SHIPPING AND AIR POLLUTION: NEW ZEALAND'S FAILURE TO RATIFY MARPOL ANNEX VI

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1 Introduction

The global conversation around the amount of pollutants that enter earth's atmosphere is impossible to ignore, and shipping-related emissions are no exception. Whether the focus is on public health impacts in coastal settlements, or broader concerns connected with greenhouse gases and climate change, the maritime transport sector will inevitably face closer scrutiny over how ships are fuelled and operated over the course of this century. This article focuses in on New Zealand's lack of engagement with this issue, and in particular its omission to ratify Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL).[1] The country's failure to address shipping emissions has made it a real outlier internationally, and raises important policy questions connected with international shipping regulation. The aims of this article are first, at the international level, to provide an illustration of a form of "negative" State practice in this field, in this instance a State's decision not to engage with an aspect of widely-accepted international maritime law. Here New Zealand provides a useful example of the challenges faced by those who seek to improve environmental and regulatory standards by way of uniform international law. Second, at the domestic level, the article attempts to refute the reasons given for New Zealand's position, and to help steer this matter on to New Zealand's legislative agenda.

2 MARPOL Annex VI

The importance of regulating vessel emissions is illustrated by Cullinane and Bergqvist in the following terms, highlighting the fact that even the most modern marine engines produce a high level of emissions relative to road transport:[2]

> The vast majority (95%) of the world's shipping fleet runs on diesel. However, the diesel used in ships (usually referred to as bunker oil) is much lower quality than that used in road vehicles. Bunker fuel is much cheaper as it is virtually a waste product of the standard oil refining process. It is a cross between a solid and a liquid that is too thick for road vehicles – it is literally 'the bottom of the barrel'.

Although the prevention of shipping-related pollution has been a major international priority since the middle of the twentieth century, the air pollution rules that became Annex VI of MARPOL were not agreed to until 1997. These provisions entered into force in 2005 and, following a rocky start and subsequent amendment in 2008, have been highly successful at the global level.[3] Annex VI currently has 86 States parties representing 95% of the world's tonnage.[4]

Annex VI contains regulations dealing with ozone-depleting substances, sulphur oxides ('SOX'), nitrogen oxides ('NOX'), volatile organic compounds from tankers, and shipboard incineration.[5] The Annex sets out a testing and certification regime,[6] along with rules on fuel supplies and reception facilities,[7] and also provides for IMO-designated emission control areas (such as the Baltic Sea, North Sea, and the North American seaboard).[8] This article will primarily focus on the SOX and NOX aspects of the Annex.

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[1] *International Convention on the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 relating thereto (MARPOL)*, opened for signature 2 November 1973 and 17 February 1978 respectively, 1340 UNTS 62 (entered into force 2 October 1983); *Protocol of 1997 to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978 Relating Thereto (MARPOL Annex VI)*, opened for signature 26 September 1997 (entered into force 19 May 2005). Technically New Zealand would accede to the Annex – the country was not one of the Protocol's original signatories.

[2] Kevin Cullinane and Rickard Bergqvist, 'Emission Control Areas and their Impact on Maritime Transport' (2014) 28 *Transportation Research Part D* 1, 1.

[3] For the background to these developments within the IMO see: James Harrison, 'Recent Developments and Continuing Challenges in the Regulation of Greenhouse Gas Emissions from International Shipping' (2012) 27 *Ocean Yearbook* 359; Sherry P Broder and Jon M Van Dyke, 'The Urgency of Reducing Air Pollution from Global Shipping' in Aldo Chircop et al (eds) *The Regulation of International Shipping: International and Comparative Perspectives* (2012), 261-278.

[4] International Maritime Organization (IMO), *Summary of Status of Conventions* (8 March 2016) <http://www.imo.org/en/About/Conventions/StatusOfConventions/Pages/Default.aspx>.

[5] *MARPOL Annex VI*, regs 12-16.

[6] *MARPOL Annex VI*, regs 5-9.

[7] *MARPOL Annex VI*, regs 17-18.

[8] *MARPOL Annex VI*, regs 13.6 and 14.3.

SOX is one of the by-products of marine diesel engines, forming during the combustion process, and also leads to particulate matter emissions when the gases leaving the exhaust system cool and condense.[9] This can have a negative impact on both the environment, for example by contributing to acidification, and on human health.[10] The New Zealand Ministry for the Environment advises that:[11]

> Sulphur dioxide can cause respiratory problems such as bronchitis, and can irritate your nose, throat and lungs. It may cause coughing, wheezing, phlegm and asthma attacks. The effects are worse when you are exercising. Sulphur dioxide has been linked to cardiovascular disease.

Shipping accounts for around 4% to 9% of global anthropogenic SOX emissions,[12] but as the figures cited below in relation to New Zealand demonstrate, shipping's relative contribution can be much greater in some locations.

