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REFINING NZ
IMPACT OF CONVERSION TO FUELS TERMINAL

Prepared for MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT

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Authorship

This document was written by:

Ian Twomey	Phone: +64 4 471 1109, e-mail: ian@haletwomey.co.nz
Richard Hale	Phone: +64 4 471 1108, e-mail: richard@haletwomey.co.nz

Please phone or e-mail for further information.

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Executive Summary

Refining NZ operates the only fuels refinery in New Zealand and supplies 65-70% of the country's fuel demand for the main petroleum products (petrol, jet fuel and diesel). It is currently under severe financial pressure due to low refining margins and there is a risk that refining may no longer be viable.

As well as refinery processing, Refining NZ provides a key part of New Zealand's fuel infrastructure. It is the key supply route for supply into Northland, Auckland and the northern Waikato regions. Should processing cease the refinery facility would be transitioned to a major import terminal so those regions could still be supplied. The main change required would be converting storage so that larger volumes of finished products could be held in the facility.

The change of the Marsden Point facility to a fuels terminal would have a significant impact of New Zealand's fuel security including:

- A reduction in physical inventories (expected to be 25-30%) that ultimately is likely to impact New Zealand's supply security;
- An increased cost of compliance to meet the IEA membership requirement to hold stocks covering at least 90 days of New Zealand's daily net import requirement;
- The loss of the coastal tanker operation and the expertise associated with that (albeit import tankers would increase so there would still be plenty of ships on the coast);
- No ability in New Zealand to correct product that is significantly off-specification which needs to be taken into account with stock level decisions;
- Possible issues with jet import availability if it all needs to meet a lower sulphur specification for transport via RAP;
- No local supply of sulphur for fertiliser; replacement supply needed for CO_2;
- Loss of technical processing expertise; and
- Loss of ability to process New Zealand crude in a major supply emergency (global meltdown or pandemic where New Zealand might be isolated for a time).

1.0 Introduction

Refining NZ (RNZ) operate the only fuels refinery in New Zealand at Marsden Point which is a key component in New Zealand's fuel supply chain. The company is currently under severe financial pressure given the low refining margin environment[1] and there are concerns regarding the viability, both now and in the future of its refining activities. The Ministry of Business, Innovation and Employment (MBIE) is interested in understanding the importance of refining operations at Marsden Point to New Zealand's fuel markets, including from a supply security perspective. MBIE would also like advice on any issues for the Government to consider if the Marsden Point Refinery were to transition to a terminal operation.

This report is a high level report summarising the key issues for MBIE.

[1] https://www.refiningnz.com/refininglogin/wp-content/uploads/2020/02/Results-Announcement-Amended.pdf

2.0 Refining NZ's role in the fuel supply chain

The place of the Marsden Point refinery in New Zealand's fuel supply chain has been detailed in earlier reports such as 2005 Oil Security Report[2] and the recent Commerce Commission Market Study into Retail Fuels[3]. This report assumes the reader has a reasonable understanding of New Zealand's fuel supply chain.

In recent years the percentage of New Zealand's demand[4] for the key fuel grades produced by RNZ has been between 65-70% in total (Table 1). The decline in share from 2015 reflects demand growth (particularly jet and diesel growth) rather than a change in refinery output.

Table 1: Refinery output as a percentage of total NZ demand

	2015	2016	2017	2018[5]	2019
Petrol	62%	64%	59%	61%	62%
Jet Fuel	95%	88%	84%	86%	87%
Diesel	75%	65%	67%	56%	62%
Total	74%	69%	68%	64%	67%

The rest of the market demand is supplied by direct imports, primarily to the three largest demand ports (Tauranga, Wellington, Lyttelton) but also at times to some of the other seven ports around the country.

The refinery's output directly services the Northland and Auckland markets via a pipeline to a truck loading facility at Marsden Point (Northland) and the refinery to Auckland pipeline (RAP) to the Wiri terminal in Auckland. These locations take around 57%[6] of the refinery's output including most of the jet fuel as 75-80% of New Zealand's jet fuel demand is required for Auckland Airport, which is fed directly by a pipeline from the Wiri terminal.

