# 5

# LEGAL ISSUES AND REGULATORY DEVELOPMENTS

Technology has become a crucial element of many systems on board ships and in ports and is continuing to transform and revolutionize the way in which shipping operations are conducted. Many current technological advances, including, for example, autonomous ships, drones and various distributed ledger technologies such as blockchain, hold considerable promise for the increased efficiency of operations and reduced costs, among other possibilities. However, uncertainty remains in the maritime industry with regard to their potential safety and security, and there is concern about the cybersecurity incidents that may occur. To minimize such risks for systems on board ships and in ports, and to facilitate the transition to potential new technologies, Governments and the maritime industry are continuing to improve the safety and risk management culture and making efforts to ensure compliance with the complex and evolving legal framework. In addition, the various distributed ledger technologies currently emerging and proliferating, including blockchain-related initiatives, need to be interoperable, as competition between them in a bid to make a specific technology the chosen standard for the industry may be detrimental for shipping.

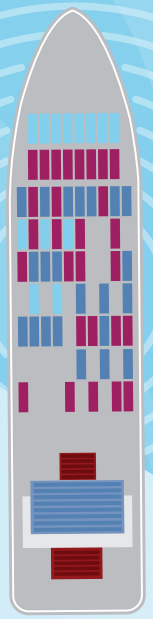
As the future of technological advances in shipping is being defined, and the maritime industry is leveraging technology to improve its services, the existing legal, policy and regulatory frameworks are being adapted and new frameworks written, as necessary, at both the national and international levels. The strategic plan for IMO adopted in December 2017 recognizes the need to integrate new and emerging technologies into the regulatory framework for shipping. This plan follows the adoption of a resolution that encourages maritime administrations to ensure that cyberrisks are appropriately addressed in existing safety management systems starting from 1 January 2021, as well as the adoption in July 2017 of the IMO guidelines on maritime cybersecurity risk management.

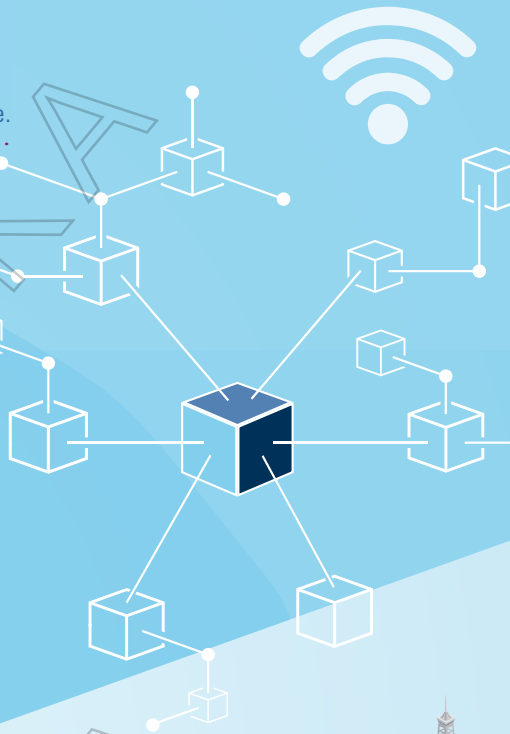
Important international regulatory developments during the period under review include the adoption by IMO in April 2018 of an initial strategy on the reduction of greenhouse gas emissions from ships, which aims at the reduction of total annual greenhouse gas emissions from ships by at least 50 per cent by 2050, compared with 2008. In addition, IMO adopted a decision with regard to regulatory scoping exercises to establish the extent to which the international regulatory framework should be modified to integrate the new technology involving maritime autonomous surface ships.

This chapter provides a summary of legal and regulatory developments related to these issues and highlights relevant policy considerations for the maritime sector.

# EMERGING TECHNOLOGIES

New technologies, such as blockchain, autonomous ships and drones offer potential benefits in shipping, but also give rise to concerns, including about safety, seafarer employment, cybersecurity and liability and insurance.





## REDUCING GREENHOUSE GAS EMISSIONS FROM SHIPPING

An initial strategy adopted at IMO in April 2018 aims to reduce total annual greenhouse gas emissions from ships by at least


by 2050.