The SOX requirements in Annex VI simply refer to permitted sulphur percentages for marine fuels. The current limit, which came into effect in 2012, calls for a maximum sulphur content of 3.5%. This is already comfortably met by existing marine fuel supplies,[13] meaning this aspect of MARPOL has had little impact on vessel operators in many parts of the world. However, in 2020 this limit should lower to 0.5% (subject to a review ascertaining the availability of adequate fuel supplies for the world's tonnage),[14] while in emissions control areas the limit is already just 0.1%.[15]

NOX is another by-product of ships' engines, with shipping accounting for around 10% to 15% of global anthropogenic emissions.[16] NOX emissions and related particulate matter (nitric acid and nitrates) contribute to atmospheric pollution, acidification, eutrophication, and can also be linked to human health problems.[17] Unlike with SOX emissions, which can be reduced by using lower-sulphur fuels, the nature of diesel combustion means fuel quality has little impact on the amount of NOX produced.[18] As a result MARPOL's NOX regulations are more complex, and are aimed at improving engine efficiency. The regulation does this by prohibiting NOX emissions above a certain level based on an engine's rated speed. For example, marine diesel engines installed on ships after 1 January 2016 must not have NOX emissions exceeding 3.4 g/kWh when the rated engine speed is less than 130 revolutions per minute.[19]

3 The New Zealand Position

New Zealand could not be described as a fast mover in relation to MARPOL generally, having only been a party to the Convention since 1998 (Australia, for example, ratified in 1987), but its lack of interest in Annex VI is still concerning. The country has not overlooked this development on the basis that it has an equivalent, or even a more stringent set of laws, and has therefore declined to support a lesser international standard: New Zealand law currently permits any discharge of contaminants relating to the "normal operations of a ship", including discharges into the air from propulsion and waste incineration.[20]

Nor has New Zealand omitted to ratify Annex VI on any principled basis. In July 2011 the Associate Minister of Transport told local media that New Zealand was not looking to ratify Annex VI 'because we do not consider emissions from shipping to be a significant air pollution problem around New Zealand ports and any change is likely to result in increased compliance costs.'[21] On the basis of this pragmatic position, consideration of this

[9] Laurie Goldworthy, 'Exhaust Emissions from Ship Engines – Significance, Regulations, Control Technologies' (2010) 24 *Australia and New Zealand Maritime Law Journal* 21, 21.
[10] Oyvind Endresen et al, 'International Maritime Shipping: Environmental Impacts of Increased Activity Levels' in OECD, *Globalisation, Transport and the Environment* (2010), 161-184, 163 and 167-168.
[11] Ministry for the Environment, *Sulphur Dioxide* (14 January 2016) <http://www.mfe.govt.nz/air/specific-air-pollutants/sulphur-dioxide>; Ministry for the Environment, *Ambient Air Quality Guidelines* (May 2002), 13-14.
[12] Endresen et al, above n 10, 162.
[13] International Council on Clean Transportation, *Air Pollution and Greenhouse Gas Emissions from Ocean-going Ships: Impacts, Mitigation Options and Opportunities for Managing Growth* (2007), 6.
[14] *MARPOL Annex VI*, reg 14.1 and 14.8.
[15] *MARPOL Annex VI*, reg 14.4.
[16] Endresen et al, above n 10, 162.
[17] Endresen et al, above n 10, 163 and 167-168.
[18] Goldworthy, above n 9, 21.
[19] *MARPOL Annex VI*, reg 13.5.1.
[20] *Resource Management (Marine Pollution) Regulations 1998* (NZ) cl15 and sch4.
[21] Andrea Vance, *Wellington ferries seen as huge pollution problem* (23 July 2011) Stuff.co.nz <http://www.stuff.co.nz/environment/5329506/Wellington-ferries-seen-as-huge-pollution-problem>.

Annex is not on the Ministry of Transport's work programme,[22] and the Ministry of Transport's current advice on the matter is that ratification is not a priority because:[23]

- First, 'New Zealand does not currently have significant air pollution problems arising from shipping largely due to weather conditions and the low volume of shipping';

- Second, New Zealand has no international shipping fleet operating under its flag, while virtually all foreign vessels visiting New Zealand will already be subject to the Annex VI standards as a result of flag or port State measures;

- Third, the adoption of Annex VI would increase costs for domestic shipping operators, at least once the 2020 SOX emissions levels come into effect.

The first point can be summarised as the practical argument, namely that there is insufficient local air pollution to make regulation a priority. The second can be summarised as the international regulatory argument, namely that it does not make sense for New Zealand to regulate this aspect of international shipping. The third is the economic argument around operator costs that accompanies any raising of regulatory standards. This article addresses each argument in turn below.

3.1 Is there a Pollution Problem?

At an anecdotal level New Zealand's air pollution levels could hardly be compared with those confronting large cities in other parts of the world. Still, this does not excuse the country from examining the limited data available on air quality to obtain a more scientific basis to assess the extent of any problem, particularly where human health is concerned.

