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IMO Regulations
&
Green Maritime Corridors Overview

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MARITIME TECHNOLOGY COOPERATION CENTRE FOR LATIN AMERICA

SUSTAINABLE SHIPPING FOR A SUSTAINABLE PLANET

INTERNATIONAL MARITIME ORGANIZATION

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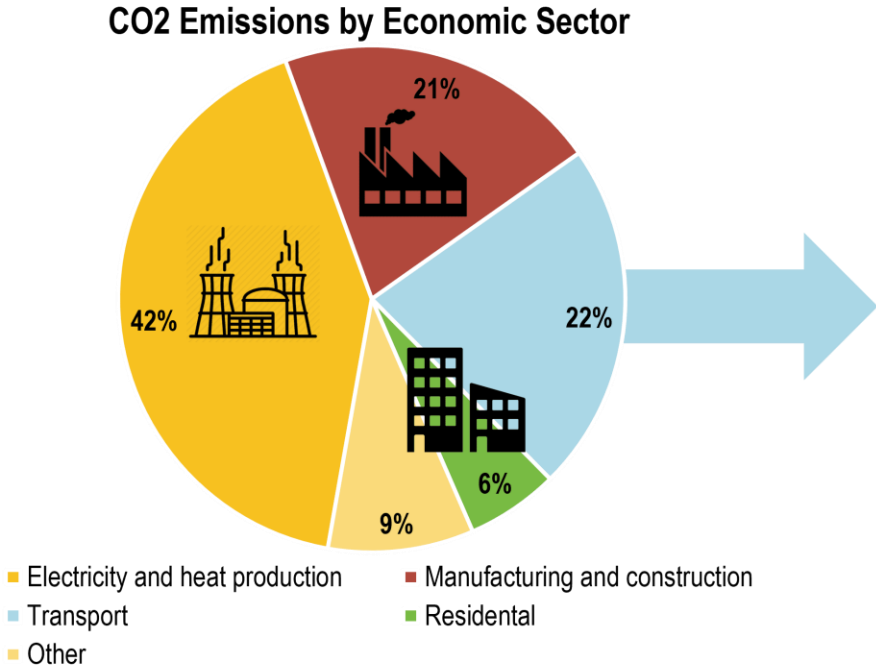
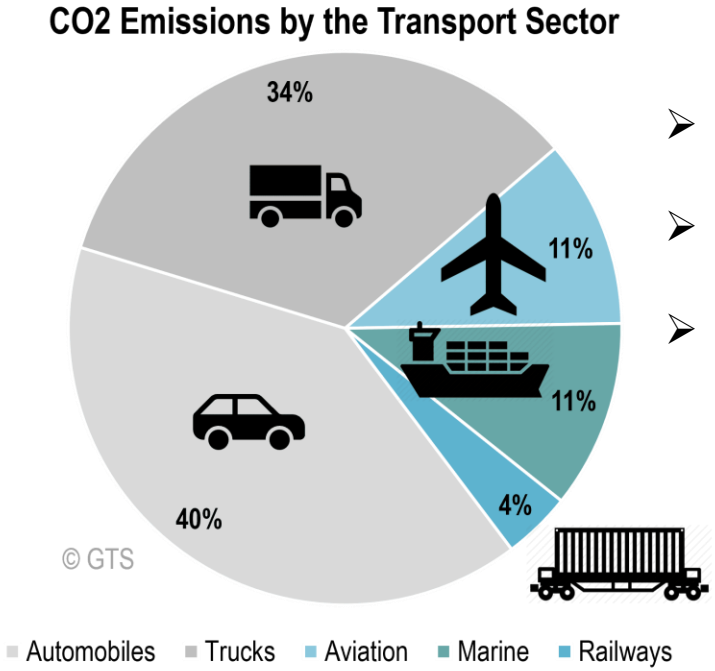
NAVIGATING THE FUTURE: SAFETY FIRST!

Setting the scene: shipping GHG emissions





- Carries approx. 80 to 90% of global trade
- Essential to the economic development
- Most energy efficiency mode of mass transportation

- **2 to 3% of global GHG emissions**
- **2012-2018: +9.6%**
- **~1 Billion tons of CO2/year**
- **Projections show an upward trend**

- Reduce emissions while maintaining the same level of service.
- A sector that is difficult to overcome (the boats carry their own fuel, a large technical gap to be filled, etc.) and of an international nature

The Shipping Decarbonization requires appropriate policies at the international level

LEVEL of Ambition 2023 IMO GHG Strategy

Reduction of GHG emissions

- **2030: 20% (aiming for 30%)**
- **2040: 70% (aiming for 80%)**
- **Achieve net-zero GHG emissions by or around 2050.**

Basket of Measures to Reduce GHG from international shipping

1. Short-term measures already agreed (EEXI and CII)
2. Voluntary measures already agreed (Development of National Action Plans on GHG)
3. Global fuel standards and support for uptake of low-carbon and zero-carbon fuels
4. Market-based measures implementing a mandatory GHG Contribution

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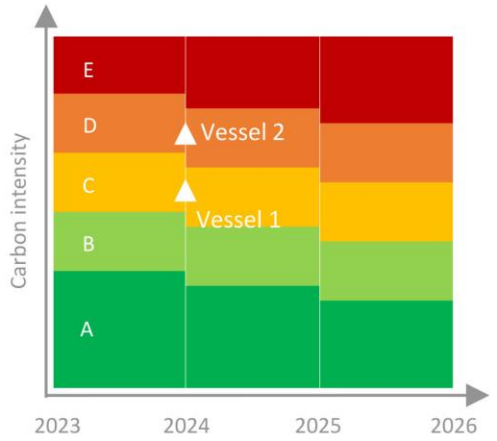
Short-Term Measures

	New ships only	All ships	All ships
	EEDI	**EEXI**	**CII**
	IMPROVED HULL DESIGN	POWER LIMITATION	SPEED OPTIMIZATION
	WASTE HEAT RECOVERY	WIND ASSISTANCE	BIOFOULING MANAGEMENT
	REDUCED ELECTRIC CONSUMPTION	PROPELLER OPTIMIZATION	ALTERNATIVE FUELS
	etc.	etc.	etc.

