Energy transition in shipping and its implications

Transport Events

10-12 March 2026

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Director - Head Maritime Advisors, Drewry

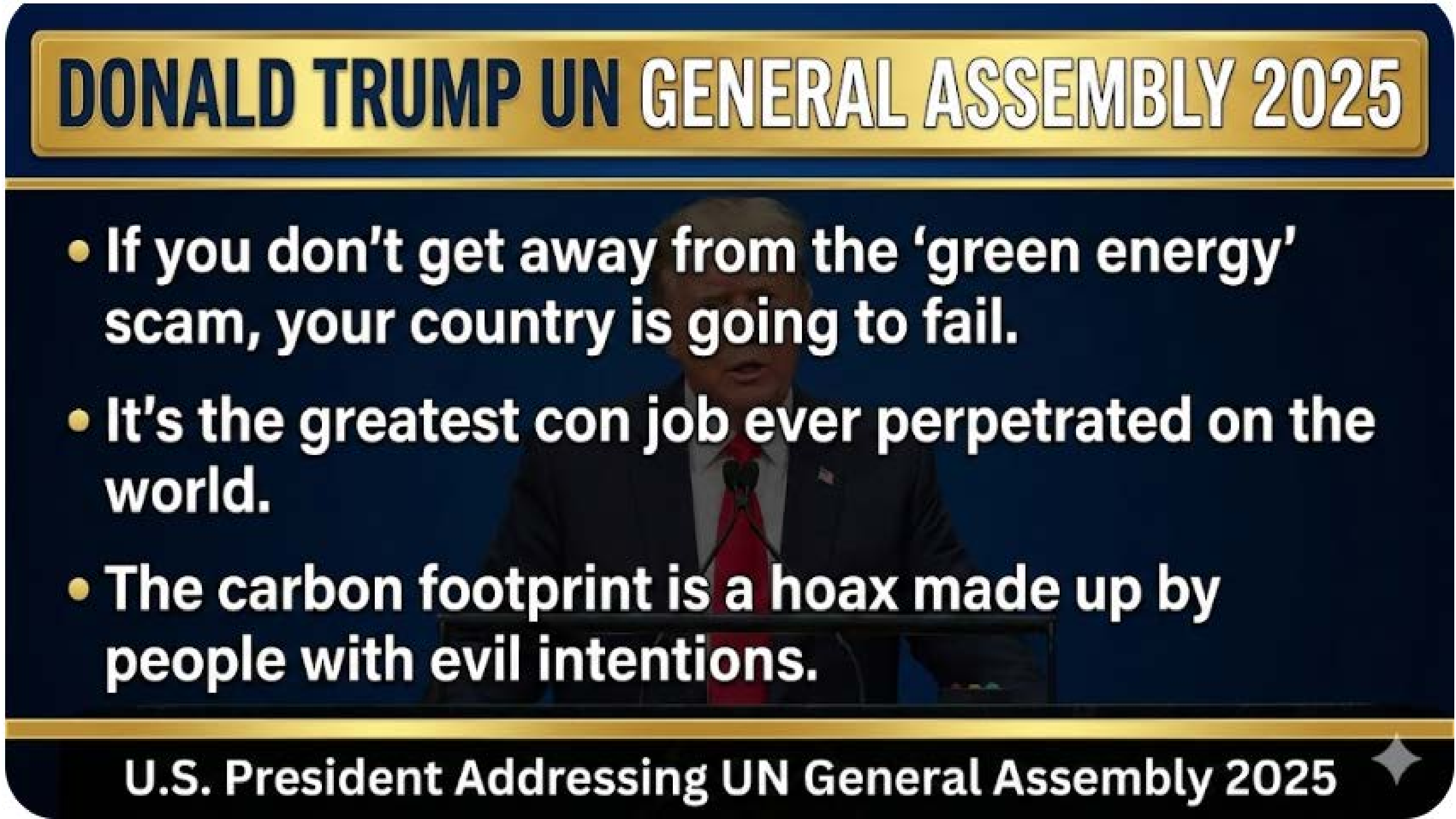
Agenda

1	Drewry Introduction
2	Energy transition: Key drivers, Risks
3	Latest developments
4	Implications
5	Drewry Capability Statements
6	Q&A

Maritime Advisors

Rigorous analysis – Practical advice

DONALD TRUMP UN GENERAL ASSEMBLY 2025



- If you don't get away from the 'green energy' scam, your country is going to fail.
- It's the greatest con job ever perpetrated on the world.
- The carbon footprint is a hoax made up by people with evil intentions.