New Zealand's shipping-related emissions are likely to be highest in Auckland, Tauranga and Wellington due to the amount of shipping and the geography of these cities.[24] The busiest commercial ports in New Zealand, Auckland and Tauranga, currently receive around 1,500 commercial ship visits each year.[25] Wellington's CentrePort receives less commercial traffic at around 600 ship visits per year, but hosts the regular interisland ferry services that involve around six to ten return voyages to Picton each day. This boosts the annual total to around 4,200 visits.[26]

Although the presence of other industries can make it difficult to separate out shipping-related emissions from shore-based emissions in some data sets, the strong connection between shipping and SOX emissions has been reflected in studies commissioned by the Auckland Regional Council. In 2004 shipping was recorded as the highest producer of SOX emissions in the region, accounting for 1.47 of 4.20 kt/year from all sources (transport, industry and domestic).[27] In the winter of 2007 17 sites around Auckland were tested for SOX emissions. This testing found:[28]

> … elevated concentrations around the port of Auckland and the Penrose site compared with all the other sampling locations. This is due to the environmental impact of shipping and industrial activities. Ships use high sulphur fuels which emit SO_2 during combustion ….

A less detailed 2015 report stated that air quality across the Auckland region had improved,[29] although shipping was still singled out as a source of air pollutants,[30] and data released in 2014 suggested that shipping-related SOX emissions were likely to increase.[31] In 2012 the Auckland Council's Environment and Sustainability Forum

[22] Email from Melanie Hutton, Ministry of Transport, to Elizabeth Bolton, Maritime New Zealand (7 November 2011).
[23] Ministry of Transport, *MARPOL Annex VI: Prevention of Air Pollution from Ships* (file note, 9 July 2013).
[24] The port of Lyttelton (Christchurch) is also likely to be affected, but no data on shipping-related emissions appears to have been sourced from this port to date.
[25] Ports of Auckland <http://www.poal.co.nz/>; Port of Tauranga <http://www.port-tauranga.co.nz/>.
[26] Centreport <http://www.centreport.co.nz/>.
[27] Auckland Regional Council, *State of the Auckland Region 2009* (16 March 2010), 70; see also Ministry of Transport, *MARPOL Annex VI: Prevention of Air Pollution from Ships* (file note, 9 March 2009).
[28] Auckland Regional Council, *State of the Auckland Region 2009* (16 March 2010), 115.
[29] Auckland Regional Council, *The Health of Auckland's Natural Environment in 2015* (8 October 2015), 208-209.
[30] Ibid, 39, 44-45, 208.
[31] Auckland Council, *Auckland Air Emissions Inventory 2006* (April 2014), 34 and 47.

expressed concern about cruise ship emissions in particular,[32] and other groups have continued to express such concerns in more recent times as cruise visits continue to grow.[33]

Information on SOX emissions is also available for Mount Maunganui, the site of Tauranga's port. However, due to the presence of a fertiliser factory with a sulphuric acid plant, which is clearly the largest source of sulphur emissions in the area,[34] the specific contribution of shipping to the total emissions is not available in the Regional Council's 2010 report.[35] An earlier report had estimated the impact of shipping at the port as 390 tonnes of SOX over the course of 2001.[36]

In Wellington the impact of sulphur from shipping is highlighted as a "knowledge gap" to be addressed by the Regional Council's 2012 air quality report.[37] An earlier study had found that commercial shipping was the principal source of SOX emissions in the region,[38] and concern has been expressed in the past about the impact of the interisland ferries on air quality in the city.[39]

NOX emissions from shipping have been less prominent in New Zealand, as shown in the Auckland Regional Council's 2004 study whereby shipping was the third highest source of NOX, but contributed just 2.06 of 35.00 kt/year (5.9%) – a long way behind motor vehicles and industry.[40] The Bay of Plenty data for 2001 suggested that the region's shipping was the fourth highest source of NOX, and contributed just under 6% of the region's emissions, compared with the 73% arising from motor vehicles and 8% from rail transport.[41] In Wellington the relative contribution of shipping to NOX emissions is possibly higher: in 1998 shipping and aviation were reported as contributing 28% of NOX emissions compared with 68% from motor vehicles.[42] In any event, most of the focus on NOX emissions at a national level is aimed at road transport, and New Zealand's roads generally meet World Health Organization ('WHO') guidelines in this respect.[43] In addition, the country does not typically experience the smog-related problems connected with NOX prevalent in some other parts of the world.[44]

On this basis the NOX side of the equation alone is unlikely to make shipping emissions a priority in New Zealand in the near future. However, the impact of SOX emissions on human health means that the issue of shipping emissions overall may give more cause for concern. Based on the reports referred to above, it is reasonable to conclude that shipping is a major contributor to SOX emissions in New Zealand. Furthermore, given the close proximity of New Zealand's main ports to population centres, if these emissions are recorded at unhealthy levels in port areas, then there could be a risk to human health.

