MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

BRIEFING

Update on Refining NZ's strategic review

Date:	3 June 2020	**Priority:**	Medium
Security classification:		**Tracking number:**	3319 19-20

Action sought		
	Action sought	**Deadline**
Hon Dr Megan Woods **Minister of Energy and Resources**	**Note** the advice in the briefing.	3 June 2020

Contact for telephone discussion (if required)				
Name	**Position**	**Telephone**		**1st contact**
Andrew Hume	Policy Director, Energy and Resource Markets	04 901 1474	s 9(2)(a)	✓
Gareth Wilson	Principal Advisor	04 460 1375	s 9(2)(a)	

The following departments/agencies have been consulted

Minister's office to complete:

☐ Approved ☐ Declined
☐ Noted ☐ Needs change
☐ Seen ☐ Overtaken by Events
☐ See Minister's Notes ☐ Withdrawn

Comments

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Purpose

This briefing provides an update on our engagement with Refining NZ on its strategic review, ahead of your scheduled meeting on 4 June with Refining NZ's Chief Executive Naomi James.

Recommended action

The Ministry of Business, Innovation and Employment (MBIE) recommends that you:

a **Note** you are scheduled to meet Naomi James, Chief Executive of Refining New Zealand, on 4 June to discuss progress on the company's strategic review.

Noted

b **Note** that we have engaged with Refining NZ over the past month and sought expert perspectives on areas where the refinery appears to have strategic value to New Zealand.

Noted

c **Agree** to forward this briefing to the Minister of Finance, Minister of Transport, Minister of Economic Development, and any other colleagues with an interest in the refinery's future.

Agreed

d **Agree** to discuss next steps with officials.

Agreed

Andy Hume
Policy Director, Energy and Resource Markets
Building, Resources and Markets, MBIE

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Hon Dr Megan Woods
Minister of Energy and Resources

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Introduction

1. You are meeting Refining New Zealand (RNZ) on 4 June to discuss progress on its strategic review. A brief biography of the RNZ's Chief Executive Officer, Naomi James, is attached. We have been engaging with RNZ since your last meeting on 23 April 2020 and this briefing provides further information and advice to support your meeting.

2. While RNZ's strategic review is considering a range of options, this briefing focuses on the one with the most significant implications, which is to close the refinery and convert the Marsden Point site to a fuels import terminal. We have previously advised you on how this option would affect the supply of fuel in New Zealand. We provide some further comments on fuel security in this briefing, and discuss other implications.

3. We generally agree with the views expressed by RNZ about the implications of closing the refinery. Closure would have a number of adverse consequences, and taken together, they suggest the maintenance of domestic refining capacity has some strategic value to New Zealand. It is not straightforward to quantify that strategic value, and therefore difficult to assess the merits of any government interventions that might help RNZ retain its refinery business.

4. On balance, we think that domestic refining capacity is not of critical strategic significance to New Zealand, in the sense that its closure would not create significant risks and would not entirely foreclose important future opportunities. But we think its closure could limit future opportunities if a domestic biofuels and/or hydrogen industry could develop in a way that leveraged the skills, facilities, and utilities (used in petroleum refining) to make production of renewable fuels more competitive.

Implications of replacing refinery with import terminal

Highly skilled jobs and manufacturing capability

5. RNZ currently employs around 400 people directly, a similar number indirectly, and has previously been assessed as contributing about 7 per cent of the Northland GDP. A terminal operation would likely employ less than 20 per cent of that number of people, with a different mix of skill sets. Similarly, reduction in refining output and replacement with directly imported finished products could result in less demand for the current New Zealand coastal shipping fleet which transports products from Marsden Point to regional ports.

6. RNZ contributes about $10 million to the largely fixed cost of supplying electricity, water and other utilities in the Northland region and to New Zealand more generally. Without this contribution, the cost of these services to other users would likely increase.

