

BRICS Report on Decarbonization of Ports and Maritime Transport

Record of actions, experiences and initiatives reported among BRICS members, on the theme "Decarbonization of Ports and Maritime Transport".

This report aims to record the actions, experiences and initiatives in decarbonization of ports and maritime transport identified by member countries as relevant to be presented, reported and recorded as a product of the work carried out during the technical meetings of the BRICS Transport Working Group.





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Brazil Experience





MINISTÉRIO DE PORTOS E AEROPORTOS



01

BRAZIL'S PARTICIPATION IN THE INTERNATIONAL MARITIME ORGANIZATION – IMO

The International Maritime Organization (IMO) is a specialized agency of the United Nations, established in 1948 and operational since 1959. Its mission is to ensure the safety and security of international maritime transport and to prevent marine pollution caused by ships. Headquartered in London, the IMO has 176 Member States, including Brazil, which is a member and signatory to the organization's agreements.

IMO's targets for reducing greenhouse gas (GHG) emissions include improving the energy efficiency of new ships, using low-carbon fuels and achieving net neutrality of GHG emissions by 2050, in line with the objectives of the Paris Agreement. Quantitative targets for 2030 include reducing average CO_2 emissions by at least 40% and total annual GHG emissions by at least 20%, with the goal of achieving 30%. By 2040, the target is to reduce total annual GHG emissions by at least 70%, with a target of reaching 80%. By 2050, the target is to achieve carbon neutrality, with net zero GHG emissions in international shipping.

Brazil is represented at the IMO by the Brazilian Navy, which coordinates issues related to the organization. The organizational structure includes the Coordinating Committee for IMO Affairs (CCA-IMO), the Permanent Representation of Brazil to the IMO in London (RPBIMO) and the Executive Secretariat of the CCA-IMO. This structure demonstrates Brazil's commitment to maintaining an active and influential presence at the IMO, ensuring that international maritime transport standards and regulations consider the country's needs and interests.

In 2025, the IMO is taking important decisions, such as the creation of a global charge on GHG emissions; and it will define taxes for countries that do not meet decarbonization targets, with the tax expected to come into effect in 2027/28. In addition, the IMO is creating a fund to support the transition to net-zero emissions and promote technical cooperation and technology transfer to ensure a fair and equitable transition. The aim is to finance the introduction of new decarbonization technologies, including new fuels, and to promote the energy transition of international shipping.

Several measures have been discussed at the IMO, including the regulation of low sulphur fuels (IMO 2020), the implementation of green shipping corridors, the creation of economic and regulatory incentives, investments in port infrastructure, development of innovative technologies and global taxation on GHG emissions. The review of MARPOL Annex VI will determine new regulations to reduce greenhouse gas (GHG) emissions in international shipping, requiring ships to continuously improve energy efficiency and report annual GHG intensity. The regulations include verification of the Ship Energy Efficiency Management Plan (SEEMP), certification of sustainable fuels and the definition of annual GHG fuel intensity targets. From a Brazilian perspective, IMO decisions may affect exports and imports in Brazil, especially if Brazilian biofuels are not classified as low carbon emitting. This may result in additional fees for ships that refuel in the country, influencing the operational costs and competitiveness of Brazilian exports and imports. In addition, changes in emissions and safety standards may require adaptations in Brazilian shipping fleets. The fuels under discussion at the IMO include biodiesel, ethanol, HVO (Hydrotreated Vegetable Oil), biomethane, biomethanol, green hydrogen, green ammonia, e-methanol, e-methane and e-diesel. The global charge on carbon emissions from the shipping sector will be implemented for vessels that do not use fuels within the limits established by the IMO. As explained above, the fund proposed by the IMO includes financing









research and development (R&D) in low and zero carbon fuels, the acceleration of the commercialization of these fuels, investments in infrastructure for production, storage and distribution, and support for developing countries to ensure access to technologies. Currently, the threshold level of emissions to access the fund is 19 gCO2eq/Mj, but this value is part of a complex table with several details to be studied by specific groups at the IMO. The Brazilian products most affected by the IMO tax from 2027 onwards will be mainly those that depend on maritime transport for export, such as soybeans, iron ore, meat (beef, pork and chicken), coffee and sugar. In addition to these agricultural and mineral products, the tax will also affect finished products from high and medium complexity industries, such as vehicles and auto parts, machinery and equipment, chemical products, electronics and metallurgy. Brazil has a leading role in defending biofuels as an alternative for maritime decarbonization, actively defending the use of biodiesel and ethanol as maritime fuel. The country highlights its already established infrastructure and sustainable production, proposing to consider regional characteristics in carbon intensity calculations and emphasizing the sustainability of land use in Brazil. The key points defended by Brazil regarding the market potential for biofuels in maritime navigation include the global demand for maritime biofuels, the increased share of these fuels in the fuel mix of international maritime transport, the operational advantages of using biofuels directly in ship engines without major technological adaptations, and the low need for investment in biofuel production and distribution infrastructure. Other IMO countries already have an established biofuel industry, which can create jobs in the production and distribution chain and strengthen the position of producing countries in the global clean energy market.

Countries that oppose the use of biofuels in shipping defend sustainability issues linked to land use, environmental impact, economic viability, energy efficiency, as well as infrastructure and logistics.

The challenges faced by Brazil in accepting biofuels at the IMO include the presentation of technical and scientific studies that demonstrate the reduction of GHG emissions by biofuels, the formation of coalitions with other biofuel producing countries, alignment with international regulations, investments in green maritime infrastructure and active diplomatic engagement at the IMO.

Challenges related to the effectiveness of developing new technologies and the average age of the ship fleet include low levels of technological and commercial readiness of new technologies, the average age of the global fleet exceeding 20 years, and the need for substantial investments in new technologies and fuel. The introduction of biofuels is proposed as a cost-effective, short- to medium-term solution to reduce emissions, being compatible with existing engines and avoiding the need for large investments in infrastructure.

The raw materials to produce renewable fuels are classified into four generations: 1st generation (food and agricultural crops), 2nd generation (agricultural and forestry residues, and non-edible crops), 3rd generation (microalgae and other aquatic biomass) and 4th generation (genetically modified biomass and advanced carbon capture processes). The classification of raw materials has evolved over time, based on their origin, environmental impact and economic viability, and has been developed by researchers and experts in bioenergy and biofuels. The production of first-generation biofuels does not pose a significant risk to food security or resource availability, provided that sustainable agricultural practices, investments in technology and appropriate policies are implemented. The interdependence between food production and biofuels can be positive, with increases in agricultural productivity offsetting possible negative effects.

MEPC.391(81) - Guidelines on LCA GHG Intensity of Marine Fuels may influence Brazilian biofuels, highlighting the need to complement the methodology for calculating GHG emissions from well to tank (WtW), the inadequacy of the biofuel pathway codes in Appendix 1, the importance of considering









regional characteristics and the need to provide more options for non-fossil fuels. The lack of clarity and detail in the guidelines may hinder the adoption of biofuels as a viable decarbonization solution.

Suggestions for future cooperation:

Brazil's maritime exports to BRICS countries play a crucial role in the Brazilian economy. In 2024, trade between Brazil and BRICS countries exceeded USD 210 billion, representing 35% of total Brazilian exports. The main exported products include metal ores, petroleum, oilseeds and oleaginous fruits, meat, iron and steel. China is Brazil's largest trading partner within the group, followed by India, Russia and South Africa. These countries are important destinations for Brazilian exports, reflecting the strong economic ties between them. Considering the BRICS member countries, there are several opportunities for cooperation and pertinent approaches in the context of the IMO's targets for reducing greenhouse gas (GHG) emissions in international maritime transport. First, countries can collaborate in the defense and promotion of biofuels as viable alternatives for maritime decarbonization, taking advantage of the already established infrastructure and sustainable production of biofuels, such as biodiesel and ethanol, especially in Brazil. The formation of coalitions among BRICS countries can strengthen the position of these fuels in the IMO, highlighting the importance of considering regional characteristics in carbon intensity calculations. In addition, joint investments in research and development (R&D) of new decarbonization technologies, including low- and zero-carbon fuels, can accelerate the commercialization of these technologies and promote the energy transition in the maritime sector.

The creation of economic and regulatory incentives, as well as the implementation of green shipping corridors, are measures that can be adopted jointly to reduce GHG emissions. Technical cooperation and technology transfer between BRICS countries are also essential to ensure a fair and equitable transition, supporting developing countries in the adoption of sustainable technologies.

Finally, the active and coordinated participation of BRICS countries in IMO discussions and decisions can ensure that international standards and regulations consider the needs and interests of these countries, promoting a balanced and inclusive approach to the decarbonization of international shipping.

02

SUSTAINABLE FUEL WORKING SUB-GROUP OF THE NATIONAL ENERGY POLICY COMMISSION – CNPE

The National Energy Policy Council (CNPE) established, within its structure, the Working Group (WG) responsible for preparing studies to support:

- structuring measures and guidelines for the national waterway fuel market, including marine fuel oil and marine diesel oil;
- the inclusion of sustainable waterway fuel in the National Biofuel Policy RenovaBio;
- the scalability of national production of biofuels and other low-carbon fuels for eventual demand for waterway transportation;
- adaptation of the port infrastructure necessary for the implementation of biofuels and other low-carbon fuels in the waterway fuel market.









Suggestions for future cooperation:

Brazil believes it is important to encourage the exchange of experiences with other member countries on this subject.

03

MEMORANDUM OF UNDERSTANDING SIGNED BY THE MINISTRY OF PORTS AND AIRPORTS ON THE THEME "DECARBONIZATION OF PORTS AND MARITIME TRANSPORT"

The Federative Republic of Brazil signed, through the Ministry of Ports and Airports – MPOR, the following Memorandum of Understanding (MoU) on the topic of decarbonization of ports and maritime transport:

1) Memorandum of Understanding signed between the Ministry of Ports and Airports and the Ministry of Climate and Environment of Norway, with a view to:

- Promoting more sustainable maritime transport through a decarbonized maritime corridor between Brazil and Norway/Europe;
- Seeking sustainable, more energy-efficient and decarbonized logistics chains for industries in Brazil and Norway;
- Improving more sustainable business cooperation between Brazil and Norway;
- Stimulate the development of low and zero carbon value chains in Brazil and Norway.

The MoU will be implemented through strategic dialogues between the countries to identify the most appropriate route for implementing the corridor, stakeholder engagement and studies on the applicability of implementing the corridor.

2) Memorandum of Understanding (MoU) signed between the Federative Republic of Brazil, through the Ministry of Ports and Airports, and the Portuguese Republic, through the Ministry of Infrastructure, with the aim of promoting cooperation in areas of mutual interest related to ports, infrastructure development and terminal operations.

Among the priority topics, the exchange of knowledge focused on sustainability and decarbonization of port operations, including the development of green corridors between the ports of both States, stands out.

3) Memorandum of Understanding (MoU) between the Ministry of Ports and Airports (MPOR) and the International Council on Clean Transportation (ICCT Brasil), with the aim of fostering the energy transition in the country's organized ports.

The partnership aims, initially, to identify the capacities and potential of Brazilian ports in the production and flow of low-carbon hydrogen. The ICCT, a global reference in technical and scientific analyses on clean transport, will provide data, studies and the best international practices that will support the formulation of more efficient and sustainable public policies.









As part of the planned actions, it is planned to carry out inventories of greenhouse gas (GHG) emissions in public ports, contributing to the advancement of the sector's decarbonization agenda.

4) Memorandum of Understanding (MoU) signed between the Ministry of Ports and Airports and the Grand Port Fluvio-Maritime de L'axe Seine – Haropa Port establishes a basis for cooperation for the development of a Green Maritime Corridor, promoting the adoption of lowcarbon fuels and innovative technologies. Brazil's participation in the initiative strengthens national climate mitigation efforts and creates opportunities for the modernization of port infrastructure, the expansion of the supply of alternative fuels and the implementation of solutions aimed at reducing emissions in the sector.

The creation of these corridors also has the potential to boost demand for sustainable logistics services, accelerate the adaptation of port infrastructure and include Brazil in the construction of more efficient and environmentally responsible logistics chains.

5) Memorandum of Understanding between the Netherlands and the Federative Republic of Brazil on cooperation in the areas of ports, maritime transport and logistics, signed in 2008. The agreement is in the process of being updated, in which new topics of mutual interest will be considered, for which the following have been suggested, among others: Adaptation of port infrastructure for the exploration, supply and use of sustainable energy; Development of technologies and digital tools to optimize port operations, reducing environmental impacts and increasing energy efficiency; Implementation of technologies for supplying electricity to vessels; Formulation of sustainable port planning; Assessment of the inclusion of environmental sustainability criteria in current and future port contracts, etc.

Suggestions for future cooperation:

MOU with South Africa: At the beginning of April 2025, the South African Embassy in Brasília sent a Note Verbale to the Brazilian Ministry of Ports and Airports with a proposal for a Memorandum of Understanding on issues related to transportation, covering civil aviation, maritime and land transportation, infrastructure development, road safety management, technology, skills development and other relevant topics to consolidate, expand and deepen economic strengthening, through industrial and commercial cooperation between the Parties, in the aforementioned areas.

The Brazilian technical teams are evaluating South Africa's proposal, and we emphasize that this is an example of cooperation that can be established between BRICS countries, bilaterally or multilaterally, to work, intra-BRICS, on industrial and commercial economic development related to the decarbonization of ports and maritime transportation. In this regard, Brazil sees as positive the signing of other Memoranda of Understanding with BRICS countries, to address the issue and disseminate good practices and experiences, to promote future cooperation that can generate economic development in BRICS.