The current New Zealand legal standards for SOX emissions are 350 or 570 micrograms per cubic metre ($\mu g/m^3$), expressed as a one-hour mean (nine exceedances of the lower limit are allowed in each 12 month period, but no exceedances of the higher limit).[45] The non-binding "Ambient Air Quality Guideline" set by the Ministry for the Environment is lower, namely 120 $\mu g/m^3$ as a 24-hour average.[46] Since 2006 the equivalent WHO guideline has been lower still, at 20 $\mu g/m^3$.[47] Recent New Zealand data shows that this WHO guideline is being exceeded from time to time:[48]

[32] Isaac Davison, *Cruise ship pollution under scrutiny* (8 February 2012) New Zealand Herald <http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10784057>.
[33] Michael Field, *With cruise ships comes air pollution* (6 January 2015) Stuff.co.nz <http://www.stuff.co.nz/travel/news/64689243/with-cruise-ships-comes-air-pollution.html>.
[34] Bay of Plenty Regional Council, *Mount Maunganui Ambient Sulphur Dioxide Monitoring* (September 2010), 6; see also Environet Ltd, *New Zealand Sulphur Dioxide Industrial Emission Survey 2007* (2008).
[35] *Sulphur Dioxide Concentrations* (21 October 2015) Statistics New Zealand <http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Air/sulphur-dioxide.aspx>; Bay of Plenty Regional Council (2010), above n 34.
[36] Bay of Plenty Regional Council, *Bay of Plenty Regional Air Emission Inventory – Final Report* (August 2001), 28; Bay of Plenty Regional Council (2010), above n 34, 9.
[37] Greater Wellington Regional Council, *Air Quality in the Wellington Region* (January 2012), 44, 86, 89, 90.
[38] Ministry for the Environment, *Emissions Inventories for CO, NOX, SO2, ozone, benzene and benzo(a)pyrene in New Zealand: Air Quality Technical Report No 44* (November 2003), 22.
[39] Vance, above n 21.
[40] Auckland Regional Council, *State of the Auckland Region 2009* (16 March 2010), 70.
[41] Bay of Plenty Regional Council (2001), above n 36, ii.
[42] Ministry for the Environment (2003), above n 38, 19; Greater Wellington Regional Council, above n 37, 19.
[43] Ministry for the Environment and Statistics New Zealand, *New Zealand's Environmental Reporting Series: 2014 Air Domain Report* (May 2014), 31.
[44] See for example Ling Zhu, Henning Jessen and Mingzhao Zhang, 'The Way Forward for Hong Kong to Combat Vessel Source Emissions in the Pearl River Delta Region' (2015) 46 *Ocean Development and International Law* 208-224.
[45] *Resource Management (National Environmental Standards for Air Quality) Regulations 2004* (NZ), sch1.
[46] Ministry for the Environment, *Ambient Air Quality Guidelines* (May 2002), 13.
[47] World Health Organization, *WHO Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide* (2006), 18.
[48] Ministry for the Environment and Statistics New Zealand, *New Zealand's Environmental Reporting Series: 2014 Air Domain Report* (May 2014), 38.

> In 2012, none of the nine sites monitoring sulphur dioxide breached the short-term (one-hour) national standard. Of the nine sites, three peak sites exceeded the WHO short-term (daily) guideline for sulphur dioxide. These sites have large emissions from industrial or shipping activities. The two sites influenced by industry emissions (Woolston in Christchurch and Mount Maunganui) exceeded the guideline 54 and 69 times over the year respectively, and the site influenced by shipping (Auckland waterfront) did so 13 times.

Similarly:[49]

> Sulphur dioxide (associated with respiratory problems) exceeded the short-term guideline at 4 of the 8 monitored locations in 2013. The four sites exceeded the guideline between 1 and 65 days of the year. The four sites were three industrial locations (Mount Maunganui, Woolston in Christchurch, and Timaru) and one port location (Auckland waterfront).

On this basis it is possible to conclude that shipping is making more than a minor contribution to air pollution in New Zealand, particularly in relation to SOX emissions. Therefore, contrary to the current government position on this issue, there is a shipping-related air pollution problem that is at least worthy of closer attention.

Although it could be argued that there is an insufficient amount of data available on this issue to reach such a conclusion, the precautionary principle would hold that a State in New Zealand's position could introduce restrictions to address the potential risks notwithstanding the lack of comprehensive data, particularly given the known risks to public health.[50] In other words, New Zealand should at least take care to adopt the international agreed minimum standards represented by Annex VI, given the potential health implications of the current position, so that by 2020 the sulphur levels in ships' fuel can be reduced in its ports.

