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Rocking the Boat: The Legal Implications of IMO 2020 for Future IMO Greenhouse Gas Reduction Strategies and the Impacts to Louisiana

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Rocking the Boat: The Legal Implications of IMO 2020 for Future IMO Greenhouse Gas Reduction Strategies and the Impacts to Louisiana

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INTRODUCTION

With the average daily value of \$156,178,082,¹ exporting goods through international trade represents one of Louisiana's most important economic engines. The industry is responsible for one in five jobs in the state and generates over \$2 billion in annual state tax revenue, much of which is dependent on maritime cargo vessels.² However, vast uncertainty remains over Louisiana's maritime industry due to the implications of new regulations from the International Maritime Organization (IMO) aimed at reducing greenhouse gas (GHG) emissions.³ In 2020, marine fuels will be required to contain 85% less sulfur dioxide.⁴ This forthcoming regulation resulted from decades of work to address greenhouse gas emissions from the international shipping community. This new fuel standard will require vessels to either begin using higher cost fuels or to retrofit their vessels with expensive equipment⁵ in order to comply with the new standards.

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1. This figure is reached by dividing the total value of 2017 exports from Louisiana by 365. U.S. CENSUS BUREAU, STATE EXPORTS FROM LOUISIANA, <https://www.census.gov/foreign-trade/statistics/state/data/la.html> [<https://perma.cc/UMY3-Z7SW>].

2. LA. ASS'N OF BUS. & INDUS., LA. CMTY. & TECH. COLL. SYS., AN INVISIBLE GIANT: THE MARITIME INDUSTRY IN LOUISIANA (2015), https://labi.org/assets/images/media/Maritime_Workforce_Study_LABI_LCTCS.pdf [<https://perma.cc/EM2A-QPUJ>].

3. Loren C. Scott, *The Louisiana Economic Outlook: 2019 and 2020*, ECONS. & POLICY RESEARCH GRP., E.J. OURSO COLL. OF BUS., LA. ST. UNIV. 3 (2018), https://www.oneacadiana.org/sites/default/files/2018-09/LEO_2019-20.pdf [<https://perma.cc/6PXJ-VGFQ>].

4. *Sulphur 2020 - Cutting Sulphur Oxide Emissions*, INT'L MAR. ORG., <http://www.imo.org/en/mediacentre/hottopics/pages/sulphur-2020.aspx> [<https://perma.cc/R954-PYEK>] (last visited July 23, 2019).

5. Scrubbers, such as those used to clean the emissions of coal burning power plants, may be installed on ships to ensure compliance with the emissions standards.

While this regulation impacts both the shipping and crude oil industries, another IMO action could have even greater effects to the long-term viability of the shipping industry. In April 2018, the IMO adopted an initial strategy pursuant to an ambitious goal: reduce *total* greenhouse gas emissions from international vessels by 50% by the year 2050.⁶ This regulation goes beyond the IMO 2020 plan for sulfur content and has vastly larger implications for the shipping industry. Moreover, while such a reduction would have vast implications for international maritime law, a comprehensive plan realizing this goal does not yet exist.

The IMO is unable to enforce new regulations unilaterally,⁷ relying instead on its member states to enforce the regulation domestically. This is the case for other IMO treaties and regulations, such as the International Convention for the Prevention of Pollution from Ships, or MARPOL.⁸ Under MARPOL, concurrent jurisdictions are established that allow for inspection and enforcement of not only a nation's own flag vessels, or those which are registered with the respective state's governing authority for maritime regulations and enforcement,⁹ but also over vessels under other flags that visit a nation's territorial waters.¹⁰ The Obama Administration stated its willingness to enforce these new fuel regulations, but mixed reaction from the current administration casts misconceptions

6. *Adoption of the Initial IMO Strategy on Reduction of GHG Emissions from Ships and Existing IMO Activity Related to Reducing GHG Emissions in the Shipping Sector*, Note by the International Maritime Organization to the UNFCCC Talanoa Dialogue (Apr. 13, 2018), 1.

7. *Implementation of IMO Instruments*, INT'L MAR. ORG., <http://www.imo.org/en/OurWork/Safety/Implementation/Pages/ImplementationOfIMOInstrument.aspx> [<https://perma.cc/RW2A-FMKY>] (last visited July 27, 2019).

8. International Convention for the Prevention of Pollution from Ships, Nov. 2, 1973, 1973 U.S.T. 322, 1340 U.N.T.S. 184 [hereinafter MARPOL].

9. A nation's flag vessels are those which fly its flag both within its waters and on the high seas. The flag of a vessel is determined by where the vessel is registered and submits documentation. As discussed later, exclusive or concurrent jurisdiction varies on the location of the vessel, and vessel owners are conscious of the advantageous quality of certain nation's laws for maritime purposes. See United Nations Convention on the Law of the Sea arts. 91–94, Dec. 10, 1982, 1833 U.N.T.S. 3.

10. Marine Environment Protection Committee Res. 117/52, Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, (Oct. 15, 2004) (entered into force Jan. 1, 2007), <http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-Protection-Committee-%28MEPC%29/Documents/MEPC.117%2852%29.pdf> [<https://perma.cc/6E4W-8XWU>].

about whether the new fuel standard will be adopted domestically and in what form.

Regardless of President Trump's position on the new IMO strategy for GHG reduction or any other international treaty on climate change,¹¹ the United States will have to comply with new IMO GHG regulations. The international regulation of maritime activities poses a unique situation in the context of international law. Maritime regulations adopted by the IMO have a unique character in international law because member states have less flexibility in choosing whether to adopt IMO regulations.¹² This unique character is due to the interconnected nature of maritime activity and the need for uniformity for the protections offered by flag states.¹³ Consequently, it is to the advantage of the member state to provide for consistent enforcement of IMO regulations to ensure that its effects, both positive and negative, are experienced equally by all participating parties. This is best achieved through clearly articulated standards adopted domestically in the United States. Failing to adopt the IMO 2020 sulfur standards would create confusion and panic for industry players, as evidenced by adverse reaction of crude oil investors to the Trump Administration's unclear position on IMO 2020.¹⁴

As was the case with the IMO 2020 regulation, it is likely that the IMO's strategy for GHG emission reductions will also be considered as an amendment to MARPOL, clearing the way to U.S. compliance and implementation.¹⁵ Even without formal adoption by the United States, the shipping industry will make its own choices as to whether it is "worth it" to continue to operate internationally. That decision will likely be made based on a variety of factors, such as the age of a company's shipping fleet, the existing capability of the fleet to reduce GHG emissions through

11. The U.S. Delegation to the IMO cited the Trump Administration's decision to withdraw from the Paris Agreement in its objections to the IMO strategy for GHG emission reduction.

12. Stephen Cunningham, *U.S. Seeks to Phase in Shipping Rules, Sending Refiners Sharply Lower*, BLOOMBERG (Oct. 20, 2018, 2:10 AM), <https://www.bloombergquint.com/business/u-s-refiners-slump-as-trump-looks-to-slow-roll-shipping-rules#gs.f9xQNua> [<https://perma.cc/5R45-BZP7>].