Most of the rest of the refinery's output (~40%) is shipped by coastal tanker to the 10 ports around the country. This task is run by Coastal Oil Logistics Limited (COLL), a joint venture owned by RNZ's customers (BP, Mobil and Z). For this task they operate two Medium Range (MR) sized tankers (capable of carrying around 40,000 tonnes or 50 million litres each)[7].

Most of the crude processed through the refinery is imported, with the Middle East (mainly United Arab Emirates) the main supplying region. However, some indigenous crudes and condensates are processed (~2%) and these are transported to the refinery on the same coastal tankers used for product distribution.

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[2] *Oil Security*, Covec and Hale & Twomey, February 2005, Section 1.3, pg. 10

[3] Retail fuel market study - Final Report - 5 December 2019, Commerce Commission. Section 2.111 (pg. 79) through 2.152 (pg. 85)

[4] From MBIE Energy Data. The percentage is calculated on total demand including international transport.

[5] 2018 refinery output was lower due to a full refinery shutdown in that year.

[6] https://www.refiningnz.com/about/our-company/. The percentage would be higher if expressed as only petrol, jet , diesel as most black product is shipped from the refinery on the coastal tankers.

[7] http://www.coll.co.nz/about.html

3.0 Conversion to a terminal

Should the refinery be converted to a terminal our expectation is the following:

- An import terminal at Marsden Point would still be needed as that is the logical and most efficient supply route to Northland and Auckland;
- RNZ tankage capability would allow it to receive imports directly from Asian refineries (and further afield if the economics were favourable);
- As an import terminal it would handle two/three grades of petrol, jet fuel and diesel;
- The RAP would still be used for supplying Auckland;
- Whether a bunkering facility (imported bunker fuel) was maintained is open to question (given the lack of these facilities in Auckland post Americas Cup changes and the possibility of increased port activity in Northport[8]);
- The facility could act as a bitumen import terminal should there be customer demand;
- All other ports would be fully serviced by direct imports; and
- There would be no need for a regular shipping task from Marsden Point to other ports, so the two ships currently on the coast would no longer be required.

Given these changes a terminal at Marsden Point would service about 40% of New Zealand's demand - 30-35% for petrol and diesel and 75-80% for jet fuel. Therefore, terminal throughout would be around 55-60% of current refinery output.

4.0 Impact from refinery conversion to an import fuels terminal

4.1 Physical changes to facilities

Import fuels terminals have four major components:

1. A suitable port to receive appropriately sized tankers;
2. Suitable jetty facilities;
3. Appropriate storage to receive the volume and number of products required; and
4. Distribution facilities such as pipelines and truck loading facilities.

RNZ has all these components (although the truck loading facility adjacent to the refinery is owned by their customers with RNZ delivering to them by pipeline).

An operational question is whether these facilities would be suitable and appropriate for use as a product import terminal rather than crude processing.

4.1.1 Port

Marsden Point is a deep water port suitable for loading crude tankers to 14.7 metres draft. This is sufficient for fully loaded Aframax tankers and partially loaded Suezmax tankers. Product tankers

[8] https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12273168

that currently come to New Zealand are much smaller (~40,000 tonnes) so have no problem coming into the refinery (many now call at the refinery to deliver petrol blendstocks and, at times, pick up product for onward distribution).

As a deep water port, RNZ would be able to receive product imports on larger LR1/LR2[9] tankers. These can carry up to 120,000 tonnes and have a significant cost advantage over MRs as measured in cost per litre of delivery. However, LR delivery requires the facility to have more storage and the company delivering the product to hold higher levels of stocks. Product delivery on larger LR tankers is now a structural feature of the import terminals that were formally refineries in Australia.

4.1.2 Jetty

RNZ has two major jetties, both capable of handling tankers from MR through to Suezmax size. The jetties are capable of both importing product (currently product imports include petrol blendstocks, jet fuel and during shutdowns, petrol and diesel). They are also capable of loading all products (as currently happens on coastal tankers).

