Petroleum import infrastructure in Australia

Executive Summary

Prepared for the Department of Resources, Energy and Tourism

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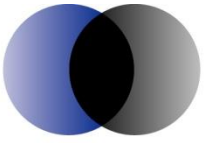

ACIL Tasman

Economics Policy Strategy

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Contents

List of figures

List of tables

1 Introduction

1.1 Terms of reference

This report was commissioned by the Department of Resources, Energy and Tourism to address the outlook for supply and demand for imported crude oil and petroleum product and the capacity of Australia's existing import infrastructure to meet foreshadowed petroleum import requirements. The adequacy of existing and planned infrastructure is to be assessed and any barriers to competition and efficient investment identified.

1.2 Background

Despite relatively high levels of domestic oil production in the past, imports of crude oil and refined petroleum products have always played an important role in supplying the Australian demand for liquid petroleum fuels.

Imports of crude oil increased gradually over the past twenty years as production from Australia's producing fields in the east declined, peaking at around 30,000 ML per annum in 1998-99. Australia's imports of petroleum products were less than 5,000 ML per annum until 2002-03, when they increased to around 10,000 ML per annum following the mothballing of Mobil's Port Stanvac Refinery. Imports were around 19,000 ML per annum by 2007-08 and are expected to continue to rise as demand for petroleum products grows.

A number of policy issues have emerged concerning levels of competition in the Australian petroleum products market and the adequacy of infrastructure as imports of petroleum products increase.

The Australian Competition and Consumer Commission (ACCC) report *Petrol Prices and Australian Consumers*, released in December 2007, discussed the role of independent importers as competitors in the Australian petroleum products market. In its report the ACCC concluded that the four domestic refiner marketers were able to dominate the market (ACCC, 2007).

The report noted that the most significant competitive threat to domestic refiner marketers would be large scale importing of petrol by a reseller or independent retailer. The ACCC recommended that:

- a comprehensive audit of terminals suitable for importing refined petrol in Australia. The audit should cover current and future terminal capacity, current and future use of terminal capacity, as well as terminal leasing and sharing arrangements.

- following the audit, there be on-going monitoring of the use, leasing and sharing of terminals suitable for importing refined petrol into Australia.

In April 2008, the Government announced its support for the ACCC's recommendations for a comprehensive audit of terminals and subsequently announced the Department of Resources, Energy and Tourism would manage the audit.

The ACCC released a further report on petrol prices in December 2008 which, among other things, discussed the level of import competition in the Australian market (ACCC, 2008). In this report the ACCC noted

> The refiner–marketers accounted for about 93 per cent of the petrol imported into Australia in 2007-08. This high share is unsurprising because the refiner–marketers control most terminals that are capable of receiving imports. Of the 55 terminals around Australia that are capable of receiving imports, 46 of these are owned by the refiner–marketers while a further four are controlled by them through lease arrangements. Consequently, the constraint imposed by actual or potential import competition is reduced.

1.3 Methodology

The audit was conducted through a questionnaire that was sent to the refiner-marketers and independent terminal operators. Interviews were also held with selected port corporations and independent fuel suppliers. ACIL Tasman undertook econometric analysis to develop forecasts of petrol, diesel and jet fuel by State and Territory. The forecasts were used to assist with judgements on adequacy and future requirements. ACIL Tasman also consulted with the ACCC, the Department of Treasury, the Australian Bureau of Agricultural and Resources Economics (ABARE), the Australian Institute of Petroleum (AIP) and LPG Australia (LPGA).

While relevant government agencies were consulted in the preparation of the report, the contents of the report reflect the views of ACIL Tasman and do not necessarily reflect the views of the Government.

2 Characteristics of import infrastructure

Petroleum import infrastructure includes ports, wharves/berths, discharge facilities, pipelines, storage tanks at terminals and other remote locations, as well as facilities for loading petroleum products onto road and rail transport.

Terminals are those storage facilities where refined petroleum products are received from either refineries or import facilities. Fuel is distributed from terminals by truck or rail to retailers or bulk users. Terminals are the points

where wholesalers, distributors, retailers and other end users access petroleum products. All terminals have loading gantries and storage and can be supplied by pipeline, ship and in some cases by road transport. Import terminals, however, are only supplied by pipeline from refineries or ports.

2.1 Determinants of import capacity

Australia's overall fuel import capacity is determined by the number of fuel terminals around the country and by the capacity of each terminal and its associated infrastructure. It is important to recognise that a fuel terminal's capacity should be measured as a *flow* or throughput over a period of time (such as a year) rather than the physical size of the terminal or the *stock* it holds at a given point in time.

The key determinants of the capacity of a terminal include demand patterns, delivery infrastructure, shipping schedules, berth capacity, tank storage and load-out facilities. Interactions along the supply chain determine ultimate capacity.

Capacity is not an absolute concept as it depends on the operating conditions that apply at individual terminals and in the supply network from time to time. In cases where there are no bottlenecks it is usually possible to increase throughput above normal operating capacity but at an increased cost (such as increased demurrage and shipping costs).

2.2 Ownership and commercial arrangements

There are a variety of ownership and access arrangements applying to fuel terminals in Australia. The main types of ownership arrangements in Australia are:

- terminals solely owned and operated by refiner-marketers
  - this can involve sole ownership or joint venture arrangements
  - where fixed costs are shared according to an agreement and variable costs are related to throughput
  - ownership shares can vary according to the joint venture agreement
- terminals owned and operated by an independent terminal operator
- terminals owned and operated by an independent importer.

There are two major types of fuel storage arrangements that provide refiner-marketers and independent importers with access to terminals that they do not own:

- hosting arrangement

  - provides access by another company to store and load product at the terminal for a market-based usage charge either on a spot or long term basis
- leasing arrangement
  - under this type of arrangement, refiner-marketers and independent importers lease storage capacity, on either an exclusive or non-exclusive basis, from independently owned terminals.

Oil companies and independents often buy petroleum products from each other in markets where they do not own facilities or where they do not directly import through hosting arrangements. Sales into terminals are generally set at an import parity price (IPP). Sales of product out of terminals reflect the terminal gate price (TGP) which is based on IPP plus terminal charges including any taxes and other charges. Discounts or premium charges may apply depending on volume, contract period and any branding and/or marketing support that applies.

3 Location, infrastructure and capacity

There are seven refineries and 64 petroleum product import terminals in Australia. This number includes a number of mainly smaller terminals that were not included in the ACCC report *Monitoring of the Australian Petroleum Industry* released in December 2008. All refineries have facilities for importing crude oil and for importing and exporting petroleum products. The locations of key petroleum import facilities and infrastructure around Australia are shown in Figure 1.

Figure 1 **Petroleum Import Infrastructure in Australia**

Data source: ACIL Tasman

3.1 Refineries

3.1.1 Petroleum refineries in Australia

The location and berth arrangements of the seven refineries in Australia are summarised in Table 1. Each refinery has pipeline connections to deepwater berths that can receive large crude oil tankers, and has both crude oil and product storage infrastructure to support operations.