13. "It is the duty of the flag nation to control its vessels. If another nation should wish to board a foreign flag vessel, the other nation would generally seek authorization to do so from the nation whose flag the vessel flies. A foreign flag vessel is thereby protected by her country of registration." *U.S. v. Rubies*, 612 F.2d 397, 403 (9th Cir. 1979); *See United States v. Postal*, 589 F.2d 862 (5th Cir. 1979).

14. Cunningham, *supra* note 12.

15. *See* 33 U.S.C. 1901–1909 (2012).

scrubbing technologies and alternative fuels, and the impact of international trade to the company's shipping portfolio.

This Comment will first provide an overview of IMO actions on emission reduction to date, including MARPOL. Second, this Comment will address adoption by the United States of the new GHG reduction strategy pursuant to the Act to Prevent Pollution from Ships (APPS) as it was utilized to accomplish U.S. adoption of the IMO 2020 sulfur standards. Third, this Comment will identify legal and normative challenges to the adoption of emission reducing regulations for ships and will proffer solutions for these challenges. Finally, this Comment will conclude that the growing international consensus in favor of a 50% reduction in emissions will be the ultimate factor in adoption by the United States.

I. BACKGROUND

The International Maritime Organization was created to bring uniformity and consistency to maritime regulations on the high seas. Like other international organizations, the organization has undergone changes in policy goals since its founding, namely those related to climate change. While the shipping industry was not at the forethought of other organizations in framing climate change agendas, the IMO has endeavored to find ways to incorporate and develop initiatives related to emission reduction in its agenda. Specifically, the organization has used the Convention to Prevent Pollution from Ships (or MARPOL) as a vehicle for such emissions. First used to prevent careless discharge of oil and pollutants into waters, it now extends to pollutants released into the atmosphere through the adoption and subsequent amendment to Annex VI of the Convention.

A. *"I'm the Captain Now:" The Introduction of the International Maritime Organization*

The IMO is the global standard-setting authority for the safety, security, and environmental performance of international shipping.¹⁶ It was created by the United Nations in 1948.¹⁷ Its main role is to create a regulatory framework for the shipping industry that is fair and effective,

16. Michael L. Hoffman, *Ship Organization Nears Final Form; U.N. Maritime Body Expected to Have 3 Principle Organs – Panama in Opposition*, N.Y. TIMES, Mar. 4, 1948, at 51.

17. *Id.*

universally adopted, and universally implemented.¹⁸ It characterizes its mission as creating “a level playing-field so that ship operators cannot address their financial issues by simply cutting corners and compromising on safety, security and environmental performance. This approach also encourages innovation and efficiency.”¹⁹ While the IMO does not hold enforcement authority, it still serves a “vital function coordinating the uniformity of ship regulations and inducing cooperation among nations with regard to the economic and technical aspects of maritime commerce.”²⁰

B. Changing Tides: The Framework for International Response to Climate Change

The first major international agreement on climate change came in 1992 with the adoption of the United Nations Framework Convention on Climate Change (FCCC), thus setting forth the initial framework for climate change solutions. The United States Senate ratified and adopted the FCCC into domestic law shortly thereafter.²¹ However, the FCCC imposed no legally binding obligations, targets, or timetables for limiting GHG emissions,²² and the Clinton Administration would not agree to amendments or protocols to the treaty that created a binding emissions reduction commitment without subsequent Senate approval.²³ At the 1995 Conference of the Parties to the FCCC in Berlin, the United States first indicated it was willing to accept legally binding targets for capping GHG emissions.²⁴

The Third Conference of the Parties in 1997 produced the Kyoto Protocol to the United Nations FCCC.²⁵ This Protocol called for a blanket baseline 6% reduction in emissions among Annex I, or developed,

18. INT'L. MAR. ORG., <http://www.imo.org/en/About/Pages/Default.aspx> [<https://perma.cc/V6TQ-9SX9>] (last visited July 27, 2019).

19. *Id.*

20. THOMAS SCHOENBAUM, ADMIRALTY AND MARITIME LAW § 18-1 (5th ed. 2017).

21. International Convention on the Prevention of Climate Change, May 9, 1992, 1771 U.N.T.S. 107.

22. ARNOLD W. REITZE, JR., AIR POLLUTION CONTROL LAW: COMPLIANCE AND ENFORCEMENT, 422 (2001).

23. *Id.*

24. Organization Summary, *Environmental Law Alliance Worldwide (E-LAW)*, 8 COLO. J. INT'L ENVTL. L. & POL'Y 127, 158 (1997).

25. REITZE, JR., *supra* note 22.

nations,²⁶ but imposed no obligation other than to report emissions for non-Annex I, or developing, nations.²⁷ While the United States agreed to a 7% reduction to be implemented through domestic law, the treaty was never ratified by the U.S. Senate primarily due to economic concerns.²⁸

In 2016, the nations of the world convened in Paris to set forth a bold, new agenda for combating climate change through the reduction of greenhouse gas emissions in an effort to decrease the temperature of the planet by 2°C.²⁹ The agreement identified specific ways nations would reduce carbon footprints. This agreement, however, failed to include any reference to the international shipping industry.

The interconnected nature of the industry makes it impossible to attribute pollution to any one state. This is for two reasons. First, the only way to attribute pollution to a state for international cargo vessels is attribution to the vessel's flag state, or the flag under which the vessel sails. Second, even if that method is used, it is not foolproof, since many states allow for their flag to be flown as a "flag of convenience."³⁰ For example, Liberia and Panama are the two flags which vessels use most often, though few of those vessels are owned by companies or individuals in either of those states.³¹

The policy position of the United States on international climate change policy and regulations fluctuates according to the ideology of the President, the majority party in the houses of Congress, and economic considerations at the time agreements are considered. For instance, the economic conditions in the United States at the time of the adoption of the Kyoto Protocol would have been more onerous for the United States than for Europe, as the declining economy throughout eastern Europe allowed

26. Kate M. Joyce, *U.S. Energy Policy Since September 2001*, 15 FORDHAM ENVTL. L. REV. 31, 40 (2004).

27. Non-Annex I nations must report GHG inventories annually, but are not required to make GHG reductions, while Annex II nations are a subset of Annex I nations and must financially assist non-Annex I nations to meet GHG reduction goals. Arnold W. Reitze, Jr., *Federal Control of Greenhouse Gas Emissions*, 40 ENVTL. L. 1261, 1264 (2010) (quoting Caleb W. Christopher, *Success by a Thousand Cuts: The Use of Environmental Impact Assessment in Addressing Climate Change*, 9 VT. J. ENVTL. L. 549, 561 (2008)).

28. *Id.* at 1266.

29. INT'L MAR. ORG., *supra* note 18.

30. "The term 'flag of convenience' refers to a state which registers foreign-owned vessels, granting the vessel its nationality and the right to fly its flag, giving the vessel the benefit of registration fees, annual fees, and taxes which are considerably less than in other states." ARND BERNAERT, BERNAERTS' GUIDE TO THE 1982 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 104 (2006).