U.S. President Addressing UN General Assembly 2025

What is driving the GHG emission reduction of shipping?

Various stakeholders are driving the push towards reducing vessel emissions.

Net Zero target of individual countries	• Paris Agreement
Regulations from multilateral institutions/countries	• Push from the IMO, UK ETS and the UK ETS to reduce emissions from vessels.
Charterers	• Charterers are also exerting pressure on shipowners by the adoption of the Sea Cargo Charter, Zero Emission Buyers Alliance
Financial institutions	• Adoption of the 'Poseidon Principles' by 75% of ship financiers.
Marine insurers	• By adoption of 'Poseidon Principles for Marine Insurance', there is an increasing push from marine insurers to reduce emissions from vessels
End customers	• This requires the declaration of the emissions from vessels as the end customers want to know the emissions from products.
Incentivising decarbonisation by government/ports	• Discount on port disbursements, giving grants for pilot projects.
Shipowners' internal ESG targets	•Net Zero target of the shipping companies. Increase in competitiveness for low emission vessels vs high emission vessels.

What is the risk?

Potential risk of not focusing on decarbonization.

Loss of competitiveness	• An increasing number of charterers demand want to reduce Scope 3 emissions. High emission ships may have difficulty getting charter contracts.
Loss of access to competitive finance	• Higher margin required if the shipping companies are not aligned with the stipulated emission targets. Eg Sustainability-linked loan and sustainability-linked bond
Risk of accelerated depreciation	• Loss of asset value when emission regulations accelerate, and the vessel's emissions are high. Risk of stranded asset
Penalty for non-compliance with the regulations	• Payment for EU ETS, FuelEU Maritime, EU ETS or IMO GHG levy.
Inability to operate at stringent terminals	• Currently, there are age-based restrictions. In the future, it could be based on the vessels' emissions.
Reputational loss	• The companies unable to reduce emission may have a reputational loss. May be unable to attract talent.

Emission Control Regulation implementation measures

IMO enforces regulations to prevent pollution from ships through the MARPOL convention. SO_x emission control, NO_x emission control and IMO 2023 GHG strategy are a few examples of impactful global regulations in the industry. Regions like the EU have implemented GHG emission regulations under their Fit for 55 package. The greenhouse gas (GHG) emissions regulation is being gradually tightened by both IMO and regional organisations.

Sulphur emission control

- Global: **0.5% limit**
- ECA areas (Black Sea, the North Sea, the Baltic Sea, the US Caribbean Sea area, the North American Area, the Mediterranean Sea): **0.1% limit**
- From 1 January 2020, China's Air Emission Regulations require all ships operating within inland emission control areas to comply with the fuel sulphur limit of 0.1%.

Compliance options:
- **Fuel with low sulphur content**
- **Scrubbers**

NO_x emission control

- **Tier I-** Basic emission limits
- **Tier II** emission is around 20% below Tier I emission limits
- **Tier III** emission is 80% below Tier I emission limits

Compliance options:
- **No_x reduction technologies**
- **Certified spare parts**

GHG emission control (GHG 2023 strategy)

IMO decided on a net-zero target along with indicative checkpoints along the way (all compared to 2008):
- **2030** reduction targets
- **2040** reduction targets
- **Net-zero** GHG emissions by around **2050**

Short-term measures (EEXI and CII) have already been adopted. IMO declared that the annual required CII will be reduced by 21.5% in 2030 relative to the 2019 baseline.