EXAMPLES OF SOLUTIONS FOR COMPLIANCE

	Vessel 1	Vessel 2
Type	Bulk carrier	Bulk carrier
Deadweight	62,000 t	62,000 t
Distance travelled	60,045 nm	53,000 nm
CO2 emissions	17,447 t	18,000 t
Attained CII	4.69	5.27
Rating for 2023	C	D



Above graph is for illustration purposes only

CARBON INTENSITY INDICATOR (CII RATING)

IMPROVING THE OPERATIONAL PERFORMANCE OF EXISTING SHIPS

1 Each year, ships of 5,000 gross tonnage and above **collect and report fuel consumption data.** On the basis of this data, **A CARBON INTENSITY RATING IS ASSIGNED TO THE SHIP, FROM A TO E**

2 There are a variety of operational means to **IMPROVE THE CARBON INTENSITY OF EXISTING SHIPS** and achieve the Required CII, e.g.:
- Ship speed optimization
- Weather routing
- Just-in-time arrival
- Trim, draft, and ballast optimization

3 Poorly rated ships **have to implement A PLAN OF CORRECTIVE ACTIONS,** and the company is regularly audited incentives may be provided to best rated (A/B) ships

4 **The requirements** for CII rating **ENTERED INTO EFFECT on 1 January 2023**

NAVIGATING THE FUTURE: SAFETY FIRST!

The impact of ports on a ship's CII ratings

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CII is based on the transport work performed by a vessel. As a vessel sits in port, it does not perform transport work, and therefore the **CII** increases.

Example: a vessel is operating on a fixed charter from **Golf of Mexico** to **Singapore (~10 voyages/year).** The vessel experiences an increase in port waiting time of 2 days per voyage (**20 extra days total**) beyond expected/scheduled. This will cause a change in their CII rating 1 year earlier than expected.

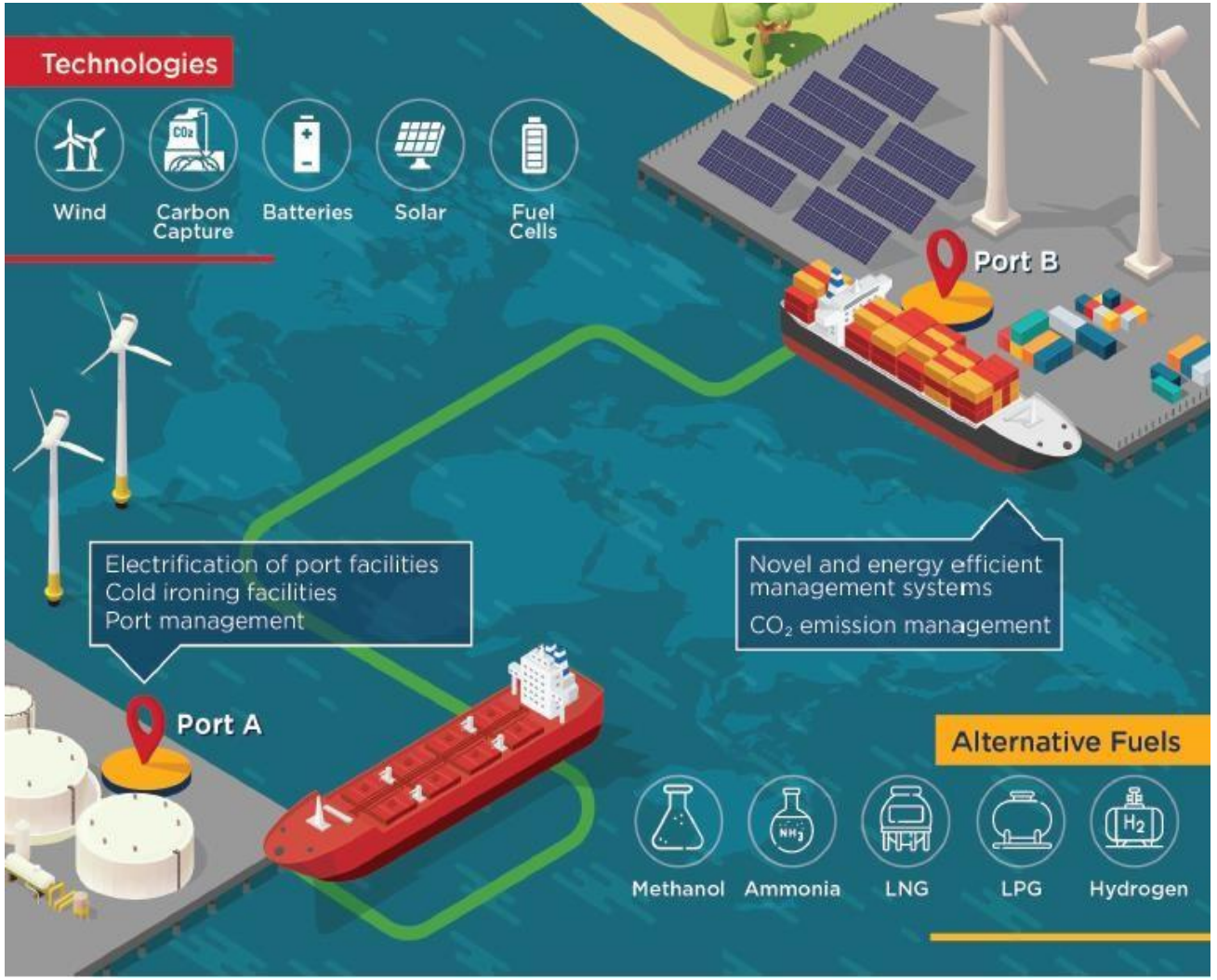
	174k XDF on GOM to Singapore via Suez route @ 17 kts and 50/50 LNG/Diesel Fuel (MEPC 76 - 2% Phase 3)																	
Vessel	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Baseline	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	D
+1 Day per Voyage	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	D
+2 Days per Voyage	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	D	D
+3 Days per Voyage	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	C	D	D
+4 Days per Voyage	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D