31. *Id.*

for baseline compliance to be met more easily.³² The United States' population grew far more rapidly than many of the Annex I (or developed) nations.³³ Because no effective penalties are included in the Protocol for a nation's noncompliance, nations are relatively free to ignore the agreement.³⁴ Sweeping political changes within the United States in the last decade have also contributed to this sort of variance in United States climate change policy.³⁵ While the United States initially joined the Paris Agreement under the Obama Administration, President Trump has now announced his intention to withdraw from the Agreement.³⁶

C. *Clearing the Slush*.³⁷ *The Regulation of Maritime Pollution*

The international shipping industry makes up 2% of GHG emissions worldwide.³⁸ In the absence of regulations, the IMO estimates that, at a minimum, shipping emissions will increase 50% by 2050, but that increase could be as high as 250%.³⁹ This variation is due to modeling that takes into account different levels of economic growth, as well as the impact of

32. Robert O. Mendelsohn, *An Economist's View of the Kyoto Climate Treaty*, NAT'L PUB. RADIO ONLINE, (Feb. 18, 2005, 12:00 AM), <http://www.npr.org/templates/story/story.php?storyId=4504298> [<https://perma.cc/RB7R-CJND>].

33. See *Population (1990) by Country*, NATIONALMASTER, http://www.nationmaster.com/graph/peo_pop-people-population&date=1990 [<https://perma.cc/BSH2-7RZG>] (last visited July 27, 2019). See also *U.S. & World Population Clock*, U.S. CENSUS BUREAU, <http://www.census.gov/population/www/popclockus.html> [<https://perma.cc/X7BP-AE3U>] (last visited July 29, 2019).

34. Reitze, Jr., *supra* note 27, at 1264–65.

35. See generally Amy Royden, *U.S. Climate Change Policy Under President Clinton: A Look Back*, 32 GOLDEN GATE U. L. REV. 415, 455, 458 (2002).

36. The earliest that the United States can withdraw from the Agreement is November of 2020 on the day after the 2020 U.S. Presidential election. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, <https://unfccc.int/news/on-the-possibility-to-withdraw-from-the-paris-agreement-a-short-over-view> [<https://perma.cc/JUN9-A6W6>] (last visited July 27, 2019).

37. Aside from its more popular usage, “slush” was a term used in the Royal Navy to refer to a greasy substance obtained by boiling or scraping the fat from empty salted meat storage barrels. Cooks sold or exchanged it (usually for alcohol) with other members of the crew, who would use it to grease parts of the rigging of the ship.

38. David Shukman, *Plea for Action on Shipping Emissions*, BBC (Apr. 9, 2018) [<https://perma.cc/576B-RQ4M>].

39. INT'L MAR. ORG., THIRD GREENHOUSE GAS STUDY 2014: EXECUTIVE SUMMARY 20 (2015), <https://www.bbc.com/news/science-environment-43701631> [<https://perma.cc/NWU6-TKTM>] (last visited July 27, 2019).

greater efficiency and control measures.⁴⁰ For example, the level of utilization of certain fuels, such as liquid natural gas (LNG), will affect not only the overall level of pollution, but will also result in variation in specific outputs of compounds, such as sulfur.⁴¹

The IMO's initial strategy is largely a realization of the specific provisions in the Kyoto Protocol's mandate for international shipping and the overarching goals of the Paris Agreement. Unlike the Kyoto Protocol, the Paris Agreement does not include cargo vessels in its objectives⁴² because carbon dioxide emissions from shipping cannot be attributed to any specific nation.⁴³

1. Changing Ensigns: MARPOL's Evolution of Pollution Regulations

MARPOL, or the International Convention for the Prevention of Pollution from Ships, was signed on November 2, 1973,⁴⁴ and was later modified by the Protocol of 1978.⁴⁵ It is the main international convention to prevent marine environment pollution from ocean-going vessels.⁴⁶ This multilateral maritime treaty aims "to achieve the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances."⁴⁷ MARPOL is not a self-executing treaty or one which becomes judicially enforceable through ratification.⁴⁸ Instead, each signing

40. *Id.*

41. *Id.* at 22.

42. Aldo Chircop, Meinhard Doelle & Ryan Gauvin, *Shipping and Climate Change: International Law And Policy Considerations*, CTR. FOR INT'L GOVERNANCE INNOVATION (CIGI) (Sept. 6, 2018) (citing CANADIAN MARITIME LAW 19 (Aldo Chircop et. al., eds., 2d. ed. (2016)), https://www.cigionline.org/sites/default/files/documents/Shipping%27s%20contribution%20to%20climate%20change%202018web_0.pdf [<https://perma.cc/B7AV-TGHM>]).

43. Jessica Green, *Why do we Need New Rules on Shipping Emissions? Well, 90 Percent of Global Trade Depends on Ships*, WASH. POST (Apr. 17, 2018), https://www.washingtonpost.com/news/monkey-cage/wp/2018/04/17/why-do-we-need-new-rules-on-shipping-emissions-well-90-of-global-trade-depends-on-ships/?noredirect=on&utm_term=.ff637f1a4ab1 [<https://perma.cc/5F4H-D8KU>].

44. *U.S. v. Pena*, 684 F.3d 1137, 1142 (11th Cir. 2012) (citing 1340 U.N.T.S. 62).

45. Protocol of 1978, Feb. 17, 1978, 1978 U.S.T. 322, 1340 U.N.T.S. 61.

46. MARPOL, *supra* note 8.

47. *Id.*

48. A treaty is only self-executing and thus has "automatic domestic effect" if: (1) Congress has enacted implementing legislation; or (2) the treaty explicitly states that it is self-executing. *Medellin v. Texas*, 552 U.S. 491, 505 & n.2, 128 (2008).

state agrees to “give effect”⁴⁹ to it by establishing rules for ships that fly its flag, certifying that such ships comply with the treaty rules, and sanctioning those ships that violate the treaty.⁵⁰ The Act to Prevent Pollution from Ships (APPS), codifies MARPOL in the United States and authorizes the U.S. Coast Guard to issue regulations implementing the requirements of the treaty.⁵¹

Under MARPOL, it is the responsibility of the “flag state” to certify that ships sailing under its authority (or “flag”) comply with MARPOL.⁵² With respect to the prevention of oil pollution, the flag state conducts an inspection, or “survey,” and certifies the ship’s compliance by issuing an International Oil Pollution Prevention (“IOPP”) Certificate.⁵³ The flag state may delegate the authority to conduct the survey and to issue the IOPP Certificate to a recognized “classification society,” which is an organization that inspects the vessels and issues the certificates on the flag state’s behalf.⁵⁴ The individual employed by a classification society to conduct the survey and issue the certificate on behalf of the flag state is known as a “surveyor.”⁵⁵ “Port States”—nations visited by commercial ships—may inspect the vessels entering their waters and ports to ensure compliance with MARPOL regulations.⁵⁶ An inspection of a foreign vessel by a Port State is called a “port state control examination.” In the United States, the U.S. Coast Guard is charged with conducting port state control examinations to ensure that all commercial vessels entering the United States comply with MARPOL.⁵⁷

49. *Id.*

50. MARPOL, *supra* note 8, arts. 1(1), 4(1), 5(1); *see also* United States v. Ionia Mgmt. S.A., 555 F.3d 303, 307 (2d Cir. 2009).

51. *See* 33 U.S.C. § 1903(c)(1); 33 C.F.R. § 151.01–159.321.