## SUSTAINABLE DEVELOPMENT GOALS

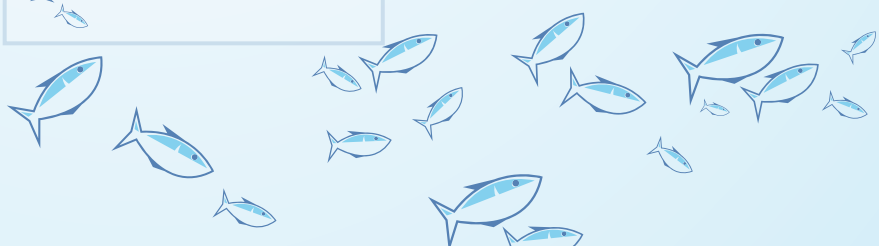
13 CLIMATE ACTION

14 LIFE BELOW WATER

This complements international efforts to address greenhouse gas emissions, including under the Paris Agreement and Sustainable Development Goal 13 on taking urgent action to combat climate change and its impacts.

## PROTECTING THE MARINE ENVIRONMENT

In the light of Sustainable Development Goal 14, all countries are encouraged to consider becoming parties to relevant international conventions on marine pollution prevention and control as a matter of priority.



# B. REGULATORY DEVELOPMENTS RELATED TO THE REDUCTION OF GREENHOUSE GAS EMISSIONS FROM INTERNATIONAL SHIPPING AND OTHER ENVIRONMENTAL ISSUES

## 1. Reduction of greenhouse gas emissions

Carbon dioxide emissions from international shipping have increasingly been in the spotlight, in particular as they are not covered under the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change. Relevant regulations have been considered under the auspices of IMO, including the adoption in 2011 of a set of technical and operational measures to reduce emissions from international shipping and related guidelines (UNCTAD, 2011a; UNCTAD, 2012a). More recently, following the adoption in 2015 of the Paris Agreement under the Convention, further progress has been made, including the adoption in 2016 of a road map for developing a comprehensive IMO strategy on the reduction of greenhouse gas emissions from ships (IMO, 2016, annex 11), and the adoption of an initial strategy in 2018.

### *Initial strategy on greenhouse gas emissions*

According to IMO estimates, in 2012, greenhouse gas emissions from international shipping accounted for 2.2 per cent of anthropogenic carbon dioxide emissions and relevant emissions could increase by between 50 and 250 per cent by 2050 (IMO, 2014). This is of particular concern, given the internationally agreed goal in the Paris Agreement of limiting the global average temperature increase to below 2°C above pre-industrial levels, which will require worldwide emissions to be at least halved from the 1990 level by 2050. The implementation of technical and operational measures for ships could increase efficiency and reduce emissions by up to 75 per cent and further reductions could be achieved by implementing innovative technologies (IMO, 2009).

In April 2018, the seventy-second session of the Marine Environment Protection Committee, at a meeting attended by more than 100 member States of IMO, adopted an initial strategy on the reduction of greenhouse gas emissions from ships (IMO, 2018e). The strategy envisions reducing greenhouse gas emissions from international shipping and phasing them out as soon as possible before 2100. This complements international efforts to address greenhouse gas emissions, including under the Paris Agreement and the 2030 Agenda for Sustainable Development, in particular Sustainable Development Goal 13 on taking urgent action to combat climate change and its impacts. In addition, the strategy sets out relevant guiding principles, including the principles of non-discrimination and of no more

favourable treatment, as enshrined in the International Convention for the Prevention of Pollution from Ships and other IMO conventions, as well as the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances, as enshrined in article 4 of the United Nations Framework Convention on Climate Change, including the Kyoto Protocol and the Paris Agreement. The strategy identifies candidate short-term, midterm and long-term further measures, with possible timelines and their impacts on States, stating that specific attention should be paid to the needs of developing countries, in particular the least developed countries and small island developing States. It also identifies supportive measures, including capacity-building, technical cooperation and research and development.

According to the 2016 road map, a revised strategy is to be adopted in 2023. Under short-term measures to be further developed and agreed upon by member States in 2018–2023, the initial strategy includes technical and operational energy efficiency measures for both new and existing ships, including for speed optimization and reduction, and the use of alternative low-carbon and zero-carbon fuels for marine propulsion and other new technologies. Under midterm measures to be agreed upon in 2023–2030, the strategy includes innovative emissions-reduction mechanisms, possibly including market-based measures, to incentivize the reduction of greenhouse gas emissions. Under long-term measures to be undertaken beyond 2030, the strategy aims for measures that will lead to zero-carbon or fossil-free fuels, to enable the potential decarbonization of the shipping sector after 2050. The strategy notes that "technological innovation and the global introduction of alternative fuels and/or energy sources for international shipping will be integral" to achieving the overall ambition, and includes the following levels of ambition (IMO, 2018f, annex 1):

> "1. Carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index for new ships: to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate; 2. carbon intensity of international shipping to decline: to reduce [carbon dioxide] emissions per transport work, as an average across international shipping, by at least 40 per cent by 2030, pursuing efforts towards 70 per cent by 2050, compared to 2008; and 3. [greenhouse gas] emissions from international shipping to peak and decline: to peak [greenhouse gas] emissions from international shipping as soon as possible and to reduce the total annual [greenhouse gas] emissions by at least 50 per cent by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the vision as a point on a pathway of [carbon dioxide] emissions reduction consistent with the Paris Agreement temperature goals."