The effect on **CII** shown in the example above is worse for vessels with more frequent voyages/port stays.

Reducing emissions in port is therefore of highest importance to most vessels.

CII and Port Infrastructure

- **How can ports assist vessel owners with CII?**
  - **Electrification**
    - Cold ironing can reduce or completely eliminate in-port emissions
  - **Increase fuel diversity**
    - Switching to lower carbon fuels will enable vessels to operate longer under the CII regulation. Having wider access to these fuels will encourage adoption by vessel owners
  - **Carbon capture**
    - While not yet part of the regulation, it is likely to be incorporated
    - Port based carbon capture can reduce in port emissions, while reception facilities for ships with onboard carbon capture systems will be needed



Alternative low/zero carbon fuels and technologies are the key to achieve the ambitions

Level of readiness in three main areas:

- **Technology**
- **Investment**
- **Community**

Solutions that can contribute to decarbonize shipping, and their GHG reduction potential

LOGISTICS AND DIGITALIZATION	HYDRODYNAMICS	MACHINERY	ENERGY	AFTER TREATMENT
Speed reduction	Hull coating	Machinery efficiency improvements	LNG, LPG	Carbon capture and storage
Vessel utilization	Hull-form optimization	Waste-heat recovery	Biofuels	
Vessel size	Air lubrication	Engine de-rating	Electrification	
Alternative routes	Cleaning	Battery hybridization	Methanol	
		Fuel cells	Ammonia	
			Hydrogen	
			Wind power	
			Nuclear	
>20%	5%-15%	5%-20%	0%-100%	0%-90%

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IMO GHG STRATEGY 2023: SUMMARY

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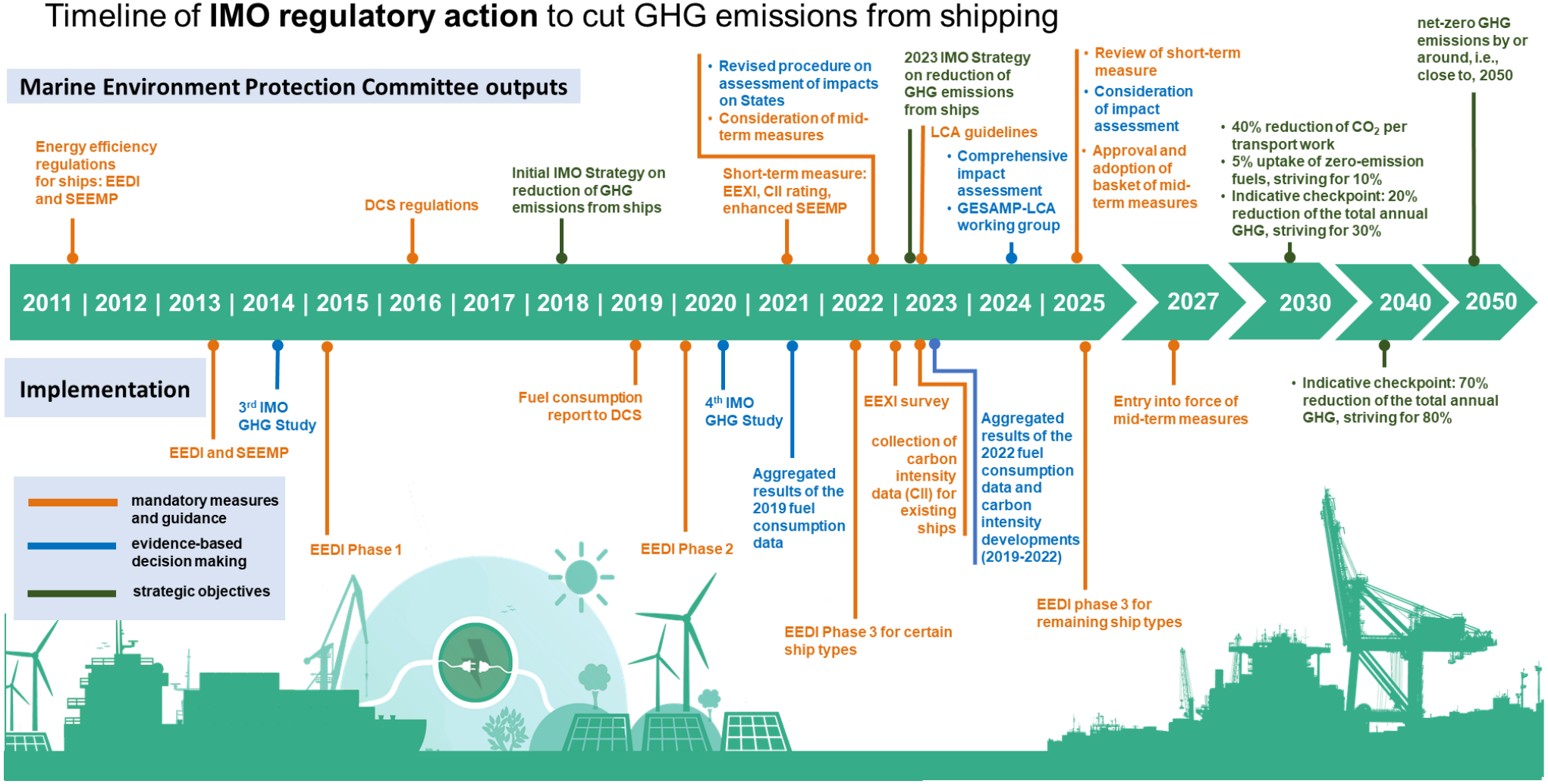
IMO INTERNATIONAL MARITIME ORGANIZATION