52. Int’l Maritime Org. [IMO], Regs. 6.3.1, 6.3.4., Resolution MEPC.117(52), *Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships*, 1973, (Oct. 15, 2004) (entered into force Jan. 1, 2007), <http://www.imo.org/en/KnowledgeCentre/Index/ofIMOResolutions/Marine-Environment-Protection-Committee-%28MEPC%29/Documents/MEPC.117%2852%29.pdf> [<https://perma.cc/5QK6-Q98A>].

53. *Id.* at Regs. 6.1, 6.3.1, 7.

54. *Id.* at Reg. 6.3.1.

55. *Id.*

56. MARPOL, *supra* note 8, arts. 5(2), 6(2).

57. Oil Pollution, Inspection for Enforcement and Compliance, 33 C.F.R. § 151.23 (Mar. 1, 1991).

2. *Is it Applicable under Annex VI? Maybe SO_x, Maybe NO_x*⁵⁸

Annex VI of MARPOL sets limits for nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter (PM)⁵⁹ emissions from ocean-going vessels that are of “400 gross tonnages or more, and general enforcement and monitoring procedures.”⁶⁰ Ratifying states are required to designate certain sea areas as emission control areas (ECAs), where states enforce the mandatory measures of Regulation 2 of Annex VI to control the emission of “NO_x or SO_x and [PM] or all three.”⁶¹ This also includes limiting the sulfur content of fuel oil to reduce SO_x and PM emissions through Regulation 14, and prescribing three “tiers” of design standards for marine diesel engines to control NO_x emission through Regulation 13. Due to the long service life of cargo vessels,⁶² varying tiers of emission standards are used under MARPOL Regulation 13 for marine diesel engines depending on the age of the vessel: (1) 2000 to 2011, (2) after 2011, and (3) after 2016. These emission limits use rated engine speed (rpm, revolutions per minute) as the variable in the formula model rather than a finite standard of emission limits.⁶³

3. *Welcome Aboard: U.S. Adoption of Annex VI*

The United States ratified Annex VI in 2008 and implemented the mandatory air emission standards through amendments to the APPS and the Clean Air Act.⁶⁴ Currently, two ECAs have been established, covering

58. SO_x and NO_x are the periodic symbols for sulfur oxides and nitrogen oxides, respectively. As there are several variants of these oxides, the “x” subscript encapsulates all in a collective expression.

59. Particulate matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. This complex mixture includes both organic and inorganic particles, such as dust, pollen, soot, smoke, and liquid droplets. ENV'T'L. PROT. AGENCY, PARTICULATE MATTER POLLUTION, <https://www.epa.gov/pm-pollution> [<https://perma.cc/JZQ8-L9QL>] (last visited July 27, 2019).

60. Xiaoxin Shi, *Making Ends Meet: Using a Market-Based Approach to Incentivize Foreign Vessels to Comply with the Air Emission Standards of MARPOL Annex VI*, 4 PENN ST. J.L. & INT'L AFF. 556 (2015).

61. *Id.* at 560, 561 (citing MARPOL Annex VI, Regulation 2, ¶ 8).

62. The average life of a U.S. inspected cargo vessel in 2017 was 28 years. U. S. COAST GUARD, DEP'T. OF HOMELAND SEC., FLAG STATE CONTROL IN THE UNITED STATES, 2017 ANNUAL REPORT 5, <https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC1/AnnualRpt/2017DomesticAnnualReport.pdf> [<https://perma.cc/XK9T-9XBQ>].

63. MARPOL, *supra* note 8, at Annex VI, Regulation 13.

64. Clean Air Act, 42 U.S.C. §§ 7401–7431 (2012).

virtually all U.S. coastlines. The North American ECA came into force on August 1, 2012, extending up to 200 nautical miles from the Pacific coast, the Atlantic coast, the Gulf coast, and the eight Hawaiian Islands. The United States Caribbean Sea ECA, covering coastal waters around Puerto Rico and the U.S. Virgin Islands, was approved by the IMO in 2011 and became enforceable starting January 1, 2014. Emissions of SO_x, NO_x, and PM are all regulated in both ECAs.

D. Sulfur So Good, or Knot Good at All? IMO 2020 for Sulfur Content Reduction

First envisioned twenty years ago, the IMO developed a final rule on the sulfur content of marine fuels through an amendment to MARPOL Annex VI.⁶⁵ Specifically, the new IMO regulation looks to reduce the sulfur content of the fuel used by international vessels from 3.5% per weight to 0.5% per weight.⁶⁶ This means the demand for heavy crude oil variants will drastically decrease for cargo vessels, while the demand for light, or “sweet” crude oil will drastically increase. The displacement of heavy crude from the market may have far reaching effects on the global energy market, but the increased demand for light, sweet crude will likely have a positive impact for producers in the United States. IMO 2020 is likely to result in increased global demand for sweet crudes (sulfur content less than 0.3%), particularly from less complex refineries overseas that are not well configured to remove sulfur from crude.⁶⁷

E. Full Steam Ahead: the IMO Strategy to Reduce Greenhouse Gases

In April 2018, the IMO Marine Environment Protection Committee (MEPC) adopted a bold new strategy to reduce all greenhouse gas emissions generated by international vessels by 50% by the year 2050.⁶⁸

65. INT’L. MAR. ORG., MARINE ENVIRONMENT PROTECTION COMMITTEE MEETING SUMMARY, 73RD SESSION (Oct. 22–26, 2018), <http://www.imo.org/en/MediaCentre/MeetingSummaries/MEPC/Pages/MEPC-73rd-session.aspx?platform=hootsuite> [<https://perma.cc/3XQE-3GR3>].

66. *Id.*

67. Stacy Morris, *With the U.S. Exporting 20% Of Its Oil Production, What Midstream Companies Could Benefit?*, SEEKING ALPHA, (Sept. 12, 2018, 8:00 AM), <https://seekingalpha.com/article/4205684-u-s-exporting-20-percent-oil-production-midstream-companies-benefit?page=3> [<https://perma.cc/WPC2-QFCY>].

68. *Adoption of the Initial IMO Strategy on Reduction of GHG Emissions from Ships and Existing IMO Activity Related to Reducing GHG Emissions in the Shipping Sector*, Note by the International Maritime Organization to the UNFCCC Talanoa Dialogue 1 (Apr. 13, 2018), <https://unfccc.int/sites/default/files/resource>

At the 73rd session of MEPC, the body adopted the goals proffered by the initial strategy through the year 2023.⁶⁹ Those objectives include:

- (1) the establishment of an Existing Fleet Improvement Programme,
- (2) development and update of national action plans to develop policies and strategies to address emissions in accordance with IMO guidelines,
- (3) the development of incentives to develop and take up new technologies, the development of robust lifecycle Greenhouse Gas (GHG) carbon intensity guidelines for all types of fuel, and
- (4) the analysis of measures to encourage port developments and activities globally to facilitate reduction of GHG emissions from shipping.⁷⁰

II. ROUGH SEAS AHEAD: THE TIDE OF ISSUES CONFRONTING U.S. IMPLEMENTATION

The regulations of the IMO for both the forthcoming sulfur content reduction standards and for the less specifically targeted Greenhouse Gas Reduction strategy will present legal, economic, and policy issues. United States statutory enactments giving effect to MARPOL could pave the way for automatic compliance pending the Administration's approval. However, the two policies will be in conflict with one another as the maritime industry seeks alternatives to achieve compliance.