7. RNZ employs about 50 engineers, with specialist expertise in energy consumption, chemical, mechanical, civil, processing units, process control, electrical and metallurgical engineering, maintenance and process safety and another 70 employees and contractors who are skilled operators and tradespeople operating and maintaining the refinery. RNZ considers many of these skills may not have alternate sources of employment in New Zealand, making it likely many may leave New Zealand in search of new employment opportunities resulting in a loss of capability from the New Zealand economy.

8. RNZ told us the refinery would be mothballed if closed. Demolition of the refinery equipment would not occur for up to a decade, depending on the planned re-use of the site and equipment. The refinery could only be restarted after some years in a mothballed state, with substantial investment costs associated with a total overhaul. On the other hand, demolishing the refinery and remediating the site could cost hundreds of millions of dollars, based on Australian experience with refinery closures.

Refinery by-products

9. RNZ is a major supplier of CO_2 for carbonated drinks and water treatment plants, sulphur for fertilizer manufacture, and bitumen for construction and civil works. If the refinery were to close, the bulk of the replacement stock for each of these would need to be imported. We think the CO_2 market would be the most affected.

10. We understand CO_2 production could potentially be increased at other industrial sites (e.g. the Kapuni gas processing station) but this would require investment to achieve the necessary quality standards. We have been told that importing CO_2 is currently viable in small quantities, but any rapid transition to large-scale importing would be problematic given the increased need for costly containers. It is possible some applications would switch to alternatives (e.g. water treatment could switch to chemicals).

Transition to future domestic hydrogen and liquid biofuels industries

11. One area of strategic value is the potential for refinery operations at Marsden Point to assist in a transition to low emission fuels, particularly hydrogen and drop-in biofuels that could be produced in New Zealand. We have sought input from people with expertise in these areas to inform our thinking about the option value of RNZ's facilities, land, utilities and workforce capabilities.

12. Greenhouse gas emissions from liquid fuel consumption, driven by transport, account for about half of energy sector emissions, and almost 20 per cent of total gross emissions. Reducing emissions from liquid fossil fuel use, particularly for transport, represent one of the best options to significantly reduce the country's emissions.

Green hydrogen

13. RNZ is currently the largest manufacturer and consumer of brown hydrogen in New Zealand. Hydrogen is produced on site from natural gas, and is used in the petroleum refining process. RNZ considers that continued refining activities could facilitate a lower cost transition to hydrogen transport fuel, with the low-cost manufacture of brown hydrogen today at scale moving to greener hydrogen production over time.

14. RNZ's location potentially gives it a comparative advantage in supplying green hydrogen to key domestic transport/distribution nodes (trucks and trains), and/or port facilities for export. Its ability to scale up production (which lowers the unit costs of any investment in electrolysers) and its ability to consume any periodic excess supply of hydrogen, suggest it could potentially support large-scale green hydrogen production. RNZ has deep technical capability and experience of handling hydrogen.

15. However, on a pure production basis it is not clear that RNZ would ever be a low-cost or competitive producer of green hydrogen. Other areas in New Zealand, and other countries, will likely have access to lower cost renewable electricity - a critical component in the cost of producing green hydrogen.

Liquid biofuels

16. While not discounting the role RNZ could play in green hydrogen production, we think it more likely that RNZ could play an important role in that industry if it also produced drop-in liquid biofuels (particularly renewable jet and diesel fuels). Hydrogen, whether brown or green, would be a critical enabler of drop-in biofuels (for reasons discussed below) if there were ever a business case for domestic production of renewable liquid fuels. Such fuels could potentially come from domestic biomass or intermediate bio-crude feedstocks transported from regional processing plants located close to biomass crops or residue streams.

17. There is work underway on opportunities to reduce emissions in the transport sector, including biofuels produced from domestic feedstocks. The Ministry of Transport is currently consulting on a Green Freight Strategy Working Paper, which explores the potential of three alternative green fuels - electricity, green hydrogen and biofuels - to reduce emissions from road freight. Biofuels also feature prominently in options to reduce emissions in the aviation and maritime sectors.