04

INVENTORY OF EMISSIONS FROM THE WATERWAY SECTOR AND PROPOSAL FOR THE PORT SECTOR

The objective of the project is to provide a solid database on greenhouse gas (GHG) emissions from the waterway sector, consolidating essential information for the adoption of more effective public policies and to drive the decarbonization of activities.

The Inventory was the first step in an ongoing effort to map, quantify and mitigate GHG emissions from waterway operations, aiming to create a solid database and promote a greener, more efficient waterway sector aligned with the best environmental practices. The 1st survey covers emissions generated by coastal and inland navigation in Brazilian waters from 2021 to 2023, representing a fundamental milestone for the sector and society.

The methodology used was developed by ANTAQ, in partnership with Environpact, in accordance with international guidelines, guaranteeing the transparency and reliability of the data, and ensuring that the sector is aligned with global commitments and best practices for decarbonization.

The continuation of the Greenhouse Gas Emissions Inventory project aims to improve the methodology used in shipping, with the aim of expanding the analyses to Brazilian ports and Brazilian Shipping Companies (EBNs).

The main deliverables of the project include the 1st GHG Inventory Report, which presents the methodology and GHG data for cabotage and inland navigation in Brazil, for the period 2021 to 2023. The data is also available on the Inventory Dashboard, developed to facilitate the visualization and comparison of GHG emissions data in a dynamic and interactive way. Simultaneously with the Inventory, the Waterway Sector Decarbonization Guide was developed, which aims to level the knowledge of all actors involved in the waterway sector on the fundamental concepts of decarbonization and the actions necessary to promote a low-carbon model.

Suggestions for future cooperation:

Carry out comparative studies with other BRICS countries, aiming to structure possible green corridors between the bloc's nations, through Memorandums of Understanding (MoUs) or cooperation agreements.

05

NEW REGULATORY FRAMEWORK FOR CARBON CREDIT TRADING

The Brazilian Greenhouse Gas Emissions Trading System (SBCE) was established by Law No. 15,042, of December 11, 2024, covering activities, sources and facilities located in the









national territory that emit or may emit greenhouse gases (GHG). Companies were divided into two levels of responsibility, with requirements proportional to the volume of emissions:

- Companies that emit more than 10 thousand tCO₂e/year: must submit detailed annual reports to the SBCE management body, documenting emissions and removals of greenhouse gases;
- Companies with emissions greater than 25 thousand tCO $_2$ e/year, which face broader and more rigorous obligations.
- The SBCE's operation is based on the Brazilian Emissions Quota (CBE), which represents the emission right of each sector to be granted in the National Allocation Plan, and the Verified Emissions Reduction or Removal Certificate (CRVE). These instruments correspond to fungible, tradable assets equivalent to 1 tCO2e (one ton of carbon dioxide equivalent), and function as a counterweight, since:
- The Verified Emissions Reduction or Removal Certificate (CRVE) represents the effective reduction of emissions or removal of GHG, following an accredited methodology and with registration carried out within the scope of the SBCE; and
- The Brazilian Emissions Quota (CBE) corresponds to the emission right granted by the SBCE's managing body, free of charge or for a fee, to the regulated facilities or sources; In short, the measure corresponds to the emissions trading system (Cap and Trade) in a market where companies trade GHG emissions permits in a regulated environment, with legal certainty, transparency and private sector participation in a governance structure, as illustrated below:



Source: Regulated Carbon Market (CNI, 2023).

This market will be regulated by the SBCE, which, among other responsibilities, will be responsible for:

- implementing the National Allocation Plan in each commitment period;
- defining the activities, facilities, sources and gases to be regulated;
- defining the methodologies for monitoring the presentation of information on emissions;
- issuing CBEs;
- accrediting and de-accrediting methodologies for generating CRVE, after consulting the Regulatory Affairs Chamber;
- periodically reconciling obligations between the quantities of CBEs and CRVEs delivered, and the level of net emissions reported by operators.









The Interministerial Committee on Climate Change (CIM), the deliberative body of the SBCE, has the fundamental role of defining the general guidelines of the SBCE and approving the National Allocation Plan, which will establish the sectoral emission limits.

The SBCE will be implemented according to the following schedule:

I - phase I: period of 12 (twelve) months, extendable for another 12 (twelve) months, for the enactment of the regulations of this Law, counted from its entry into force;

II - phase II: period of 1 (one) year for the operationalization, by the operators, of the instruments for reporting emissions;

III - phase III: period of 2 (two) years, during which operators will only be subject to the obligation to submit a monitoring plan and report on GHG emissions and removals to the SBCE management body;

IV - phase IV: validity of the first National Allocation Plan, with non-onerous distribution of CBEs and implementation of the SBCE asset market;

V - phase V: full implementation of the SBCE, at the end of the validity of the first National Allocation Plan.

The establishment of the SBCE represents a significant opportunity for coastal maritime transport in Brazil, a transport mode recognized for providing positive externalities for society, including the lowest level of emissions per ton of cargo transported.

According to the study entitled Brazilian coastal shipping: New prospects for growth with decarbonization, published by the International Council on Clean Transportation – ICCT in 2022, although the expansion of the cabotage sector brings benefits in terms of cargo transportation balance and cost reduction, there are some trade-offs in relation to GHG emissions, since, although the modal shift in cargo transportation from road to cabotage can reduce emissions, the increased use of this mode would imply an increase in GHG emissions from the cabotage sector.

In this context, if the expected increase in waterway cargo transportation materializes, cabotage emissions could grow by 28% between 2020 and 2031, reaching 4.68 million tons of CO_2e , almost the same level as in 2008 (4.76 million tons of CO_2e), as shown in the following graph:











Source: Brazilian coastal shipping: New prospects for growth with decarbonization (ICCT, 2022).

The graph shows a reduction in emissions between 2008 and 2020, exceeding 20%, despite the 52% growth in cargo transported in cabotage between 2010 and 2020, according to data from the National Waterway Transportation Agency (ANTAQ).

Investments in fleet renewal and the entry into force of the regulation that limited the sulfur content in maritime fuel to 0.5% in 2020 are identified as the factors that provided the dynamic growth of the mode with a significant reduction in emissions in the sector. However, projections indicate a challenging scenario for the coming years.

Therefore, the establishment of the SBCE represents a relevant initiative to contribute to the financing of projects necessary to ensure the continued development of coastal maritime transportation and the reduction of emissions levels in the sector.

Suggestions for future cooperation:

Brazil believes it is pertinent to encourage the exchange of experiences with other member countries on this subject, especially regarding a possible system for transferring carbon credits abroad.

06

CARBON ACCOUNTING COORDINATION UNIT OF THE MINISTRY OF FOREIGN AFFAIRS OF THE FEDERATIVE REPUBLIC OF BRAZIL

This is the "Bioenergy Hub", coordinated by the Carbon Accounting Coordination Unit of the Secretariat for Climate, Energy and Environment of the Ministry of Foreign Affairs (NCC/MRE). The "Bioenergy Hub" aims to provide technical support for Brazil's international activities on issues related to bioenergy and carbon accounting in an orderly manner.

The group, made up of government, experts, the productive sector and research institutes, seeks to identify priority agendas in the jurisdictions of interest, support the construction of Brazil's positioning on strategic issues and fill gaps in technical knowledge.









Among its functions, the hub will be dedicated to identifying priority agendas in jurisdictions of interest, supporting the construction of Brazil's positioning on strategic issues and filling gaps in technical knowledge. The hub's activities are aligned with Brazilian diplomatic efforts to ensure the adoption of non-discriminatory, environmentally sound and technologically neutral metrics.

In the group's first meeting, 15 critical issues were identified that affect carbon accounting and bioenergy for the Hub's work agenda. Among them, Cluster 3 - Sustainable Fuels in Energy Transition, and Cluster 4 - Sustainability and Certification Criteria, are worth highlighting.

07

CLIMATE PLAN - MITIGATION AND ADAPTATION

The National Plan on Climate Change is a Brazilian effort to create the necessary foundations to achieve the goals agreed upon in the Paris Agreement and net zero GHG emissions. Structured as a guide for Brazilian climate policy until 2035, the Climate Plan is an instrument provided for in the National Policy on Climate Change (PNMC). Composed of the National Mitigation Strategy and the National Adaptation Strategy, the Climate Plan seeks to respond to extreme climate events and reduce sources of GHG emissions.

The Climate Mitigation Plan seeks to identify the best alternatives in terms of costs and effectiveness for the country to cut emissions. Actions such as the promotion of low-carbon agricultural practices, increased energy efficiency, the supply of green hydrogen and the use of other low-emission fuels, selective garbage collection and the energy use of solid waste are foreseen.

The Climate Adaptation Plan aims to reduce vulnerability to the impacts of climate change, with sectoral guidelines and guidance for states and municipalities.

As for the waterway transportation sector, adaptation and mitigation actions have been proposed to make the sector more resilient to extreme weather events and reduce GHG emissions by the sector. The following actions stand out:

- Enable the inclusion of an emergency budget reserve in future waterway concessions to be used exclusively for the restoration of infrastructure damaged by adverse weather conditions resulting from unforeseeable events, or foreseeable events, but with incalculable consequences, due to some extreme weather events.
- Develop public policy, with other stakeholders, to finance sustainable infrastructure projects or those related to the response to adverse weather events, with resources from the Merchant Marine Fund FMM.
- Establish special lines of financing, together with the financial agents of the Merchant Marine Fund FMM, aimed at the construction of sustainable vessels.
- Grant the provision of services on waterways to the private sector with the aim of enabling further investments in dredging, signaling, traffic management, and









hydrological and environmental monitoring, with a view to improving safety and navigability. Cargo transportation by waterway emits fewer GHGs than other modes of transportation.

- Establish GHG emission reduction targets for domestic shipping by increasing the biofuel blend in marine fuel.
- Provide comprehensive refueling infrastructure, including ultra-fast electric recharging networks, a distribution network for biofuels, hydrogen, natural gas, and biogas.

Suggestions for future cooperation:

Brazil believes it is pertinent to promote the exchange of experiences with other member countries on this subject.

80

BRAZILIAN SUSTAINABLE TAXONOMY (TSB)

The Brazilian Sustainable Taxonomy (TSB) is a classification system that clearly, objectively and scientifically defines activities, assets and/or categories of projects that contribute to climate, environmental and/or social objectives, using specific criteria. According to the International Capital Markets Association (ICMA, 2021), the sustainable taxonomy presents specific criteria and indicators that allow us to assess whether an activity contributes to sustainability and/or the transition to a sustainable economy.

The TSB has the potential to become an important tool for mobilizing and redirecting capital flows towards the investments needed to address the climate crisis.

Therefore, the development of a Brazilian taxonomy aims to respond to the main challenges of economic development that respect the country's environmental and social criteria, taking into account its commitments, objectives and priority plans.

The TSB presents criteria and indicators for various economic sectors, specifically for the maritime and inland navigation sector. The following are listed: Booklet 2.7 – CNAE H - Transport, storage and mail contains the following CNAE: H4: Long-distance and coastal maritime transport, H5: Support navigation and H6: Transport by inland waterway and other waterways.

The strategic objectives of the Brazilian Sustainable Taxonomy are:

1. Mobilize and redirect public and private financing and investments towards economic activities with positive environmental, climate and social impacts, aiming at sustainable, inclusive and regenerative development;

2. Promote technological consolidation aimed at environmental, climate, social and economic sustainability, with increased productivity and competitiveness of the Brazilian economy on sustainable bases;









3. Create the basis to produce reliable information on sustainable finance flows by encouraging transparency, integrity and a long-term vision for economic and financial activity.

Suggestions for future cooperation:

Brazil believes it is important to encourage the exchange of experiences with other member countries on this subject.

09

WORKING GROUP N° 07, OF THE MINISTRY OF DEVELOPMENT, INDUSTRY, TRADE AND SERVICES – MDIC AND GUIDELINES FOR THE BRAZILIAN PRODUCTION SECTOR

The Naval Strategy 2030-2040-2050 outlined in the document Naval Policy - Planning - 02042025 presents a comprehensive plan for the recovery and development of the shipbuilding industry in Brazil, under the NOVA INDÚSTRIA BRASIL (NEW INDUSTRY BRAZIL - NIB) initiative. The strategy is divided into three main time frames: 2030, 2040 and 2050, each with specific objectives and ambitious goals to position Brazil as a global leader in the naval industry. By 2030, the goal is to transform Brazil into a globally recognized naval hub for the construction, revitalization, repair and dismantling of vessels. By 2040, the goal is to establish Brazil as one of the top five global naval hubs and to make it a benchmark in carbon footprint technologies and the use of naval artificial intelligence (AI). Finally, by 2050, Brazil should position itself among the top three global naval hubs and be a benchmark in new construction technologies and new materials.

To achieve these goals, the strategy includes several key initiatives and programs. These include the National Training Plan and Naval Technology Center, which aims to develop a national plan for training professionals and creating a specialized technology center, and Naviparts, which fosters the development of local suppliers and the production of naval components. In addition, the strategy foresees the implementation of priority programs for the development of advanced maritime equipment, the creation of financing and guarantee mechanisms, and the establishment of policies to encourage domestic purchases and increase local content in naval production. The promotion of sustainable technologies and practices, including decarbonization and the circular economy, is also an important focus. The governance and institutionality of the strategy will be ensured by committees and oversight structures, in addition to a specific legislative and tax agenda to support the naval industry.