A. Legal Questions of Implementation and Enforcement

From a legal perspective, it is unclear how the IMO's new strategy will affect the interpretation of MARPOL Annex VI. The Initial Strategy and the Vision adopted by the IMO contain language strongly linking the mission of the new strategy to the Annex; however, there is no direct statement that this action is an amendment to Annex VI.⁷¹ Should the new strategy be considered such an amendment, courts have held that the President and Secretary of State hold expansive power in what may be

/250_IMO%20submission_Talanoa%20Dialogue_April%202018.pdf [https://perma.cc/7HAQ-C2H6] [hereinafter Talanoa Dialogue].

69. MARINE ENVIRONMENTAL PROTECTION COMMITTEE 73RD SESSION, INT'L MAR. ORG. (Oct. 26, 2018) <http://www.imo.org/en/MediaCentre/MeetingSummaries/MEPC/Pages/MEPC-73rd-session.aspx> [https://perma.cc/C96W-GEZ5].

70. *Id.*

71. *See generally* Talanoa Dialogue, *supra* note 68.

accepted.⁷² In *Alaska v. Kerry*, the U.S. District Court of Alaska concluded that the enacting statute for Annex VI contains considerable flexibility in the adoption of amendments to the Annex.⁷³ Should the Executive Branch choose to accept the amendment, it can do so without Senate consent and may also promulgate rules and procedures through the Administrative Procedures Act for the enforcement of those amendments.⁷⁴

There are also legal issues that arise from the inherent nature of maritime law and regulation. The diversity, functionality, and mobility of shipping vessels inherently present challenges in how to enforce uniform emission standards.⁷⁵ The diversity of actors involved in the operational life of a ship poses challenges in distributing emissions reductions equitably.⁷⁶ A ship's energy use and efficiency starts with its construction. Standards are often decided based on what will be required to achieve cargo-carrying capacity, optimal fuel use and emissions outcomes. Therefore, construction of new vessels will need to be guided by international rules and standards including prospective standards with effectiveness at a later date, as well as market demand and finance.⁷⁷ The payment arrangement customary to the industry for the construction of such vessels must also be considered, as lengthy amortization periods and balloon payment plans will have to be considered in any regulations made pursuant to this new strategy.⁷⁸ Additionally, the wide variety of classes of ships will make uniform regulation nearly impossible to attain. Therefore, the differences between classes will have to be factored into any new regulations.⁷⁹ Certain types and sizes of vessels require a minimum speed to ensure maneuverability.

B. Why so Special? The Unique Character of the IMO in International Law

Unlike other organizations and agreements, the United States would find it substantially more difficult not to comply in a regulation that governs the movement of ships and is enforced through concurrent jurisdictions. The success of sulfur reduction regulations depends greatly

72. *Alaska v. Kerry*, 972 F. Supp. 2d 1111, 1129 (Alaska 2013).

73. 33 U.S.C. § 1909 (2012).

74. *Kerry*, 972 F. Supp. 2d at 1129.

75. Chircop, Doelle & Gauvin, *supra* note 42.

76. *Id.*

77. *Id.*

78. *Id.*

79. *Id.*

on equal and effective enforcement measures across member states.⁸⁰ While on the high seas, a vessel is only subject to the laws and regulations of the flag state which it claims.⁸¹ However, once a vessel enters the jurisdiction of another nation via use of its territorial waters or ports, it becomes subject to its regulations and laws.⁸² Consequently, travel between nations by sea necessitates a heightened level of compliance and sensitivity to the laws of other nations. Given that both IMO 2020 and the new strategy for GHG emission reductions has garnered widespread support, it is likely that U.S. ships will be subject to the requirements of IMO requirements regardless of whether they are adopted in the United States.

C. “Knot on My Watch!” Impacts to Industries and Their Response to the IMO

There is the concern that the United States will carry the bulk of the burden in the implementation of the IMO GHG-reduction strategy. As the second largest exporter of goods, the United States will be among the most burdened nations, along with China and Germany.⁸³ Given the relaxed enforcement mechanisms contained in Kyoto and other similar international emissions agreements, this debate will become a question of whether enough nations actually implement these standards to justify U.S. compliance.

Similar to the issues presented by IMO 2020, there have been numerous concerns raised about the affordability of implementing this proposal for ship-owners and oil producers.⁸⁴ While environmental activists and diplomats hailed the proposal as a major victory for greenhouse gas reduction, the implementation of the proposal will have considerably more drastic effects than IMO 2020, to which carriers have

80. Ralph Grimmer, *Expected Pricing and Economic Impacts of the IMO 2020 Rule*, STILLWATER ASSOCIATES (July 11, 2018), [<https://perma.cc/44CL-ZV4W>].

81. United Nations Convention on the Law of the Sea art. 91, Dec. 10, 1982, 1833 U.N.T.S. 3.

82. *Id.* arts. 27–28.

83. *Trade Profile – United States of America*, WORLD TRADE ORG., <http://stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=US> [<https://perma.cc/3YVF-8ZHL>] (last visited July 27, 2019).

84. Niels Bjørn Mortensen, *IMO Greenhouse Gas Agreement – What Will be the Impact on Shipowners and Operators?* RIVIERA MARITIME MEDIA (Jul. 2, 2018), https://www.lngworldshipping.com/news/view,imo-greenhouse-gas-agreement-what-will-be-the-impact-on-shipowners-and-operators_53341.htm [<https://perma.cc/J2H9-CMQQ>].

consistently raised concerns that low-sulfur fuels will not be affordable to use.⁸⁵ Indeed, forecasts now project a significant price increase beginning in the fourth quarter of 2019.⁸⁶

The Trump Administration cited the need for technological innovations for the implementation of the Initial Strategy.⁸⁷ However, independent researchers have found that emissions can be reduced by more than 75% by 2050 based on current technologies.⁸⁸ In 2017, the Marine Environment Protection Committee (MPEC) was advised that nearly 2,500 new vessels had been certified as complying with energy standards of the Energy Efficiency Design Index.⁸⁹ One obstacle to U.S. compliance is the requirements of Section 27 of the Merchant Marine Act that shipments made between U.S. ports be done using only ships built in the United States.⁹⁰ This limits the number of shipbuilders available for U.S. shipments and the supply of technology required to meet the goals of the Initial Strategy.

1. A Rough Riverboat Ride: Potential Impacts to Louisiana by IMO 2020 and GHG Strategies

At the mouth of the Mississippi River, Louisiana ranked first in the nation in export intensity and export growth in 2015.⁹¹ The state transfers 500 million tons of cargo each year, accounting for 20% of the nation's total waterborne commerce.⁹² Attached to those transfers are over \$2

85. Joseph Bonney, *Report Downplays Cost Of Low-Sulfur Fuel*, J. COMM. 36 (2017).

86. Erwin Seba, *New Martine Fuel Rules to Boost Diesel Prices for at Least a Year -Analysts*, REUTERS (June 10, 2019), <https://www.cnbc.com/2019/06/10/reuters-america-new-marine-fuel-rules-to-boost-diesel-prices-for-at-least-a-year-analysts.html> [<https://perma.cc/WKH2-LMY8>].