Going by the Australian experience, where localised concerns over the health impacts of shipping emissions have led to authorities investigating the need for stricter controls,[51] New Zealand government agencies including regional authorities are likely to have an increasing interest in SOX emissions. This may already be emerging at the central government level: in the press release announcing the launch of *Environment Aotearoa 2015*, the first major report into New Zealand's environment under the Environmental Reporting Act 2015, the Minister for the Environment noted that "We need to make more progress on transport emissions".[52]

3.2 International Regulatory Considerations

While the previous section focused on shipping's impact on New Zealand's land-based communities, from a legal perspective domestic concerns are not necessarily the most important consideration when assessing MARPOL Annex VI. Air pollution is a global problem, shipping is a global industry, and MARPOL represents global standards. With this wider context in mind, New Zealand's current position on Annex VI can be seen as overly inward-looking at best, and cynical at worst.

It is certainly true that there are no New Zealand-flagged ships plying international trade routes on a regular basis, meaning that New Zealand relies on foreign-flagged shipping to provide virtually all of its international trade needs. Not being a significant flag State understandably affects New Zealand's policy priorities in the maritime context, but it has not stopped the country from being an active participant at the IMO. As a very rough guide New Zealand has ratified 32 of the 60 conventions currently listed on the IMO's "status of conventions by country" record, and the Government has been working to extend this on several fronts in recent years, meaning the total should soon rise to 36.[53]

Engagement with IMO by a State like New Zealand is of course not unusual because, as the number of Annex VI ratifications globally makes clear, it is not only flag States that have an interest in ratifying international maritime

[49] Ministry for the Environment and Statistics New Zealand *New Zealand's Environmental Reporting Series: Environment Aotearoa 2015* (October 2015), 37.
[50] Bénédicte Sage-Fuller, *The Precautionary Principle in Marine Environmental Law* (2013), 120-132.
[51] Danielle Shaw, 'Port emissions were the special focus at shipping sector meeting' (26 February 2015) *Lloyd's List Australia*, 10; Jim Wilson, 'NSW acting on resident concerns, holds cruise ships from terminal pending use of low-sulphur fuel' (11 June 2015) *Lloyd's List Australia*, 3.
[52] Hon Nick Smith, Minister for the Environment and Craig Foss, Minister for Statistics, *Environment Aotearoa 2015 report welcomed* (Press release, 21 October 2015).
[53] See for example *Marine Legislation Bill 2012 (58-1)* (NZ), explanatory note (giving effect to the Limitation of Liability Convention 1996 Protocol, the Bunkers Convention 2001, and the 1973 Protocol to the Intervention Convention 1969); *Biosecurity Law Reform Bill 2012 (256-1)* (NZ), explanatory note (giving effect to the Ballast Water Convention); Minister of Transport, *Approval to Accede: Supplementary Fund Protocol* (8 December 2014); Ministry of Transport, *Discussion Paper: Cape Town Agreement 2012* (April 2015); Ministry of Transport, *Consultation Paper: STCW-F Convention 1995* (April 2015).

environmental conventions. The practice of port State control, through which States inspect visiting foreign-flagged vessels against international standards, and enforce compliance with those standards if necessary, is applied to all vessels regardless of whether the flag State is a party to the relevant convention (the "no more favourable treatment" approach).[54] In this way the regulatory net closes around countries whose fleets are dragging behind the international norm, and the more widely-ratified a convention is the fewer places substandard vessels have to hide.[55] From New Zealand's perspective, ratifying Annex VI would involve being able to enforce its standards against all visiting vessels, not just parties to the Annex.[56] The lack of a foreign-going fleet is arguably of no importance to a coastal State that values high environmental standards.

In the case of MARPOL Annex VI New Zealand should not rely on its regional partners within the Tokyo Memorandum of Understanding on Port State Control (Tokyo MoU) to carry this enforcement burden.[57] The Ministry of Transport in its policy advice expressly refers to New Zealand's current 'free rider' position: 'International ships would not likely be affected [by New Zealand's ratification] as most or all would already be complying with MARPOL VI as a result of their visiting other countries who are Party to the convention.'[58] This statement, which represents a particularly inward-looking and ungenerous attitude, is not an accurate reflection of the position were New Zealand to ratify the Annex. First, international ships would be affected to the extent that New Zealand is carrying out its responsibilities under the Tokyo MoU to inspect visiting vessels. If some vessels in the region are failing to comply with Annex VI then New Zealand's contribution to the Tokyo MoU inspection regime will help ensure that these vessels are caught by the regulatory net of which New Zealand forms one part.

Second, in the air pollution context it is port States that are best placed to regulate vessels, as opposed to flag States.[59] A flag State, relying on regular class surveys for example, is in a good position to ensure that vessels have particular equipment fitted, such as the shipboard incinerator requirements of Annex VI.[60] However, given that most vessels operate independently of their flag States for the majority of their voyages, flag States are not well positioned to regulate ongoing operational matters, such as fuel use or ongoing engine emissions.[61] For example, a vessel that was carrying MARPOL-compliant fuel at the time of its most recent flag survey might have switched to a lower-grade fuel shortly afterwards. Only port State control inspections have the capacity to monitor such requirements on a regular basis, which is something that New Zealand should be considering in the context of Annex VI.[62] Vessels are capable of carrying different quality fuels in different tanks,[63] and switching to the lower-quality one where regulation is light or non-existent to save costs.[64] If New Zealand's does not adopt Annex VI then there is no guarantee at all that vessels visiting New Zealand – which is of course a considerable distance from other countries – will not switch to lower-quality fuel for voyages to this part of the world. The 'free rider' approach outlined in the Ministry of Transport's advice will therefore be of limited assistance.