Addressing climate change

Timeline of **IMO regulatory action** to cut GHG emissions from shipping



IMO Med-term Measures

Q1 2024

MEPC 81

18-22 march (London)

2023 IMO GHG Strategy

Q2 2024

MEPC 82

30 sept.30 – oct. 04 (London)

Development of GHG measures

1) **IMO GHG pricing mechanism**
2) **Global fuel standard**
3) **Review of carbon intensity index**

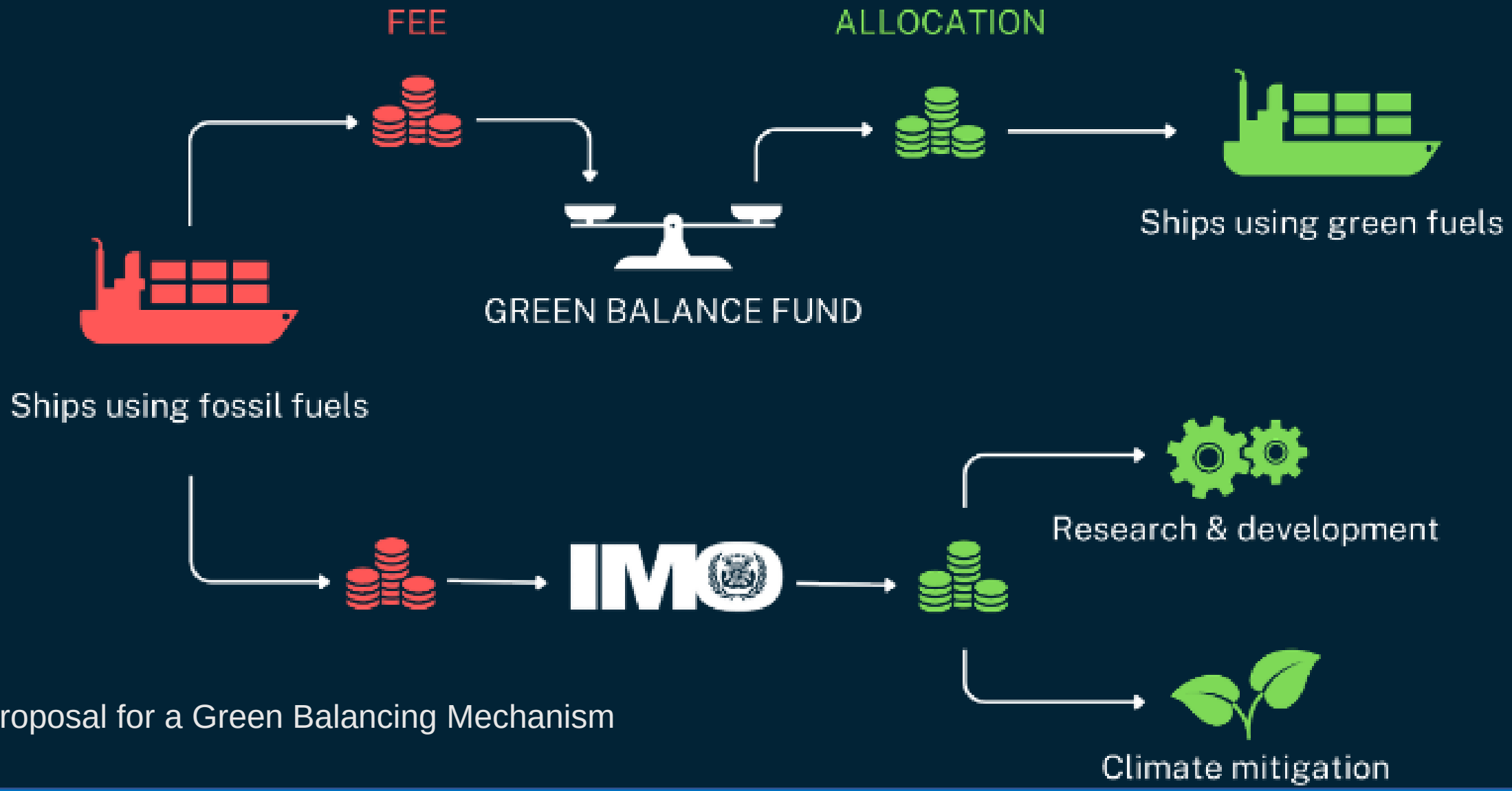
Q2 2025

MEPC 83

Spring/Summer (London)