Following conversion, the crude import facilities would be redundant and there may be value in limited conversion of those facilities to product service to improve the discharge speed of large product imports. Other than that, we would not expect major work to be required on the jetties.

4.1.3 Storage (tankage)

Current refinery storage falls into three general categories:

- Crude and feedstock tankage;
- Intermediate product tankage[10];
- Finished product tankage

The capacity of the storage needed for a terminal would be significantly less than the current refinery storage. This is because there is no longer any need for crude and intermediate product storage, and because the throughput of the facility is likely to drop to around 60% of the previous level as noted in Section 3.0.

However, more product storage would be required as there is no longer the continuous rundown of intermediate product from the refining processes. Exactly how much is required would depend on import delivery patterns (particularly size of import ships), whether imports are single or multi-grade, co-ordination between different customers (number of customers) and customer requirement for minimum stock levels (what level of buffer or safety stock is required).

These decisions would need to be worked through with the terminal's customers. In Hale & Twomey's (H&T) analysis of the prospective conversion of Australia refineries to terminals we calculated that the refineries would typically need their product and intermediate tankage all

[9] LR stands for Long Range and is the term used for large product tankers rather than Suezmax/Aframax which are used for crude tankers. An LR2 is similar size to an Aframax tanker. Some tankers can transition between crude and product but for the larger tankers, as this requires substantial cleaning time and restrictions of product cargoes for a time, this does not happen frequently.

[10] We include imported blendstock tankage in this category.

converted to finished product tankage to provide sufficient terminal capacity[11]. This high-level assumption was seen as reasonable by the Australian fuel industry.

It may be a little lower for Refining NZ as their throughout is expected to drop to 60% of the previous output (the assumption for Australian refinery conversion is that throughput would be relatively similar for white products). However, it is not a direct relationship as the capacity can be set by the size of the ship delivering product as much as the throughput requirement.

Our expectation (without doing a full analysis of likely import deliveries) is that the refinery would need its finished tankage as well as converting at least half of its intermediate product tankage to product storage. It is very costly to convert crude tankage to product tankage, so we expect most of these tanks to be written off[12]. It is likely all fuel oil/bitumen tanks would be written off if the refinery does not handle bunker fuel/bitumen as these would not be suitable for white products without major investment (based on relative product throughputs this could cover nearly 15% of finished product storage).

4.1.4 Distribution assets

As noted in Section 2.0, RNZ distributes its inland product via pipeline to a terminal outside its gate and via the RAP to Wiri terminal in Auckland. We expect both these assets to be operated in a similar way to current operations, although it is possible additional products could be added to the mix once the facility operates as a terminal (e.g. another grade of petrol). It is possible new facilities might be added for different customers but that would depend on customer requirements at the time.

4.1.5 Summary of physical changes

In summary the major physical refinery changes required would be with tankage to provide the necessary product storage to operate as an import terminal. We expect most crude tankage, all black product tankage and refining units to be redundant as far as the requirements of a product import terminal (whether any refinery units can be repurposed for an alternative use is beyond the scope of this report and expertise of the authors[13]).

Some refineries have chosen to mothball facilities initially but in general, once mothballed it is rare to see the refineries restarting.

4.2 Inventories

Inventory levels would reduce with the change to terminal operation roughly in line with the assumptions on product tankage. That is product inventories would drop to around the level of current finished product inventories and around half the intermediate inventory for the portion servicing white product demand. This is a substantial reduction in inventories, although the level of finished (ready to use) product in the country would rise. The consequences of this issue will be covered in the next section.

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[11] *Competitive Pressures on Domestic Refining,* Hale & Twomey for Australian Department of Resources, Energy and Tourism, June 2012

[12] Crude tanks are generally floating roof like larger petrol tanks. These are not suitable for jet fuel and diesel which use fixed roof tanks.

[13] As far as we are aware all units in Australian refineries that have closed have been removed.