### *Energy efficiency*

Energy efficiency measures have been legally binding in the maritime industry since 2013, following the entry into force of relevant amendments to annex VI of the International Convention for the Prevention of Pollution from Ships, and include the energy efficiency design index, which sets standards for new ships and associated operational energy efficiency measures for existing ships. In April 2018, the Marine Environment Protection Committee was advised that nearly 2,700 new ships had been certified as complying with energy efficiency standards, and adopted amendments to annex VI, regulation 21 on energy efficiency design index requirements for roll-on roll-off cargo and passenger ships (IMO, 2018e). A correspondence group is expected to present an interim report in October 2018 and a final report in 2019 with recommendations on the time periods and reduction rates for requirements for phase 3 of the energy efficiency design index and the possible introduction of requirements for phase 4. In addition, amendments to the Convention have entered into force that make a data collection system for the fuel oil consumption of ships of 5,000 gross tons and above mandatory, with data collection from 1 January 2019. The data must be reported to the flag State after the end of each calendar year and subsequently transferred to the IMO database.

In addition to technical and operational measures, discussions on market-based measures to reduce emissions from international shipping have been ongoing at IMO, yet an agreement has not yet been reached (UNCTAD, 2011a; UNCTAD, 2012a; for a summary of potential market-based measures currently under discussion, see chapter 3). In 2013, formal discussions on market-based measures at the Marine Environment Protection Committee were suspended (IMO, 2013). The topic was considered at meetings of the Intersessional Working Group on Reduction of Greenhouse Gas Emissions from Ships in June and October 2017 with regard to its possible inclusion in a strategy on the reduction of emissions (IMO, 2017d; IMO, 2017e). The reports of the meetings reflect the different views expressed, in particular that measures "will include technical and operational measures, but market-based measures may be needed in the medium term whilst alternative fuels are developed" and that "market-based measures should be addressed as candidate midterm measures in order to help incentivize uptake of alternative fuels; potentially market-based measures can be designed not to only remove funds from the sector but also to bring funds into the sector to support greater emissions reductions" (IMO, 2017d; IMO, 2017e). The initial strategy on the reduction of emissions from ships includes among candidate midterm measures new and innovative emission-reduction mechanisms, possibly including market-based measures, to incentivize the reduction of greenhouse gas emissions (IMO, 2018f).

## 2. Ship-source pollution and protection of the environment

Other recent regulatory developments under the auspices of IMO regarding ship-source pollution control and environmental protection, aimed at ensuring clean and environmentally sustainable shipping, cover air pollution, ballast water management, hazardous and noxious substances and marine litter.

### *Air pollution*

Sulphur oxides and nitrogen oxides, through chemical reactions in the air, are converted into fine particles that, in addition to particles directly emitted by ships such as black carbon and other carcinogenic particles, increase the health-related impacts of shipping pollution and are linked to premature deaths. The Review of Maritime Transport 2017 noted that an important decision had been adopted at IMO, whereby the global limit of 0.5 per cent on sulphur in fuel oil, as set out in annex VI, regulation 14.1.3 of the International Convention for the Prevention of Pollution from Ships, would come into effect on 1 January 2020 (UNCTAD, 2017a). Within emission control areas in which more stringent controls on sulphur oxide emissions apply, the sulphur content of fuel oil must be no more than 0.1 per cent (1,000 parts per million) from 1 January 2015. The first two sulphur oxide emission control areas were established in Europe, in the Baltic Sea and the North Sea, and took effect in 2006 and 2007, respectively; the third was established in North America and took effect in 2012; and the fourth was established as the United States Caribbean Sea, covering waters adjacent to the coasts of Puerto Rico and the United States Virgin Islands, and took effect in 2014. The consistent implementation of a global sulphur content limit for all ships is expected to bring positive results for human health and the environment, in particular as shipping emissions are associated with a large number of fatalities and illnesses at the global level (Independent, 2018).