Adoption of GHG measures

World Shipping Council:



Proposal for a Green Balancing Mechanism

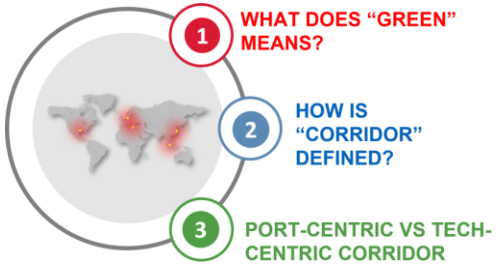
Foundational Elements of a Green Corridors

Cross Value Chain Collaboration
Owner/operators, cargo owners, ports, marine fuel producers

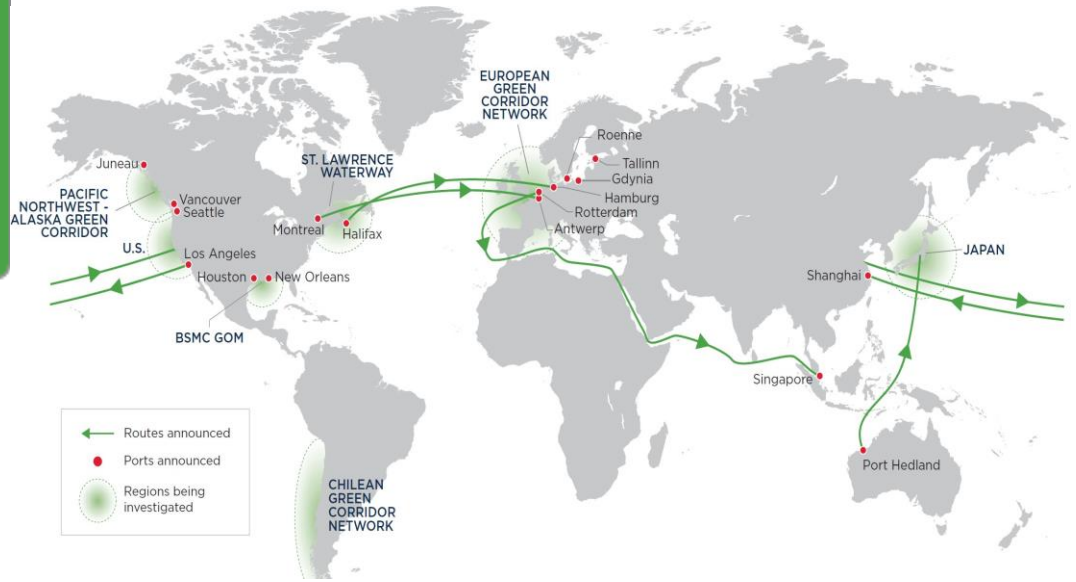
Viable Fuel Pathways
Zero emission fuels and bunkering infrastructure

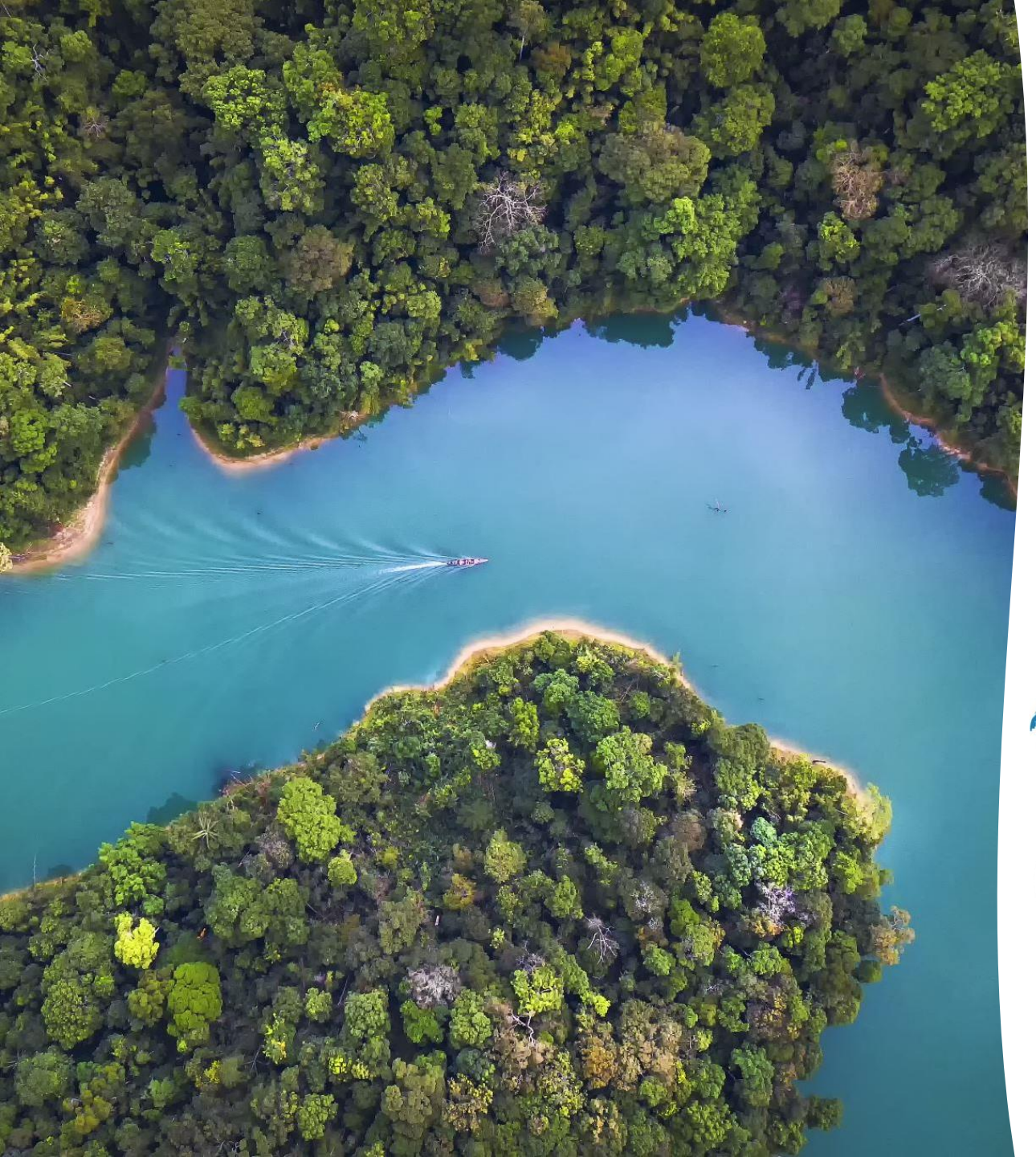
Shipping Impact/ Logistical Case
Market forces demanding green shipping at scale