Table 1 **Australian Refineries**

City	Location	Owner	Berth
Sydney	Clyde	Shell	Gore Bay
Sydney	Kurnell	Caltex	Kurnell
Melbourne	Altona	ExxonMobil	Gellibrand Dock
Geelong	Geelong	Shell	Geelong Port
Brisbane	Lytton	Caltex	Fisherman Island crude oil berth
Brisbane	Bulwer Island	BP	Luggage Point crude oil berth
Perth	Kwinana	BP	Kwinana BP Jetty

Data source: Australian Institute of Petroleum *(AIP, 2007)*

The amount of crude oil and product stored at refineries by metropolitan centre is summarised in Table 2.

Table 2 **Crude Oil and product storage at refineries in Australia**

	Crude oil	Petrol	Diesel	Jet fuel	Lubes, solvents, other	Total product
	ML	ML	ML	ML	ML	ML
Sydney	502	214	140	81	37	472
Melbourne/ Geelong	388	79	82	48	117	327
Brisbane	531	194	161	73	1	519
Perth	347	263	99	66	13	440
Total	1,769	719	515	356	169	1,758

Data source: ACIL Tasman Survey

Crude oil storage requirements are determined by operating conditions, the nature of supply, and ship delivery cycles. This storage is generally located at the refinery site. However, in the case of Shell's Clyde refinery, storage is also located at the Gore Bay berth and delivered by pipeline to the refinery site.

At the present time, the capacity to import crude oil at Australian refineries is adequate to meet demand. As production from Australian petroleum fields

declines, particularly in the south eastern region, there may be a need to increase crude oil import capacity in Victorian refineries. However ACIL Tasman understands that there are no material constraints to doing so.

3.1.2 Annual throughput of product through refineries

The annual throughput from refineries by metropolitan centre is summarised in Table 3. Total Australian production of petroleum products was around 37,770 ML in 2007-08. Some of this production is shipped to other states. Brisbane refineries also ship product to coastal centres in Queensland.

Sydney is the only centre that must import product to make up the shortfall in supply from refineries.

Table 3 **Throughput from refineries by State 2007-08**

	Petrol	Diesel	Jet fuel	Lubes, solvents other	Total
	ML	ML	ML	ML	ML
Sydney	4,633	2,491	1,281	n/a	8,405
Melbourne/ Geelong	4,978	3,582	1,298	672	10,530
Brisbane	3,955	4,436	1,428	527	10,345
Perth	3,139	2,409	657	1,095	7,300
Australia total	16,705	12,918	4,664	2,294	36,581

Note: Does not include all production from refineries
Data source: ACIL Tasman Survey

3.2 Import terminals

3.2.1 Location and capacity

New South Wales

Petroleum product storage in New South Wales is 24 per cent of Australia's total. The principle centres for import terminals in New South Wales are Sydney and Newcastle. The location and infrastructure arrangements for these terminals are summarised in Table 4.

Table 4 **Petroleum product terminals in NSW**

Centre	Location	Owner/Joint Venture	Infrastructure
Sydney	Banksmeadow	Caltex	Supplied by pipeline from Kurnell
Sydney	Botany	Mobil	Supplied by ship and refineries
Sydney	Silverwater	Caltex /Mobil JV	Supplied by pipeline from Kurnell and Clyde refineries
Sydney	Parramatta	Shell	Supplied from Clyde refinery with some product from Gore Bay
Sydney	Botany	Vopak	Botany bulk liquids berth
Sydney	Botany	Terminals Pty Ltd	Botany bulk liquids berth
Sydney	Sydney Airport	Shell/Mobil/Caltex/BP/ Qantas JV	Supplied from refineries and imports through Botany
Newcastle	Wickham	Caltex	Supplied by Caltex pipeline from Sydney
Newcastle	Hamilton	Shell/Mobil JV	Supplied by Caltex pipeline from Sydney
Newcastle	Carrington	BP	Supplied by Caltex pipeline from Sydney and from products imported through Newcastle Port

Note: Does not include LPG terminals or storage and excludes two small terminals for confidentiality reasons.
Data source: ACIL Tasman survey

Victoria

Petroleum product storage in Victoria is 13 per cent of Australia's total. The location and infrastructure arrangements for terminals in Victoria are summarised in Table 5.

Table 5 **Petroleum product terminals in Victoria**

Centre	Location	Owner/Joint Venture	Infrastructure
Melbourne	Newport	Caltex	Supplied by ship from Holden Dock and by Mobil Altona and Shell Corio refineries via pipeline
Melbourne	Newport	Shell	Supplied by ship from Holden Dock and by Mobil Altona and Shell Corio refineries by pipeline
Melbourne	Yarraville	Mobil/BP JV	Supplied by ship from Holden Dock and from Mobil Altona refinery and Shell Corio refinery by pipeline
Melbourne	Somerton	Mobil/BP/Shell	Supplied by refineries and terminals via pipelines
Western Port	Hastings	United	Supplied by ships berthing at Crib Point Pier

Note: Does not include LPG terminals or storage
Data source: ACIL Tasman survey

Queensland

Petroleum product storage in Queensland is 26 per cent of Australia's total. The location and infrastructure arrangements for terminals in Queensland are summarised in Table 6.

Table 6 **Petroleum product terminals in Queensland**

Centre	Location	Owner/Joint Venture	Infrastructure
Brisbane	Eagle Farm	Neumann Petroleum	Supplied by ship and by Caltex Lytton and BP Bulwer Island refineries
Brisbane	Lytton	Caltex	Supplied by Caltex Lytton refinery
Brisbane	Pinkenba	Shell	Supplied by ship and by Caltex Lytton and BP Bulwer Island refineries
Brisbane	Whinstanes	BP/Mobil JV	Supplied by Caltex Lytton and BP Bulwer Island refinery
Bundaberg	Bundaberg	Marstel	Supplied by ship
Cairns	Cairns	BP	Supplied by ship from Brisbane and overseas refineries
Cairns	Cairns	Caltex	Supplied by ship from Brisbane and overseas refineries
Cairns	Cairns	Shell	Supplied by ship from Brisbane and overseas refineries
Gladstone	Gladstone	Caltex/Mobil JV	Supplied by ship from Brisbane and overseas refineries
Gladstone	Gladstone	Shell/BP JV	Supplied by ship from Brisbane and overseas refineries
Mackay	Mackay	BP	Supplied by ship from Brisbane and overseas refineries
Mackay	Mackay	Caltex	Supplied by ship from Brisbane and overseas refineries
Mackay	Mackay	Shell	Supplied by ship from Brisbane and overseas refineries
Port Alma	Port Alma	Marstel	Supplied by ship
Townsville	Townsville	BP	Supplied by ship from Brisbane and overseas refineries
Townsville	Townsville	Shell/Caltex JV	Supplied by ship from Brisbane and overseas refineries
Weipa	Weipa	Rio Tinto	Supplied by ship
Cape Flattery	Cape Flattery	Cape Flattery Mining	Supplied by ship
Torres Strait	Thursday and Horn Islands	Independent	Supplied by Ship

Note: Does not include LPG terminals or storage
Data source: ACIL Tasman survey

Western Australia

Petroleum product storage in Western Australia is 17 per cent of Australia's total. The location and infrastructure arrangements for terminals in Western Australia are summarised in Table 7.