While a New Zealand policymaker will naturally focus on the practical benefits of a prospective law to New Zealand, any national interest analysis of an IMO regulatory convention should also take into account certain principled arguments connected with the role of international maritime law. At a broad level this can be connected with the general obligation to protect the marine environment in UNCLOS (to which New Zealand is a party),[65] as well as the particular emphasis in art 212 of UNCLOS to prevent "pollution of the marine environment from or through the atmosphere".[66]

In addition to the general obligation to protect the environment, the organisational background from which treaties like MARPOL stem is important. The IMO is a cooperative enterprise through which the world's maritime standards are improved at a level that countries are broadly comfortable with. The compromises reached are often

[54] *MARPOL*, art 5(4); see Erik Jaap Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution* (1998) at 119-121; Harrison, above n 3, 366-367.
[55] See Bevan Marten, *Port State Jurisdiction and the Regulation of International Merchant Shipping* (2014) 46-49.
[56] *MARPOL Annex VI*, reg 10.
[57] *Memorandum of Understanding on Port State Control in the Asia-Pacific Region (Tokyo MoU)*, 1993.
[58] Ministry of Transport, *MARPOL Annex VI: Prevention of Air Pollution from Ships* (file note, 9 July 2013).
[59] See also Richard Hildreth and Alison Torbitt, "International Treaties and U.S. Laws as Tools to Regulate the Greenhouse Gas Emissions from Ships and Ports" (2010) 25 *International Journal of Marine and Coastal Law* 347, 375; Harrison, above n 3, 381-383 (arguing that port States are well placed to regulate in this context).
[60] *MARPOL Annex VI*, reg 16.6.1 and appendix IV.
[61] See Marten, above n 55, 61-62.
[62] On the regulation by port States of shipping emissions see Henrik Ringbom, 'Global Problem – Regional Solution? International Law Reflections on an EU CO2 Emissions Trading Scheme for Ships' (2011) 26 *International Journal of Marine and Coastal Law* 613.
[63] Alexander P Burgel, 'Air Pollution from Ships: Recent Developments' (2007) 6 *WMU Journal of Maritime Affairs* 217, 219.
[64] Zhu, Jessen and Zhang, above n 44, 213.
[65] *United Nations Convention on the Law of the Sea (UNCLOS)*, 1982, 1833 UNTS 3, art 192.
[66] See *MARPOL Annex VI*, reg 11.6; Molenaar, above n 54, 500-503 and 506.

described as favouring maritime nations with strong shipping interests.[67] So it would be one thing for a coastal State like New Zealand to refrain from ratifying an agreement on the basis that the standard was not stringent enough, and the country wanted to introduce its own more demanding one. However, it is an unusual and cynical stance to decide not to ratify on the basis that enough other countries have already done so, making it easier and cheaper not to bother. Standing with the international community and raising marine environmental standards is the more responsible position for a country like New Zealand, which values its commitment to international law.

Adding further pressure in this specific context is the fact that 86 other countries have already put their name to Annex VI, so it is likely that this lack of engagement would be raised in any IMO audit of New Zealand[68] – this was a factor Iceland considered when it decided to begin the ratification process recently.[69] Maritime New Zealand, the agency responsible for New Zealand's engagement with IMO, has published a Strategy for New Zealand's Engagement with IMO (2013-2020), which includes the goals of 'strengthening New Zealand's ability to influence international outcomes consistent with New Zealand's interests' and 'safeguard[ing] New Zealand's "brand" as a responsible maritime regulator and constructive participant in the international maritime system'.[70] Neither of these strategies can be achieved without government prioritising core marine environmental regulations under MARPOL, which has been described as one of the four 'pillars' of international maritime regulation.[71] MARPOL updates, including new annexes, should be something that a State like New Zealand ratifies as a matter of course and in a timely fashion – the question should really be whether there are strong reasons for not doing so.

There is also a cost to not being party to Annex VI in terms of the wider international discussion about emissions in connection with climate change. This is noted in the Ministry of Transport's advice which notes that 'NZ's ability to influence related issues at IMO is limited by not being a signatory' to the instrument.[72] As shipping-related emissions were left to the IMO by the Kyoto Protocol,[73] and this did not change following the December 2015 Paris climate agreement,[74] discussions in this important area coalesce around the IMO,[75] and MARPOL Annex VI in particular. New Zealand can have no meaningful part in any discussion in this area until it becomes a party to Annex VI, particularly if a vote of Annex VI parties is called for. The Ministry of Transport has also advised that even if New Zealand does not become a signatory there may be flow-on effects in terms of future SOX levels in fuel and regulations concerning greenhouse gas emissions: 'this international regulation will not go away'.[76] Before New Zealand could even start talking about whether this is the best solution, or whether the standards should change in future, it will need to join the club.