Policy and Regulation
Incentives, penalties, and enabling support from government



All foundational elements play an important role in the viability of the green corridor and are equally important and come together in unison to create a sustainable green shipping corridor





Green Maritime Corridors in Panama

Uniendo Continentes, Sosteniendo el Ambiente: El Papel de Panamá en el Desarrollo de Corredores Marítimos Verdes

Bridging Continents, Sustaining Environments: Panama's Role in Green Shipping Corridor Development

MTCC LATIN AMERICA
Maritime Technology Cooperation Centre

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NHH

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UNIVERSIDAD TECNOLÓGICA DE PANAMÁ
UTP
1981

LIVERPOOL JOHN MOORES UNIVERSITY

GEORGIA TECH Panama
Logistics Innovation & Research Center

Development of NAP

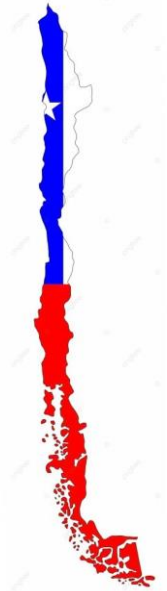
- **Identification and engagement of relevant stakeholders**
- Determination of the objective and scope of **NAP**
- Development of **NAP**
- **Identification of financing needs**
- **NAP review**
- **NAP Approval**

It is necessary to Encourage Latin America and Caribbean Countries to develop and submit voluntary **NATIONAL ACTION PLANS** to address **GHG** emissions from ships and other related maritime activities. This will be a milestone to start considering alternative marine fuels in the road of Decarbonization.

Current Developments in Latin America: National Hydrogen Strategies

Argentina 2030 National Low-Emission Hydrogen Strategy

Baseline to support the Brazilian Hydrogen Strategy



Chile Hydrogen Strategy

Colombia Hydrogen Roadmap

National Hydrogen Plan Mexico

DEVELOPING A NATIONAL HYDROGEN STRATEGY

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“SUSTAINABLE ENERGY HUB”

Panama’s Strategy calls for producing 500,000 tons of **Green Hydrogen** or its **derivatives** in the country by **2030** and four times that amount by **2040**.

The strategy identifies the Maritime Industry as an especially promising market for **Clean Fuels**, as **Shipping Companies** seek to reduce their **Carbon Footprints.**

https://www.energia.gob.pa/mdocs-posts/estrategia-nacional-de-hidrogeno-verde-enhive/

ROADMAP FOR THE ESTABLISHMENT HIGH-LEVEL INTERINSTITUTIONAL COMMISSION TO CREATE THE MARITIME BUNKERING HUB FOR ALTERNATIVE MARINE FUELS IN THE REPUBLIC OF PANAMA

NAP, focused on **Maritime Transport** – become a Regional and International Hub in the Strategic **Decarbonization** of **Maritime Transport**

NAP includes:

- Multisectoral
- Interdisciplinary strategic measures for the creation of **Green Policies** that allow Sustainable Development

AUTORIDAD MARÍTIMA DE PANAMÁ

CANAL DE PANAMÁ

MINISTERIO DE RELACIONES EXTERIORES

MINISTERIO DE ECONOMÍA Y FINANZAS

PROPANAMA
AUTORIDAD PARA LA ATRACCIÓN DE INVERSIONES Y LA PROMOCIÓN DE EXPORTACIONES

UNIVERSIDAD TECNOLÓGICA DE PANAMÁ 1981

UMIP

SECRETARÍA NACIONAL DE ENERGÍA

MiAMBIENTE

NACIONES UNIDAS
CEPAL

CÁMARA MARÍTIMA DE PANAMÁ
DESDE 1979

REPÚBLICA DE PANAMÁ
GOBIERNO NACIONAL
MINISTERIO DE COMERCIO E INDUSTRIAS

REPÚBLICA DE PANAMÁ
GOBIERNO NACIONAL
MINISTERIO DE LA PRESIDENCIA
Secretaría Estratégica para el desarrollo y Competitividad