Working Group 07 (WG07) has been working since 2024 with the main objective of decarbonizing the Brazilian naval industry, in line with the 2030-2040-2050 Naval Strategy. To this end, WG07 monitors the regulation of the sector and supports the generation of knowledge for Brazil's positions in the negotiations of the International Maritime Organization (IMO). In addition, the group effectively collaborates to insert Brazilian biofuels into the global maritime scenario, participating in discussions in national and international forums. WG07









also proposes texts that serve as a basis for legislative projects related to decarbonization and contributes to the creation and implementation of a national action plan aimed at reducing greenhouse gas (GHG) emissions in shipping.

WG07's activities include discussing and contributing to the understanding of IMO standards, in addition to analyzing the life cycle of fuels used in shipping. The group proposes suggestions for creating a national strategy that meets the demands for reducing GHG emissions and strengthens international partnerships to support negotiations in the public interest. GT07 promotes the exchange of knowledge aimed at reducing GHG emissions in shipping and identifies ways to prevent and combat international technical barriers, such as discussions on land use change and competition between food and biofuels. The group also helps define policies to encourage decarbonization initiatives in the shipping industry and discusses technical issues related to the implementation of biodiesel, ethanol and green diesel in marine fuels.

In addition, GT07 assesses possible initiatives that could contribute to the decarbonization of the shipping industry, covering all types of shipping, shipbuilding and port infrastructure. The group contributes to the coordination of national efforts to reduce GHG emissions and maps out opportunities for energy transition for the construction and retrofitting of vessels. GT07 connects the main players in the sector and coordinates the preparation of official materials on the topic of Food x Fuel in the shipping industry. The group develops communication and knowledge dissemination programs on the decarbonization of shipping, promotes research and development of new technologies to reduce emissions, and proposes a certification system to ensure that fuels used in shipping are sustainable.

Suggestions for future cooperation:

Cooperation between the BRICS countries (Brazil, Russia, India, China and South Africa) is essential for the success of the GT07 initiatives. Brazil's maritime exports to the BRICS countries play a crucial role in the Brazilian economy, totaling USD 210 billion in 2024 and representing 35% of total Brazilian exports. These strong economic ties reflect the importance of a collaborative approach to decarbonizing the shipping industry.

BRICS countries can collaborate to advocate and promote biofuels as viable alternatives for maritime decarbonization, leveraging the already established infrastructure and sustainable production of biofuels such as biodiesel and ethanol, especially in Brazil. The formation of coalitions among BRICS countries can strengthen the position of these fuels in the IMO, highlighting the importance of considering regional characteristics in carbon intensity calculations.

In addition, joint investments in research and development (R&D) of new decarbonization technologies, including low- and zero-carbon fuels, can accelerate the commercialization of these technologies and promote the energy transition in the maritime sector. The creation of economic and regulatory incentives, as well as the implementation of green shipping corridors, are measures that can be adopted jointly to reduce GHG emissions. Technical cooperation and technology transfer among BRICS countries are also essential to ensure a









fair and equitable transition, supporting developing countries in adopting sustainable technologies.

Finally, the active and coordinated participation of BRICS countries in IMO discussions and decisions can ensure that international standards and regulations consider the needs and interests of these countries, promoting a balanced and inclusive approach to the decarbonization of international shipping.

10

BRAZILIAN ALLIANCE FOR THE DECARBONIZATION OF PORTS – ABDP

The Brazilian Alliance for the Decarbonization of Ports is a democratic space for the exchange of experiences and information, with the aim of accelerating the decarbonization process of the port and waterway sectors in Brazil. It seeks to promote collaboration among a wide range of stakeholders, both national and international, encouraging the sharing of knowledge and technologies and the implementation of new strategic actions for the decarbonization of ports and fleets. With characteristics of a think tank, the Alliance promotes discussion, and the construction of knowledge and strategies aimed at decarbonization among its participants. The creation of the Brazilian Alliance for the Decarbonization of Ports (ABDP) was motivated by a strategic perception of emerging opportunities in the global sustainability scenario, combined with the identification of a significant gap in Brazil: the lack of specialized services and integrated support aimed at the decarbonization of the port and waterway sector. The Brazilian port sector, which is of crucial importance to the national economy, has been faced with the imperative need to adapt to new global demands for sustainable practices, in a context in which decarbonization has become a critical factor for international competitiveness. However, the lack of specialized services, advanced technologies and technical knowledge in the country constituted a substantial obstacle to Brazilian ports being able to embark on this transition effectively and efficiently. In this scenario, a unique opportunity was identified: instead of acting in isolation, each port could benefit greatly from a strategic alliance that would promote the union of efforts, the sharing of resources and knowledge, and the strengthening of common interests on the national and international scene. The ABDP was therefore conceived as a structured response to this need for cooperation, creating a forum where ports and other actors in the sector can support each other, exchange best practices and develop joint solutions for decarbonization. In addition to addressing technological and knowledge barriers, the Alliance set out to coordinate efforts that would enable Brazilian ports to access climate finance, innovate in clean technologies and improve operational efficiency in a sustainable manner. ABDP is thus an essential collaborative platform that not only facilitates the exchange of information and technologies but also strengthens the positioning of Brazilian ports on the global stage, promoting their competitiveness and ensuring that Brazil can fully take advantage of emerging opportunities in the field of sustainability. In this way, the creation of ABDP represents a strategic opportunity for Brazilian ports: by joining forces, they not only overcome the limitations imposed by









individual action, but also build a more resilient, sustainable and competitive future, aligned with global demands for environmentally responsible and economically viable port practices. Natural Members are composed of ports, privately-owned terminals (TUPs), leased terminals, port operators, shipowners and companies in the waterway sector that have a direct relationship with port operations and management. These members are key to the practical implementation of decarbonization initiatives, as they are directly involved in day-to-day port operations. They apply the technologies, practices and policies discussed in the Alliance and provide crucial feedback on the effectiveness of these measures. Furthermore, as major operators in the sector, the Native Members lead by example, demonstrating the positive impact of ABDP actions on their operations.

The Associate Members category includes companies, unions, associations or startups whose area of activity is directly linked to the maritime and port sector or decarbonization, as well as indirect sectors that can contribute best practices, know-how or relevant technologies. Associate Members bring technical expertise, innovation and academic knowledge to the Alliance. They play a crucial role in the research and development of new technologies, the creation of innovative solutions and the formation of strategic alliances. These members also contribute to the advancement of knowledge and the training of professionals in the sector, through training programs, workshops and collaborative projects.

In addition to its members, ABDP also relies on the institutional support of some public or private institutions, such as associations, unions, agencies or foundations, which provide institutional support for the Alliance's activities and objectives. These members act as facilitators and promoters of ABDP's initiatives, providing institutional support that is essential for the implementation of decarbonization actions. They help align public policies and regulations with the Alliance's objectives, in addition to offering resources and networks that amplify the impact of ABDP's activities. Their support can range from promoting the Alliance's activities to facilitating partnerships with other stakeholders and obtaining financing for projects.

The Ministry of Ports and Airports (MPOR) is an institutional support member for the activities and objectives of the Alliance.

Considering the strategic importance of the Brazilian Alliance for Decarbonization of Ports, especially for the port sector in Brazil and Latin America, the National Waterway Transportation Agency (ANTAQ) is in negotiations to sign a Memorandum of Understanding with the Brazilian Association of Technical Standards (ABNT). ABNT acts as the manager of the collection of Brazilian technical standards, consisting of more than 9,000 titles, which brings together technological information in all sectors of the economy, and is highly relevant at the national level, especially with its expertise in terms of certification.

The purpose of this instrument is to establish actions to promote a decarbonization certification program for the Port Sector and for the management of Greenhouse Gases (GHG), considering the intention of mutually developing a standard or improving existing standards on a low-carbon economy through sustainable development.









ANTAQ's participation in the partnership agreement with ABNT is essential to strengthen the technical and regulatory basis for decarbonization in the Brazilian port sector. The creation of a guiding standard for the preparation of greenhouse gas (GHG) inventories in ports is a strategic step towards standardizing methodologies and ensuring that the practices adopted are consistent, transparent and aligned with international best practices. ANTAQ, as the regulatory body for the waterway sector, plays a fundamental role in promoting sustainability and creating guidelines that encourage the adoption of effective emissions reduction measures, directly contributing to the fulfillment of the climate commitments assumed by Brazil.

In this way, this initiative reinforces Brazil's commitment to encouraging the energy transition and the sustainable modernization of the country's ports, positioning them as global references in sustainability. By integrating ABNT's efforts, a collaborative environment will be created that promotes innovation, operational efficiency and the development of practical tools that can be scaled to different contexts, benefiting both port operators and society.

Suggestions for future cooperation:

Brazil believes it is pertinent to exchange experiences with other member countries on this subject.

11

FRAMEWORK FOR ACTION – PREPARED BY THE OCEAN BUSINESS WORKING GROUP OF THE UN/BRAZIL GLOBAL COMPACT.

The Ocean Business Working Group (GTNO), an initiative led by the UN Global Compact -Brazil Network, was created with the aim of establishing a group dedicated to discussing and addressing the challenges and opportunities of the energy transition in the maritime and port sector, addressing the decarbonization agenda in the Brazilian context.

Given the urgent responses that this scenario requires to accelerate the energy transition of the maritime and port sector in Brazil, in early 2023, the UN Global Compact - Rede Brasil is building a project to engage the Brazilian companies present: an intersectoral working group, formed by companies that participate in the "Action for Water and the Ocean" and "Action for Climate" Platforms, focusing on the decarbonization of ports and maritime fleets. This is how the Ocean Business Working Group was born.

The WG currently has 79 members, 65 of whom are private sector companies and 14 nonbusiness organizations, including government agencies. The meetings and thematic subgroups took place regularly between August 2023 and May 2024, and were attended by numerous national and international guests from various industries and governments, who shared with the group case studies, practices and initiatives that cover the most important topics on this agenda: government policies and incentives, financing, energy and fuel efficiency, modernization of ports and maritime fleets, with "safety" being a cross-cutting theme for all others.









The Group's main results were compiled in the report: "Accelerating Port and Maritime Decarbonization in Brazil - Framework for Action". The publication offers a Brazilian perspective on the decarbonization of the waterway sector and the opportunities we must advance this agenda, not only in Brazil, but also contributing globally, bringing competitiveness and promoting economic and social development.

The document also includes a booklet of Recommendations for a fair transition in the waterway sector. This strategic tool is designed to guide the implementation of sustainable and effective practices with the aim of reducing GHG emissions in the maritime and port sector.

12

SCIENTIFIC STUDIES PREPARED BY NATIONAL INSTITUTIONS

Diagnosis of Decarbonization, Infrastructure and Applications of Hydrogen in Ports

The project aimed to identify, prepare and monitor the implementation of projects for the production and use of green hydrogen and derivatives, as well as to raise awareness and transfer knowledge for the development of projects in Brazilian ports, considering the importance of the port sector as a strategic player in the implementation of the green hydrogen value chain.

With this diagnosis it will be possible to establish guidelines and directives to reduce greenhouse gas emissions by ships in ports and enable the decarbonization of port infrastructure and port services provided.

The project is being carried out under a Technical Cooperation Agreement (ACT) between the National Waterway Transport Agency (ANTAQ) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), funded by the German Ministry of Economy and Climate Action (BMWK).

As indicated by the diagnosis, 35% of Terminals (TUPs, TAs and ETCs) and 81% of Public Ports still do not have a GHG emissions inventory and 98% of the fleet is still fueled by fossil fuels, with only 21% of the ships currently being produced using alternative fuels, such as LNG and methanol.

The study concluded that decarbonizing the port sector requires integrated actions to achieve a significant reduction in greenhouse gas emissions. With the diagnosis, it will be possible to determine the measures to be adopted by port facilities and the sector.

The project also included a Review of International Experience on Reducing Emissions in Maritime Transport and Ports and a Guide to Recommendations, which details guidelines for port facilities to achieve greater maturity in relation to the decarbonization process and next steps for sectoral action.









Global Port Risks

The project aims to prepare a detailed report on the main global risks that may impact the Brazilian port sector, addressing economic, environmental, geopolitical, social and technological aspects, inspired by the World Economic Forum's "Global Risks Report", with the aim of providing a strategic vision for port sector leaders and public policy makers.

Impacts and Risks of Climate Change in Brazilian Public Ports

In 2021, ANTAQ developed an important and innovative study on the "Impacts and Risks of Climate Change in Brazilian Public Ports", aiming to identify and assess climate threats and risks in 21 public ports located on the Brazilian coast. The results presented demonstrated the immediate need for the port sector to adopt adaptation measures as a way of minimizing the possible impacts and losses generated by the occurrence of the three main risks identified: storms, gales and rising sea levels. In addition, the rankings of the ports analyzed classified as having the highest risk for each of these climate events were presented.

As an important delivery of the study, the Guide for Conducting Climate Risk Assessments and Adaptation Measures for Port Infrastructures was published, a practical instrument for directing Brazilian port facilities in the face of climate change.

Suggestions for future cooperation:

Raise indicators that support comparative analyses between the BRICS countries, in the context of possible Memoranda of Understanding (MoUs) or cooperation agreements.

13

INCENTIVE POLICY FOR THE CHARTERING OF SUSTAINABLE FOREIGN VESSELS FOR BRAZILIAN CABOTAGE – BR DO MAR

The Cabotage Incentive Program – BR do Mar was established by Law No. 14,301, of January 7, 2022.

The main benefits of the program are:

- Increase the availability of the fleet of vessels to meet the cabotage demand.
- Reduce logistics costs for the service user.
- Stimulate the entry of new investors and operators in cabotage, increasing the competitiveness and quality of services.
- Generation of jobs and income for the transportation sector.
- Generation of jobs and income for the Brazilian shipbuilding and ship repair industry.
- Encouragement of a fair energy transition in the maritime shipping sector, with a focus on environmental quality and the quality of life of workers and Brazilian society.