18. The Ministry of Primary Industries and others are developing an industry transformation strategy for the forestry and wood processing sector ("Wood Fibre Futures"). We understand this work has identified biofuels (particularly bio-crude from forest residues and wood waste) as a promising candidate for early investment support. Both liquid and solid biofuels are considered key elements of a circular bio-economy, hand-in-hand with a strong timber processing sector.

19. Bio-crude derived from woody biomass can be refined into drop-in fuels (including jet, diesel and petrol). Drop-in biofuels have the distinct advantage over other renewable fuels in their ability to be used in existing engines without modification or blending, and to use the same distribution and refuelling infrastructure as existing petroleum fuels.

20. Replacing petroleum fuels (even just jet fuel) through domestic production of biofuels would require large quantities of feedstock and commercial scale production facilities. Scion, in its *New Zealand Biofuels Roadmap,* found that New Zealand could have sufficient low-value marginal land to grow feedstock to meet 30 percent of current liquid fuel demand by 2050. New Zealand could also import biofuels from overseas and other low emission fuels such as electricity and hydrogen could potentially meet remaining transport fuel demands.

21. Scion's *Biofuels Roadmap* analysed a range of biofuel options and indicated that the most likely large volume opportunity would require significant amount of hydrogen upgrading of bio-liquids.[1] This hydrogen capability and capacity currently resides at the refinery at Marsden Point, and recent investigation into bio-jet options found that making use of utilities and intermediate streams at the refinery could reduce the overall cost of drop-in biofuels production versus a standalone biofuels plant.

Fuel security

22. RNZ initially indicated the refinery was important to fuel security and provided "fuel supply optionality". However, in more recent discussions RNZ has said that closure of the refinery would not adversely affect fuel security. We agree with that view, which is also consistent with the interim report of the Australian Government's *Liquid Fuel Security Review*[2].

23. Under most scenarios, importing refined fuels only (the model if the refinery were to close) is not less secure or less resilient than importing a combination of crude oil and refined fuels (the current model). Indeed, sourcing fuels from multiple refineries in multiple locations would reduce the "single point of failure" exposure we currently face with most of our fuel produced at Marsden Point.

24. However, having domestic refining capacity combined with domestic crude oil production could provide more security if regional or global fuel supply chains were severely disrupted by geopolitical conflict, natural disaster or pandemic (or some combination of all of these). In such an event the ability to refine domestic crude oil could reduce the severity of a fuel supply shortage. The probability of such a severe disruption may be very low but it cannot be discounted entirely.

[1] "Upgrading" involves reacting bio-oil with hydrogen to produce a mixture of drop-in petrol, diesel and/or jet fuel.
[2] Available at: https://www.environment.gov.au/system/files/consultations/7cf6f8e2-fef0-479e-b2dd-3c1d87efb637/files/liquid-fuel-security-review-interim-report.pdf

The benefit of being able to refine domestic crude oil may also diminish over time, given current trends in domestic crude production due to declining petroleum exploration and production activity.

IEA oil stock-holding obligation

25. As previously advised, closure of the refinery would likely result in fuel companies holding more final product stocks but lower levels of stocks overall (because there would be no crude oil stocks ready for refining). New Zealand would need to replace that reduced stock in order to remain compliant with the IEA stock-holding obligation. The cost of purchasing additional oil stock tickets to meet these obligations is estimated to be in the range of NZ$6.5-12.0 million a year.

26. While purchasing oil stock tickets is the lowest cost means to achieve compliance with IEA obligations, the value of domestic stocks (or the cost of reduced stocks) in terms of fuel supply resilience should also be considered. Many other countries maintain domestic oil stock reserves, over and above commercial stocks, because they value the additional resilience of having stock available to ride through severe domestic or global disruptions. Among countries that are net importers of oil, Australia and NZ are notable exceptions to the general OECD norm, in that we do not hold such domestic reserves.