Table 7 **Petroleum product terminals in Western Australia**

Centre	Location	Owner/Joint Venture	Infrastructure
Perth	North Fremantle	BP	Supplied by BP Kwinana refinery via pipeline
Perth	North Fremantle	Shell/Caltex JV	Supplied by BP Kwinana refinery via pipeline
Perth	Kewdale	BP	Supplied by BP Kwinana refinery via pipeline
Perth	Kwinana	Gull Petroleum	Supplied via the Fremantle Ports manifold by ships unloading at Kwinana Bulk Berths 3 or 4
Perth	Kwinana	Coogee Chemicals	Supplied via the Fremantle Ports manifold by ships unloading at Kwinana Bulk Berths 3 or 4
Albany	Albany	Caltex	Supplied by ship and by road
Broome	Broome	BP	Supplied by ship
Broome	Broome	Shell	Supplied by ship
Cape Lambert	Cape Lambert	Rio Tinto	Fuel imported through Rio Tinto wharf under arrangement with BP
Dampier	Dampier	Rio Tinto	Fuel imported through Rio Tinto wharf under arrangement with BP
Esperance	Esperance	BP	Supplied by ship
Esperance	Esperance	Shell	Supplied by ship
Geraldton	Geraldton	BP	Supplied by ship
Geraldton	Geraldton	Shell	Supplied by ship
Port Hedland	Port Hedland	BP	Supplied by ship
Port Hedland	Port Hedland	Caltex	Supplied by ship
Wyndham	Wyndham	CGL Fuels	Supplied by ship from refinery in Korea

Note: Does not include LPG terminals or storage
Data source: ACIL Tasman survey

South Australia

Petroleum product storage in South Australia is 6 per cent of Australia's total. The location and infrastructure arrangements for terminals in South Australia are summarised in Table 8.

Table 8 **Petroleum product terminals in South Australia**

Centre	Location	Owner/Joint Venture	Infrastructure
Adelaide	Birkenhead	Caltex	Supplied by ships primarily from Singapore
Adelaide	Birkenhead	Mobil/Shell JV	Supplied by ships primarily from Singapore
Adelaide	Largs North	BP	Supplied products by ship mainly from BP's Kwinana refinery in WA
Adelaide	Port Adelaide	Terminals Pty Ltd	Supplied by ship
Port Lincoln	Port Lincoln	Caltex	Supplied by ship
Port Lincoln	Port Lincoln	Shell	Supplied by ship

Note: Does not include LPG terminals or storage or facilities at Port Stanvac that are currently mothballed
Data source: ACIL Tasman survey

Tasmania

Petroleum product storage in Tasmania is 5 per cent of Australia's total. The location and infrastructure arrangements for terminals in Tasmania are summarised in Table 9.

Table 9 **Petroleum product terminals in Tasmania**

Centre	Location	Owner/Joint Venture	Infrastructure
Hobart	Hobart	BP	Supplied by ship
Hobart	Hobart	Caltex	Supplied by ship
Bell Bay	Bell Bay	Marstel	Supplied by ship
Burnie	Burnie	BP	Supplied by ship
Devonport	Devonport	Shell	Supplied by ship

Note: Does not include LPG terminals or storage
Data source: ACIL Tasman survey

Northern Territory

Petroleum product storage in the Northern Territory is 9 per cent of Australia's total. The location and infrastructure arrangements for terminals in the Northern Territory are summarised in Table 10.

Table 10 **Petroleum product terminals in the Northern Territory**

Centre	Location	Owner/Joint Venture	Infrastructure
Darwin	Darwin	Vopak	Supplied by ship
Gove	Gove	Rio Tinto Alcan	Supplied by ship
Groote Eylandt	Groote Eylandt	GEMCO (BHP Billiton)	Supplied by ship
McArthur River Mine	McArthur River Mine	Xstrata	Supplied by ship

Data source: ACIL Tasman survey

3.2.2 Storage capacity and throughput

Total storage capacity of petroleum products at import terminals in 2007-08 was 3,166 ML. The storage capacity of import terminals in Australia is summarised in Table 11 below. The largest storage is held in Queensland followed by New South Wales, Victoria and Western Australia. Queensland and Western Australia have larger proportions of diesel storage, reflecting the importance of primary industries in those States.

Table 11 **Summary of storage capacity at terminals in Australia by State**

State	Petrol	Diesel	Jet fuel	Other	Total
	ML	ML	ML	ML	ML
New South Wales	295	214	159	86	754
Victoria	207	128	54	29	418
Queensland	204	481	78	65	827
Western Australia	121	355	19	29	524
South Australia	99	78	20	1	198
Tasmania	94	65	4	3	165
NT	33	73	36	138	281
Australia total	**1,052**	**1,394**	**369**	**351**	**3,166**

Note: Storage numbers are for 2007-08

Data source: ACIL Taman Survey

Total throughput of petrol, diesel and jet fuel through terminals in Australia was 46,371ML in 2007-08 according to the returns from the questionnaire. The throughputs by region are summarised in Table 12.

Table 12 **Terminal throughput by State in 2007-08**

State	Petrol	Diesel	Jet fuel	Other	Total
	ML/a	ML/a	ML/a	ML/a	ML/a
NSW	6,197	3,958	2,995	340	13,491
Victoria	4,590	3,120	2,004	157	9,871
Queensland	4,305	5,598	915	5	10,823
Western Australia	2,025	4,187	609	193	7,013
South Australia	1,367	1,325	237	15	2,944
Tasmania	453	355	33	1	842
NT	142	529	210	508	1,388
Australia total	**19,079**	**19,072**	**7,003**	**1,218**	**46,371**

Note: The throughputs relate to terminals and do not include all petroleum products or LPG

Data source: ACIL Tasman survey

The data shows that diesel throughput in Queensland and Western Australia is very high relative to these States' populations. This reflects the heavy use of the fuel by primary industries, which feature prominently in the Queensland and WA economies.

In principle, it is possible to use storage tanks for different fuel types. However modifications must be made in some cases. For example, a floating roof must be installed for gasoline storage and gantry connections may need to be reconfigured. There are specific fire safety issues that are different for each fuel. Tanks must also be emptied and cleaned if fuel types are to be switched.

Petroleum pipelines can ship different products in batches. Changing the product batch involves a short period of mixed fuel being pumped through the pipeline at the changeover. This is usually bled off and reprocessed.

4 Ownership and usage arrangements

The ownership structure of petroleum import terminals around Australia is shown in Table 13.

Of the 64 terminals, the majority (44) are owned by refiner-marketers (BP, Caltex, Mobil and Shell), usually under sole ownership but sometimes under a joint venture arrangement.

Twenty terminals are owned by independent importers of petroleum such as Gull, United, Neumann's and Coogee Chemicals, independent bulk liquids terminal operators such as Marstel and Terminals Pty Ltd, and mining companies such as Rio Tinto and GEMCO.

Approximately half of the terminals around Australia offer hosting arrangements, including short-term spot hosting and long term arrangements. The refiner marketers indicated that hosting is an ancillary function to the primary function of servicing the business needs of the terminal owner. Hosting is subject to operational and quality considerations and to excess capacity being available.

Independent terminal owners are in the business of operating terminal services for their own use or for third parties, including through hosting or leasing arrangements. At Hastings there is currently no hosting but hosting is available for any party that would wish to enter into a contract for access.