87. David Shuckman, *Global Shipping in 'Historic' Climate Deal*, BBC (Apr. 13, 2018), <https://www.bbc.com/news/science-environment-43759923> [<https://perma.cc/3HRB-2W7U>].

88. Evert A. Bouman, Elizabeth Lindstad, Agathe I. Riiland & Anders H. Strømman, *State-of-the-Art Technologies, Measures, and Potential for Reducing GHG Emissions From Shipping – A Review*, 52 TRANSP. RESEARCH PART D 408 (2017) (the authors are faculty and staff of the Industrial Ecology Programme and Department of Energy and Process Engineering, Norwegian University of Science and Technology).

89. *Marine Environment Protection Committee Opens*, INTERMARITIME CERTIFICATION SERV. (July 4, 2017), <https://icsclass.org/news/marine-environment-protection-committee-opens-2/> [<https://perma.cc/8A7B-23P8>].

90. 46 U.S.C. § 50101 (2012).

91. LA. ASS'N OF BUS. & INDUS., *supra* note 2.

92. *Id.*

billion in tax revenues and nearly one in every five jobs in the state.⁹³ With the maritime industry serving as such a vital role in Louisiana's economy, it is understandable that the forthcoming IMO regulations are causing a great deal of uncertainty among the state's leading economic experts.⁹⁴ Conversely, another of Louisiana's top industries, oil and gas, is set to benefit from the IMO's proposed changes for sulfur content, as fuels such as natural gas and light, sweet crude will be in higher demand.⁹⁵

What is not clear for either industry, however, is how either will be impacted by the IMO strategy for overall greenhouse gas emission reduction. The uncertainty surrounding the method of implementation and the effects across domestic markets in each nation is concerning for the future of the maritime industry.

III. SOLUTIONS: CHARTING COURSE FOR COMPLIANCE

While the IMO Strategy to reduce GHG emissions is concerning, the nature and implications of the 50% reduction goal present a number of opportunities for both sustainability within the industry and meaningful emission reductions. Unlike IMO 2020, the GHG Strategy is framed to set a goal for the *entire* industry rather than each individual vessel. The Strategy incorporates a far less ambitious timeline, creating opportunities for technological advancements in diesel engines and energy consumption while allowing for a gradual and natural retirement of existing vessels lacking the capacity to meet new emissions standards. However, a key concern among hesitant nations is that new standards are enforced across all nations and not simply those readily willing to comply.

A. Setting a Heading: Use of the MARPOL Annex VI Enforcement Model

In order to understand how a strategy as bold and broad as the 2050 reduction objective may be implemented, one must first understand how similar standards are implemented and enforced by the United States. While ships have the nationality of the State where they are registered,⁹⁶ they also traverse the waters of other nations when engaged in international trade. This creates an issue for maritime law and enforcement, as well as a question of what law applies and the consequences for noncompliance should U.S. ships not meet the standards set by another state. Additionally, there is the

93. *Id.*

94. Scott, *supra* note 3.

95. Morris, *supra* note 67.

96. Chircop, Doelle & Gauvin, *supra* note 42.

question of grandfathering older ships and those that have changed registration by virtue of a change in ownership.⁹⁷

MARPOL is enforced through the Environmental Protection Agency (EPA). The United States currently complies with MARPOL Annex IV. Annex VI represents the portion of MARPOL that regulates air pollution from ships.⁹⁸ MARPOL was ratified and codified into U.S. law in 1980 through the Act to Prevent Pollution from Ships (APPS) in Chapter 33 of the United States Code.⁹⁹ Together, the APPS and MARPOL Annex VI establish the fuel sulfur standards applicable to ships operating in the North American and U.S. Caribbean Sea Emissions Control Areas.¹⁰⁰ The EPA maintains authority to take action for violations of the APPS, whenever such violations have been referred to the EPA by the U.S. Coast Guard.¹⁰¹ Receipt of evidence of a violation constitutes a referral and triggers EPA sanction authority.¹⁰² Under section 1908(b), the EPA may assess a civil penalty of \$25,000 per violation per day. The EPA must calculate civil penalties by “taking into account the nature, circumstances, extent, and gravity of the prohibited acts committed and, with respect to the violator, the degree of culpability, any history of prior offenses, ability to pay, and other matters as justice may require.”¹⁰³

The APPS treats both foreign and U.S. flagged vessels alike. The APPS provides that Annex VI applies to all foreign flagged vessels “in” or bound for “a port, shipyard, offshore terminal, or the internal waters of the United States.”¹⁰⁴ Civil penalties are imposed for failure to provide documentation of compliance with Annex VI. Each day of non-compliance is considered a separate violation.¹⁰⁵ The EPA requires a “corrective action plan signed by the ship owner or operator and a report of the noncompliance to be sent to the ship’s country of registry.”¹⁰⁶ A

97. *Id.*

98. ENVTL. PROT. AGENCY: NORTH AMERICAN AND U.S. CARIBBEAN SEA EMISSIONS CONTROL AREAS PENALTY POLICY FOR VIOLATIONS BY SHIPS OF THE SULFUR IN FUEL STANDARD AND RELATED PROVISIONS 1 (2015), <https://www.epa.gov/sites/production/files/2015-03/documents/marinepenaltypolicy.pdf> [<https://perma.cc/M8BR-RPZ7>] [hereinafter PENALTY POLICY].

99. 33 U.S.C. § 1901 (2012).

100. PENALTY POLICY, *supra* note 98.

101. *Id.*

102. 33 U.S.C. § 1907(b) (2012).

103. *See* 33 U.S.C. § 1908(b) (2012).

104. *See* 33 U.S.C. § 1902(a) (2012).

105. *See* 33 U.S.C. § 1908(b) (2012).

106. OFFICE OF COMMERCIAL VESSEL COMPLIANCE (CG-CVC), U.S. COAST GUARD, ECA JOB AID: DOMESTIC & FOREIGN VESSELS (2012), [<https://perma.cc/9NNS-YK68>].

class D felony is committed if a ship owner or operator “knowingly violates” Annex VI.¹⁰⁷ A class D felony generally carries penalties of imprisonment for up to ten years.¹⁰⁸ Up to one-half of the criminal fines may be paid to the “person giving information leading to conviction.”¹⁰⁹ The Coast Guard is responsible for conducting ship inspections and investigations to establish criminal liability.¹¹⁰

The Coast Guard conducts compliance inspections on foreign vessels when they call at a U.S. port as authorized by the control authority provisions set forth in the establishment of emission control areas and through federal statute.¹¹¹ In doing so, the Coast Guard is allowed to board the vessel, examine it for deficiencies, detain the vessel, or even expel it from the port.¹¹² Specifically for Annex VI, the Coast Guard examines the vessel’s International Air Pollution Prevention Certificate, the oil record book, technical files for the engines, bunker delivery notes, and engine logs.¹¹³ The Coast Guard also inspects U.S. flag vessels that travel internationally during annual inspections, which are typically analyzed with heightened scrutiny.¹¹⁴ This jurisdiction holds regardless of whether the vessel’s flag state has adopted the relevant international treaty or not.¹¹⁵

107. 33 C.F.R. § 151.04(c).

