



15 February 2019

Tom Forster
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Ministry of Transport – Te Manatū Waka
MARPOL Annex VI submissions
PO Box 3175
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Via email: maritime@transport.govt.nz

Dear Tom

‘MARPOL Annex VI submission’

Refining NZ appreciates the opportunity to make this submission to the Ministry of Transport regarding the discussion document “New Zealand’s potential accession to International Maritime Organisation Treaty: MARPOL Annex VI: Prevention of Air Pollution from Ships” dated November 2018.

Refinery background:

1. Refining NZ is the only oil refinery in New Zealand. It supplies approximately 40% of the total energy needs of New Zealand and 70% of the transport fuel needs, with the remaining 30% imported by our customers from larger Asia Pacific refiners (our competitors) in Korea, Singapore, and Japan.
2. Refining NZ is a toll refiner, which means we process crude oil brought and shipped to our Marsden Point refinery by our customers (BP, ExxonMobil, Z Energy) into the high quality transport fuel products for New Zealand.
3. Our objective is to produce the highest quality transport fuels with the lowest carbon footprint practically possible. We have made substantial investments in our refinery (~\$735 million) in order to improve energy intensity (and hence, our carbon emissions profile), remove benzene from petrol and to produce low sulphur diesel.
4. In 2005 as part of our \$180 million investment in the Future Fuels project we installed sulphur removing units to reduce the sulphur content of our fuel products in particular, to bring the sulphur content of diesel to less than 10 ppm.
5. By our own reckoning, our investment in Future Fuels has reduced the amount of sulphur dioxide (SO₂) from fuel products made at Marsden Point by around 24,000 tonnes per year - a total of 336,000 tonnes of SO₂ over the last 14 years. This will have had a direct and beneficial impact on the air quality in New Zealand’s major cities.

Refining NZ

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By contrast, New Zealand signing up to MARPOL Annex VI would reduce total SO₂ emissions by around 4000 tonnes per year. The resultant air improvement will be spread throughout New Zealand, but will largely be in the Cook Strait (ferries) and further offshore where the fishing fleet operates.

6. Refining NZ has long been committed to helping New Zealand meet its climate change obligations. A prime example is the refinery's \$365 million investment in a new petrol making unit (Te Mahi Hou), which has reduced carbon emissions at the refinery by 120,000 tonnes per year – the emissions equivalent of removing 60,000 Toyota Corolla's from New Zealand roads.
7. Refining NZ is a major contributor to the Northland regional economy, with over 500 employees and contractors coming through the refinery gates every day. In addition, for every full time job at the refinery another six are created in New Zealand (in sectors supplying the refinery)¹.

Key points from our submission:

8. Answers to specific questions are included at the back of this submission. Our response to issues raised in the discussion document can be summarised under the following key headings:

Our concern is with the low sulphur fuel oil specification only

9. Refining NZ supports the intent of limiting or reducing air pollution from New Zealand shipping activities. While we agree with the intent of the MARPOL Annex VI regulations MARPOL Annex VI is not just about SO₂ but also nitrogen dioxide (NO_x), and particulates. To that end, we also believe care needs to be taken to not lump SO₂ with these and greenhouse gases that have a recognised link to climate change:
 - SO₂ is not a greenhouse gas. It is a pollutant known to cause harmful smog and acid rain in high density shipping lanes and in dense urban areas and industrial areas: most problematic in Asia, Europe in the 20th Century and North America.
 - NO_x on the other hand, forms a chemical pathway for ozone which is a greenhouse gas.

Accession before 2023 will have unintended environmental consequences

10. There is a high risk that early adoption of the sulphur content restrictions in MARPOL Annex VI may lead to the unintended consequence of high sulphur fuel oil (3.5%) which is left after our refining processes, ends up being shipped as a coal equivalent priced fuel to the very areas of the world (e.g. Asia) that are highly exposed to SO₂ as a pollutant. This would lead to a very negative environmental impact.

¹ Bruce, P. Hughes, D. et al (2008); "The New Zealand Refining Company – Our Contribution"; *NorthTec and Institute of Public Policy*; P 6.

Retaining crude flexibility is critical to the refinery

11. Our business case as a refinery is based on our ability to handle a wide range of low sulphur and high sulphur crudes on behalf of our customers with a comprehensive capability to remove sulphur from our high end petroleum products and sell it on as feedstock to the domestic fertiliser industry.
12. MARPOL Annex VI does, to some degree, represent a threat to our toll refinery given it may restrict our ability to process as wide a range of crudes as we do at the moment thereby impinging on our refining margin and revenue stream.