Table 13 **Ownership arrangements at petroleum import terminals in various States and Territories**

Location	Refiner-marketer – sole ownership	Refiner-marketer – joint venture	Independent (2)	Total	With hosting arrange-ments(1)
New South Wales					
Sydney/Newcastle	4	3	4	11	5
Victoria					
Melbourne/Hastings	2	1	1	4	0
Queensland					
Brisbane	2	1	1	4	3
Other (Bundaberg, Cairns, Gladstone, Mackay, Rockhampton, Townsville, Weipa)	7	3	3 *	13	6
Western Australia					
Perth/Fremantle	2	1	2	5	4
Other (Albany, Broome, Cape Lambert, Dampier, Esperance, Geraldton, Port Hedland)	9	0	3(3)	12	9
South Australia					
Adelaide	2	1	1	4	2
Other (Port Lincoln)	2	0	0	2	1
Tasmania					
Hobart	2	0	0	2	2
Other (Bell Bay, Burnie, Devonport)	2		1	3	2
Northern Territory					
Darwin	0	0	1	1	0
Other (Gove, McArthur River, Groote Eylandt)			3*	3	
Total	34	10	20	64	34

Note: 1. Hosting arrangements do not include leasing arrangements at terminals owned by independents. Estimate of terminals with hosting arrangements indicate current hosting and may not reflect all potential hosting arrangements.

2 Independents include mining companies; Table does not include JUHI facilities at airports.

3. Does not include Bundaberg or Port Alma

Data source: ACIL Tasman

Charges for terminal use, whether for hosting or included in products sold out of terminals, are market based and situation specific. Charges are based on depreciation, operating costs, a return on capital and ancillary costs. Charges also reflect volume discounts and the term of the contract and the cost of alternatives for the hosted party. In addition, strategic considerations are taken into account, including operational issues such as expected facility utilisation and whether the hosted party may be able to host the terminal owner in other locations.

Leasing arrangements are based on a commercial return on capital and operating costs. Vopak advised that there were no constraints on access by independents at its terminal in Sydney. However the company requires long term agreements with companies that have established distribution contracts to

markets. All imported products are also required to meet Australian fuel standards.

Ownership of terminals tends to be stable over time although changes of ownership can occur from time to time. There were no changes confirmed at the time the audit was undertaken.

5 Capacity Utilisation

The terms of reference require an assessment of the capacity utilisation of existing major petroleum import infrastructure. This requires an assessment of the maximum throughput that an existing terminal could achieve. However, this is not a simple concept or calculation. As discussed above, import capacity depends on a range of factors along the supply chain, from shipping cycles to berthing logistics, pipeline and storage utilisation, and loading bay operations.

Most existing terminal owners optimise investment to meet projected needs. While they might host others, in most cases they will not expand capacity until it is required for their own needs or the needs of their term hosted parties. Spot hosting, however, occurs when the opportunity arises and is subject to commercial negotiation.

In the short run, it is possible to increase throughput above normal operating levels through steps such as increasing shipping rotations, running the terminal assets harder or making adjustments elsewhere in the supply chain. However this generally comes at additional cost such as in demurrage charges or additional pipeline and other charges. The higher costs that are associated with higher throughput in such circumstances are usually only sustainable in special circumstances and do not reflect maximum capacity under normal operating conditions.

To establish import capacity for the purpose of this report, it has been assumed that capacity is defined under business-as-usual conditions. Emergency or other arrangements that might increase capacity at a higher cost for a limited period have not been considered. Current utilisation of terminals by State is summarised in Table 14. The table lists the constraints that are emerging at locations where terminals are approaching capacity.

Table 14 **Capacity utilisation at product import terminals in Australia**

State	Region	Total product Storage	Capacity utilisation as at December 2008	Constraints
	ML	ML		
New South Wales	Sydney	610	Close to full capacity	Berth and pipeline constraints. JUHI pipeline requires further capacity.
	Newcastle	144	Close to full capacity	Caltex pipeline close to capacity
Victoria	Melbourne terminals	327	Close to full capacity	Emerging constraints for ULP storage in west Melbourne. Holden dock around 80% utilised Potential need for increased pipeline capacity for jet fuel
	Hastings	91	80% utilisation	Space for additional storage if market conditions justify
Queensland	Brisbane	241	Close to full capacity	Berth and pipeline constraints reported.
	Regional	586	Close to full capacity	Constraints in Mackay and Gladstone. Some shipping constraints.
Western Australia	Perth	206	Significant spare capacity	Potential to increase imports through independent terminals at Kwinana.
	Regional	319	Some spare capacity and some constraints	Spare capacity at Geraldton and Broome Constraints at Port Hedland, Esperance and Dampier
South Australia	Adelaide	176	Close to full capacity	Draught limitations at Birkenhead terminal
	Port Lincoln	22	Some spare capacity	
Tasmania	Hobart	60	Close to full capacity	Shipping frequency is a bottleneck
	North	105	Some spare capacity at Bell Bay	Devonport experiences shipping frequency constraints Marstel recently recommissioned around 40 ML of storage at Bell Bay.
Northern Territory	Darwin	124	Close to full capacity	Small increases in throughput possible
	Mining	157	At full capacity	Terminals mainly service mining operations

Data source: ACIL Tasman

As at December 2008, there was little spare capacity in New South Wales, Queensland and the Northern Territory. There was spare capacity in Western Australia at Kwinana and small spare capacity in South Australia, Victoria and Tasmania.

6 Committed and planned capacity expansions

As explained in the previous chapter, projects designed to address emerging constraints and increase throughput capacity are being planned and undertaken at various locations across States and Territories. These are summarised by region in Table 15

Table 15 **Investment in new capacity at product import terminals in Australia**

State	Region	Committed additions to capacity	Planned additions to capacity
New South Wales	Sydney	Additional 75 ML storage under construction.	Second bulk liquids berth at Botany approved in principle. Expansion of JUHI pipeline is under consideration
	Newcastle	Additional 40 ML storages plus berth connection.	A further 60 ML new terminal in the final planning stages
Victoria	Melbourne	Tank conversion to ULP at a west Melbourne terminal	
	Hastings	Expansion of ethanol storage.	
Queensland	Brisbane	Additional 28 ML product storage under construction. New investment in product berth by independent	Interest in development of bulk liquids berths by Port of Brisbane
	Regional	Additional 63 ML capacity underway in Bundaberg and Port Alma Storage and gantry expansion in Mackay Additional investment in Gladstone and Mackay terminals	Potential interest from independents in Mackay and Gladstone
Western Australia	Perth	Construction of 24 ML of additional storage capacity currently undertaken at Fremantle	
	Regional	Additional 50ML storage being installed at Port Hedland.	Longer term plans to expand port capacity in Esperance
South Australia	Adelaide	Some conversions of storage to increase diesel throughput	
	Regional	ULP storage expansion.	Stuart Petroleum and the Scott Group have planned construction of 80ML storages at Port Bonython (around 40% of current State capacity)
Tasmania	Hobart	No expansion plans	
	North	No further investment at the present time	
Northern Territory	Darwin	Small expansion planned for 2010	
	Mining	No known expansion plans	

Data source: ACIL Tasman

There is new investment underway for a total of 270 ML of additional tank capacity around Australia, which represents around 9 per cent of total storage

capacity in Australia. Of this, 64 per cent is being installed by independent terminal operators.