108. 18 U.S.C. § 3559(A)(4) (2012); *see also* UNITED STATES COAST GUARD & UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REVISED PROTOCOL ON REFERRALS UNDER MARPOL ANNEX VI, AS IMPLEMENTED BY THE ACT TO PREVENT POLLUTION FROM SHIPS 3 (2019), <https://www.epa.gov/sites/product/files/2019-07/documents/annexvifonarrevreferralprotocolfinaljointexecuted.pdf> [<https://perma.cc/7JDM-8XT3>] [hereinafter U.S. COAST GUARD].

109. 33 U.S.C. § 1908(a) (2012).

110. *Id.*; *see also* U.S. COAST GUARD, *supra* note 108.

111. *See* 33 U.S.C. § 1902(a)(5)(A) (2012), which provides that Annex VI of the International Convention for the Prevention of Pollution from Ships shall apply to foreign-flagged ships that are in a port, shipyard, offshore terminal, or the internal waters of the United States.

112. UNITED STATES COAST GUARD, MARINE SAFETY MANUAL, VOLUME II, COMDTINST 1600.78, § D, Port State Control, <https://perma.cc/PW5J-GSQU> (last visited July 29, 2019).

113. Email Interview with Lieutenant Commander Andrew Czarniak, P.E., Inspections Division Chief, United States Coast Guard Marine Safety Unit – Morgan City, Louisiana, (Dec. 28, 2018).

114. *Id.*

115. A vessel of a nonsignatory state may nonetheless be required to comply with the provisions of an international treaty when a) the provisions have been promulgated in the U.S. Code of Federal Regulations and b) the vessel is operating in U.S. waters and thus is subject to inspection and enforcement by the United

B. “Belay That!” The Implications of Noncompliance in MARPOL Annex VI Amendments

Just as the President and the Secretary of State may accept amendments, they may also refuse to adopt the MARPOL Annex VI amendments.¹¹⁶ The MARPOL enacting legislation provides that, following consultation with the Secretary of the EPA, the Secretary of State may make a declaration that the United States does not accept an amendment proposed pursuant to Article VI of the MARPOL Protocol.¹¹⁷ The current administration is reluctant to support the IMO strategy. Representing the United States at the conference, Jeffrey Lantz¹¹⁸ spoke in opposition to the proposal, stating that “achieving significant emissions reductions, in the international shipping sector, would depend on technological innovation and further improvements in energy efficiency.”¹¹⁹ Lantz also noted that the United States had announced its withdrawal from the Paris Agreement, another international measure aimed at curbing GHG emissions.¹²⁰ As a sole executive agreement, presidential action is the only requirement for execution of the Paris Agreement.¹²¹ Executive agreements are politically, rather than legally, binding because their effectuation is only guaranteed under the administration with which the agreement is made.¹²² However, this withdrawal is merely a statement of intent, as the Paris Agreement’s exit provision does not allow for a nation’s withdrawal until November 4, 2020.¹²³ This accounts for the three years of time since entry into force and a one-year delay from receipt by the United Nations Secretary General of

States Coast Guard. *See* *Cont’l Grain Co. v. Puerto Rico Mar. Shipping Auth.*, 972 F.2d 426, 432–34 (1st Cir. 1992).

116. 33 U.S.C. §1909(c) (2012).

117. *Id.*

118. Jeffrey Lantz is Director, Commercial Regulations and Standards for the Coast Guard’s Assistant Commandant for Marine Safety, Security and Stewardship. U.S. COAST GUARD, <https://www.uscg.mil/Biographies/Display/Article/1391277/mr-jeffrey-g-lantz/> [<https://perma.cc/LE9J-ZU3J>] (last visited July 30, 2019).

119. Shuckman, *supra* note 87.

120. The Paris Agreement, United Nations Framework Convention on Climate Change, art. 2, Dec. 12, 2015.

121. U.S. Dept. of State, *Agreements Pursuant to the Constitutional Authority of the President*, 11 FAM 723.2-2(C) (2006), <https://fam.state.gov/FAM/11FAM/11FAM0720.html> [<https://perma.cc/Z2NN-R7P5>].

122. *See Executive Agreement*, BLACK’S LAW DICTIONARY (11th ed. 2019).

123. Paris Agreement, *supra* note 120.

the nation's notice of withdrawal as required by Article 28 of the Agreement.¹²⁴

These articulated concerns are not unlike those of the U.S. Senate in response to the Kyoto Protocol,¹²⁵ but highlight two key issues in the enforcement of this strategy: (1) the technology required for enforcement of the strategic goals may either be unavailable or impractical for some cargo vessels to obtain and (2) the nature of a ship (i.e., not only as movable property, but through its practical function) makes enforcement of such a standard increasingly difficult. Annex VI affords ratifying states with broad authority in enforcement. However, such authority is qualified when the violation is caused by non-availability of low-sulfur fuels that are in compliance with MARPOL standards.¹²⁶ When this is the case, Annex VI provides that when a ship furnishes evidence and documentation of good faith attempts to secure compliant fuel without availability thereof, the port state shall consider "not taking control measures."¹²⁷ Annex VI prohibits the deviation or delay of a voyage in order to achieve compliance.¹²⁸

Just as executive action could be taken, shippers could theoretically also make the choice not to comply. As it is candidly stated in the 2019-2020 Louisiana Economic Outlook, "after all, when you are in the middle of the ocean, who is watching and what is the cost except reputational damage?"¹²⁹ The challenge for individual noncompliance is that the IMO has threatened to put pressure on insurance companies to declare such vessels "unseaworthy."¹³⁰ This means that those vessels would not be eligible for insurance coverage on the high seas.¹³¹ It is unclear whether unseaworthy declarations are a serious concern, as it would be a stretch for actualization. However, the possibility does present a serious obstacle about the viability of individual noncompliance.

124. *Id.*

125. Reitze, Jr., *supra* note 27, at 1274.

126. Shi, *supra* note 60, at 562.

127. *Id.*

128. *Id.*

129. Scott, *supra* note 3.

130. *Id.*

131. *Id.*

C. It's all in the Rigging: Technological Flexibility in Adopting the IMO GHG Strategy

Annex VI includes flexibility in achieving compliance and encourages technological innovation to do so.¹³² Under Regulation 4, port states can allow “any fitting, material, appliance or apparatus . . . or other procedures, alternative fuel oils, or compliance methods” so long as such alternatives are as effective in terms of emission reductions as the measures provided by Annex VI.¹³³ In the event that low-sulfur fuel is unavailable or unfeasible, installing desulfurization technology to achieve compliance is permissible under Annex VI, but the high cost of these cleaning systems makes this alternative unattractive.¹³⁴

Similar to the response to IMO 2020, technologies exist that can contribute to alleviating pollutant levels in emissions. Vessels that have installed and operate stack gas scrubbing systems will be exempt from this rule and allowed to continue utilizing 3.5% sulfur marine fuel.¹³⁵ These scrubbers are similar to those used at coal-burning power plants. Scrubbers are expensive and not available in the quantities required for the 70,000 ocean-going ships to meet IMO 2020 requirements, with only enough for roughly 3,000–4,000 ships by 2020.¹³⁶ Ships can convert to LNG or methanol to power their ships, but such a conversion would be expensive as it requires new LNG bunkering infrastructures.