The BR do Mar is designed to facilitate modal integration, complementing road transport, especially over long distances, where transportation is more expensive and difficult for trucks,









and to make better use of the country's more than 8,000 km of coastline, strengthening the national maritime and port transport sector.

For every container transported by cabotage, there are another 4.8 that could also use the country's waterway transport system. It is recorded that 21% of Brazilian industries express their intention to adopt cabotage. Currently, 63% of national production is transported by road, 19% by rail and 13% by sea.

The BR do Mar creates incentives for the Brazilian naval industry for the construction, repair and maintenance of vessels that will serve as ballast for the chartering of other foreign vessels. This will foster the Brazilian shipbuilding industry and, at the same time, the competitiveness of maritime transport companies, to offer a cheaper service that meets the needs of users.

It is worth highlighting the incentive to generate direct and indirect jobs in the maritime transport sector, including the employment of professionals in the technical and administrative areas of logistics companies, such as maritime professionals, strengthening Brazil's representation in the training and qualification of these professionals, defending its leading role in national and international forums in the maritime sector.

It is also worth noting that one of the main measures of BR do Mar is the incentive to charter foreign vessels that meet social and environmental sustainability criteria. This measure reinforces Brazil's commitment to offering socially and environmentally responsible logistics options, contributing to a less polluting transport matrix and favoring a fair transition in this sector.

The environmental and social sustainability criteria that must be met by chartered foreign vessels will be defined in a regulation by the Ministry of Ports and Airports, with the participation of the National Waterway Transportation Agency (ANTAQ) and other stakeholders in the sector.

The text is in the final phase of technical adjustments, with a public consultation scheduled for the beginning of the second half of 2025 and publication after the analysis process and incorporation of the suggestions made during the social participation phase are completed.

Suggestions for future cooperation:

Brazil believes that it is pertinent to exchange experiences with other member countries on this subject.









14

SUSTAINABILITY POLICY OF THE MINISTRY OF PORTS AND AIRPORTS -MPOR

The Sustainability Policy of the Ministry of Ports and Airports is a set of measures to implement sustainability, governance and social responsibility practices in the ports, airports and waterway transport sectors.

The MPOR Sustainability Policy aims to ensure that logistics infrastructures and services meet their purposes with respect for the environment, human dignity, continuity of service provision and the public interest.

The proposal seeks to encourage sustainable practices, promote transparency and strengthen social inclusion.

In the public sphere, the Annual Sustainability Policy Agenda will be prepared, which will include projects, studies and possible regulatory changes. For the private sector, the implementation of the policy will be made possible through the "Pact for Sustainability", a commitment aimed at companies interested in adopting environmental, social and governance (ESG) practices.

Suggestions for future cooperation:

Brazil believes it is pertinent to exchange experiences with other member countries on this subject.

15

BRAZILIAN TAX REFORM AND INCENTIVES FOR BIOFUELS AND SUSTAINABILITY

The Brazilian Tax Reform (Complementary Law 214/2025) is a milestone for the Brazilian economy, enabling the transition from one of the most complex tax systems in the world to a modern, digitalized and automated model. The new system simplifies tax collection, reduces the burden on exports and investments and stimulates domestic production with greater added value. The Tax Reform is focused on three main objectives:

- Technological densification and generation of high-quality jobs;
- Environmental sustainability and
- Reduction of social and regional inequalities.

About the maritime sector and navigation, the possible incentives proposed for biofuels and low-carbon emissions actions stand out. The Tax Regime for Incentives to Naval Economic Activity – Renaval, which ensures the maintenance of public policy to promote the









shipbuilding industry in the country, is added. It is complemented by other sustainability and green economy actions that bring significant advances to the environmental area, such as:

- Creation of the Selective Tax (IS), which is levied on products and processes that are harmful to the environment or public health;
- Tax incentives for biofuels, with the aim of reducing carbon emissions;
- Incentives for the circular economy, such as the granting of presumed credits to companies that acquire recyclable materials from individuals or waste picker cooperatives;
- A 60% reduction in the standard tax rate for forest products, including environmental services, ensuring economic incentives for the regeneration of forests and other biomes.

Suggestions for future cooperation:

Understand how the tax laws of the BRICS countries promote policies to promote maritime transport.

16

MPOR STRATEGIC GUIDELINES FOR INCORPORATING SUSTAINABLE PRACTICES AND ADDRESSING CLIMATE CHANGE IN THE PORT SECTOR

The National Secretariat of Ports – SNP, of the Ministry of Ports and Airports – MPOR, is working on the development of a regulatory instrument that will establish strategic sustainability guidelines for the Brazilian port sector. The proposal consolidates principles aligned with the 2030 Agenda and aims to guide the sector in adopting ESG practices, with a focus on climate, environment, social responsibility and governance. Among the central axes of the standard, the guidelines aimed at decarbonizing port activity stand out, such as:

- Promoting the use of renewable and alternative energy in ports;
- Encouraging the electrification of equipment and vehicles used in operations;
- Adapting port infrastructure to supply sustainable fuels to vessels (e.g. LNG, green methanol, hydrogen, biofuels);
- Encouraging energy efficiency and reducing emissions in logistics and operational processes;
- Supporting the integration of ports into energy transition and green logistics value chains. The text is in the final phase of technical adjustments, with an expected opening for public consultation in the first half of 2025 and publication in the second half of the year.









Suggestions for future cooperation:

Brazil believes it is pertinent to encourage the exchange of experiences with other member countries on this subject.

17

EXPERIENCES IN IMPLEMENTING ONSHORE POWER SUPPLY (OPS) IN BRAZILIAN PORTS

Since November 2025, the Port of Santos has had an onshore power supply system (OPS) for tugboats operating in the port. The energy used comes from the surplus generated by the Itatinga Hydroelectric Power Plant, allowing docked vessels to turn off their combustion engines and keep their refrigeration systems and equipment operating with clean energy. This is estimated to reduce CO_2 emissions by tugboats by up to 15%. This measure represents another step forward in the decarbonization process of the Port of Santos, which had already adopted incentive tariffs for sustainable vessels.

Suggestions for future cooperation:

Brazil believes it is pertinent to encourage the exchange of experiences with other member countries on this subject.







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South Africa Experience





MINISTÉRIO DE PORTOS E AEROPORTOS



South Africa's Compendium of Good Practices

on

Mobility, Logistics and Sustainable Transport within the BRICS









01

SOUTH AFRICA'S PARTICIPATION IN THE INTERNATIONAL MARITIME ORGANIZATION – IMO.

South Africa is a Member State of the International Maritime Organization (IMO), has an Alternate Permanent Representative (APR) who leads delegation in all Committee and Sub-Committees of the IMO. For each seating, we get specialists from implementing Authorities to send officials to support the APR and that also assist in ensuring that the officials can engage, learn new trends, share their experiences with their peers and form ties for future.

South Africa is party to a number of IMO Conventions and always strive to ratify IMO Instruments into national legislation. The current work is the amendment of the Marine Pollution Act No. 36 of 2024 which include Annex IV and VI (approved January 2025) A number of initiatives are underway to promote the work of the IMO and ensure that there is compliance to Convention,

South Africa is currently seeking re-election back into the IMO Council, and seek support of BRICS Members.

Suggestions for future cooperation:

- Cooperation in research and developing Working Papers for tabling at the IMO we have common interests as Developing Countries, far from the markets and to ensure that there is alignment within BRICS to make an impact and on policy decision making supported by facts/evidence.
- ✓ Explore opportunities for joint capacity building programs and personnel secondments among BRICS maritime authorities to enhance expertise in IMO matters and decarbonization strategies.
- ✓ Initiate a BRICS working group focused on coordinating positions and developing joint submissions to IMO meetings on key decarbonization topics, ensuring the unique challenges and perspectives of developing nations are addressed.







02

SUSTAINABLE FUEL WORKING SUBGROUP OF THE NATIONAL ENERGY POLICY COUNCIL

Not yet defined for South Africa and area of interest that we would like to be part of discussions further.

Suggestions for future cooperation:

- ✓ Facilitate workshops and expert roundtables among BRICS members to share experiences and progress in defining national sustainable fuel policies and strategies for the maritime sector.
- ✓ Identify potential areas for collaborative research and pilot projects on the production, bunkering, and use of promising alternative marine fuels, such as green hydrogen, ammonia, and methanol, within BRICS ports and shipping routes.

03

MEMORANDUM OF UNDERSTANDING SIGNED BY THE MINISTRY OF PORTS AND AIRPORTS ON THE THEME: "DECARBONIZATION OF PORTS AND MARITIME TRANSPORT"

South Africa appreciates the work and guidance provided by Chair – Brasilia Presidency, and South Africa is in full support of the establishment of the BRICS Institute for Sustainable Transport, Mobility and Logistics (BISTML) within the Transport Working

South Africa is a Member State of the International Maritime Organization (IMO) and has ratified the MARPOL Convention, with the Marine Pollution Act amended and approved in January 2025.

South Africa has participated in a number of initiatives to curb and control carbon emissions through energy efficiency programs offered by the IMO – the GloMEEP, Greenvoyage2050 and currently working on a project to **develop a Road map for maritime decarbonization National Action Plan (NAP).**

The National Action Plan will in part have a compendium of success stories and that will be shared as we make progress.

Suggestions for future cooperation:

South African ports are a complementary system with eight (08) commercial ports that are earmarked for development, maintenance and operations for port efficiency, to provide marine services and related to the shipping sector.

Noting the discussions and outcomes of the MEPC 83 (7-11 April 2025), that is, IMO Net-Zero Framework – a legally binding framework to reduce greenhouse gas (GHG) emissions from









ships globally; also with measures for new fuel standards and GHG pricing across an entire industry sector. It is important for BRICS Member States to continue working on the implementation plan by collaboration and learning or sharing from each other on the "how" modalities.

South Africa strongly believes **research and sharing of best practices is required** as part of mitigation strategies for developing countries, LDC and SIDS. We take note of the need for BRICS Members to come up with policy and regulatory framework that leads to realistic implementation plans and how can we to our mutual advantage, maritime decarbonization to drive economic inclusion and transformation.

Cognisance that, **Training and Development** requires huge financial investments in people and infrastructure and that is where collaboration will benefit without waiting for the global fund to come into effect.

South Africa suggests that a clear **funding mechanism be established**, to have a clear process of how to access the BRICS New Development Funding to support transport (maritime) decarbonization. Public-Private Partnerships or Collaborations are required for the success of GHG emissions reduction. We have noted the difficulties for South African interested parties in setting up test plants and/or production companies, their struggles to reach financial closure and get offtake agreements.

South Africa is still in the planning stages on the NAP, and has opted for alternative fuels for use within the port system. For instance, the Ports Authority has made a call for proposals to assess and retrofit or modification of selected tug boats enabling them to to service the ports using alternative fuels (LNG, biodiesel, green methanol, etc.). There are a number of developments underway in five of the nine Provinces to set up production hubs for green hydrogen, under-pinned by the broader Government Green Hydrogen Society Strategy.

- ✓ Develop a BRICS-wide platform for sharing best practices and lessons learned from the implementation of maritime decarbonisation initiatives, including the development and execution of National Action Plans (NAPs).
- Establish a joint BRICS working group to explore mechanisms for preferential access to and utilization of the BRICS New Development Bank funding for port and maritime decarbonisation projects in member countries.
- ✓ Organize business forums and matchmaking events to connect public and private sector stakeholders within BRICS to foster partnerships and attract investment in green maritime technologies and infrastructure.









04

EMISSIONS INVENTORY OF THE WATERWAY SECTOR AND PROPOSAL FOR THE PORT SECTOR

Our waterways are mainly for recreational purposes and very scarce mode of transport with exception of limited boat crossings.

The DFFE currently is a repository of Emissions Inventory (annual report) and further work is required to enhance collect methods, store and analyse this data as a base for future policy directive and measure of compliance. Latest publication is the 9th National Green House Gas (GHG) Inventory (2024).

Suggestions for future cooperation:

Contact: Mr Jongi Witi jwiti@dffe.gov.za GHGreporting@dffe.gov.za

✓ Share experiences and technical expertise on the establishment and operation of national emissions inventory systems, potentially leading to the development of a BRICS-level data sharing and analysis platform.

05

NEW REGULATORY FRAMEWORK ON CARBON CREDIT TRADING.

National Treasury has developed a position on carbon tax. South Africa's carbon credit system, particularly through the Carbon Tax Act, which allows companies to offset their carbon tax liability by using carbon credits. These credits represent verifiable emissions reductions from approved projects, including renewable energy initiatives, allowing companies to reduce their carbon tax burden.

1. Carbon Tax and Offset Allowance:

- The Carbon Tax Act, introduced in June 2019, allows companies to reduce their carbon tax liability by up to 10% of their total greenhouse gas emissions through the use of carbon offsets.
- The offset allowance provides flexibility for companies to reduce their emissions and tax liability by investing in projects that reduce emissions outside of their core activities.
- Companies can use carbon credits, representing one metric tonne of carbon dioxide emissions reduced, to offset their own emissions when it's not possible to reduce them through operational changes.