27. Previous studies of stock-holding policy (in 2005 and 2012) concluded that it was not cost effective for NZ to build strategic domestic oil reserves. The inputs and assumptions underpinning those studies were updated in 2017, and were found to have not changed sufficiently to warrant a review of the standing stock-holding policy. However, the prospect of losing a significant amount of commercial stock as a result of refinery closure may warrant a more considered review of the stock-holding policy.

What might make domestic refining viable?

28. RNZ has identified several factors that could potentially increase incentives for domestically refined fuels, and therefore support future operation of the refinery:

    a. new revenue sources, such as for the avoided cost of IEA oil stock holding

    b. lower customs and excise duty for domestically refined fuels

    c. incentives to fast-track low carbon energy transition, and

    d. lower electricity and gas costs.

Fuel security policy settings could potentially affect the refinery's future viability

29. Although fuel security, of itself, may not be an important consideration in RNZ's strategic review, any changes to New Zealand's fuel security policy settings could be relevant. s 9(2)(f)(iv) [redacted]

31. We have not undertaken any analysis of the pros and cons of changing fuel security policy settings, and we mention it here only as a potential intervention option should the Government consider it desirable to retain domestic refining capacity.

Excise duty on domestically refined fuels

32. We have not considered the implications of changing excise duty to favour domestically refined fuels, but we expect it would be inconsistent with New Zealand's international trade positions and obligations.

Low emissions transition policies

33. Work is underway to amend regulations to enable RNZ to enter the NZ ETS from 2023 and receive an allocation under the same policy settings as other emissions intensive trade exposed activities. A review of the electricity allocation factor is also underway and is a source of some regulatory uncertainty for RNZ.

34. As mentioned above, there is work underway to explore pathways towards lower emissions transport. New Zealand is committed to reducing emissions and we consider it very likely there will be interventions to accelerate the development of low emissions fuels, including hydrogen and liquid biofuels. We also think there will likely be measures to promote domestic production of low emission fuels, in preference to importing those fuels, especially where such policies support wider bio-economy or forest industry transformation objectives. However, the landscape is complex and at this time it is difficult to be sure which options or pathways will be chosen, or when.

Electricity and gas costs

35. RNZ has told us its energy costs are significant and make up about one third of total operating costs. We expect RNZ has explored opportunities to reduce electricity costs with Northpower, Transpower and the Electricity Authority.

Suggested questions for RNZ:

- *What kinds of incentives or policy measures relating to fuel security would have the biggest impact on the refinery's economic viability?*
- *What kind of incentives or policy measures to reduce emissions would have the biggest impact on the refinery's economic viability in the short to medium term?*
- *Has RNZ explored opportunities to reduce energy costs with its energy suppliers and with the Electricity Authority?*

Next steps

36. RNZ has, to date, asked for the Government's input into its strategic review. As the review progresses, it is possible RNZ will develop clearer views on the issues and options, and it may approach you and other Ministers with more specific requests or proposals.

37. We are available to discuss, at your convenience, how to engage with RNZ during the remainder of this phase of the review, and in the next phase.

38. In light of the prospect of a closure of the refinery, and the resulting reduction in total oil stocks held in New Zealand, we think it could be timely to review the current stock-holding policies. A review would consider whether it remains appropriate to meet the IEA's 90 days of net imports target solely by procuring reserve oil stock tickets offshore, or whether some minimum level of domestic stock should be maintained.

Annex one: Brief biography

Naomi James, CEO, Refining NZ

Naomi joined Refining NZ in April 2020 as Chief Executive Officer. Naomi trained as a lawyer, and has extensive experience in strategy development, operations and change management.

Prior to joining Refining NZ, Naomi held the position of Executive Vice President at Santos Ltd, Australia's second largest independent oil and gas producer, where she was responsible for Santos' midstream infrastructure assets including oil and gas processing facilities.

Prior to Santos, Naomi held leadership roles at Australian mining and materials company Arrium Ltd, including Chief Executive of the Group's non-integrated steel businesses.