In New South Wales the in-principle decision by the Sydney Ports Corporation to proceed with the second common user bulk liquids facility will greatly enhance the capacity of the Sydney system. Vopak is currently adding 75 ML storage at their Botany terminal, which is available to any potential importer.

The future ability to deliver products to inland distribution points from refineries and from Port Botany is restricted due to pipeline constraints in Sydney and in the Caltex pipeline to Newcastle. However completion in April 2009 of an additional 40 ML of storage at the BP Carrington terminal and connection through to the Port will ease pressure on the Sydney to Newcastle Pipeline and the Sydney Metropolitan Pipeline. The JUHI pipeline is currently constrained and the need to increase its capacity is under review.

There appear to be few serious current or emerging bottlenecks for fuel imports into Victoria. While there are some constraints in tankage, berthing at Holden Dock and a need for expansion of the jet fuel line to Somerton, this is not seen to be a major obstacle to meeting demand in Victoria. There is some spare terminal capacity at Hastings and potential to increase considerably the import capacity at Hastings should market conditions justify further investment.

The committed investments in Queensland will address current bottlenecks in Brisbane and in regional centres. Expansion of facilities at Eagle Farm (15 ML), Bundaberg (30 ML) and Port Alma (23 ML) can be expected to provide additional options for independents should they wish to enter into commercial hosting arrangements.

The regional ports are in most cases adequate to meet current demand, although shipping cycles and berth depth were reported to be constraints in most of the regional ports.

All ports in Western Australia are currently meeting the demand requirements of petroleum product importers and there is considerable spare capacity in the Fremantle/Kwinana system serving the Perth metropolitan area as well as spare capacity at Broome and Geraldton. The principle pressures appear to be Port Hedland and Esperance where planning is underway to address future demand.

Product storage capacity in Western Australia will increase by 14 per cent once the investments in additional storage at Port Hedland (50 ML) and by Coogee Chemicals in Fremantle (23 ML) are fully implemented. In the case of the Port of Fremantle, recent developments that have allowed Berth 3 at Kwinana Bulk

Berth to accommodate vessels importing petroleum products have alleviated past congestion issues.

In Adelaide, there are currently storage capacity and draught limitations at Port Adelaide. Concerns were raised about the balance between tankage and shipping patterns as mining volumes grow, as well as potential issues with having a berth only capable of handling Medium Range (MR) tankers. BP is converting some tanks for diesel storage to deal with increasing demand for the fuel. There are plans to expand storage capacity and upgrade equipment and systems at Birkenhead.

There is some spare capacity at Port Lincoln, depending on product balance. Further spare capacity will be created if the planned developments at Port Bonython proceed.

There are ship frequency issues for Tasmanian terminals that are a concern rather than a major constraint. There is additional capacity in the State with the recommissioning of terminal capacity at Bell Bay by Marstel.

Vopak plans a modest increase in the capacity of its Darwin terminal by 2010. The Port of Darwin is also reviewing its longer term development strategies, which may impact on bulk import berths. However this had not been released at the time of writing.

If the committed and planned investments proceed, total storage capacity in Australia would be increased by approximately 13 per cent. Once the committed expansions are completed, all jurisdictions will have some spare capacity. Spare capacity in the Northern Territory will, however, be small and ongoing constraints will remain in Adelaide despite the availability of some spare capacity for the State overall (see Table 16).

7 LPG

LPG is sourced from petroleum production fields in Gippsland, the Otway and Bass Basins, the Cooper Basin and from the Carnarvon Basin in the north west of Western Australia. It is also manufactured at Australia's seven petroleum refineries. Australia is a net exporter of LPG.

In 2007-08 Australia produced 2,886,000 tonnes of LPG either from producing fields or refineries. In the same year 388,000 tonnes were imported and 1,454,000 tonnes were exported. LPG consumption in Australia in 2007-08 was 1,798,000 tonnes including an increase in stocks of 22,000 tonnes. In general terms, there is a surplus of LPG production in Western Australia, South Australia and Victoria. LPG is imported into the other States and Territories either by ship or road transport.

Table 16 **Situation after committed investments have proceeded and been completed**

State	Region	Spare storage capacity post committed investments	Remaining bottlenecks
New South Wales	Sydney	Around 12% spare storage capacity	JUHI pipeline may require expansion
	Newcastle	Around 28% spare storage capacity.	
Victoria	Melbourne	Very small spare capacity	
	Hastings	Around 20% spare capacity	
Queensland	Brisbane	Around 11% spare storage capacity.	Some pipeline constraints will remain
	Regional	Around 9% spare storage capacity	Potential interest from independents in Mackay and Gladstone
Western Australia	Perth	Around 35% spare storage capacity	
	Regional	Some spare storage capacity at Broome and Geraldton	Esperance may require additional berth capacity in the medium term.
South Australia	Adelaide	Close to full capacity	Berth constraints will remain
	Regional	Some spare capacity at Port Bonython.	
Tasmania	Hobart	Close to full capacity	
	North	Spare storage capacity at Bell Bay	
Northern Territory	Darwin	Small amount of spare storage capacity	
	Mining	Capacity linked to mining operations	

Data source: ACIL Tasman

There are eighteen dedicated LPG storages around the country. This includes the 65,000 tonne LPG cavern owned by Elgas at Botany in Sydney, seven LPG import facilities owned and operated by Origin and other storages owned by producers (see Table 17).

Kleenheat operates a 40,000 tonne LPG facility at Kwinana that has a production capacity of 360,000 tonne per annum for LPG and is primarily used for export. It has import capacity in the event of disruption in supply from domestic sources.

The Kleenheat LPG facility at Darwin has a storage capacity of 1,000 tonnes, through which Kleenheat imports about 12,000 tonnes of the fuel annually.

Table 17 **LPG storages in Australia**

Port	Operator	Capacity	Use
Botany	Origin	4,710 tonnes	LPG distribution
Botany	Elgas	65,000 tonnes	Importing and storing propane for distribution
Botany	Qenos	14,400 tonnes	Propane (petrochemicals)
Darwin	Kleenheat	1,000 tonnes	LPG distribution
Brisbane	Origin Energy	1,700 tonnes	LPG distribution
Brisbane	BP	2,100 tonnes	LPG distribution
Brisbane	Shell		LPG distribution
Cairns	Origin Energy	2,500 tonnes	LPG distribution
Townsville	Origin Energy	1,200 tonnes	LPG distribution
Port Bonython	Santos	70,000 tonnes	LPG distribution
Devonport	Origin Energy	2,000 tonnes	LPG distribution
Hobart	Origin Energy	1,800 tonnes	LPG distribution
Dandenong	Elgas	2,000 tonnes	LPG distribution
Westernport	Esso/BHP	85,120 tonnes	LPG storage and export
Lang Lang (Victoria)	Origin Energy	2,125 tonnes	LPG storage, distribution
Otway	Woodside Petroleum	800 tonnes	LPG storage and export
Dampier (WA)	Woodside Petroleum	62,000 tonnes	LPG storage and export
Kwinana	Kleenheat	40,000 tonnes	LPG storage and export

Data source: ALPGA Supply and Demand Study 2008 *(ALPGA, 2008)* and ACIL Tasman survey

Elgas imports propane for distribution in eastern Australia and re-export. Shipments of LPG to the Botany caverns are made in Very Large Gas Carriers of approximately 44,000 million tonne capacity requiring a deep wharf at Botany bulk liquids berth. Shipments around the coast are made in smaller vessels between 1,000 to 2,500 tonnes.