Continue to explore local solutions to sequester sulphur

13. The environmental impacts relating to SO₂ are well recognized, and hence why the refinery devotes considerable resource to ensuring SO₂ emissions from our Marsden Point operation comply with New Zealand's air quality guideline values and continually monitors for SO₂ in the adjacent community.
14. We are exploring a number of very exciting opportunities around both producing a low sulphur fuel oil from spare desulphurisation capacity at the refinery to converting a large portion of the high sulphur residue into asphalt for roads where both the sulphur and the carbon in the residue would effectively be sequestered into New Zealand roads.
15. Refining NZ notes the concerns regarding air pollution from activities particularly at the Ports of Auckland. As the majority of large vessels visiting Auckland are registered overseas, these vessels will be required to be MARPOL Annex VI compliant from 1 January 2020, irrespective of the time when New Zealand accedes. Thus New Zealand's accession to MARPOL Annex VI will not have a material impact on the SO₂ emissions from shipping activity in Auckland.
16. We are firmly of the view that delaying accession to MARPOL Annex VI till 2023 would allow the refinery sufficient time to progress these potential solutions, working in tandem with policy makers, and industry (i.e. the oil companies, New Zealand shippers, bitumen suppliers and consumers).

Recommendations:

17. Legislative changes will be required before New Zealand can sign up to the IMO Treaty. In light of that, our recommendation to policy makers is to introduce regulations that meet MARPOL Annex VI requirements in a staged manner, starting with the NO_x and particulate standards.
18. Sulphur content restrictions should be the last to be introduced given the potential economic disruption to Refining NZ and local shippers in the initial years as well as the very real risk of an adverse environmental outcome globally, from New Zealand exporting its high sulphur fuel oil.

19. Refining NZ needs the continued cooperation of Industry and government to fully explore the opportunities to sequester sulphur and carbon in bitumen/ asphalt.

Concluding comments

Refining NZ supports New Zealand's accession to MARPOL Annex VI but this needs to be carefully phased to allow industry and policy makers the opportunity to progress viable solutions that meet our IMO Treaty obligations and support our shipping industry in a period of transition.

Thank you again for the opportunity to make this submission. We would welcome more detailed discussion with the Ministry on the issues we have raised.

For Refining NZ



Mike Fuge
Chief Executive Officer

Responses to the Ministry's questions:

Q 1. New Zealand's stated ambition is to be a global leader on climate change and strengthen our credibility and influence in international climate negotiations. To enable New Zealand to influence climate change policy at the IMO we need to accede to Annex VI and be at the table to influence decisions. Do you agree?

- At an international level, New Zealand's 'Clean and Green' image underpins its success in marketing its goods and services to world markets, especially when trading commodities. It is therefore important for New Zealand to continue to pursue goals that enhance our environment, and by so doing, provide substance to that global image.
- At a local level, Refining NZ is a major manufacturer, employer and an emissions intensive industry. We are proud of our environmental performance, conscious of the carbon footprint of our operations and committed to helping New Zealand meet its climate change obligations. A prime example of that carbon commitment is our \$365 million investment in a new petrol making unit (Te Mahi Hou), which has reduced carbon emissions at the refinery by 120,000 tonnes per year – the emissions equivalent of removing 60,000 Toyota Corolla's from New Zealand roads.
- With regards to the sulphur content in fuel oil which is a focus of MARPOL Annex VI, we need to be very clear that the benefits from reducing sulphur are environmental and health related (not climate change) and felt most in those areas where air pollution is compromised (i.e. ports, dense urban and industrial areas). As noted earlier in our submission SO₂ is not a greenhouse gas and hence, does not have an impact on climate change.
- As outlined in this submission Refining NZ believes that a phased accession to MARPOL Annex VI in 2023 would prove the most robust policy decision for New Zealand.

Q 2. What are the costs associated with complying with SEEMP and EEDI requirements?

- While not a shipper, and hence not qualified to comment on the costs associated with SEEMP and EEDI requirements Refining NZ is reliant on international shipping for the supply of all of its feedstocks (typically crude oil from the Middle East or Far East). Incremental freight costs would raise the delivered cost of feedstock for Refining NZ, though this could be offset by the (likely) incremental freight costs for imported finished product valuations. The nett effects on Refining NZ may therefore be limited.

Q 3. What are the benefits associated with the EEDI and SEEMP requirements?

- Refining NZ is not a shipper, and is not qualified to comment on the benefits associated with SEEMP and EEDI requirements, other than to note the environmental benefits, and the consequential benefits to NZ's 'Clean and Green' image.

Q 4. What does New Zealand need to bear in mind on slow steaming when considering accession to Annex VI?

- Voyages for feedstocks supplied from the Middle East have a duration of around four weeks for delivery to Marsden Point. The incremental voyage time resulting from slow steaming will need to be incorporated into the supply chain planning processes to ensure continued timely delivery of feedstocks. We expect that this will be manageable.
- Longer supply chains reduce operational flexibility, as a result of the longer lead times between procurement decisions being made and the time of crude processing through the refinery.