4.3 Rest of New Zealand's import infrastructure

The 10 coastal distribution fuel ports[14] (this will reduce to nine once Auckland Wynyard wharf storage is removed later this year) are currently served by both product from the refinery and direct imports. If the refinery is converted to a terminal our expectation is these ports would be 100% supplied by imports in the base case. Import tankers are similar in size and capacity to the coastal tankers so there are no port restrictions limiting this change, other than many of the smaller ports are draft restricted. The draft restrictions means these ports can only be visited once the ships have discharged some of their cargoes (this applies to coastal tankers as well).

The change to 100% import delivery may require some changes to the terminal infrastructure. These terminals have all been developed in a system where product is delivered regularly and rateably from the refinery in a mix of product grades designed to best service the demand in each port. Cargoes are also only loaded a few days prior to delivery so can be readily adjusted to reflect changing demand. Under a full import delivery model this would be much more challenging, particularly for the smaller ports which are currently largely serviced by coastal tanker from the refinery.

H&T's view is there is not sufficient storage at many ports to be efficiently serviced by direct imports[15], particularly as it is much more difficult to get appropriate mixes of products on import ships (it is generally more cost effective to ship whole cargoes of diesel or petrol rather than mixed cargoes and import vessels trading internationally generally have less flexibility to handle multi-product cargoes servicing the full range of demand). This could lead to very inefficient deliveries (multiple discharges, frequent port visits) and possibly an increased chance of stock shortages with a greater requirement on trucking to cover those issues. In our view this means:

- Fuel companies would need to invest in more port tankage in many ports to manage the change in supply system;
- Fuel companies would incur much higher import delivery costs (multiple drops) with increased risk of stock shortages that would need to be covered by trucking from other ports (where feasible); or
- Use RNZ import storage as a back-up for the rest of the system, as effectively happens now with coastal distribution.

The storage back up option at RNZ is effectively similar to current operation, where much of the finished product stock required to support the distribution system is held at the refinery. With Marsden Point converted to an import terminal, companies may choose to hold higher stocks at the facility, which they could call on if necessary to give them a buffer to the overall system. They could call on that buffer when needed either by shifting demand from Tauranga to Wiri or by getting import tankers (once discharged) to lift product from the refinery on occasions for delivery to smaller ports (this could make sense to provide balanced cargoes to smaller ports and because the delivery to the refinery using LR tankers gives a cost advantage versus normal MR supply).

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[14] Note the three Wellington port locations are treated as a single port for the purposes of this discussion.

[15] We note that the Commerce Commission raised concerns about the current terminal infrastructure provision in its recent market review. Executive Summary recommendation X89 "We consider that infrastructure sharing arrangements may be diluting incentives to invest in infrastructure, contributing to tight supply conditions at many ports. This is reflected in insufficient investment being made in shared storage terminals over the past decade, despite increased demand for fuel from the majors". Pg. 25

Should companies choose to use the refinery terminal in that way (i.e. for supply security) this would need to be built into the tank requirements for the facility.

4.4 Price impact

As New Zealand's fuel prices are set by the marginal import barrel[16], in theory a shutdown of the refinery should have no impact. H&T's report for Refining NZ into the Competitiveness of the Processing Agreement[17], shows that at times processing through the refinery can be more cost effective than importing and at others less. This variation is currently managed by fuel companies rather than passed through to the market as there are market participants who can set their prices independent of the level refining margins (direct importers).

While companies who currently refine will be reducing inventories, that reduction in inventory is not part of the import parity price build up, rather a necessary part of the refining process. The cost of holding that inventory is expected to be covered by funds generated from the refining process. A direct importer will naturally hold lower stock and the import parity price, while not explicitly including an inventory cost component, reflects that supply method.

Should additional investment be required in storage facilities, there may be an increase in terminal charges.

5.0 Likely resulting issues

This section covers likely impacts from the transition of the refinery to an import terminal. Most of these factors have a supply security impact and these are summarised in Section 5.11.