Mid-term measure: The IMO Net Zero Framework *(not approved yet).*

EU-Fit for 55

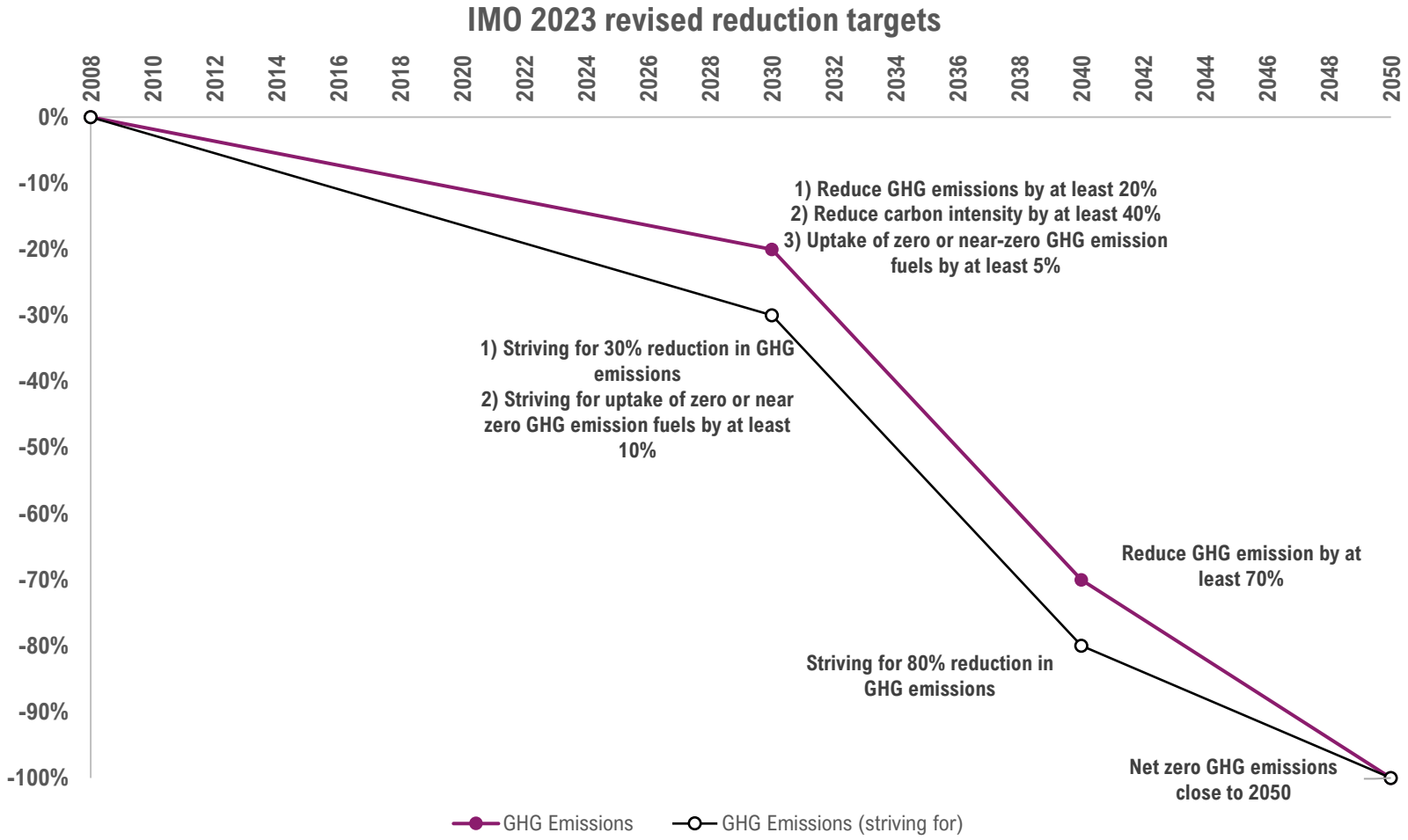
- Aims to reduce **80% GHG intensity** by 2050 compared to 2020 level; and reduce 62% CO_2 emissions by 2030 compared to 2005 levels.
- Makes obligatory for container/passenger ships to use the on-shore power supply (for port stays above 2 hrs) in EU ports.

Compliance options:
- **ESD (Energy Saving Devices) and PIDs (Propulsion Improvement Devices)**
- **Onboard carbon capture and storage**
- **Alternative low or zero-carbon bunker fuels**

Source: IMO, EU

2023 IMO GHG Strategy

The International Maritime Organisation revised its GHG emission reduction targets in 2023 which had more ambitious targets compared to its 2018 initial GHG strategy. IMO now aims to have the shipping industry's emissions be net-zero close to 2050.



Key developments:

- The focus moved from Tank to Wake **(TtW)** approach (which only focuses on emissions from the vessel), to Well to Wake **(WtW)** emissions (which take all the emissions from the time of extraction from the 'well' to final combustion on board into consideration).
- IMO already came up with short-term measures and implemented them. IMO started work on planning and drafting the mid-term measures to be implemented in 2027, which can further assist IMO in achieving its net-zero target.