In April 2018, the Marine Environment Protection Committee approved draft amendments to annex VI of the International Convention for the Prevention of Pollution from Ships, concerning the prohibition on the carriage of non-compliant fuel oil, with sulphur content exceeding 0.5 per cent, for combustion purposes for propulsion or operation on board a ship (IMO, 2018e). Ships fitted with an approved equivalent arrangement to meet the sulphur limit, such as an exhaust gas cleaning system or scrubber, permitted under annex VI, regulation 4.1, would be exempt. Under regulation 3.2, ships undertaking research trials of emissions reduction and control technology could also be exempt. Guidelines to support the implementation of the sulphur limit to come into effect on 1 January 2020 are in preparation at IMO. Finally, the Committee approved guidance on best practices for fuel oil purchasers and users for assuring the quality of fuel oil used on board ships.

### *Ballast water management*

A significant achievement in 2017 was the entry into force on 8 September of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004. As at 31 July 2018, the Convention had 75 States Parties, representing 75.34 per cent of the world's tonnage. The Convention aims to prevent the risk of the introduction and proliferation of non-native species following the discharge of untreated ballast water from ships. This is considered one of the four greatest threats to the oceans and one of the major threats to biodiversity that, if not addressed, could have severe public health-related, environmental and economic impacts (UNCTAD, 2011b; UNCTAD, 2015; see http://globallast.imo.org). From 8 September 2017, ships are required to manage their ballast water to meet standards referred to as D-1 and D-2; the former requires ships to exchange and release at least 95 per cent of ballast water by volume far away from a coast and the latter raises the restriction to a specified maximum amount of viable organisms allowed to be discharged, limiting the discharge of specified microbes harmful to human health. In April 2018, the Marine Environment Protection Committee adopted amendments to the Convention that clarify when ships must comply with the D-2 standard. New ships, constructed on or after 8 September 2017, shall meet the D-2 standard from the date they enter into service. Existing ships constructed before 8 September 2017 shall comply with the D-2 standard after their first or second five-year renewal survey associated with the International Oil Pollution Prevention Certificate under annex I of the International Convention for the Prevention of Pollution from Ships conducted after 8 September 2017, and in any event not later than 8 September 2024 (IMO, 2017f). Given the entry into force of the Ballast Water Management Convention, the Committee also approved a plan with specific arrangements for data gathering and analysis during the experience-building phase and approved guidance related to the form of the certificate, system and type approval process.

### *Hazardous and noxious substances*

In April 2018, the Legal Committee noted the latest States Parties to the 2010 Protocol to the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996, namely Canada and Turkey (IMO, 2018g). To enter into force, the Convention requires accession by at least 12 States, representing at least 40 million tons of contributing cargo. As at 31 July 2018, it has been ratified by Canada, Norway and Turkey and the total of contributing cargo has reached 28.7 million tons or nearly 72 per cent of the amount required for its entry into force. Other States are encouraged to address, with a view to overcoming

them, any practical issues and concerns related to implementing the Convention and to consider becoming Parties to it, to help cover a significant gap in the global liability and compensation framework. A comprehensive and robust international liability and compensation regime is in place with regard to oil pollution from tankers through the International Oil Pollution Compensation Fund regime, which includes the International Convention on Civil Liability for Oil Pollution Damage and its Protocol and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, and its 1992 and 2003 Protocols; and with regard to bunker oil pollution from ships other than tankers through the International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001. However, at present, there is no international liability and compensation regime in place for hazardous and noxious substances that may cause significant personal injury and marine pollution (for an analytical overview of the international legal framework, see UNCTAD, 2012b, and UNCTAD, 2013).

### *Marine litter*

In April 2018, the Marine Environment Protection Committee agreed to include a new item on its agenda to address the issue of marine plastic litter from shipping in the context of Sustainable Development Goal 14 (IMO, 2018e). Member States and international organizations were invited to submit proposals on the development of an action plan to the next session of the Committee. The issue of marine debris, plastics and microplastics in the oceans has been receiving increasing public attention and was the topic of focus at the seventeenth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea in 2016 (United Nations, 2016). Marine debris in general, and plastics and microplastics in particular, are one of the greatest current environmental concerns, along with climate change, ocean acidification and the loss of biodiversity, which directly affect the sustainable development aspirations of developing States, in particular small island developing States, which, as custodians of vast areas of oceans and seas, face “an existential threat from and [are] disproportionately affected by the effects of pollution from plastics” (United Nations, 2016). Target 14.1 to, by 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution, is particularly relevant in this context. Given the cross-cutting nature of the issue, other Goals are also relevant, including Goal 4 on education, Goal 6 on water and sanitation, Goal 12 on sustainable consumption and production patterns and Goal 15 on the sustainable use of terrestrial ecosystems.