Deliveries of domestically produced propane and butane are often determined by shipping logistics and by the Australian heating specification which requires 95 per cent propane for commercial heating applications. LPG Australia is currently reviewing the heating specification to see if the butane content can be increased.

The audit found that LPG import facilities were adequate to meet current demand. Some operators reported plans for expansion to meet emerging demand but did not identify any obstacles to doing so, other than the increasing cost of land rental and increasing port charges.

Industry reported some constraints in Sydney, Brisbane and Devonport from berth congestion and other issues. While imports are not constrained in Sydney, there is limited capacity for re-export of LPG from the Sydney Cavern due to the congestion of the Botany Bulk Liquids Berth. The in-principle decision to proceed with construction of a second common user bulk liquids berth at Botany should alleviate these constraints.

No significant expansions of LPG import terminals were reported by the industry.

8 Adequacy to meet future demand

The terms of reference require projections of petroleum product by State/Territory in order to assess the adequacy of existing and planned petroleum import infrastructure. There are no specific published forecasts of demand for petrol, diesel, jet fuel and LPG by product and by State/Territory.

ACIL Tasman has therefore prepared its own projections of demand by State/Territory and by product. These have been developed from an analysis of recent trends in consumption of petroleum products, a review of ABARE and other projections, and an econometric (multivariate regression) analysis of consumption patterns by State/Territory.

The results are discussed in the main report and summarised by State/Territory below. It is important to note that these projections are subject to some uncertainty, particularly in relation to the impact of the current economic downturn and the pattern of recovery from the downturn.

8.1 New South Wales

The projections for future demand prepared by ACIL Tasman are shown in Table 18. These forecasts indicate that the current import capacity for petrol, diesel and jet fuel in Sydney and Newcastle is not likely to be adequate to meet the anticipated growth in demand for petrol, diesel and jet fuel in NSW in the medium term as well as in the longer term.

Table 18 **Current and projected demand for petroleum products in NSW (ML)**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	6,197	3,958	2,995	457
2014-15	6,321	4,433	3,252	479
2019-20	6,358	4,864	3,625	551
2024-25	6,382	5,302	4,034	624
2029-30	6,398	5,753	4,487	656

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes petrochemical use.

The investments by Vopak in Sydney and by BP in Newcastle address these needs to some extent. With the construction of a second common user bulk

liquids berth at Port Botany there will be some spare capacity to meet medium term demand growth.

Potential investment in a new import terminal being considered by Marstel at Newcastle will provide further capacity to meet growth in demand for diesel in New South Wales in the longer term.

There is likely to be some need to increase pipeline capacity in Sydney to service the needs of the JUHI as well as growing demand for petrol and diesel in the Sydney metropolitan area.

With the 67,000 tonne LPG storage at Port Botany, LPG production from the local refineries and LPG storage at terminals at Port Botany, NSW is not likely to be constrained for LPG import capacity.

8.2 Victoria

The projections indicate only modest growth in demand for the main petroleum products in Victoria (see Table 19). There appear to be few serious current or emerging bottlenecks regarding fuel importation into Victoria. While there are some constraints in tankage, berthing at Holden Dock and a need for expansion of the jet fuel line to Somerton, these are not seen to be major obstacles to meeting future demand in Victoria.

Table 19 **Current and projected demand for petroleum products in Victoria**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	4,590	3,120	2031	713
2014-15	5,173	3,148	2424	863
2019-20	5,180	3,539	2704	936
2024-25	5,091	3,945	3009	983
2029-30	4,952	4,369	3347	1,033

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes petrochemical use.
Data source: ACIL Tasman

Spare capacity at Hastings and the potential to significantly expand that capacity will provide an opportunity for further expansion of imports should market conditions allow.

The production fields in Gippsland and Bass Basin are significant producers of LPG. This, together with refinery production, means that Victoria is a significant exporter of LPG. There should be no problems with supplying LPG from existing refineries in Victoria.

8.3 Queensland

The current annual throughput and ACIL Tasman's projection of future demand for petrol and diesel in Queensland are shown in Table 20.

Table 20 **Current and projected demand for petroleum products in Queensland**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	4,305	5,598	1,286	276
2014-15	5,081	4,863	1,536	317
2019-20	5,478	5,677	1,713	339
2024-25	5,857	6,505	1,906	356
2029-30	6,222	7,353	2,120	374

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes petrochemical use. Queensland jet fuel includes domestic and imported product.

Data source: ACIL Tasman

The projections indicate that despite the short term effects of the economic downturn, additional import capacity will be required to meet growing demand for petrol and diesel demand in Queensland over the longer term.

With the above mentioned investments, storage capacity in Queensland import terminals will be increased by at least 10 per cent in 2009. Both the established refiner marketers and independents are investing in increasing capacity. This should be sufficient to service demand growth in the medium term, to say 2014-15.

In addition, there is some evidence of interest from independent fuel companies in investing in new petroleum import capacity both in Brisbane and in the regional ports. It is too early to judge the prospects for this investment. Should demand grow further in the longer term there appear to be no significant obstacles to further investment in Brisbane or the regional areas.

8.4 Western Australia

The current annual throughput and ACIL Tasman's projections of future demand for petrol and diesel in Western Australia are shown in Table 21.

Table 21 **Current and projected demand for petroleum products in Western Australia**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	2,025	4,187	609	173
2014-15	2,166	3,460	832	203
2019-20	2,229	3,782	927	219
2024-25	2,276	4,101	1,032	230
2029-30	2,312	4,380	1,148	242

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes petrochemical use
Data source: ACIL Tasman

The econometric modelling shows a decline in diesel consumption initially. This reflects assumptions on lower economic growth following the economic downturn that commenced in 2008-09. This decline is reversed over the longer term..

There is sufficient spare capacity in the Kwinana/Fremantle area to increase imports in this region in response to demand growth over the medium and probably longer term.

The projections suggest that further capacity for import of diesel is likely to be required in other regional areas in Western Australia to meet longer term growth demand for diesel by resource and mining activities. Current committed investment plans will meet medium term needs, and in the longer term there are plans to address emerging bottlenecks in Esperance and Dampier.

As a major exporter of LPG, Western Australia does not have a requirement for import capacity for LPG except in the case of emergencies. These are generally easily handled with existing storage capacity at Kwinana.

8.5 South Australia

The current annual throughput and ACIL Tasman's projection of future demand for petrol and diesel in South Australia are shown in Table 22.

Table 22 **Current and projected demand for petroleum products in South Australia**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	1,367	1,325	237	188
2014-15	1,349	1,438	282	222
2019-20	1,323	1,525	314	239
2024-25	1,297	1,607	350	252
2029-30	1,271	1,686	389	264

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes *petrochemical use*

Source: ACIL Tasman

While there is some spare capacity at Port Lincoln, growth in demand for diesel in South Australia is likely to require additional import capacity. This may be able to be met from expansion at regional ports rather than at Adelaide facilities, recognising the berth constraints in Adelaide as well as regional access arrangements.

The storage capacity and berth constraints in Adelaide are to some extent being addressed through installation of additional storage and upgrading of terminal capacity.