Source: Drewry

Alternative fuels

Three main alternative fuels broadly considered are LNG, Methanol and Ammonia. It is not known whether any particular fuel will become dominant in the future, as it depends on various factors. The energy transition is expected to be from 'grey' fuels to 'bio or blue' fuels and thereafter to 'green or e-fuels'.

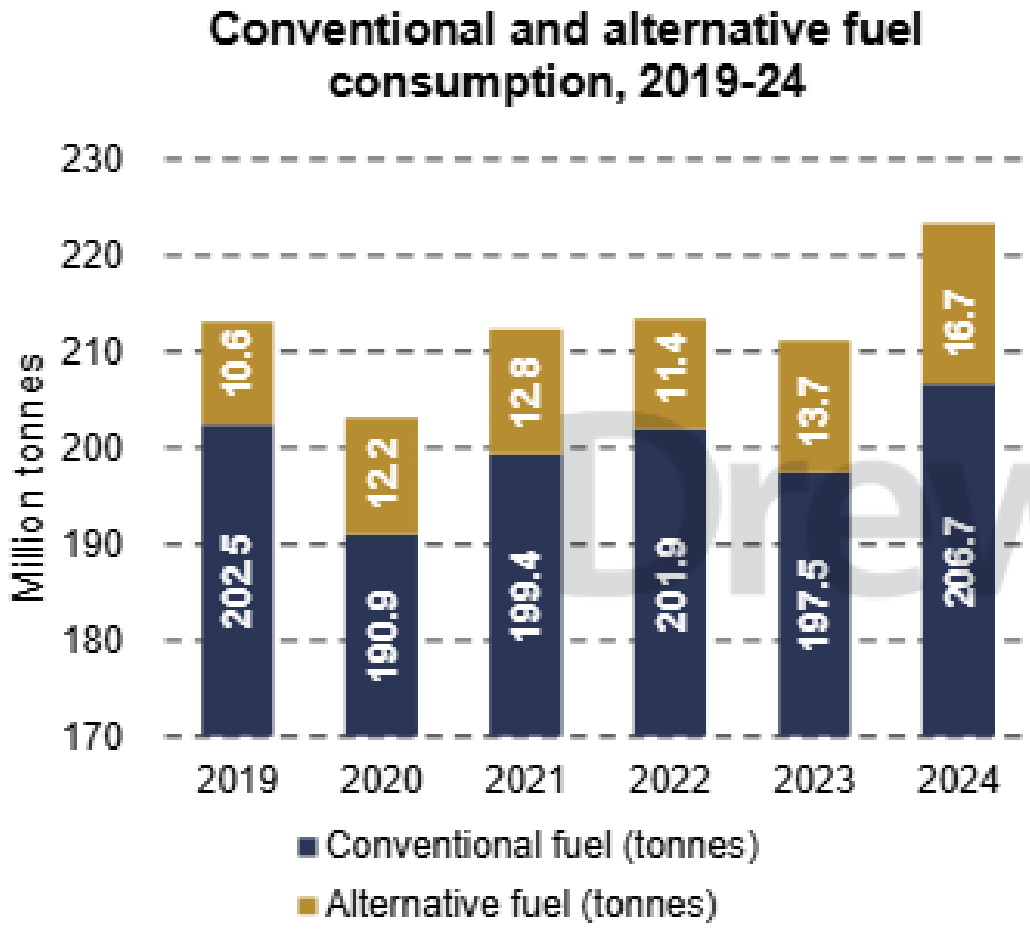
Ammonia	• There are concerns about the safety of the engine room crew due to its very high toxicity. • Highly corrosive
Methanol and Ethanol	• Toxic if inhaled in a certain proportion • Low flash point
LNG	• In case of a spillage, LNG undergoes a Risk of Rapid Phase Transition (RPT), leading to vapour formation, which needs special handling precautions. • Highly flammable
Hydrogen	• Highly flammable • Prone to leakage as the molecule is extremely small