Carbon Credit Eligibility and Approval:









- To be eligible for the carbon offset allowance, carbon credits must come from projects approved by recognized standards, such as the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS), and Gold Standard (GS).
- These standards ensure the projects generate real, verifiable, and additional emission reductions.
- Increase to the threshold for eligible renewable energy projects from 15 to 30 megawatts for the carbon offset allowance has been effected to encourage additional embedded generation and some utility scale investments, government announced an increase to the threshold for eligible renewable energy projects for the carbon offsets under the carbon tax. This is aligned with the principle of financial additionality for carbon offset projects and will contribute towards meeting South Africa's climate commitments and help contribute towards energy security of supply.

Source: National Treasury –

https://www.treasury.gov.za/public%20comments/TaxationOfAlcoholicBeverages/Phase% 20two%20of%20the%20carbon%20tax.pdf

06

CLIMATE PLAN – MITIGATION AND ADAPTATION

Climate Change Act, No. 22 of 2024 of South Africa approved and

Led by Department of Forestry, Fisheries and Environment (DFFE) as Chief Negotiators at the UNFCCC meetings, also develop the country position in liaison with all stakeholders to get a Negotiating Mandate.

Suggestions for future cooperation:

Contact: Ms Pemy Gasela PGASELA@dffe.gov.za

07

FRAMEWORK FOR ACTION

Development of the Maritime Decarbonization National Action Plan (NAP), underway.

Implementation Plan to be developed.

Monitoring and Evaluation Tool to be developed.







80

SCIENTIFIC STUDIES CONDUCTED BY NATIONAL INSTITUTIONS

Council for Scientific and Industrial Research (CSIR)

✓ <u>https://www.csir.co.za/south-african-green-hydrogen-eia-guideline-and-potential-atlas-launched</u>

World Bank

 https://openknowledge.worldbank.org/entities/publication/da61a3f6-88b8-41b0-98f9-1e08efa989fd World Bank study

Green Hydrogen South Africa (GH₂)

- ✓ Research studies available (sponsored by GIZ)
- ✓ <u>https://www.giz.de/en/downloads/giz2024-en-promoting-a-south-african-green-hydrogen-economy.pdf</u>
- https://greenhydrogensummit.org.za/resources/

GIZ has been instrumental in providing support to South African Government in developing green hydrogen through collaboration and funding Government Departments, academia, research institute, industry and civil society on strategies, capacity building and skills development and promoting innovation. Ensure that project developers design eco-friendly project and assist with securing of finance by promoting network session between relevant parties and that identified projects sustainable, environmental and socially acceptable (principles of ESG).

Hydrogen South Africa (HySA) Infrastructure

- ✓ Under Department of Science and Innovation with overall goal to develop and guide innovation along the value chain of hydrogen and fuel cell technologies in South Africa. Core focus on Research & Development (R&D) and Innovation.
- ✓ Database development of projects
- ✓ Work in collaboration with Academic Institutes e.g. North West University (NWU); University of the Western Cape (UWC), etc.

Hydrogen Society Roadmap

- ✓ Sets ambitions and sector prioritization on the deployment of the hydrogen economy in South Africa in line with the Integrated Energy Plan, which also includes decarbonization of hard to abate transport sectors such as maritime and aviation.
- ✓ Green Hydrogen Commercialization Strategy
- ✓ Led by Department of Trade, Industry and Competition (DTIC) with the aim to: prioritise exports, stimulate domestic market, support localization secure financing and proactive socio-economic development
- ✓ All these institution have to collaborate, share lessons and ensure that there is no repetion but to enhance the work that will assist the South African economy to thrive.









Suggestions for future cooperation:

- Create a BRICS network of research institutions and universities focused on port and maritime decarbonization, facilitating joint research projects, student exchanges, and the co-supervision of postgraduate studies.
- Establish a joint BRICS fund to support collaborative research and innovation projects aimed at developing and deploying cutting-edge technologies for green ports and sustainable maritime transport.
- ✓ Organize annual BRICS scientific conferences or symposia on maritime decarbonization to showcase research findings, foster collaboration, and attract international participation.

09

INCENTIVE POLICY FOR THE CHARTERING SUSTAINABLE FOREIGN VESSELS FOR SOUTH AFRICAN COASTAL SHIPPING

Now, South Africa does not have cabotage policy and the current review of the Merchant Shipping Act, No 57 of 1951 makes provision for coastal shipping.

10

SUSTAINABILITY POLICY OF THE MINISTRY OF TRANSPORT

Comprehensive Maritime Transport Policy (2017).

Green Transport Strategy (GTS) under review. GTS aims to minimise the adverse impact of transport on the environment, while addressing current and future transport demands.

The Chapter on maritime decarbonization will be aligned to the content of the National Action Plan.

11

SOUTH AFRICAN TAX REFORM AND INCENTIVES FOR BIOFUELS AND SUSTAINABILITY

No information - Under investigation








SOUTH AFRICA STRATEGIC GUIDELINES FOR INCORPORATING SUSTAINABLE PRACTICES AND ADDRESSING CLIMATE CHANGE IN THE PORT SECTOR

a) South African Maritime / Ports Decarbonization

i) As a state-owned enterprise, Transnet is integral to supporting South Africa's commitments under various agreements, through the reduction of greenhouse gas emissions and to ensure the global target of net zero by 2050 is achieved. Adherence to Nationally Determined Contributions (NDC) targets under the Paris Agreement, Transnet has various initiates to support South Africa to accomplish this target. Furthermore, to aid in reducing greenhouse gas (GHG) emissions in the maritime sector as towards the decarbonization of international shipping as per 2023 International Maritime Organization (IMO) GHG strategy.

ii) Furthermore, aligning with national climate goals enables Transnet to access climate finance mechanisms, including green bonds and international funding, which are contingent on alignment with decarbonization strategies.

iii) Participation in the national just transition to a low-carbon economy is vital for mitigating the socio-economic impacts of climate change and job creation in emerging green sectors. By positioning itself within South Africa's broader decarbonization efforts, Transnet secures its long-term viability and reduces exposure to climate-induced disruptions in the global supply chain.

Transnet National Ports Authority (TNPA), as the port landlord, is strategically iv) positioned to provide the necessary port infrastructure to support the decarbonization of the maritime sector. TNPA's decarbonization strategy focuses on three pillars: energy efficiency, clean energy, and feedstock. Current initiatives include energy efficiency programs, renewable energy deployment, and studies to support decarbonization. Also, TNPA is certified with ISO 50001: Energy management organization. The implementation of the system helps to improve energy efficiency for the Ports and come up with initiatives to reduce GHG emissions. TNPA's carbon emissions are calculated on a monthly basis. As per the latest February 2025 report, Scope 1 emissions were 31 882 tonCO₂e, Scope 2 emissions were 30 339 tonCO₂e, and Scope 3 emissions were 29 794 tonCO₂e year to date, starting from April 2024. TNPA's scope 1 emissions are calculated from the Ports fuel using fleet (Tugs, pilot boats, dredging vessels, helicopters, and TNPA owned vehicles). About 94% of scope 1 emissions are from the TNPA owned maritime fleet. The scope 2 emissions are calculated from electricity consumption by TNPA buildings and operations. As per the scope 3 emissions they are based on energy use data from leased assets, business travels, and other indirect GHG emitting activities. . Efforts are also underway to retrofit the marine fleet, including tugs, with low- or zero-carbon fuel alternatives. Additionally, studies are being conducted on bunkering facilities for clean fuels and the potential implementation of a licensing system for green maritime fuel supply at ports

v) Transnet Port Terminals (TPT) is strongly implementing the current net-zero model, referred to as the Net Zero Model which outlines the pathways for achieving net-zero by 2040









and 2050. The model also recalculates baseline emissions and assesses alignment with the Science Based Targets initiative (SBTi) framework.

vi) TPTs operations involve heavy use of fuel-powered machinery and grid electricity for equipment and facility operations. TPT contributes 14% from Scope 1 and 9% from Scope 2 emissions to the Transnet average. The OD's emissions are primarily driven by stationary diesel and electricity consumption. The high Scope 2 emissions suggest a potential to reduce emissions by integrating renewable energy sources. Improving energy efficiency of diesel-powered equipment and transitioning to alternative fuels can reduce the Scope 1. A comprehensive alternate energy pathway has been suggested for TPT that leads to a Net Zero achievement with the aid of new equipment and technology. There is a structured approach to achieving Transnet's net-zero model. TPT is aligning with best practices, supporting Transnet's efforts to contribute to South Africa's transition toward a low-carbon economy while maintaining flexibility to adapt to changing circumstances.

Work in progress:

b) The TNPA-funded project that seeks to provide the next logical step in the process of undertaking a more rigorous risk and vulnerability assessment of TNPA ports to climate change and in developing a climate adaptation strategy that includes appropriate adaptation measures for each of the 8 TNPA major ports, commensurate with the assessed risks for the individual ports. Ensuring a sufficiently robust assessment of the risks associated with climate change for the 8 TNPA-managed ports requires a sufficiently rigorous assessment of how climate change will play out not only for the greater region but specifically within each port. This requires not only a region-specific assessment of the atmospheric and oceanic forcing mechanisms and how these will change under future climate change but also how these changes will affect the key environmental drivers (e.g. statistical distributions and extremes of winds, waves, currents, etc.) typically used to provide design criteria for maintaining existing port infrastructure, developing future infrastructure and informing both existing and planned future port operations.

c) TNPA has adopted the Western Indian Ocean region's Toolkit for Sustainable Port Development in a Blue Economy. This Toolkit comprises a selection of practical management and operational tools for port operators and managers in the WIO region to use to advance sustainable port planning and operations in the region, in alignment with international best practice. The tools included in the toolkit were largely distilled from international best practice, but they are applicable and workable in ports of the WIO region

Suggestions for future cooperation:

- ✓ Share experiences and lessons learned from conducting climate change risk and vulnerability assessments for ports and coastal infrastructure among BRICS members.
- ✓ Collaborate on the development and adaptation of toolkits and guidelines for incorporating climate resilience and sustainable practices into port planning, development, and operations, drawing on the diverse experiences of BRICS nations.
- ✓ Explore opportunities for joint pilot projects focused on implementing climate adaptation measures in vulnerable port areas within BRICS countries.









- ✓ Facilitate the exchange of knowledge and experiences on the adoption of green technologies within the port sector to reduce environmental footprint and enhance sustainability.
- ✓ Member Countries who are PIANC Members can participate in PAINC webinars and working groups focused on climate change and energy transition in ports to share South African experiences and learn from international case studies.

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13

IMPLEMENTATION EXPERIENCES OF ONSHORE POWER SUPPLY (OPS) IN SOUTH AFRICAN PORTS

Work is in progress to give effect to onshore power supply across the South Africa Port System





Suggestions for future cooperation:

- ✓ Organize technical visits and knowledge exchange programs between BRICS ports to share practical experiences, technical specifications, and operational challenges related to the implementation and operation of Onshore Power Supply (OPS) systems.
- Collaborate on developing common technical standards and guidelines for OPS infrastructure and ship-to-shore connections to facilitate interoperability and encourage wider adoption within BRICS.

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Roadmap: South Africa Maritime Decarbonization National Action Plan

Title of Case Study

14

Roadmap: South Africa Maritime Decarbonization National Action Plan

Country/Region

South Africa

Budget in USD

110,000

Start Year:

2025

Expected Date/ Date of Completion:

2027

Abstract:

South Africa is a member State to the IMO and signatory to the UNFCCC declaration. The initiative to develop the Roadmap for maritime transport decarbonization comes as a result of the IMO call for voluntary development of National Action Plan (NAP), that is, The IMO – Marine Environment Protection Committee (MEPC) Resolution MEPC.327(75) of 2020. The **Roadmap** is a framework towards development of the NAP to address GHG emissions from ships, by outlining relevant policies and actions, **strengthen collaboration**, **develop initiatives** to improve energy efficiency of ships, production of alternative sustainable marine fuels and ensuring infrastructure development that will support **green shipping**. The Roadmap took off with capacity building of the State through training and development, research is also ongoing. This work shall integrate into identified projects in **Strategic Infrastructure Projects** (SIPs) approved by the President and foster **national cooperation** towards funding and implementation models.







Detailed Description of the Initiative and Its Impact

Sector Coverage

The Roadmap and Development of the maritime decarbonisation National Plan is done in phased approach: Stakeholder engagement that involved all Parties (Government, Entities, Private Companies, Ship Owners, Operators, Bunkers, Ship Builders and Maritime Cluster.

This was followed by the National & Provincial Government and its Entities:-

- Department of Transport (DOT);
- Trade, Industry & Competition (DTIC);
- International Relations and Cooperation (DIRCO);
- Mineral & Petroleum Resources (DMR);
- Energy & Electricity (DEE);
- National Treasury;
- South African Maritime Safety Authority (SAMSA);
- Transnet National Ports Authority (TNPA);
- South African International Maritime Institute (SAIMI);
- Central Energy Fund (CEF);
- Infrastructure South Africa (ISA);
- Council for Scientific & Industrial Research (CSIR);
- Provincial Governments of the Western Cape, Northern Cape & Eastern Cape
- PetroSA; and
- SASOL.

The last engagement will be with the extensive Maritime Industry (planned for July 2025).

A Task Force for the Development of the National Action Plan (NAP) has been established and the Terms of Reference (ToR) are being finalised.

The stakeholder engagement and technical site visits were made possible by the funding from German Cooperation – GIZ.

Background and Need for the Initiative

South Africa is a Member State of the International Maritime Organisation (IMO) and has ratified the MARPOL, with Annex VI dealt in Marine Pollution (Prevention of Pollution from Ships) Act, No. 36 of 2024 (as amended) commitments to reducing Green House Gas (GHG) from ships. Ensuring that South Africa's maritime policies align with the 2023 IMO Strategy. The Marine Pollution Act.