D. Treasure Chest Approach: Government Programs to Incentivize Compliance

Just as is the case with other major regulatory changes, a policy argument could be made that it is in the nation’s best interest to ensure compliance through the utilization of assistance programs developed domestically. Economic and technical assistance is one option for mitigating losses for vessel owners and increased costs. This could be achieved through either an increase in fuel premiums or acquiring new technologies in “cleaning” with non-compliant fuels.

Because the IMO’s GHG strategy is framed to see an overall reduction of the industry’s output rather than a vessel specific standard, it allows for some flexibility and creativity in how the IMO’s goals can be reached.

132. Shi, *supra* note 60, at 566.

133. *Id.*

134. *Id.* (citing AMERICAN BUREAU OF SHIPPING, FUEL SWITCHING ADVISORY NOTICE 7 (2010)).

135. Morris, *supra* note 67.

136. Scott, *supra* note 3.

This is a key difference between the GHG Strategy and IMO 2020, as the sulfur content standard is vessel specific. Under the current posture of the GHG Strategy, a system of carbon credits could be utilized, such as the ones used in the European Union.¹³⁷ Far from a new concept, carbon credits and emissions trading programs would provide a solution to allow older, less efficient vessels to continue to operate in the short term, while incentivizing companies to modernize their fleets in the long term. Under such a system, ship owners would either take measures to emit only what they are allowed, reduce their emissions below the allowed amount and sell or bank the surplus credits, or continue emitting above their allowance and buy credits in a marketplace to cover it.¹³⁸ Such programs have been hailed as an effective method of emission reduction for a variety of reasons. First, emissions trading has been successful in its major objective of lowering the cost of meeting emission reduction goals. Second, the use of emissions trading has enhanced—not compromised—the achievement of environmental goals.¹³⁹ The United States has emulated this model through its Acid Rain Program.¹⁴⁰

The Acid Rain Program (ARP) was established under Title IV of the 1990 Clean Air Act (CAA) Amendments.¹⁴¹ The ARP requires significant emission reductions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) from the power sector. The ARP established a permanent cap on the total amount of SO₂ emissions by electric generating units and was the first national cap and trade program in the United States. The program has achieved significant success.¹⁴²

137. EUROPEAN COMMISSION, E.U. EMISSIONS TRADING SYS., https://ec.europa.eu/clima/policies/ets_en [<https://perma.cc/B4KQ-L952>] (last visited July 27, 2019).

138. A. DENNY ELLERMAN, PAUL L. JOSKOW & DAVID HARRISON, PEW CTR. ON GLOB. CLIMATE CHANGE, EMISSIONS TRADING IN THE U.S.: EXPERIENCE, LESSONS, AND CONSIDERATIONS FOR GREENHOUSE GASES 8 (2003), <https://www.c2es.org/site/assets/uploads/2003/05/emissions-trading-us-experience-lessons-and-considerations-ghgs.pdf> [<https://perma.cc/U3FW-WZNT>].

139. *Id.*

140. Lauraine G. Chestnut & David M. Mills, *A Fresh Look at the Benefits and Costs of the U.S. Acid Rain Program*, 77 J. ENVTL. MGMT. 252 (2005).

141. *Id.*

142. *Id.*

IV. ACROSS THE SEVEN SEAS: IMPLEMENTATION AS A MATTER OF INTERNATIONAL LAW

While maritime pollution reduction likely does not rise to the level of a *jus cogens*¹⁴³ of international law, the far-reaching effects of climate change combined with the potential development of this regulation into customary international law could be used to argue that the United States has a duty to implement and comply with IMO pollution reduction regulations. With the vast majority of IMO member states invested in this regulation, it will be increasingly difficult for the U.S. to hold out under the pressures of its fellow member states. Moreover, the nations of the world have clearly stated the importance of climate change as a matter of international concern through multiple agreements previously discussed in this comment. The shipping industry is projected to contribute a substantially higher amount of GHG emissions in the coming decades. Under the Paris Agreement, the international shipping industry has a general obligation to contribute to the goal of GHG reduction.

The Initial Strategy of the IMO has the potential to become customary international law if multiple nations domestically adopt it. In order to establish customary international law, two prongs must be met: a demonstrated state practice, or *usus*, and a sense of legal obligation of the state, or *opinio juris*.¹⁴⁴ While the establishment of state practice is an objective standard, establishing *opinio juris* requires a subjective analysis. This is established through analysis of official communications and writings of the state. Both *usus* and *opinio juris* can already be seen in the reaction of more developed nations to the IMO Strategy on greenhouse gas reduction; however, there are other industrial nations that have voiced reservations or even opposition to the adoption of the Initial Strategy.¹⁴⁵

Nations, such as the United States and China, have the potential to become “persistent objectors” to the adoption of the IMO’s potential regulations on greenhouse gases should they choose not to implement the blanket requirement for a 50% reduction in emissions.¹⁴⁶ Doing so could undermine the potential for the development of customary international law in this area. This would prevent the idea of implicit consent, or that

143. Jus Cogens are norms deemed to be so fundamental to the existence of a just international legal order that states cannot derogate from them, even by agreement. JEFFREY L. DUNOFF, STEVEN R. RATNER & DAVID WIPPMAN, *INTERNATIONAL LAW: NORMS, ACTORS, PROCESS* 47 (4th ed. 2015).

144. *Id.*

145. Shuckman, *supra* note 87.

146. Holning Lau, *Rethinking the Persistent Objector Doctrine in International Human Rights Law*, 6 *CHI. J. INT’L L.* 495 (2005).

which occurs when a nation fails to voice objections or demonstrate its non-conformity to an international norm. However, such efforts may still prove futile, as the idea of the persistent objector has been criticized as ineffective as a matter of general international law. There is no instance where a dissenting state could claim such a status as a valid defense from the application of an international customary rule.¹⁴⁷

CONCLUSION

The general acceptance among the vast majority of the member states of the International Maritime Organization GHG reduction strategy will make it impractical for the United States not to comply.¹⁴⁸ Doing so will not only be impractical, it will also create an unfair advantage for foreign vessels who only utilize U.S. ports while the U.S. shipping industry will be unfairly prejudiced by compliance when entering foreign ports of nations that have accepted and implemented the strategy. While the IMO strategy is expansive, it is also likely that it could be considered an amendment to MARPOL, and thus would be subject to the more expedited acceptance process outlined in the APPS.¹⁴⁹ There are several tools at the disposal of the Administration and Coast Guard that have been recognized by courts to achieve compliance. Additionally, technologies exist that would allow for compliance with the strategy, though retrofitting vessels could prove to be a costly enterprise.¹⁵⁰ Though there are ways that the United States could resist compliance, the equitable treatment of vessels and the economic issues with an one-sided system of enforcement will make it untenable to reject the GHG reduction strategy.

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147. Patrick Dumbery, *Incoherent and Ineffective: The Concept of Persistent Objector Revisited*, 59 INT'L & COMP. L. Q. 779, 780 (2010).

148. Shuckman, *supra* note 87.

149. 33 U.S.C. § 1909 (2012).

150. Scott, *supra* note 3.

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