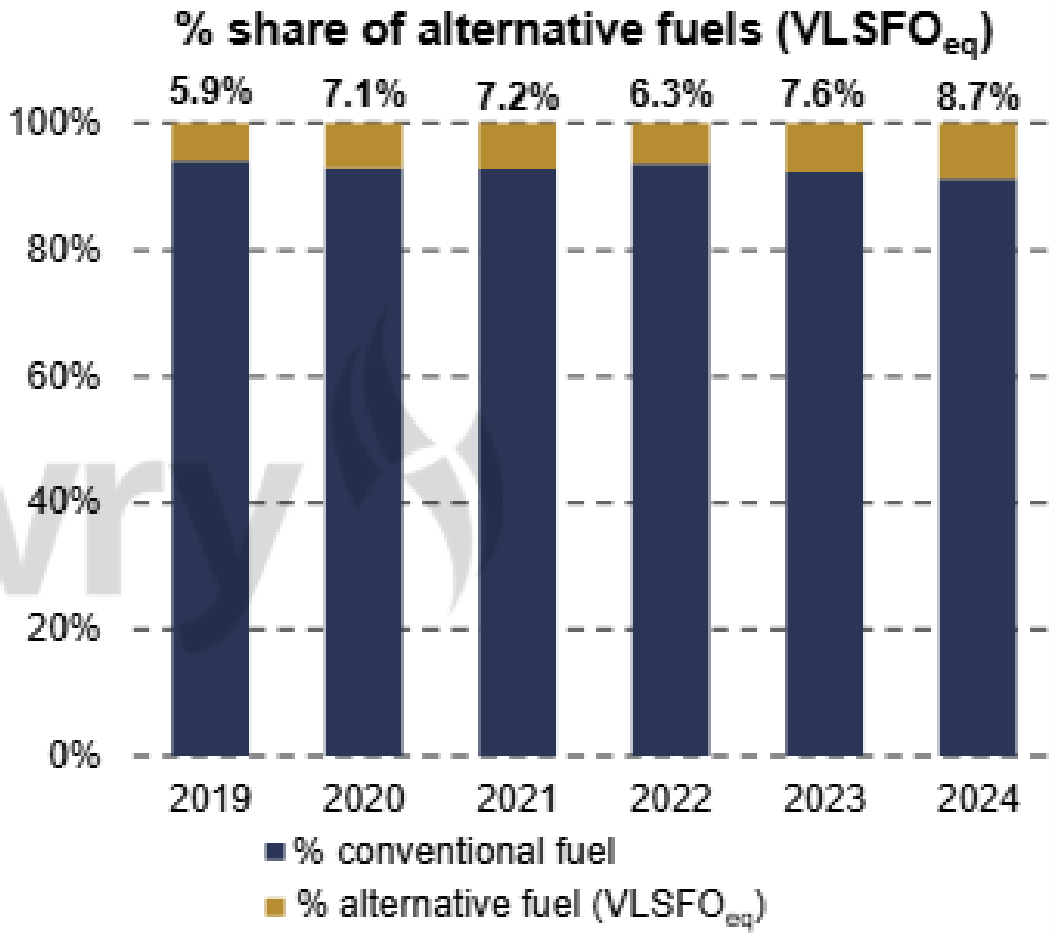
Due to the tank's space requirements, hydrogen is not suitable for deep-sea vessels.
The energy transition is expected to be from 'grey' fuels to 'bio or blue' fuels and thereafter to 'green or e-fuels'.

Source: Drewry

Trends in fuel consumption

The progress of alternative fuel consumption has been slow but upwards, increasing from 5.9% of the shipping energy demand in 2019 to 8.7% in 2024.

