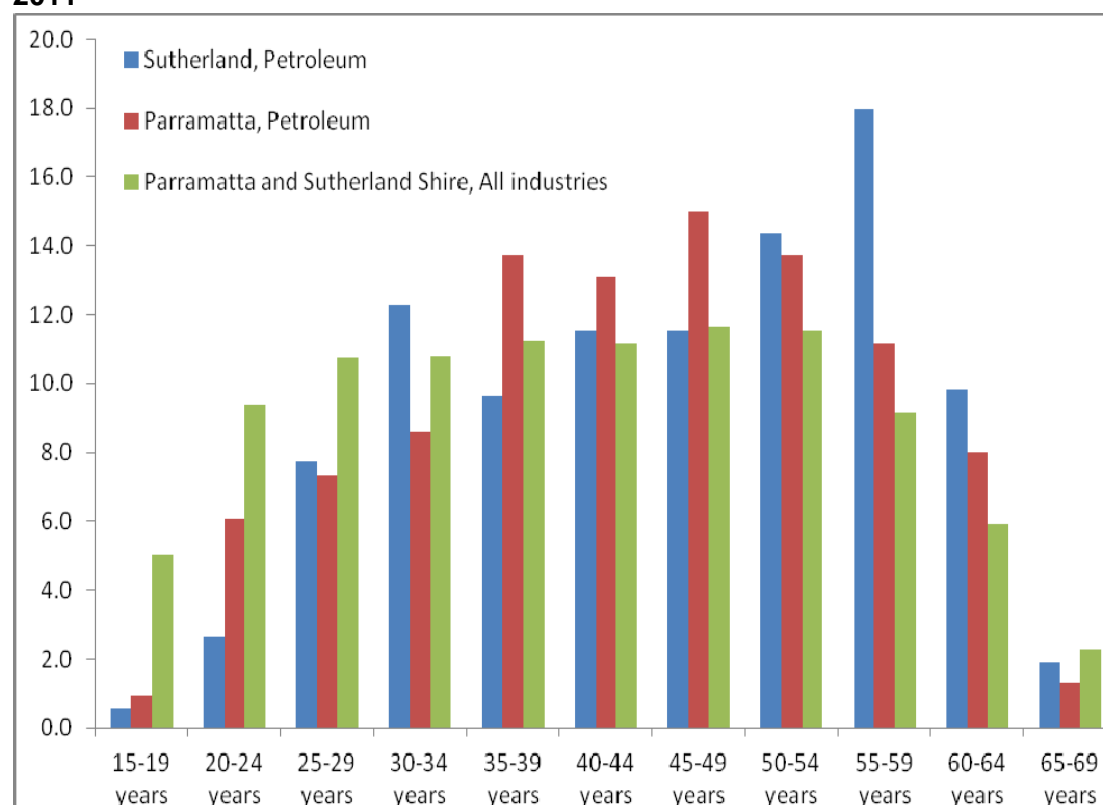
This older age profile in the sector is reflected in both Sutherland Shire and Parramatta (see Figure 6). A very large proportion of workers in the sector in the Sutherland Shire was aged 50 or over at the time of the Census (44.0 per cent), compared with Parramatta (35.1 per cent).

<sup>69</sup> Census data may understate the true number of people employed in the sector, as some people did not provide a response to the labour force status question and some people did not provide a codeable response to the industry of employer question.

<sup>70</sup> In calculating percentages, the categories of 'not stated' and 'inadequately described' have been excluded from the denominator.

<sup>71</sup> Australian Bureau of Statistics, *2011 Census of Population and Housing, Place of Work*

**Figure 7: Employment share by age group (%) —Petroleum Refining and Petroleum Fuel Manufacturing sector, Parramatta and Sutherland Shire LGAs, 2011<sup>72</sup>**



#### *Alternative employment opportunities*

Workers displaced by refinery closures will have varying job prospects, depending on their skills and abilities, and depending on their willingness to seek work in other sectors, occupations or locations. Some workers with highly specialised skills may need to undergo retraining in order to take advantage of available job opportunities.

Workers employed in the sector's largest occupation of Chemical, Gas, Petroleum and Power Generation Plant Operators may find opportunities in other sectors, such as Oil & Gas Extraction, which employs a larger share of workers in this occupation nationally than the Petroleum Refining and Petroleum Fuel Manufacturing sector (14.3 per cent compared with 13.0), and in which labour demand is currently strong. However, based on the location of these jobs at the time of the 2011 Census, almost all jobs as Chemical, Gas, Petroleum and Power Generation Plant Operators in the Oil & Gas Extraction sector would require relocation from Sydney. The occupation is relatively small, employing only around 8600 workers nationally, suggesting that opportunities may be relatively few.