The first consultation was a roundtable in February 2024 and the outcomes provided a basis for the work to unfold, and the following problem statements need to be addressed in order to promote the maritime sector and make it viable, attractive and compliant to the global initiatives to address climate change whilst promoting resilience, economic growth and environmental sustainability, are as follows:

a) South Africa's ports are strategically positioned along key maritime trade routes, making them ideal for green hydrogen bunkering and export hubs;

b) Ports play a critical role in the global hydrogen economy, transitioning from traditional storage and trade hubs to multimodal energy and hydrogen distribution centers;
c) Economic Opportunities: Identifying business prospects in clean fuels, bunkering, and green shipping technologies;









d) Trade & Economic Impacts: Evaluating how decarbonization affects South Africa's maritime industry and trade competitiveness. How does the sector plan to respond as South Africa is far from the markets and promote ease of doing business without transferring the burden of increased costs to the consumers;

e) Renewable Energy Integration: Leveraging South Africa's abundant renewable energy resources to support maritime decarbonization;

f) Economic growth in the maritime sector is critical to securing investments in newbuild vessels powered by alternative energy while simultaneously supporting skills development and the local shipbuilding industry;

g) Long-term commercial opportunities and enabling policies are necessary for vessel owners to finance and operate newer, more sustainable assets;

h) Investment in research and development, as well as the exploration of clean fuels, must be prioritized to ensure both sustainability and the safety of maritime workers; and

i) **Collaboration** between the government and industry stakeholders is vital to achieving maritime decarbonization in a way that is both economically viable and socially empowering.

It was then agreed that a Roadmap must be developed, first there was training and development of key stakeholders (as per the stakeholder mapping), evaluation of what exists, followed by establishment of a structured transition plan for policy/strategy/regulatory framework, infrastructure, and workforce adaptation towards sustainable implementation.

Funding remains a challenge and it is one area that we would like the BRICS Development Bank to look into for funding.

Implementation and Cooperation

The initiative is being implemented by the Ministry of Transport of South Africa together with South Africa Maritime Safety Authority (SAMSA) and Transnet National Ports Authority (TNPA), with some technical and funding support by the German Federal Ministry through the coordination of the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) Image 1. The technical execution is led by Government multi-stakeholder as the first phase that covered Government Departments, State Owned Entities and the second phase will cover engagements with maritime industry to build a database of projects, monitor implementation and ensure that there is collaboration across the sector.









ROADMAP: NATIONAL ACTION PLAN IN SOUTH AFRICA



Figure 1: Roadmap for Maritime Decarbonisation

What Was Done?

1. Data Collection and Analysis:

The site visits conducted to date are part of data collection in terms of State of readiness and plans that are being undertaken by both public and private sector to ensure that **South Africa position** herself **as the hub for production of alternative fuels**. These data will be used in the development of the NAP:

b) The work to adopt green initiatives has commenced with a number of State Owned Entities and Government Departments. For instance, there are plans to modify the tug-boat fleet of the Authority (TNPA) (Image 3) to bolster South Africa's just transition journey to a low-carbon economy and focus on cleaner, renewable and green fuels, a significant step towards decarbonising the port environment and ensure sustainability for the future. All the Coastal Provincial Governments, i.e. Western Cape, Northern Cape, Eastern Cape and KwaZulu Natal; including the Gauteng are developing Green Hydrogen Strategies to support initiatives that are located in their regions. This is both an economic and social benefit in a country faced with a challenge of high unemployment.

c) South Africa has well established **Fischer-Tropsch** technologies with plans to develop maritime alternative/sustainable fuels; at the State Owned Entity – **PetroSA** (Image 8-9) and and the other is a private facility with global footprint – **SASOL** (Image 6-7).

d) There are a number of private sector initiatives documented in South Africa to support the Green Hydrogen Strategy (Images 6-17). An – example of such interface plan between TNPA and Hive Hydrogen Com.; and these are at various levels of project inception. The majority of the programmes have been supported by the Presidency and approved under the Strategic Infrastructure Projects (SIPs).

e) South African Academic (Universities) and Research Institutes (CSIR, HySA, etc.) have started various research initiatives to support both public and private sector projects.

f) Even though financing is still a challenge, there is work and alignment from the DFIs such as Development Bank of South Africa (DBSA) and the Industrial Development Cooperation (IDC) assisting some of the initiatives to get capital seed funding and reach financial closure.









South Africa has been supported on training and development by the German Cooperation – GIZ funding to enhance capability of the State as the global work move toward decarbonization / defossilization and we remain grateful for the support as it has provided a build up of literature, review of existing data and analysis, market research, findings and recommendations that are essential for project start-up (product development, test labs, initial operations and the implementation phase.

This exercise is assisting the Department to ensure coordination and building a database of project information that can be used at different fora, especially to attract investment and collaboration across the world.

2. Climate Risk Assessment:

The Climate Change Act, No. 22 of 2024 which aims to address climate change through both mitigation and adaptation measures will provide sectoral targets and this is yet to be resume to set clear targets and our work is to ensure alignment.

3. Adaptation Strategies:

This will be extensively dealt with in the NAP.

Different projects have adopted different adaptation strategies and this well be integrated into the National Plan.

4. Stakeholder Engagement:

Continuous engagement with stakeholders ensured that the initial recommendations were considered as baseline for and analysis with scenario planning of what could work for South African environment and implemented effectively.

Stakeholder Profiling has been completed, for example, South African Maritime Safety Authority (SAMSA) is the Administrative Authority under Ministry of Transport with a mandate to promote safety of life and property at sea, prevention of marine pollution and promotion of South Africa's maritime interests, while ensuring maritime safety, health and environmental protection.

In line with its objectives, SAMSA's primary areas of responsibility include: participating in the development and implementation of national and international maritime safety and marine environment protection standards; enforcing technical and operational standards for all shipping operations in South African waters, **to promote responsible operations in terms of seaworthiness, safety and pollution prevention**; enforcing training standards and competency of seafarers; managing the national capability to respond to marine pollution incidents and other maritime emergencies; operating the Maritime Rescue Coordination Centre (MRCC) to coordinate maritime distress situations, and Search and Rescue Region operations.

Transnet National Ports Authority (TNPA), under the Ministry of Transport, is the landlord for the South African Port System and in terms of thein mandate, they must **provide an enabling environment for the effective performance of the ports**. South Africa has a complementary port system that is a State Owned Entity (SOE) that owns the nine (09) commecial ports. The Authority owns, manage, control and administer ports to ensure their efficient and economic functioning and must: plan, provide and improve port infrastructure; control land use within ports; provide or arrange for road and rail access within ports; arrange for services such as water, light and power; maintain the sustainability of the ports. The global maritime/shipping sector has to look into ways to accelerating port emission reduction activities and align to the IMO – MEPC.323(74) which encourages









Member States to support the regulatory, technical, operational and economic measures to cut GHG emissions within the port system. These provisions may include activities such as provision of onshore power supply from renewable sources. It is an opportune moment for South Africa is endowed with good renewables (sun, wind, land) to facilitate and promote production and uptake use of alternative low-carbon to net-zero carbon fuels.

A. Implementation Challenges and Mitigation Strategies

We started the process for the Roadmap late 2024 and getting all stakeholders in one room or virtual platform was a major challenge as people did not understand the objectives and that took some time to get buy-in through persistent engagement, at times one-on-one.

South Africa shares the same sentiments as Brazil that engaging stakeholders from various sectors, including government agencies and private partners, proved challenging. Initial resistance stemmed from differing priorities and perspectives.

This challenge was mitigated through training, continuous dialogue, workshops, and consultations, which fostered collaboration and alignment of goals.

This inclusive approach is being taken forth into the second phase as we start to put content into the National Action Plan, ensured that stakeholders inputs are reflected in the plan and keep them informed and actively involved in the decision-making process.

The National Action Plan will be broadly communicated (we are developing a Communication Plan to integrate into NAP) and shared at Bilateral or Multilateral forums for exposure and attracting investments.

Funding especially for small companies or start-ups who have developed proposal and struggle with meeting operational requirements due to lack of funding for test models, securing offtake agreements remains a challenge. Securing of off-take agreements is a challenge that has been presented to local DFIs and work has started in earnest from Development Bank of Southern Africa (DBSA) and Industrial Development Corporation (IDC) to build in-house capacity for assessment of projects for funding.

B. Co-benefits

Collaboration as driven by this project is key in terms of ensuring that all parties are able to plan together, find areas of mutual cooperation and share details of those who require assistance.

For instance, a local company in the Western Cape had developed a concept and it benefited from being referred to IMO under the GreenVoyage2050 to get technical advise and with funding wherein it was assisted to pitch their project to a number of potential investors. The company has since started its test plant to use seaweed as source for biofuel. This also assisted them to have a better understanding of the potential markets as securing of off-take agreements is also a challenge.

The full scale of economic and social benefits will be realized and documented as projects are implemented successfully. At the moment, the number of potential jobs to be created look promising and that will support the National Development Plan objectives and exponential economic growth of the South African sector.

The main goal of the NAP is to contribute to the global initiatives of reducing carbon emissions to net-zero and promote sustainable environment as per Sustainable









Development Goals (SDGs), just and equitable transition and social benefits by reducing poverty.

C. Scalability

The National Action Plan once finalized will remain a live document for review and update as new information and new technologies come up.

NAP will also assist in policy formulation and strengthening of international collaboration on development of standards, sharing of expertise, requirements for infrastructure development and/or upgrades as these elements have potential to improve production efficiencies in order to accelerate scale-up at local, national, regional and global level.

For projects, that is yet to be determined.

Otherwise, the existing companies like SASOL are investing in research to enhance their technologies and make informed decisions on scale-up of production and we will document such.

For star-ups, the current trends (e.g. the number of methanol, LNG vessels) and other alternative fuels powered ships make a good case for opportunities to expand, how much of the margins are required for scalability and location should inform viable options as part of the plans.

D. Way Forward

Shipping is global in nature and the notion of development of National Action Plans is more about promoting global or regional collaboration.

South Africa is going ahead with development of the National Action Plan (NAP). Adaptations of scenarios and integrating the recommendations from the analysis of the National Action Plan would assist new projects with lessons learned from the past how to improve methodologies and find potential partners.

Continued collaboration between government agencies, research institutions, and international partners is crucial for scaling the initiative and applying its lessons in other contexts. This approach will help build a more resilient and equitable future, both within the global potentially in other nations facing similar challenges.











Image 1 - South Africa has institutionalized the Green Hydrogen potential supported by the GIZ. There is also work done under HySA, Green Hydrogen Society Roadmap and a number of strategies developed, e.g. Greeh Hydrogen Commercialization Strategy and funded by the GIZ

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Mr Johannes Arndt johannes.arndt@giz.de





MINISTÉRIO DE Portos e Aeroportos





Image 2 - Sustainable Fuel Context. This work is led by the Council for Scientific and Industrial Research (CSIR) and the World Bank

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Image 3 – Adaptation Plans for Renewable Energy; Battery Energy Storage; Micro-Grid and Green Hydrogen by the Ports Authority (TNPA) for the South Africa Port System

Source: Transnet National Ports Authority (TNPA) HQ

Contact: Ms Amanda Makgoga amanda.makgoga@transnet.net





MINISTÉRIO DE PORTOS E ROPORTOR



OVERVIEW: RSA PORT SYSTEM

Tenants to De-carbonize.



The opportunity to produce and supply GH2 to South Africa and the world

Image 4 – Private Sector Initiatives that form part of the approved South African Strategic Infrastructure Projects (SIPs) Source GIZ and map courtesy of the Western Cape Provincial Government

The Western Cape project information shows only the larger scale ones – there are also some mobility projects with smaller volumes that are aimed at early entry into the market and at supplying locally to potential refueling stations for heavy transport along the N7

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Image 5 – Collaboration between Northern Cape Economic Development (NCEDA) and SASOL aims to complete feasibility study on the development of the new port, Port of Boegoebaai which forms part of SIPs

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Mr Hendrick Louw <u>Hlouw416@gmail.com</u>







Lead Integrator: Sasol will play the role of lead integrator across the value chain to right-size the project and ensure its long-term resilience and socio-economic success



sasol 郄

Image 6 – Collaboration between Northern Cape Economic Development (NCEDA) and SASOL aims to complete feasibility study on the development of the new port, Port of Boegoebaai which forms part of SIPs

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Mr Deelan Naidoo Deelan.Naidoo@sasol.com



Image 7 – SASOL aims to support the decarbonization of the sector and reduce carbon emissions. SASOL has existing world class facilities for the production of synthetic fuels using coal and are advancing to production of Sustainable Aviation Fuels (SAF)

Contact: Mr Deelan Naidoo Deelan.Naidoo@sasol.com









	PetroSA P	athway to Ne	et Zero Carbon	Emission	s	
₹ / ≶	Sustainable supply of water from seawater and blackwater	Water Electrolysis	Hydrogen, H ₂	N ₂		HYDROGEN AMMONIA FERTILIZER
*	Unavoidable Co ₂ emissions from cement production & WWTP	CO3/H2O co-Electrolysis CO3/H2O co-Electrolysis CO3/H2O co-Electrolysis	H ₂ /CO	⁴ ⁴ ⁴ ⁴ ⁴ ⁴ ⁴ ⁴ ⁴ ⁴	AMMONIA SYNTHESIS	METHANOL AVIATION FUEL CHEMICALS
が行	combustion, digestion, fermentation, decomposition of biological based materials.	RWGS Reverse Weier Gas SR Gastification	H ₂ O Symgas H ₂ /CO Symgas		Scher-Tropsch synthesis	AVIATION FUEL MARITIME FUEL CHEMICALS
* ∰ ≋∕≶	Purpose grown crops such sweet orghum and industrial hemp Colly See	C ₁₂ H ₂₂ O ₁₁ Fermentation CH ₃ [CH ₂) ₆ COC		Bio-Ethanol		E2-PETROL B5-DIESEL
🜔 Petros	SA Wo	king Together, Building a Be	etter PetroSA, <u>Again</u> .	Petroleum Oil & Gas	Corporation of South Afri	ca (SOC) Ltd.