5.1 Inventory

As noted in Section 4.2, total inventories in the country would drop significantly with conversion of the refinery to a terminal. However, days of finished product in the country are likely to go up which would partially offset this drop. This change is likely to have both positive and negative impacts on supply security.

Table 2: Impacts from lower inventory

Positive impact	Negative impact
■ With more finished product in the country, New Zealand will have more immediately useable product on call. ■ Disruption caused by upsets/issues to the local refinery (as explored in the Petroleum Supply Security Reports[18]) would no longer be an issue ■ There would be more product stock on the water for delivery to New Zealand	■ There would be less stock in the country and while some of the current stock is not useable (minimum refinery operating stocks), ultimately this would provide less cover overall ■ Total stock on the water would be reduced (product voyages are shorter than crude on average)

[16] This is referred to as Import Price Parity and is fully described in the *2007 ACCC report into Australian petrol prices: Review of applicability to the New Zealand petrol market,* by H&T for MBIE, July 2008

[17] *Independent Review of the Refining NZ Processing Agreement*, Hale & Twomey 2017 & 2014

[18] *New Zealand Petroleum Supply Security 2017 Update*, Hale & Twomey for MBIE, September 2017

Based on MBIE month end data, we estimate that net stock reduction will be around 340,000 tonnes. This would be all refinery crude stock, about 1/2 the intermediate product stock (the other half would now be held as finished product stock) and the percentage of stock currently held as other products (primarily fuel oil and bitumen). This is a large reduction and would reduce New Zealand's total commercial petroleum stocks by 25-30%.

5.2 International Energy Agency (IEA) membership impacts

Lower commercial inventories would require action to be taken to ensure New Zealand remained compliant with its IEA obligation. Current government policy is to cover the difference between commercial stock holdings and the stock requirement by purchasing tickets. In the absence of any other change, conversion of the refinery to an import terminal would result in an increase demand for and cost of tickets. Based on a loss of 340,000 tonnes of crude and intermediate products, this could cost in the range of NZ$6.5-12.0 million/year based on the range of ticket prices secured in recent tenders[19].

As noted in Section 4.4, direct importers naturally hold lower stock than those using a refining process. One option for the government to consider for oil security should there be a major change in the supply chain such as the refinery shutting, is to introduce minimum stockholding requirements for all market participants. This would need to apply to all market participants equally, not only those who had been using the refinery supply chain for market fairness.

Such a change would increase cost to consumers as this cost would need to be recovered in marketing margins (while the companies who had been refining might not be increasing stock holding in this case, formally the stock recovery (for the stock needed for refining) was recovered through capturing some of the refining margins)[20]. Holding higher physical stocks has been and is expected to continue to be much higher cost that securing ticket stock.

5.3 No coastal tankers

H&T's view is that it is highly likely that should refinery processing cease, both coastal tankers would no longer be needed. This is because there would no longer be a need to regularly distribute product from the refinery, as the coastal ports would be supplied by direct imports. The coastal distribution cost is also covered by the margin the fuel companies retain from refining, so is also expected to have no impact on market prices.

The coastal tankers form a reasonable part of New Zealand maritime merchant fleet so loss of the tankers would have a significant impact on New Zealand's future capability in shipping expertise. The consequence of that would need future investigation and is outside the immediate expertise of the authors.

In terms of the resulting changes to the marine activity:

- All indigenous crude and condensate production would now be exported on foreign flagged tankers (as the majority already is); and

[19] Ticket costs are currently covered by a levy on the motorist. An increase would be passed through in an increased levy.

[20] Explanation of the cost differences between direct import and refinery supply are fully explained in the report, *Independent Review of the Refining NZ Processing Agreement*, Hale & Twomey 2017 & 2014

- Should, on occasion, stock need to be transported from the terminal at Marden Point to other ports, this would be done by the same ships (MR tankers) already bringing imported product to the ports.

5.4 No ability to fix off-specification cargoes

On occasions RNZ reprocesses off-specification product for its customers. This may be stock on import ships that does not meet specification when it arrives in the country, or product that has been contaminated in country. Reprocessing is a last resort and most product quality issues are managed in terminals by isolating off-specification product and slowly blending it with on-specification product (at an appropriate ratio) so the resulting blend is on-specification.