Q13. What are the benefits of moving to fuel with a sulphur limit of 0.5 percent?

- Environmental benefits as documented by industry experts.

Q14. What are the costs associated with moving to a low sulphur fuel limit of 0.5 percent?

- Around the world, bunker fuel is a by-product from the refining industry where the primary objective is to produce white transport fuel products i.e. petrol, diesel and jet fuel. The residual (black) product from the refining process is blended with diesel components to meet the low-value bunker fuel market demand.
- The IMO MARPOL Annex VI regulations will see a step change in global bunker fuel demand:
 - demand for high sulphur bunker fuel oil, will plummet (it may only be consumed by ships utilising on-board scrubbers) whilst demand for 0.5% sulphur fuel oil (or marine gasoil) will step up. Invariably, this will result in a global surplus of high sulphur fuel oil, with consequential depressed prices (some industry consultants suggest that this may need to drop to 'coal-heating-value' price-parity to stimulate terrestrial demand for this surplus product).
- The expected spike in 0.5% sulphur (low-sulphur) bunker fuel demand, or a 0.5% sulphur marine gasoil (i.e. high sulphur diesel), is expected to push up the global market price for these products.
- Removing sulphur from white products (petrol, diesel and jet) is relatively easy, and most refiners operate hydro-de-sulphurisers to achieve this (e.g. Refining NZ produces 10ppm sulphur diesel, i.e. 0.001% sulphur and petrol). We note that it is technically very challenging to remove sulphur from residual (black) product, and very few refineries are able to do this.

- Refining NZ does not sell products, but it is reasonable to assume that ships that are able to continue operating on high sulphur fuel oil will see a significant drop in their fuel costs, whilst those forced to operate on low-sulphur bunker fuel (or marine gasoil) will see a significant increase in fuel costs.
- Future prices are not known, and IMO 2020 presents huge price uncertainty for all stakeholders around the world. International market commentators suggest that (US\$/tonne) commodity price falls of 30-40% are possible for high sulphur bunker fuel in the 2020-2025 years, while shippers switching to low-sulphur bunker fuel may see a 20+% increase initially. Note that these are industry expert views only. Actual prices will depend on the commodity markets driven by global supply and demand for fuel oil.

Q16. Would Marsden Point be able to produce low sulphur fuel?

- Refining NZ has yet to make a final investment decision, but expects the refinery will be able to produce an IMO MARPOL Annex VI compliant fuel in 2020.
- This is expected to be available to industry ships already visiting Marsden Point, and from coastal ports that Refining NZ's customers intend to stock with low-sulphur bunker fuel. We note that there may be infrastructure limitations on providing multiple marine fuel grades in every terminal.

Q17. If yes, would Marsden Point be able to produce enough quantities of low sulphur fuel at reasonable cost?

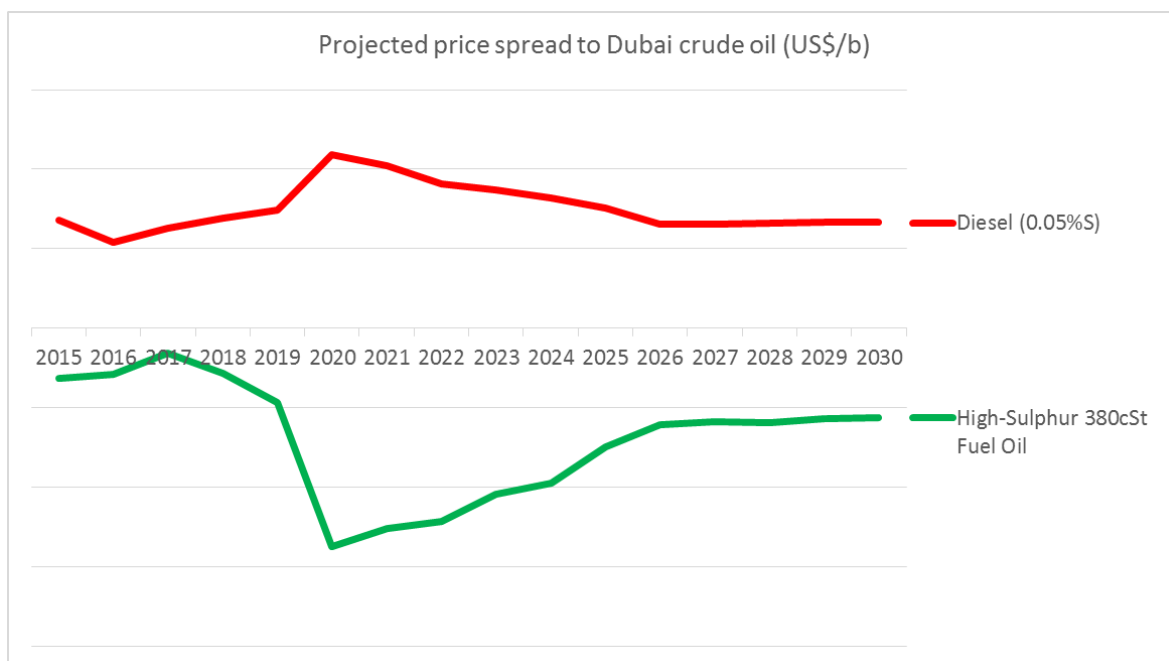
- Refining NZ does not anticipate that refinery production capacity will constrain New Zealand market supply and is continuing to work with customers (the oil companies) to estimate future domestic demand for low sulphur bunker fuel.
- The price of low-sulphur bunker fuel will be driven by the global markets. As noted above, Refining NZ expects low-sulphur fuel to trade at a premium to high-sulphur fuel.