Image 8 – Plans from PetroSA to support maritime decarbonization.

Both PetroSA and Sasol have Fischer-Tropsch technology and can scale-up production to meet the global market demands

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Ms Evelyn Mabaso evelyn.mabaso@petrosa.co.za



Image 9 – South Africa strategic position on the South-South and Green Shipping

Corridor make it ideal to market our port system and some of the inland facilities for production and supply and establish a world renowned market

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Ms Erin Campher erin.campher@petrosa.co.za









Image 10 – A small enterprise company, Innovative start-up that specialize in biofuel production from farmed seaweed in the western coast of South Africa is making inroads into alternative fuels production and some lessons on extensive research, pitching the concept for funding and breakthrough on getting collaboration partners

Contact: Mr Johannes Bochdalofsky jb@seah4.co.za



Image 11 – Investment prospects onboard, awards for innovation. SeaH4 has built and is operating their demonstration plant in Saldanha, with daily production of seaweed and biogas. This innovative project has potential to take off in both Saldanha Bay, South Africa and in Namibia and a good showcase of regional cooperation and collaboration to scale-up and serve the western seaboard of Southern Africa. The prospects of job creation for about 4,000 new jobs by 2027/28 are very high.

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The Path - from Paper to Profit



Image 12 – Pathway to demonstrate how projects require funding, are capital intensive and the importance of seed funding and off-take agreements for the project to be viable

Contact: Mr Johannes Bochdalofsky jb@seah4.co.za

HY S	SOUTH .	AFRICA?				
Everyth	ning is here					
he objec	tive of CGAP	is to produce the lowest cost Green Ammonia. South Africa offers many critical elements to achieve this:				
ELEMENT		GOVERNMENT'S SUPPORT FOR THE "GREEN HYDROGEN REVOLUTION" THROUGH POLICY AND INITIATIVES.				
Renewable Energy		Renewable energy portfolio with excellent capacity factors and energy profiles, producing an exceptional aggregate energy profile.				
Energy Exchange		A novel mechanism to bank & exchange surplus energy with the Nelson Mandela Bay Municipality, increasing plant utilisation to +85%.				
Spot Tro	ading	The SA energy market is opening up and energy trading will commence in 2026. This will allow for the sale/trade of surplus power to the market.				
Early Er	nergy	A mechanism to deploy energy assets early on a 2 to 3 years operational basis, providing revenue as a mechanism to reduce project capital costs.				
Equipn	nent	Sourcing best-in-class equipment insofar as procuring the highest efficiency electrolysers and solar panels, and lowest cost wind turbines.				
	Port	An operational world-class deep-water port with a Liquid Bulk berth (with secured capacity for export), large capac Container Port and Breakbulk Cargo quay				
ucture	Grid	Highly integrated and world class high-voltage electricity grid with approved load capacity. Wheeling capability from renewable energy generation centres to the Green Ammonia Production Facility				
ling Infrastr	Land	Industrial zoned land available and reserved within the Coega Special Economic Zone (CSEZ) Industrial zone specifically for chemicals within the CSEZ including Green Ammonia storage.				
Exist	Water	A mutually beneficial agreement with Cerebos (largest salt manufacturer in SA) allows for unlimited water, with as brine goes to Cerebos, which enhances their production	h no waste,			

Image 13 – South Africa is positioning itself as a hub for production and supply of Green Hydrogen and other alternative fuels from Renewables (with good resources of land for wind farms, Wind and Sun).

Contact: Mr Colin Loubser colin.loubser@hive-energy.com







GOVERNMENT SUPPORT

€HIVE

Unparalleled support for the Coega Green Ammonia Project at ALL government levels.



Image 14 – Hive demonstrates Government's (by the Eastern Cape Provincial Government and other National Depts.) support to provide an enabling environment through policy directives and attracting investments

€HIVE PROCESS DESCRIPTION 3 A. POWER GENERATION & TRANSMISSION WIND ENERG Galenia & Aberdeen 2 1 AMMONIA PLANT SUBSTATION TRANSMISSION LINES 1. Renewable Energy is generated Galenia (1 272 MW), Aberdeen (608 MW) and Υř Krypton (1 430 MW) clusters *** Energy Transmission lines evacuate the energy via new substations and transmission lines to the Green Ammonia Production Facility Substation 2. SOLAR PV KRYPTON 3. 400kV plant substation will receive the high voltage power and step down -44 M## to 33kV for the Production Facility's power requirements **B. WATER SUPPLY** C. AMMONIA PRODUCTION STORAGE & SHIPPING SEAWATER INTAKE 4 7. Air Separation Unit extracts Nitrogen (N₂) from air. 9. Hydrogen and Nitrogen combined in Haber 4. Feedstock - Seawater is abstracted from the Ngqura Port basin and transported to the Production Facility Bosch synthesis process to AIR SEPARATION 7 **_**₩∰ 9 10 via a dedicated pipeline within m ŧ reserved servitudes. Seawater 5. Desalination - Reverse Osmosis & Demineralised Water Treatment Plants produces 10 million fitres / day of Ultrapure Water required for Hydrogen production, and Demineralised Water for cooling. WATER 5 Ń Ammonio 8 NII₂ NH, ELECTROLYSIS NH (¢) Ultrapu Water Ŵ 10. Two 35 000 tonne Ammonia Storage Tanks with dedicated 11. Shipping: Quayside Loading Equipment will load a Very Large Ammonia Carrier (VLAC) every 23 to 25 days, requiring 72 beaus person Brine 6. Waste: The highly concentrated saline brine flows under gravity to 8. Hydrogen is produced by 850 MW Electrolysers EVAPORATION PONDS 6 pipeline to the Liquid Bulk Berth splitting water (H₂O) into Oxygen (O₂) and Hydrogen (H₂) via an electrolysis process existing solar evaporation ponds for salt, magnesium & gypsum production. -Hi hours per vesse

Contact: Mr Colin Loubser colin.loubser@hive-energy.com

Image 15 – Hive's main focus is on production of Green Ammonia earmarked for the shipping sector in the Eastern Cape, utilization of existing facilities that are being modified, addition of new infrastructure and collaboration with other Industries like Cerebos (salt producer) in the Coega Special Economic Zone (SEZ) and the Ports Authority (TNPA)









Image 16 – Ports of Richards Bay, Ngqura and Saldanha Bay are earmarked to be South Africa's liquid fuel industrial hubs under stewardship of the Transnet National Ports Authority, wherein two strategic Terminal Operator Agreements have been concluded in February 2025 for the development of the country's first Liquefied Natural Gas import terminal and a liquid bulk terminal at the Port of Richards Bay's South Dunes precinct.



Image 17 – This is a 25 years terminal operator agreement with Zululand Energy Terminal with a planned throughput of at least two-million tons and an operation date envisaged for 2028 with a floating storage unit and an onshore regasification system. The development will enhance the port's capability to handle liquid bulk cargo especially bunker fuels essential for maritime logistics.







STAKEHOLDER MATRIX: MARITIME DECARBONISATION

ENGAGED SUPPORTERS / KEEP SATISI MARITIME INDUSTR SASOL, PETROSA	FIED & INFORMED	KEY DECIS DOT, SAMSA	ION MAKERS/ MANAGE CLOSELY MD Task Force , TNPA, DIRCO, DFFE, NT, DEE, CEF, ISA, CSIR, PETROSA
	MD TASI NATIONAL ACTI	K FORCE ON PLAN (NAP)	
MINIMAL CONTACT STAKEHOLDE MARITIME INDUSTR LIST	RS / MONITOR Y	POTENTIAL IN DIRCO, DN	FLUENCERS / ANTICIPATE & MEET NEEDS ADVISORY ROLE IR, DEE, HYSA, DSI, SAIMI, PROVINCIAL DEPARTMENTS; LIST

Image 18 – Establishment of the Task Force and South African Stakeholder Mapping Exercise

Contact: Ms Tsepiso Taoana-Mashiloane MashiloT@dot.gov.za

Video Link (If Any):

https://www.youtube.com/watch?v=EOggnszE2QU

Access Link (If Any):

https://www.gov.br/transportes/pt-br/assuntos/sustentabilidade/projeto-adaptavias











Russia Experience









NATIONAL PRACTICES FOR DECARBONISATION OF PORTS AND MARITIME TRANSPORT

The maritime sector, facing increasing pressure with reduction of greenhouse gas emissions, is now considering a range of decarbonisation options.

Methods of decarbonisation of transport vessels include: application of alternative energy sources in water transport (wind power, solar energy, hydrogen fuel cells, nuclear energy), use of hybrid power plants, use of various devices for removal of harmful chemical compounds in exhaust gases of ship power plants, as well as use of alternative fuels, which combustion reduces or stops emission of greenhouse gases into the atmosphere.

The Russian Federation presents its experience and best practices for decarbonisation of ports and maritime transport are:

01

USE OF ALL-ELECTRIC POWER UNIT ON SHIPS USING ELECTRIC BATTERIES CHARGED FROM SHORE POWER SOURCES (in the future - obtained from renewable sources). Example - all-electric passenger ferry "Kotlovka", Figure 1.



Figure 1 - All-electric passenger ferry "Kotlovka", image source ru.emperium.ru







THE USE OF ALTERNATIVE FUELS ON SHIPS

the use of alternative fuels on ships (e.g. LNG) and the creation of the required port infrastructure. An example is the LNG bunkering vessel "Dmitry Mendeleev" (Figure 2, foreground) operated in the Big Port of St. Petersburg.

Modern ferries "General Chernyakhovsky" (Figure 2, background) and "Marshal Rokossovsky" with a high level of automation and a dual-fuel engine with the ability to run on both diesel and LNG are the examples of using LNG as a fuel.



Figure 2 - LNG bunkering process of the ferry General Chernyakhovsky by LNG bunkering vessel Dmitry Mendeleev, *image source marinebunker.gazprom-neft.ru*









The change in the amount of LNG used as fuel on vessels in tonnes is shown in Figures 3-4.



Figure 3 - Dynamics of change in the amount of LNG (tonnes) used as fuel on vessels with the Register class (source FAU "Russian Maritime Register of Shipping")



Figure 4 - Change in the total number of ships in the Register class equipped use LNG as fuel (source FAU Russian Maritime Register of Shipping)









03 USE OF SHIPS WITH ALTERNATIVE SHIP POWER UNITS - THE NUCLEAR-POWERED SHIPS

Examples are the nuclear-powered icebreaker Yakutia (Figure 5), the Project 10081 nuclearpowered lighter carrier Sevmorput (Figure 6), and the nuclear-powered floating energy unit Akademik Lomonosov (Figure 7).



Figure 5 - Nuclear-powered icebreaker Yakutia, *image source* TASS.*ru*









Figure 6 - Nuclear-powered lighter carrier "Sevmorput", image source https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/



Figure 7 - "Akademik Lomonosov" nuclear floating power unit, *image source strana-rosatom.ru*







THE PORT OPERATIONS OPTIMISATION THROUGH THE DIGITALISATION AND ARTIFICIAL INTELLIGENCE ELEMENTS

The application of digitalisation and artificial intelligence elements, including the creation of a digital twin of the port, makes it possible to reduce cargo handling and berthing time, balance the port equipment operation, and as well as optimise the arrival and departure of vessels "just-in-time". Implementation of similar solutions is expected to result in increased efficiency of port operations, reduction of resources consumed by the port and vessels, including fuel and electricity, which leads, among other things, to reduction of GHG emissions by vessels and port equipment.

According to Marine News of Russia, the Russian software development company Intellectika LLC offers similar solutions. The "digital twin" SmartTwin.Port developed by the company has already been implemented in a number of major Russian ports and has also attracted high interest from ports in the United Arab Emirates.

Autonomous shipping technologies play a key role in decarbonising maritime transport, increasing efficiency, reducing fuel consumption and optimising logistics.

Autonomous shipping is the driver of numerous far-reaching changes affecting the entire maritime and inland waterway shipping industry, affecting maritime education, human factors, port infrastructure, communication schemes and regulations, shipping logistics, electrical equipment, software and others areas.

Autonomous shipping systems use real-time data to plot optimal routes, minimising fuel consumption and emissions. When selecting a route, weather conditions, currents and traffic are analysed to avoid unnecessary manoeuvres. This results in annual reductions in CO_2 emissions. Autonomous vessels, with reduced crew numbers, maintain the optimum speed for vessel operation, reducing fuel consumption by up to 10 per cent on long voyages.

Autonomous coordination between ships and ports reduces waiting time and CO₂ emissions on port approaches by speed reducing. In addition, "just-in-time" systems reduce port congestion by saving 2-3% of fuel for every minute of mooring time.







Autonomous shipping navigation systems prevent accidents by detecting hazards in real time, reducing the risk of spills and delays due to forced route changes.

Since the early 2010s, Russia has been actively developing autonomous navigation technologies for commercial vessels.