We would expect as a larger terminal, Refining NZ would have a greater ability to hold and reblend off-specification product than the smaller terminals. However, the loss of the ability to reprocess product would mean where product is well off-specification, cargoes may need to be returned to their source (i.e. back to Asia). This would increase costs and fuel companies would need to build that risk into their inventory decisions (so the loss of a cargo won't cause stock outs). We note that processes are well established to avoid product quality issues so these are not common, but when they do occur the impact can be significant.

5.5 Product quality - jet sulphur

In order to maintain the product quality of petrol and diesel through the RAP, RNZ restricts the level of sulphur in the jet fuel in the pipeline. The refinery produced jet is low in sulphur but imported jet can be substantially higher[21].

Currently Refining NZ allows jet imports but if they are above a certain sulphur level they are reprocessed to reduce sulphur levels before being distributed through the RAP. Despite imports currently being a relatively small part of total demand, we understand companies often bring in higher sulphur jet. We are not sure if this is due to availability or cost, although it does highlight that industry see the ability to reprocess jet as important. We assume this ability to reprocess would be lost with shutdown of refinery processes.

If it is an availability issue that means low sulphur jet is difficult to secure, then this change could have a supply security impact. This issue would need to be explored in more detail.

5.6 Other products (Sulphur/CO_2)

The refinery currently produces sulphur and CO_2 as by-products from its process. Sulphur is sold to the fertiliser industry and CO_2 to the carbonated drinks industry. Sulphur can be imported and CO_2 could be generated from an alternative process but it is likely in both cases costs would rise for those industries in the absence of supply from Refining NZ.

5.7 Expertise

Refining is a specialised industry requiring significantly more expertise that that required for terminal operation. As well as the substantial loss of people employed, conversion to a terminal

[21] Jet fuel specification is international and due to the difficulty/time needed to get international agreement, this has not moved in line with other grades with regard to the level of sulphur allowed. The current maximum specification is 2000ppm whereas RNZ limits sulphur in jet to 300ppm to allow it down RAP,

would lead to a substantial loss of expertise in New Zealand. The impact of this, and the wider economic impact on the Northland region are beyond the scope of this report.

5.8 Crude processing

As noted in Section 2.0, RNZ processes a small amount of locally produced crude and condensate (~2% of refinery intake, although around 10% of total locally produced crude and condensate). The refinery only processes the amount its customers assess as economic. In an emergency it could process a lot more and possibly all (that would be 20% of normal capacity)[22]. We understand that the refinery could not run entirely on local crude but in conjunction with existing stocks and other crudes still available on the market, local crude could extend New Zealand's self-sufficiency should an event result in normal international market structures failing such that crude and products can't be imported into New Zealand.

This capability would be lost should refining cease in New Zealand.

5.9 Utilities and emissions

Refining NZ is a major user of electricity and gas. Closing the refining processes would substantially reduce electricity requirements and remove the need for gas. It is difficult to comment on the net impact of that, although it is likely the distribution charges would increase for other Northland consumers.

While CO2 emissions would reduce in New Zealand, these would now be generated in the refineries supplying fuel to New Zealand so there is expected be no net global benefit.

5.10 Transition to new fuels

Refining NZ currently produces hydrogen as part of its refinery process. It is also the logical place to blend and manage biofuel introduction to the New Zealand fuels market should these ever reach appropriate scale. It is difficult to make any definitive statement, although there would definitely be a loss of capability and capacity for future market enhancements should New Zealand no longer have a refinery.

We do not know whether a closure decision impacts on Refining NZ's recent decision to invest in a solar power plant.

5.11 Supply security impact summary

In summary we expect the following impacts on supply security.

1. A reduction in physical inventories (by 25-30%) that ultimately is likely to impact New Zealand's supply security, even if the impact of loss of refining processing locally is removed.