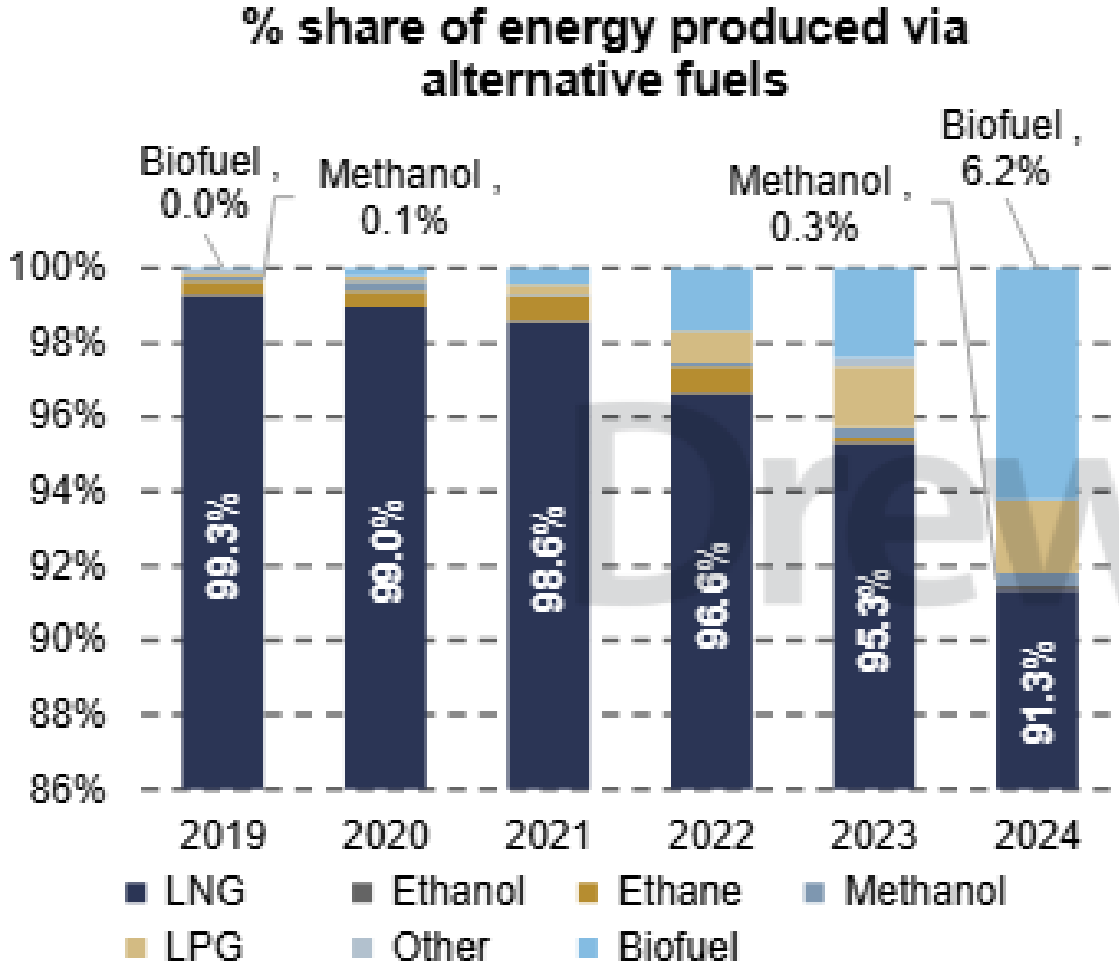


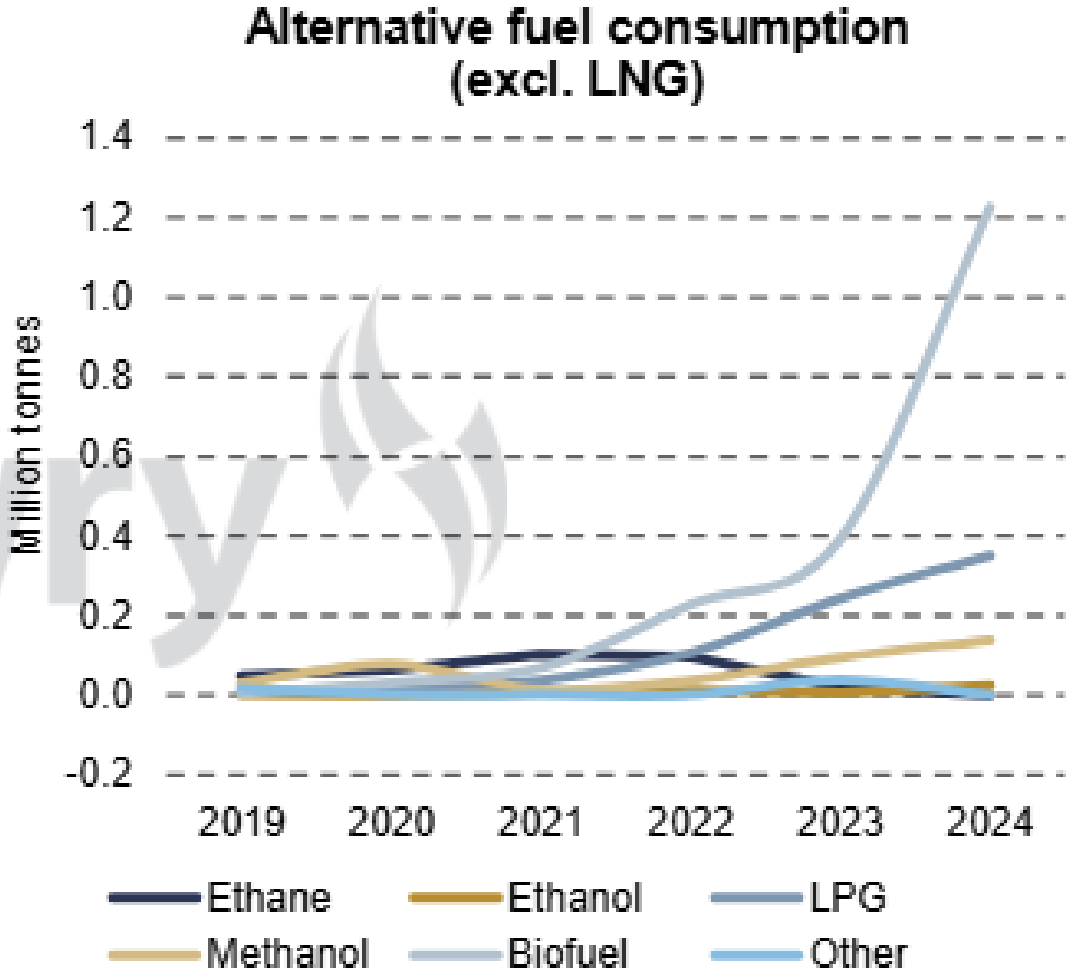


Source: IMO DCS, Drewry

Trends in fuel consumption

Biofuel was the major driver for increased consumption of alternative fuels, surpassing the 1 million tonne mark in 2024 and contributing 6.2% to the demand for alternative fuel energy. Among alternative fuels, the share of methanol has gradually increased threefold since 2019 (0.11% in 2019 to 0.34% in 2024).