In accordance with the Decree of the Government of the Russian Federation No. 2031 of 5 December 2020 an experiment on the operation of autonomous vessels under the national flag of the Russian Federation is being conducted between 2020 and 2025. In September 2023, the two largest Russian car-rail ferries "Marshal Rokossovsky" and "General Chernyakhovsky" became the first vessels officially certified by the classification society as MASS (Maritime Autonomous Surface Ships) with a reduced crew on board.

As part of the experiment, a Remote Operations Center (ROC) was built in the Passenger Port of Saint Petersburg seaport. It controls two ferries with autonomous navigation equipment and 22 crew members each vessel. The efficiency of the communication channels installed on both vessels has been proven, the volume is sufficient to meet the needs of the vessels and the RCC.

In addition to maritime transportation, autonomous navigation systems are being developed and tested on inland waterway routes. The passenger vessel Sura 2.0 (35.5 meters long, 9.5 meters wide, built in 2015, with a capacity of 250 passengers) is equipped with a remote control system and is used for passenger transportation on the Volga River.

During the 2024 navigation season, about 100,000 passengers were served.







Proposals for the BRICS Countries' Best Practices Collection on Decarbonization of Ports and Maritime Transport

Autonomus Shipping



1. Route Optimization Using Autonomous Navigation Technologies

Autonomous systems use real-time data to make optimal routes, minimizing fuel consumption and emissions. When choosing a route, weather conditions, currents, and traffic are analyzed to avoid unnecessary maneuvers, which allows for an annual reduction of CO_2 emissions.

Autonomous navigation, taking into account the reduced crew size, helps maintain optimal speed for vessel operation, reducing fuel consumption by up to 10% on long voyages.

Geofencing, considered by the vessel when selecting a route, ensures compliance with emission restrictions in environmentally sensitive areas.

2. Just-in-Time Arrivals

Autonomous coordination between vessels and ports reduces idle waiting times as well as allows for lower CO_2 emissions when approaching a port by reducing speed.

Additionally, Just-in-Time systems decrease port congestion, saving 2-3% of fuel for every minute during docking.

3. Collision Prevention

The human factor remains the main cause of incidents at sea. Autonomous navigation systems prevent accidents by detecting hazards in real time, reducing the risk of spills and delays due to forced route changes.





MINISTÉRIO DE PORTOS E AEROPORTOS



Areas of work for the implementation of autonomous shipping:



Regulatory and legal framework for Maritime Autonomous Surface Ships (MASS)

Development and operation of technologies for autonomous shipping











Autonomus Navigation in the Russian Federaiton

As part of the federal project "Autonomous Navigation" from 2021 to 2024, 12 experimental design projects were carried out,

within more than 50 types of shipboard and shore-based equipment necessary for the technical implementation of autonomous shipping projects were developed

Federal project "Autonomous Navigation"

	Trial operation of M Establishing of the	ASS, MASS Remote				
	Operations Center	programs				
	Development of Ma simulators	SS				
	Development of e-I	lavigation and VTMS	S infrastructure			
		Deve dom equi	elopment of estic MASS pment			
	Design of autonomous tugboats			dia not	7	
		Autonomo	ous ecological ship t	uilding		
2021	2022	2023	2024	2025	2026	







Autonomus Navigation in the Russian Federaiton

Simulator MASS

- Designed for preparing MASS ship navigators, operators of shore-based VTS and ROC, including practicing tasks and coordinated interaction
- Allows practicing actions of MASS operators using a decision support system for collision avoidance;
- Enables practicing interaction between autonomous and conventional ships, as well as simultaneously managing multiple autonomous ships
- The simulator allows modeling negative harmful informational influence, practicing both methods of identification and forming recommended actions in case of disruptions in video data transmission channels, loss of sensor signals and receiving false signals, the appearance of false targets, and malfunctions of onboard equipment
- The simulator apply VR (virtual reality) technology



Legislation on MASS in Russia

A comprehensive scientific and technical study was carried out in the Russian Federation, resulting in the adoption of Federal Law No. 294-FZ dated July 10, 2023, which came into force at September 1, 2023. This law established the necessary legislative foundation for the implementation of autonomous shipping and the regulation of legal relations arising from the operation of autonomous vessels.

Currently, the Russian Federation continues to work on developing and adopting by-laws and regulatory documents to ensure the full implementation of the federal law. These documents will establish requirements for external crews, shore-based autonomous vessel traffic control systems, organizations competent in the field of autonomous navigation, manning of autonomous vessels, rules for operating autonomous vessels, and other related aspects.

The relevant regulations are being adopted for a period of six years, from September 1, 2024, to September 1, 2030. They define the main provisions of the federal law and specify how these provisions should be implemented. This includes requirements for remote operations management organizations, electronic communications and agreements, assignment of unique identifiers to autonomous vessels, rules for maintaining logbooks, issuance of Minimum Safe Manning Certificates for remote crews, regulations for controlling autonomous vessels, certification or remote crews, requirements for autonomous navigation systems when maneuvering in port or approaching a port, and amendments to general navigation and anchoring rules.



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Принят Государственной Думой 29 коник 2023 года Одобров Сонетом Федерация 5 имая 2023 год

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осправлят для со у вых 199 год на 2000 О пурених мрхит илл, проторальное мер и призодано ме Услайски Федерали, 1998, № 33, от 3833 должны ситы D¹ молина Федерали, 1998, № 33, от 3833 должны ситы D¹

Federal Law came into force at September 1, 2023









UNITED ARAB EMIRATES Experience







01

UAE'S PARTICIPATION IN THE INTERNATIONAL MARITIME ORGANIZATION – IMO.

a) Provide a briefing on the topic; and

Please note that ports are not regulated by IMO. It should remian within the sovereignty of States. IMO is a UN specilaized Orhganization to regulate international shipping only.

The United Arab Emirates actively participates in the meetings of the International Maritime Organization (IMO) and is a Category B member of the organization. It also focuses on reducing carbon emissions and contributes effectively to achieving global reduction targets. Among the most important meetings in which the UAE has participated are:

The followings provides an overview of IMO work undertaken to address GHG emissions from ships:

- MEPC 62 (July 2011) adopted resolution MEPC.203(62) on Inclusion of regulations on energy efficiency for ships in MARPOL Annex VI introducing mandatory technical (EEDI) and operational (SEEMP) measures for the energy efficiency of ships;
- 2. MEPC 65 (May 2013) adopted resolution MEPC.229(65) on Promotion of technical cooperation and transfer of technology relating to the improvement of energy efficiency of ships, to provide technical assistance to Member States to enable cooperation in the transfer of energy efficient technologies, in particular to developing countries;
- 3. MEPC 67 (October 2014) approved the Third IMO GHG Study 2014, estimating that GHG emissions from international shipping in 2012 accounted for some 2.2% of anthropogenic CO2 emissions and that such emissions could grow by between 50% and 250% by 2050;
- 4. MEPC 70 (October 2016) adopted, by resolution MEPC.278(70), amendments to MARPOL Annex VI to introduce the data collection system for fuel oil consumption of ships, containing mandatory requirements for ships to record and report their fuel oil consumption, and further adopted the Road map for developing a comprehensive IMO strategy on reduction of GHG emissions from ships (the Road Map). Ships of 5,000 gross tonnage and above (representing approximately 85% of the total GHG emissions from international shipping) are required to collect consumption data for each type of fuel oil they use, as well as other, additional, specified data including proxies for "transport work";
- 5. MEPC 72 (April 2018) adopted, by resolution MEPC.304(72), the Initial IMO









Strategy on Reduction of GHG Emissions from Ships, setting out a vision which confirmed IMO's commitment to reducing GHG emissions from international shipping and to phasing them out as soon as possible, and agreed to keep the Initial Strategy under review, with a view to adoption of a Revised Strategy in 2023;

- 6. MEPC 73 (October 2018), IMO approved the Programme of follow-up actions of the Initial IMO Strategy, intended to be used as a planning tool in meeting the timelines identified in the Initial IMO Strategy;
- 7. MEPC 74 (May 2019) approved MEPC.1/Circ.855 on Procedure for assessing the impacts on States of candidate measures; adopted resolution MEPC.323(74) on Inviting Member States to encourage voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships, as revised by MEPC 79 by resolution MEPC.366(79); and agreed to establish a voluntary multi-donor trust fund ("GHG TC-Trust Fund"), to provide a dedicated source of financial support for technical cooperation and capacity development activities to support the implementation of the Initial IMO Strategy on Reduction of GHG Emissions from Ships;
- 8. MEPC 75 (November 2020) adopted resolution MEPC.327(75) on Encouraging Member States to develop and submit voluntary National Action Plans to address GHG emissions from ships, as revised by MEPC 79 by resolution MEPC.367(79); approved the Fourth IMO GHG Study 2020; and adopted, by resolution MEPC.324(75), amendments to MARPOL Annex VI advancing and strengthening EEDI Phase 3 requirements for several ship types;
- 9. MEPC 76 (June 2021) adopted, by resolution MEPC. 328(76), amendments to MARPOL Annex VI introducing the short-term GHG reduction measure containing a technical Energy Efficiency Existing Ship Index (EEXI), an operational Carbon Intensity Indicator (CII) and an enhanced Ship Energy Efficiency Management Plan (SEEMP); adopted a series of seven technical guidelines supporting the EEXI and CII frameworks; approved a Work plan to progress development of mid- and long-term GHG reduction measures in line with the Initial IMO Strategy on Reduction of GHG Emissions from Ships and its Programme of follow-up actions;
- 10. MEPC 77 (November 2021) agreed to initiate the revision of the Initial IMO Strategy on Reduction of GHG Emissions from Ships, recognizing the need to strengthen the ambition during the revision process; and adopted resolution MEPC.342(77) on Protecting the Arctic from shipping Black Carbon emissions recognizing that Black Carbon was a potent short-lived contributor to climate warming; and
- 11. MEPC 78 (June 2022) adopted a series of 10 technical guidelines to support the implementation of the short-term GHG reduction measure;
- 12. Council 128 (November 2022) endorsed the finalized terms of reference of a









Voluntary Multi-Donor Trust Fund to Facilitate the Participation of Developing Countries, Especially Small Island Developing States (SIDS) and Least Developed Countries (LDCs) in IMO GHG Meetings, and agreed to review the terms of reference, based on the experience of the first full year of operations of the Fund, no later than at the 130th session of the Council;

- 13. MEPC 79 (December 2022) adopted amendments to MARPOL Annex VI to revise the data collection system for fuel oil consumption for the implementation of the EEXI and the CII framework, approved a Revised procedure for assessing the impacts on States of candidate measures (MEPC.1/Circ.885/Rev.1) and adopted resolutions MEPC.366(79) and MEPC.367(79) on Invitation to Member States to encourage voluntary cooperation between the port and the shipping sectors to contribute to reducing GHG emissions from ships and Encouragement of Member States to develop and submit voluntary National Action Plans (NAPs) to address GHG emissions from ships, respectively; and
- 14. MEPC 80 (July 2023) adopted resolution MEPC.376(80) on Guidelines on lifecycle GHG intensity of marine fuels (LCA guidelines); initiated the comprehensive impact assessment of the basket of candidate mid-term measures; and adopted resolution MEPC.377(80) on 2023 IMO Strategy on Reduction of GHG Emissions from Ships (2023 IMO GHG Strategy).

In addition, MEPC 83 (April 2025) approved mid-term GHG reduction measures involving a new fuel standard for ships and a global pricing mechanism for emissions. These measures, set to be formally adopted in October 2025 before entry into force in 2027, will become mandatory for large ocean-going ships over 5,000 gross tonnage, which emit 85% of the total CO2 emissions from international shipping. Under the draft regulations, ships will be required to comply with: (i) a Global fuel standard under which must reduce, over time, their annual greenhouse gas fuel intensity (GFI) – the amount of GHG emitted for each unit of energy used, calculated using a well-to-wake approach. and (ii) a Global economic measure whereby ships emitting above GFI thresholds will have to acquire remedial units to balance deficit emissions, while those using zero or near-zero GHG technologies will be eligible for financial rewards.

b) Suggest possible follow-up and future cooperation, if relevant and of interest to the member country.

UAE comments: Develop a national action plan for ports to reduce emissions. Such plan may include a percentage of net zero reduction targets by 2050 at three checkpoints (2030, 2040 and 2050).








UAE PORTS CURRENT INITIATIVES TOWARD DECARBONIZATION

Shore power operation

Shore power solutions help vessels save fuel and decrease their emissions because they can plug in to the onshore electricity grid when in port. Without shore power, the vessels would have to use auxiliary engines to generate power.

Shore power systems are becoming standard in newbuild vessels, and they are a popular retrofit option for existing vessels as well.

Optimization through Digitalization and Automation (Energy Efficiency cargo handling equipment and port fixture)

Advances in digitalization by ports will also be crucial in serving the wider decarbonization of shipping. Smart ports are leveraging digital technologies to optimize cargo-handling processes, streamline logistics operations, and enhance security measures

Renewable Energy Sources

Expanding renewable power generation and storage onsite allows ports to meet carbon neutrality goals. This is by displacing carbon-intensive grid electricity usage. It also includes diesel fuel in port operations, assets, and transport. As a result, this directly mitigates substantial port emissions.

Port Electrification for Container Operations and Vessels

Electrical power is essential in the shift to a more modern, efficient and sustainable shipping industry. Dry and liquid bulk operations have been running on electrified equipment for decades, sector with regards to providing vessels with shore power. More recently, port electrification has increasingly involved container terminals; this process entails converting all existing operations that rely on fossil fuels to an electric-powered operation—in other words, shifting from the traditional pool of diesel-powered container handling equipment, commonly used for moving and storing the containers in the port, to modern electric equipment.









MINISTÉRIO DE Portos e Aeroportos