Metal Fitters and Machinists is a large occupation, employing almost 87,000 workers nationally. Workers are employed across a wide range of industry sectors, with only 0.4 per cent of them employed in Petroleum Refining and Petroleum Fuel Manufacturing. Relatively large numbers of workers in this occupation are employed in the growth sectors of mining, metal manufacturing, and heavy and civil engineering

<sup>72</sup> Australian Bureau of Statistics, *2011 Census of Population and Housing, Place of Work data for Local Government Areas*.



construction, which suggests that their prospects for employment are likely to be good.

Almost 19,000 workers are employed as Industrial, Mechanical and Production Engineers across all sectors nationally. The largest number employing sector is Engineering Design and Consulting Services (employing 21.2 per cent of Industrial, Mechanical and Production Engineers nationally and 17.6 per cent in Sydney), and with only 0.7 per cent of workers in the occupation employed in Petroleum Refining and Petroleum Fuel Manufacturing. This suggests their prospects for employment are likely to be good, and may not require relocation from Sydney.

Almost 48,000 workers are employed as Production Managers across all sectors nationally, and employment is heavily concentrated in Manufacturing (64.0 per cent), with a much smaller proportion in Mining (10.9 per cent). While demand for Mining production managers is currently strong, it is a specialist occupation, meaning that the skills of Manufacturing production managers are not readily transferable. In addition, almost all Mining production manager jobs would require relocation from Sydney. Production Managers displaced by refinery closures may find opportunities, however, in growth sectors of Manufacturing (such as metal product manufacturing or food product manufacturing).

#### *Recent job vacancies in Sydney*

The Department of Education, Employment and Workplace Relations (DEEWR) compiles statistics on the number of newly lodged vacancies on the four major online job boards (SEEK, MyCareer, CareerOne and Australian Jobsearch) which have been advertised over the course of each month. In September 2012, there were 50,670 vacancies advertised in Sydney, representing a quarter of all online vacancies advertised nationally. In line with softer labour market conditions, online vacancies in Sydney have declined over the year to September, by 9790 or 16.2 per cent, slightly lower than the national decline of 18.2 per cent.<sup>73</sup>

**Table 8** below shows the number of vacancies (across all industries) advertised online in Sydney for the largest employing occupations in the Petroleum Refining and Petroleum Fuel Manufacturing sector. For all the three occupations for which data were available, the number of vacancies has declined over the past year.

Labour market conditions in the local government areas (LGAs) surrounding the Clyde and Kurnell refineries have been generally steady over the past year. In the LGA of Parramatta, covering Clyde, the unemployment rate remained unchanged at 4.9 per cent over the year to June 2012, slightly below the comparable rate for New South Wales and Australia. Labour market conditions in the LGA of the Sutherland Shire, covering the suburb of Kurnell, appear to have improved over the same period, with the unemployment rate declining by 0.2 percentage points to stand at 2.8 per cent, well below the comparable rates for New South Wales and Australia.<sup>74</sup>

<sup>73</sup> Department of Education, Employment and Workplace Relations, *Vacancy Report*, October 2012

<sup>74</sup> Department of Education, Employment and Workplace Relations, *Small Area Labour Markets Publication*, June quarter 2012, smoothed estimates

Table 8: Online vacancies<sup>75</sup>

Occupation	Sydney			Regions with largest no. of vacancies
	September 2011 (no.)	September 2012 (no.)	Yearly change (%)	
Chemical, Gas, Petroleum and Power Generation Plant Operators* <sup>76</sup>	-	-	-	-
Metal Fitters and Machinists	280	202	-27.9%	Pilbara & Kimberley (369) Perth (328)
Industrial, Mechanical and Production Engineers	251	213	-15.3%	Perth (487) Brisbane (306)
Production Managers	239	195	-18.4%	Perth (202) Sydney (195)
Total, all occupations	60,470	50,670	-16.2%	

<sup>75</sup> Department of Education, Employment and Workplace Relations, internet vacancy statistics.

<sup>76</sup> The number of online vacancies for this occupation in Sydney was too low to be reliable. This occupation is relatively small (employing only around 8600 workers), and there were only 49 vacancies advertised nationally for this occupation in September 2012.