This is not just a matter of principle, although principle alone should be a sufficient basis for a State to seek deeper engagement with one of the most important issues facing the globe. There is an economic angle that will also be of importance to New Zealand in the form of the market-based measures under consideration in connection with the IMO's approach to curbing emissions.[77] For example, the proposal put forward by Jamaica would involve:[78]

> … member States participat[ing] in levying a uniform emissions charge on all vessels calling at their respective ports based on the amount of fuel consumed by the respective vessel on that voyage (not bunker suppliers).

The potential implications of such a scheme for New Zealand, which is a long distance from any other country, are obvious. At a minimum there would be higher freight costs, and while this is arguably inevitable in the context of improved environmental standards, the price increase in isolated New Zealand could be higher than in other markets. At worst, some shipping lines could factor New Zealand out of their schedules altogether if the cost of

[67] See in relation to air pollution Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (2006), 155-162 (noting the oil industry's influence in the negotiation of Annex VI).
[68] IMO, *IMO Member State Audit Scheme* <http://www.imo.org/en/OurWork/MSAS/Pages/AuditScheme.aspx>; IMO, *Further Development of the Voluntary IMO Member State Audit Scheme* (18 January 2010, A 26/Res.1018).
[69] Email from Sverrir Konradsson, Specialist Maritime Affairs – Legal Coordination and Translations, Icelandic Transport Authority, to author, 23 January 2016.
[70] Maritime New Zealand *Strategy for New Zealand's Engagement in IMO (2013-2020)* (2013) <http://www.maritimenz.govt.nz/IMO/International-Strategy-2013-2020-one-pager.pdf>.
[71] IMO, *IMO Secretary-General welcomes entry into force of Maritime Labour Convention* (press release, 20 August 2013).
[72] Ministry of Transport, *MARPOL Annex VI: Prevention of Air Pollution from Ships* (file note, 9 July 2013).
[73] *Kyoto Protocol to the UN Framework Convention on Climate Change (Kyoto Protocol)*, 1997, 2303 UNTS 148, art 2(2).
[74] IMO, *Full speed ahead with climate-change measures at IMO following Paris Agreement* (press release, 14 December 2015).
[75] On the debate over the IMO's role in regulating greenhouse gases see: Yubing Shi, 'Greenhouse Gas Emissions from International Shipping: The Response from China's Shipping Industry to the Regulatory Initiatives of the International Maritime Organization' (2014) 29 *International Journal of Marine and Coastal Law* 77, 81-85; see also Jamie Moffat, 'Arranging Deckchairs on the Titanic: Climate Change, Greenhouse Gas Emissions and International Shipping' (2010) 24 *Australia and New Zealand Maritime Law Journal* 104.
[76] Ministry of Transport, *MARPOL Annex VI: Prevention of Air Pollution from Ships* (file note, 9 July 2013).
[77] See Shi, above n 75, 98-102.
[78] IMO, *Reduction of GHG Emissions from Ships* (13 August 2010, MEPC/61/INF.2), 80

trading there became too high, which would be a major blow to New Zealand's export-led economy. Accordingly, with this type of proposal in mind, New Zealand should be more inclined to seek a seat at the table, so that it can guide this process as a party to MARPOL Annex VI, and not later ratify a package of measures that is poorly designed for New Zealand trading conditions (or worse still, never adopt the Annex and refuse to regulate shipping-related air pollution to avoid higher costs).

Finally, one can look to broader considerations of international reputation to support New Zealand's ratification of Annex VI. New Zealand is a developed nation that traditionally prides itself on its commitment to international law and its 'clean, green brand'.[79] However, to date it is one of only four OECD countries not to have ratified the Annex (the others are Iceland,[80] Israel and Mexico). New Zealand compared itself to other OECD countries when introducing its environmental reporting legislation in September 2015, noting it was the 'only OECD country to not have a statutory requirement for state of the environment reporting'.[81] Similarly New Zealand sees itself as a leader within the South Pacific Commission (SPC) group of countries, but is proving a late follower in this area,[82] which is of added significance given the importance of climate change issues for these States.

3.3 The Cost to Shipping

The financial burden placed on industry by higher regulatory standards is a common refrain in any debate of this nature, and in the context of shipping bunker fuel represents a major component of a vessel operator's costs. In particular, New Zealand's domestic shipping industry faces very stiff competition from international players who enjoy lower operating costs and a largely unfettered ability to trade on the New Zealand coast.[83]

While it is not the place of this article to conduct a full economic analysis of the impact an increase in standards aligned with Annex VI's requirements might have in New Zealand,[84] it is possible to make some broader comments. First, ratifying Annex VI would have no immediate impact on domestic operators' fuel costs: marine fuel currently produced in New Zealand at Marsden Point contains around 3% sulphur.[85] This meets the 2012 limit of 3.5% max sulphur, but not the 2020 limit of 0.5%.[86] There is also some protection through the review clause in Annex VI requiring an assessment in 2018 to determine whether there are adequate supplies of appropriate fuel.