ASOCIACION BANCARIA DE PANAMA
ABP

SINDICATO DE INDUSTRIALES DE PANAMÁ

Challenges and Opportunities in Latin America Region

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CHALLENGES

OPPORTUNITIES

ROAD TO A REGIONAL SUSTAINABLE DEVELOPMENT

INNOVATION

TECHNICAL REGIONAL COOPERATION

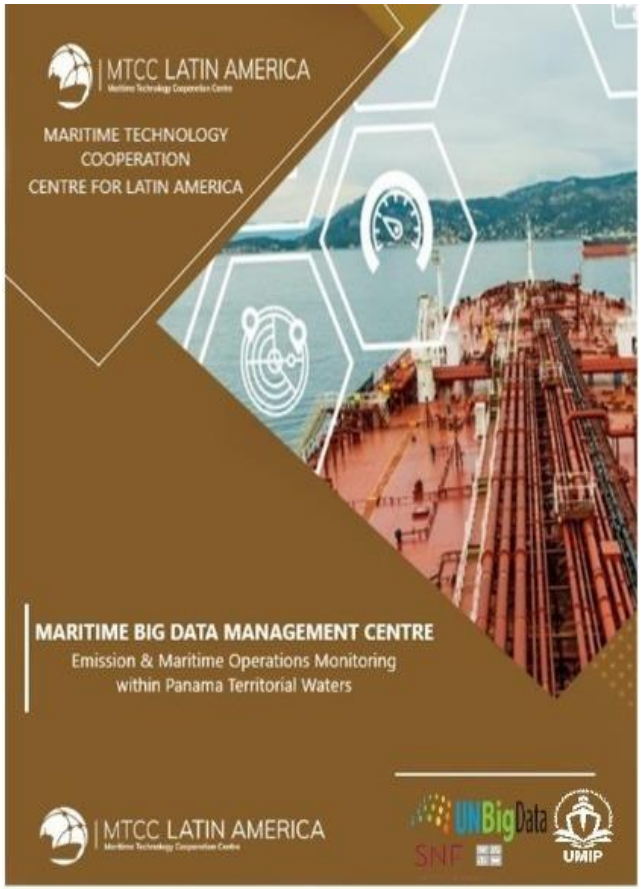
STRATEGIC INDUSTRY PARTNERSHIP

RESEARCH & DEVELOPMENT

CAPACITY & COMPETENCE BUILDING

ROADMAP 2024-2030

PILOT PROJECT 3

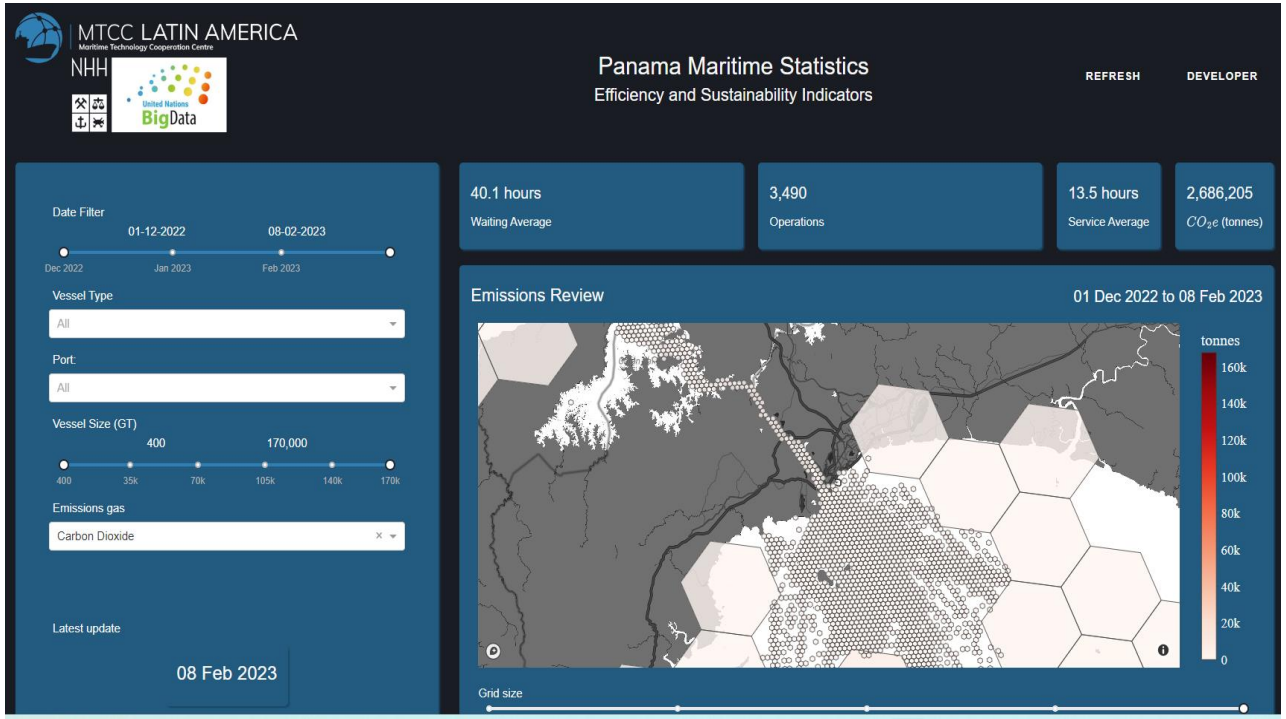


Maritime Big Data Management Centre
Emissions and Maritime Operations Monitoring within Panama Territorial Waters