In the longer term plans to expand capacity at Port Bonython would significantly enhance the capacity to import diesel into South Australia and meet conceivable needs in the longer term.

8.6 Tasmania

The projected demand for petroleum products in Tasmania is shown in Table 23. The projections for moderate growth in demand for petrol and diesel over the next two decades suggest that terminals and other import facilities in the State should not experience undue difficulties in meeting demand growth. Terminal capacity for importing LPG is also adequate to meet future demand.

Table 23 **Current and projected demand for petroleum products in Tasmania**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	453	355	33	33
2014-15	463	434	40	38
2019-20	457	447	44	40
2024-25	451	456	49	42
2029-30	446	463	55	44

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes *petrochemical use*

Data source: ACIL Tasman

There is spare capacity in Tasmania as discussed earlier. It is likely that, at current capacity levels, there will be no constraints on meeting Tasmanian demand in the future with existing capacity.

8.7 Northern Territory

The demand projections indicate modest future demand growth in the Northern Territory; with a decline in the demand for diesel as natural gas gains market share (see Table 24).

Table 24 **Current and projected demand for petroleum products in the Northern Territory**

Year	Petrol (ULP, PULP)	Diesel	Jet fuel	LPG
	ML/a	ML/a	ML/a	K Tonnes/a
2007-08	142	529	198	11
2014-15	149	493	175	13
2019-20	140	507	195	14
2024-25	131	517	217	15
2029-30	122	524	241	15

Note: Jet fuel projections have been calculated using Australia wide growth rates. LPG excludes petrochemical use

Data source: ACIL Tasman

The decline in diesel consumption in 2014-15 also reflects assumptions of lower growth following the economic downturn in 2008-09. This decline is reversed over the longer term.

Vopak plans a modest increase in the capacity of its Darwin terminal by 2010. The Port of Darwin is also reviewing its longer term development strategies, which may impact on bulk import berths. However, this had not been released at the time of writing.

LNG projects in Darwin will produce LPG which may reduce the level of imports of LPG into the Northern Territory in future.

9 Current and potential barriers to competition and efficient investment

The terms of reference for this audit required commentary on current and potential barriers to competition and efficient investment with respect to Australia's petroleum import infrastructure.

9.1 Competition

In its report "Monitoring of the Australian petroleum industry" released in December 2008, the ACCC raised the question as to whether the small presence of independents in the market meant that there was a weak threat of entry from independent importers (ACCC, 2008).

This audit has approached this question from the point of view of the operation of import terminals only. Retail arrangements and contracting arrangements downstream of the terminal gate are not part of the terms of reference for this report.

Key factors that influence the level of competition between participants in the petroleum import market in relation to import terminals include:

- availability of imported petroleum products that meet the Australian fuel specification
- access to spare capacity
- pricing policies for access to import terminal and facilities.

9.1.1 Availability of imported petroleum products

Australian fuel specifications were progressively tightened from 2002 to 2006. With Australian fuel standards out of alignment with those of Asian countries, it became more difficult to access attractively priced products from Asian refineries that met Australian specifications.

However, this situation has changed. Australian specification diesel is now readily available from low cost Asian refineries. Recently, efficient Japanese and Korean refineries have begun offering attractively priced Australian specification petrol. This appears to have encouraged independents to consider the Australian market, particularly in areas where growth is expected.

The Western Australian fuel standards differ from the rest of Australia, which may limit options for importers in that State.

9.1.2 Access to terminal capacity

The audit found that, with the new investment that is committed, there will be spare capacity available in all jurisdictions except the Northern Territory. A significant proportion of this spare capacity is owned and operated by independent terminal operators in Queensland, New South Wales, Victoria, Western Australia and Tasmania. This conclusion does not apply to certain JUHI facilities at major airports.

Approximately half of the terminals currently operating in Australia host other parties. The refiner marketers indicated that their prime objective is to meet their own needs and those of their longer term hosted customers. ACIL Tasman was advised that the refiner marketers seek to maximise the utilisation of their facilities and will provide terminal services to third parties on a short or long term basis subject to spare capacity being available.

Some independent operators require long term arrangements and established supply contracts for long term hosting arrangements. All parties require observance of relevant Australian fuel and safety standards.

Some exceptions to this policy may apply in relation to the operation of JUHI facilities at major airports. It is understood that some agreements require that users of JUHI facilities be part of the applicable joint venture agreement. Under such circumstances, fuel importers would have to be part of the joint venture agreement if they wished to source fuel from any party other than those involved in the JUHI joint venture.

9.1.3 Pricing policies

Pricing strategies for access to petroleum import facilities are also important when considering potential barriers to competition in petroleum import infrastructure. The economic structure of the fuel import supply chain is important to this consideration.

Economic structure of the supply chain

Terminal charges are based on supply chain costs that can include shipping and port charges, capital costs associated with storage and facilities and terminal operating costs. Some of these costs, such as port charges and leases, are outside the direct control of terminal operators.

The economics of petroleum import supply chains and the lumpiness of investment in new capacity, mean that the short run marginal cost of servicing additional growth in the market is generally less than the long run marginal cost of adding capacity. Under such circumstances, existing suppliers can provide small additions to supply at a lower additional cost than a new entrant.

An independent fuel supplier has three options for entering or expanding activities in the petroleum product market:

- contract product from an existing refiner marketer
- enter into a hosting arrangement with an existing terminal owner
  - Under such an arrangement, an independent would need to source imported product either from sellers offering product or by arranging the shipping and delivery of the fuel to the hosting terminal.
- either lease import capacity from another independent or invest in additional terminal capacity itself.

Under the first option, the independent would effectively pay a price based on the Terminal Gate Price. The final price and terms would depend on a range of factors, including volume discounts, credit risk, contract term and other contract specific factors. There is no standard contract for purchase ex-terminal and each is considered on a case-by-case basis. Responses to this audit and discussions with independents indicated that this was frequently the lowest cost option for an independent in the Australian market.

Under the second option, the independent would need to source product to be delivered to a hosting terminal, either from another seller, or by arranging the shipping and delivery to the hosting terminal. Approximately half of the terminals in Australia now host others.

The audit responses indicated that hosting charges are negotiated on a case by case basis subject to contract requirements including volume, period of contract and credit risk and other matters.

For the third option there must be capacity available in an existing terminal or access to land for new terminal capacity. An intermediate step to acquiring land for new facilities is to recommission unused capacity. This is a less expensive option than a greenfields development and there is evidence that it is occurring in Australia.

Independent terminals also offer leasing arrangements. The audit responses indicated that leases generally require long term agreements with charges recovering capital and operating costs. As with commercial arrangements, terms may differ according to volume and contract period and other factors such as blending or other requirements.

Charging strategies

Terminal charging varies from location to location depending on the structure of the supply chain and terminal infrastructure in each case. The audit responses indicated that all terminal operators allocate capital and operating costs to determine a transfer charge for use of a terminal. This charge may be

applied as a single throughput charge per litre of product transferred, or it may be charged on the basis of a fixed component and a volumetric component.