Q19. How would a low sulphur fuel requirement affect our domestic shipping industry?

- The step-change introduction of MARPOL Annex VI from 1 January 2020 around the world is likely to result in a step-change in global market prices, and increased price volatility. This is likely to be most extreme in the earlier years of IMO 2020 introduction, and then normalise (to a 'new normal') as the market supply and demand elements adjust to the new price signals e.g. more new-build vessels with scrubbers come into the market, and large international exporting refineries invest in additional upgrading capacity (e.g. delayed cokers).
- This means that our domestic shipping industry is likely to see an increased fuel burden from acceding to MARPOL Annex VI, particularly in the initial years. This fuel cost increment is likely to reduce with time as the international low-sulphur to high-sulphur price spread

reduces because market players respond to the new market signals.

- If New Zealand shippers were able to continue using high sulphur bunker fuels during these initial years then they may well experience a fuel cost reduction.
- There is consensus agreement amongst market commentators of a price trend (depicted on the chart below) – though the same commentators differ on the exact scale of the price dislocation. The chart below depicts the price spread projections of international commodity benchmarks for diesel and high-sulphur fuel oil relative to (Dubai) crude oil;



Q20. If low sulphur fuel is unavailable, is diesel the most likely option that will be used?

- From a fuel supply perspective diesel is the likely option. Most (if not all) ports have infrastructure in place to supply diesel. New Zealand will need to import incremental diesel to meet this demand.
- As noted above, Refining NZ expects diesel (global commodity) prices to increase as a result of IMO 2020, whilst high-sulphur bunker fuel prices are expected to fall.

Q23. Are ships likely to continue using 3.5 percent fuel but with abatement technology?

- Refining NZ expects a portion of the ships visiting NZ to have abatement technology on board however, there is great uncertainty on the quantum of this portion.

Q30. If low sulphur fuel could not be locally produced, what will happen to the 3.5 percent sulphur fuel currently produced as a by-product of the refining process?

- It would likely be exported into the Asia market at discounted value to be consumed by ships with the necessary abatement technology on-board, upgraded or destroyed in larger refineries with the necessary upgrading capacities, blended into low-sulphur fuels, or

consumed in the power generation industry.

- As noted earlier, we believe there is a real risk that high sulphur fuel will be shipped as a coal equivalent priced fuel to be burnt in the very areas of the world that are highly exposed to SO₂ as a pollutant.

Q36. Are there any other issues not considered above, but which you deem important and need to be factored in when considering the costs and benefits of accession to MARPOL Annex VI?

- The questions above address all of the key issues.

Q37. Having taken all of the above into consideration, should New Zealand accede to Annex VI?

- Refining NZ believes a managed transition to MARPOL Annex VI by 2023 would prove the most robust policy decision.

Q38. If New Zealand is to accede to Annex VI, is 2021 a reasonable timeframe to bring the requirements into effect?

- Refining NZ believes a managed transition to MARPOL Annex VI by 2023 would be the most robust policy decision.
- The global supply chain impacts and economic impacts of IMO 2020 are expected to be most significant in the early years of MARPOL Annex VI introduction (as depicted by the graphic in the answer to Q19). A delayed exposure to MARPOL Annex VI regulations would benefit NZ domestic freight costs in the earlier years because the international high-sulphur bunker fuel prices are expected to fall, at the same time as diesel prices are expected to spike due to a step-change in shipping demand for the fuel.
- Delayed accession will also reduce Refining NZ's exposure to the risk of stranded high-sulphur fuel oil for which there may be no demand in Singapore at the time of export.
- Lastly, delayed accession would help to mitigate the risk of high sulphur fuel being shipped and burnt in areas of the world that are highly exposed to SO₂ as a pollutant.