- CAPACITY BUILDING
- CONSULTING
- INNOVATION
- JOINT RESEARCH
- REGIONAL COOPERATION
- SUSTAINABLE DEVELOPMENT
- INTERCONNECTIVITY

https://stats.mtcclatinamerica.com/

DESCRIPTIVE → DIAGNOSTIC → PREDICTIVE → PRESCRIPTIVE



Data Acquisition → Data Processing → Data Analysis → Data Visualization

Decision Support Tool

Aiming to develop new Indicators for maritime operations monitoring at National & Regional Scale

Training and Capacity Building

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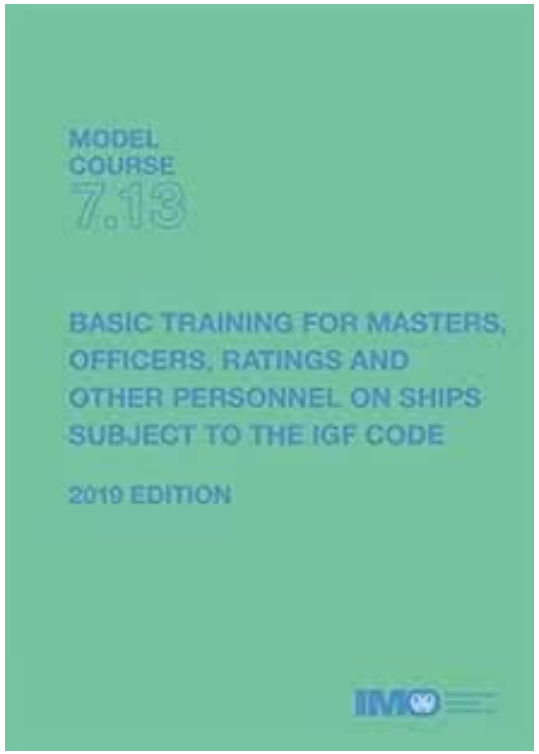
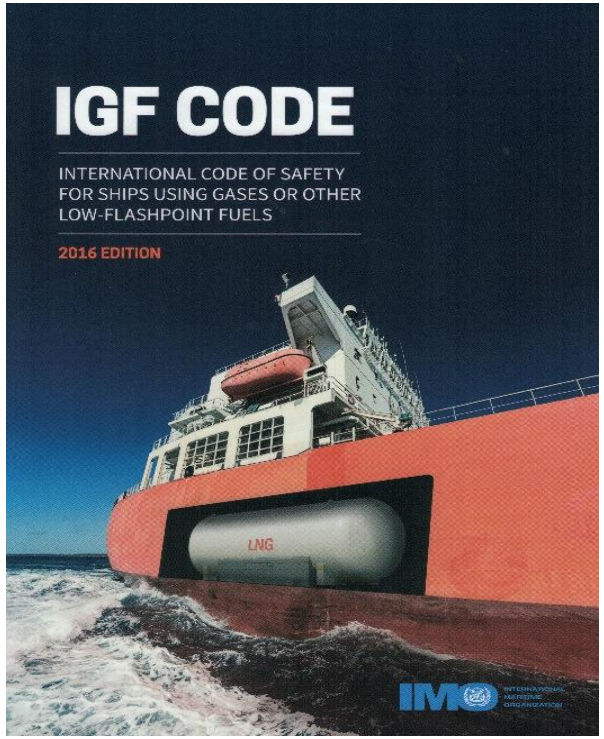
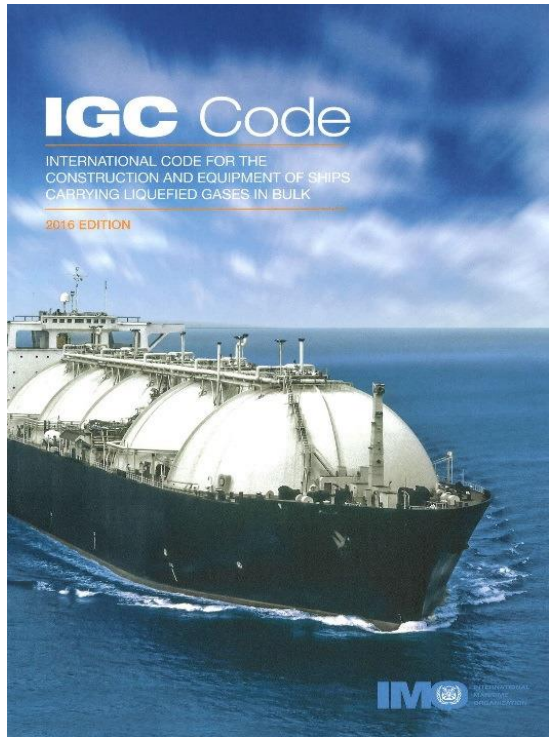
To ensure shipboard safe, efficient and sustainable operations, awareness and competence when using **ALTERNATIVE** Marine Fuels.

IMO Model Course 7.13 and 7.14



IMO IGC and IGF Code





Involving the whole Industry and Relevant Stakeholders

THANK YOU

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AND

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