The responses to audit questions by the refiner marketers indicated that a single throughput charge is the most common and this is applied to the distribution/retail arms of their operations as well as to hosted parties. Pricing also takes into account market factors such as contract length, volume and the alternative supply sources available. There are differences in pricing outcomes between the internal and external parties that reflect differences in contract risks such as credit and supply risk. ACIL Tasman was advised by the refiner marketers that the underlying pricing principles are the same for internal marketing arms and external hosted parties.

Some independent terminals include a fixed charge and a throughput charge. Such arrangements would result in higher per unit costs in circumstances where the customer is not able to maintain contract quantities. Such contracts can present financial disincentives to new entrants who may not be able to reach contract quantities in the early years. Many energy infrastructure charging structures include a fixed component to underwrite risks associated with capital investment that is recovered over a long term. This reflects sharing of the investment risk between the infrastructure investor and the customer, and is a characteristic of infrastructure pricing policies in other energy markets.

9.2 Conclusion on level of competition in the fuel import supply chain

ACIL Tasman advises on economics and policy and does not provide legal advice. The following conclusions should not be taken as legal advice.

The petroleum import supply chain is characterised by operators of different size and scope, and by varying commercial arrangements. There is evidence that these arrangements are evolving rapidly as independent operators enter the market in response to growing demand and as incumbents respond to market developments. It is also too early to judge how the current economic downturn will influence planned investment decisions.

On the basis of the responses to the audit, ACIL Tasman considers that, on the whole, the current operating environment and access arrangements for import terminals do not impose a material barrier or constraint to competition for importers of petroleum products.

This conclusion is drawn on the basis of:

- availability of petroleum products from overseas refineries that meet Australian fuel specifications

- the existence of spare capacity that either already exists in most markets or will shortly be in place with committed investments[1]
- the availability of access to, or leasing of, import terminals (including those not owned by refiner marketers) on commercial terms
- terminal charging strategies are applied consistently to all terminal users.

There are likely to be exceptions that may apply from time to time where constraints or bottlenecks exist in maritime or terminal operations. ACIL Tasman did not examine specific port charges but notes that these are subject to State and Territory regulation or Ministerial approval. There may also be situations where commercial agreements for the operation of JUHI facilities at some airports require joint venture participation and therefore limit opportunities for hosting in the short term.

ACIL Tasman acknowledges that refiner marketers, and possibly some larger independent wholesalers, have short to medium term cost advantages in established supply chains because the short run marginal cost of increasing throughput in existing facilities is lower than the long run marginal cost of investing in new capacity.

This is the reason why some independents have found it economic to purchase from refiner marketers and major importers rather than to arrange and finance shipments of imported petroleum products (with associated commercial and credit risks).

ACIL Tasman's views on pricing policies relating to terminals are based on responses to the audit questionnaire and subsequent interviews. A detailed review of competition issues across the entire supply chain (extending beyond import infrastructure to the retail market, for instance) was beyond the scope of the audit, as was an examination of private contracts and port charges in specific markets. ACIL Tasman also notes that where concerns arise, fuel companies have the option of raising them with the ACCC or seeking their own private remedies in accordance with the *Trade Practices Act*.

9.3 Constraints on efficient investment

The audit found that that the time required for planning and development approvals can be longer than desirable. The audit identified some instances, where legislation and approvals processes had impeded progress in new investment in import terminals and facilities.

[1] This conclusion is based on the assumption that spare capacity is not already subject to any pre-existing commitments or contractual rights which is likely to be the case for most of the independent operators.

However, this was not a universal finding. Some audit respondents noted that they had benefited from State Government planning and development support for significant projects. Port corporations were found to be generally supportive of investment in new bulk liquid facilities.

Access to land was identified as a concern in a number of ports. However this is not considered a critical constraint, although it will inevitably be a factor for consideration in metropolitan areas and land constrained ports.

A number of potential independent importers are currently in discussion with port authorities concerning new petroleum import capacity. It is important that planning and development approvals processes do not impede such considerations.

10 Key findings and strategic issues

This audit revealed the highly regional nature of petroleum import infrastructure. The conclusions on demand for new infrastructure investment, the nature of competition, investment requirements and the level of interest from independents, vary by region.

10.1 Adequacy to meet current and forecast demand

While there was some spare capacity in Victoria, South Australia, Western Australia and Tasmania as at December 2008, there was little spare capacity in the other States/Territories. However the audit found that current investment underway plus planned investments will change this situation over the next two years.

Expansion projects underway will increase storage capacity at terminals by 15 per cent in New South Wales, 10 per cent in Queensland and 14 per cent in Western Australia. With the completion of these committed investments there should be spare capacity in all jurisdictions except the Northern Territory.

Further expansions in New South Wales and South Australia are in the planning stages, and port corporations in Queensland and Western Australia are actively examining the prospect for further expansion in response to expected market growth.

There may be a need for increased investment in crude oil storage in Victoria as domestic oil production declines and for LPG import facilities at some ports. However the audit did not identify major constraints to such developments beyond those already discussed in relation to import terminals.

10.2 Fuel standards

The increased availability of fuel from Asian refineries that meets Australia's fuel specifications, along with growth in some sectors of the fuel market, has increased the interest of independents in entering or expanding in the Australian petroleum market. There is strong evidence of this in Queensland in particular.

Different fuel standards in Western Australia have the potential to limit the relative availability of product from Asian refineries compared to the rest of Australia. However there are also important environmental issues to be taken into account that are unique to Western Australia. The benefits and costs of maintaining different fuel standards in Western Australia should be reviewed to ensure a balanced approach to competition is maintained and Australia's energy security is not adversely affected.

10.3 Barriers to competition

On the basis of responses to the audit, ACIL Tasman considers that, on the whole, the current operating environment and access arrangements for import terminals do not impose a material barrier or constraint to competition for importers of petroleum products.

There may be circumstances that arise from time to time where this conclusion does not hold, for example, in circumstances where constraints on capacity apply or limitations on access exist such as at JUHI facilities.

10.4 Petroleum statistics

Ongoing assessment of the adequacy of petroleum import infrastructure and of barriers to competition from petroleum importers will depend on complete import and storage capacity data. ACIL Tasman noted that the Australian Petroleum Statistics may not include import data from all independent fuel importers as the provision of such data is not mandatory.

ACIL Tasman believes it is important that the publication of Australian Petroleum Statistics includes data on imports of petroleum products at import terminals, stocks of petroleum products at import terminals and the storage capacity at import terminals from *all* industry participants, and to ensure that data are provided by all independent terminal owners and importers, including the smaller ones.

10.5 Planning

The audit found examples where planning and development approvals processes were less than optimal. While this was not a universal finding, there is some evidence in some cases that legislative and approval arrangements are more complicated and time consuming than desirable in some jurisdictions.

ACIL Tasman considers that there is a case for Governments to review planning processes, legislation and any regulation of port land use or charging policies to ensure that decisions can be made in a timely manner and planning approval processes are as efficient as possible while meeting environmental requirements.

10.6 Recommendations

In summary, ACIL Tasman recommends that:

- The costs and benefits of retaining different fuel standards in Western Australia be reviewed.
- Consideration be given to measures for ensuring that the publication of Australian Petroleum Statistics captures all petroleum product imports, relevant stock level indicators and storage capacity at all import facilities.
- The Commonwealth Government consult with State and Territory Governments with a view to ensuring that planning processes, legislation, and regulation of port land use support timely planning and development approvals for petroleum import terminals.