The New Zealand Shipping Federation, which represents domestic New Zealand operators, is conscious of shipping's ability to promote itself as the most energy-efficient mode of transport for each kilometre per tonne of cargo, and argues in this context that:[87]

> The large potential benefits of reduced CO2 emissions from increased use of domestic sea freight need to be supported by a continuing focus on reducing more localised environmental impacts, including efforts to reduce sulphur dioxide and nitrous oxide emissions from vessels.

This suggests that, with the right adjustments to their competitive environment, domestic shipping operators would be prepared to bear the costs of higher fuel and engine efficiency standards if it enabled them to increase their competitive advantage as the 'greenest' of the transport modes available for domestic cargo. Otherwise fuel standards might be perceived as just one more aspect where 'equality' with international players simply puts local players at a greater disadvantage.

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[79] Hon Nick Smith, Minister for the Environment and Craig Foss, Minister for Statistics, *Environment Aotearoa 2015 report welcomed* (press release, 21 October 2015).
[80] Iceland is in the process of ratification: email from Sigurrós Friðriksdóttir, Advisor, Department for Nature, Iceland, to author, 23 January 2016.
[81] Hon Nick Smith, Minister for the Environment and Craig Foss, Minister for Statistics, *New Environmental Reporting Act passed* (press release, 24 September 2015).
[82] Australia, Cook Islands, Kiribati, Niue, Palau, Samoa, Tonga, Tuvalu and Vanuatu have ratified. Fiji, New Zealand and the Solomon Islands have not.
[83] See New Zealand Shipping Federation, *Full Steam Ahead* (7 December 2015), 8.
[84] Such work is being undertaken in relation to other areas, see for example: Johan Holmgren et al, 'Modeling Modal Choice Effects of Regulation on Low-Sulphur Marine Fuels in Northern Europe' (2014) 28 *Transportation Research Part D* 62. Research into options available to ship operators considering alternative fuel sources is also being pursued: see for example Michele Acciaro, 'Real Option Analysis for Environmental Compliance: LNG and Emission Control Areas' (2014) 28 *Transportation Research Part D* 41.
[85] Email from Melanie Hutton, Ministry of Transport, to Elizabeth Bolton, Maritime New Zealand (7 November 2011). New Zealand has just one oil refinery providing all of the country's marine fuel needs, namely Refining NZ's Marsden Point facility in Whangarei. Foreign ships plying international routes tend to take on bunkers outside of New Zealand.
[86] *MARPOL Annex VI*, reg 14.1.
[87] See New Zealand Shipping Federation, *Full Steam Ahead* (7 December 2015), 6; see also New Zealand Shipping Federation, *New Zealand Emissions Trading Scheme Review: Submission* (19 February 2016).

Second, the requirements of Annex VI do not affect all ships equally, and complete fleet refits would not be required immediately. Older vessel engines are held to lesser NOX standards than newer ones, and a State can choose to exempt pre-2005 engines from the NOX regulation altogether where domestic vessels are concerned.[88] In terms of SOX regulations the local fleet might benefit from earlier ratification, providing a few years to prepare for the 2020 sulphur limit if some form of change is seen as inevitable, rather than joining after 2020 and having a very short window for compliance.

4 Final Comments

The example of New Zealand's omission to ratify Annex VI gives an insight into the competing priorities faced by countries when ratifying international conventions. On a cursory examination the New Zealand government's lack of interest in MARPOL Annex VI might seem justifiable – the country's air seems clean, and other countries are looking after international vessels, so why raise costs for local operators? However, this article has argued that the position is unsound. First, there is some evidence of significant sulphur levels in the vicinity of major New Zealand ports, which at least warrants further investigation. But even if the practical impact on New Zealand itself is less pronounced than in more populous regions, air pollution is not an issue that only affects individual States, but rather an issue of immense global significance.

Second, where international regulatory considerations are concerned, there are both principled and practical reasons for New Zealand to ratify the Annex. New Zealand cannot and should not rely solely on other port States to enforce the operational aspects of MARPOL, and the IMO-led regulatory framework is one that all responsible States should engage with. New Zealand's economic interests may also be affected by any market-based measures that are eventually introduced to combat greenhouse gas emissions from shipping, and it would be prudent for the country to acquire a place at the table for future discussions on this theme. Third, while increased regulation will result in higher costs, there is reason to believe that New Zealand's domestic industry would be willing to work towards reducing emissions, especially if the competitive balance with international shipping is improved. From an international maritime lawyer's perspective, New Zealand's current position on MARPOL Annex VI is an embarrassment. Ratification of MARPOL Annex VI is overdue and should be made a priority on the government's agenda.

[88] *MARPOL Annex VI*, reg 13.1.3.