2. An increased cost of compliance to meet the IEA membership requirement to hold stocks covering at least 90 days of New Zealand's daily net import requirement in the absence of any other change to increase stocks.

[22] These higher percentages may require some relaxation in product specifications to maintain feasible operation.

3. The loss of the coastal tanker operation and the expertise associated with that (albeit import tankers would increase so there would still be plenty of ships on the coast).

4. No ability in New Zealand to correct import product that is significantly off-specification which needs to be taken into account with stock level decisions.

5. Possible issues with jet availability if it all needs to meet a lower sulphur specification for transport via RAP.

6. No local supply for sulphur for fertiliser; replacement supply needed for CO_2.

7. Loss of technical processing expertise.

8. Loss of ability to process New Zealand crude in a major supply emergency (global meltdown or pandemic where New Zealand might be isolated for a time).

6.0 Australia Summary

There are lessons that can be learned from Australia's experience in closing refineries in recent years. Australia has had four refineries close since 2000. In all cases the decision had to be made whether to convert to a terminal. The following is a summary of the closures.

6.1 Port Stanvac (Adelaide)

This refinery was initially closed and mothballed in 2003 before been permanently removed from 2009. There was no conversion to a terminal as there were existing terminals along with better sites for new terminals in Port Adelaide (and the new deeper water port area developed near there around the same time).

6.2 Clyde Refinery (Sydney)

Clyde was closed in 2011 and converted to a fuels terminal. It is in the Parramatta area of Sydney and supplied via a berth in Gore Bay (in the main Sydney Harbour). Given the size of the Sydney market it was deemed essential by the owner at the time (Shell) to have it converted to a fuel terminal. It supplied around one third of the NSW market.

A summary of the work completed is available from the link reference below.[23]

6.3 Kurnell (Sydney)

Kurnell, the larger of the two Sydney refineries closed in 2014. This left Sydney (and New South Wales), a city of over five million people, with no oil refineries. As with Clyde, conversion to an import terminal was seen as essential to manage Sydney's fuel supply, although closure did also result in further development of independent fuel terminals. Both Kurnell and the independent terminals are suppled through port facilities in Botany Bay.

[23] https://www.vivaenergy.com.au/driven/innovation/the-conversion-of-clyde-from-refinery-to-large-scale-import-terminal

Caltex Australia (the facility owner) now state this is the largest import facility in Australia[24]. They note that the conversion cost AU$200 million and took nearly five years in total, although, by necessity, the facility was always operational as a terminal during this time.[25]

6.4 Bulwer Island (Brisbane)

Bulwer Island refinery closed in 2015. In this case it wasn't fully converted to an import terminal as there was one refinery remaining in Brisbane that was able to shift its full production to meeting the inland market (previously product was shipped to other ports from both refineries), along with existing import terminals nearby that could be developed.

As there was a direct supply route to Brisbane airport from the refinery site (the site was very close to the airport), a jet import facility and storage was retained on the site. The closure notices also noted that BP (facility owner) was only going to mothball some facilities to retain the ability to convert to a multiproduct import terminal if needed in the future[26].

6.5 Summary of lessons from Australian refinery conversions

In summary, following refinery closure in most instances conversion to a terminal facility was required to ensure the necessary infrastructure was available for supply security (and/or alternate supply infrastructure was developed). In all cases refinery closures were also associated with the loss of coastal tankers due to the reduction in the need to move product around the coast.

Australia's physical inventories have declined with the loss of refining capacity, and while this remains a political issue in Australia, there have been no supply disruptions that we are aware of associated with the change to increased import supply (Australia still has four operating refineries meeting approximately 50% of the countries demand). In the course of our work for the Australian Government some fuel companies stated that supply was smoother with imports as they no longer had to deal with short term disruption caused by upsets of local refineries.

[24] https://www.caltex.com.au/our-company/environment/kurnell-site-conversion

[25] https://www.theleader.com.au/story/6193816/caltex-site-conversion-works-completed/

[26] https://www.smh.com.au/national/bp-turns-to-caltex-for-supplies-after-bulwer-island-closure-20150403-1me251.html