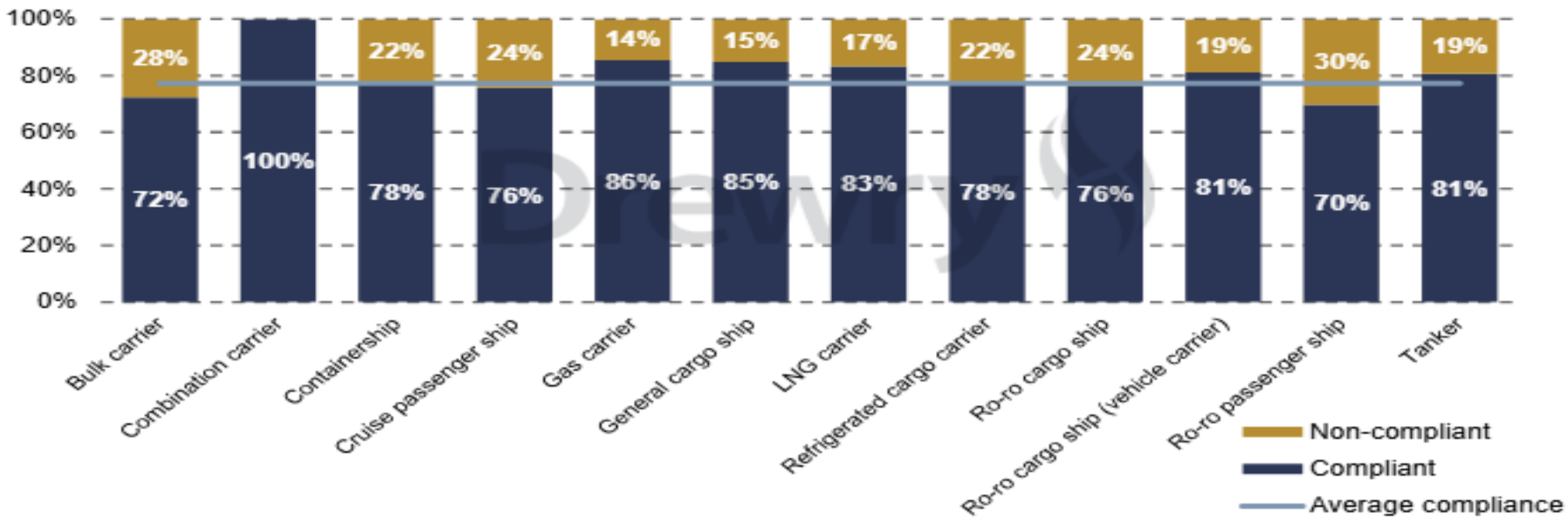


Source: IMO DCS, Drewry

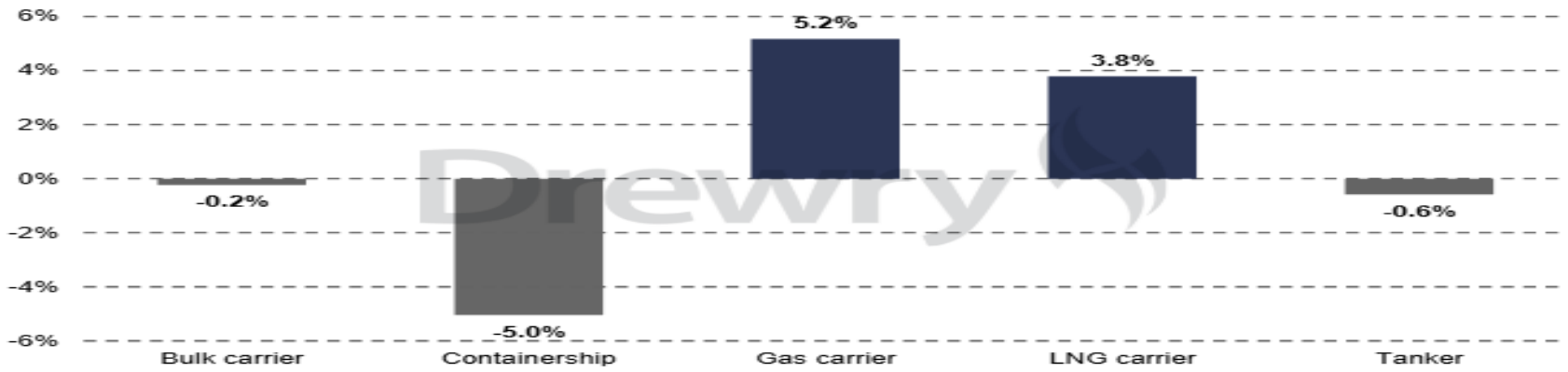
Carbon emission intensity compliance levels

With 2024 being the second year of the CII regulation, vessels were expected to implement energy efficiency measures to comply, but instead, the fleet's average compliance1 decreased 0.5% in 2024 (from 77.8% compliant vessels in 2023 to 77.3% in 2024).

Share of CII-compliant vessels (by sector)



Increase in % share of CII-compliant vessels, 2024 vs 2023



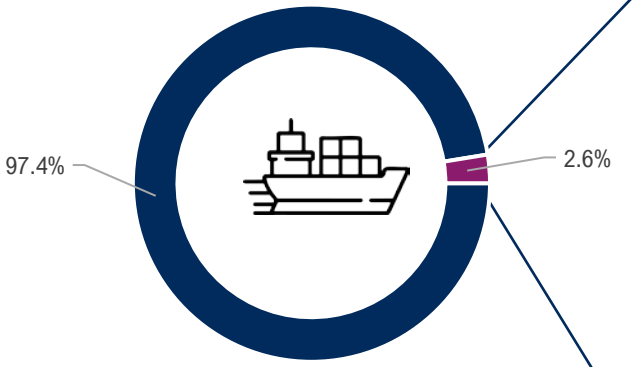
Source: IMO DCS, Drewry

Alternative fuel vessel uptake

The shipping industry is in the early stage of developing alternative fuel (AF) vessels, with only 2.6% of current ships AF-capable. Meanwhile, 24% of the orderbook for new ships (typically due to be delivered in the next 3 years) is AF-capable. LNG continues as the leading AF in the current orderbook, followed by methanol, which accounts for around 20% of AF vessels on order. Emerging fuels like ammonia are also gaining traction.

- Alternative fuel vessels
- Conventional fuel vessels

Share of alternative fuel in overall fleet (Number of vessels):



Fuel	% share	Number of vessels
Ammonia	0.1%	2
Biofuel	8.1%	157
CNG	0.2%	3
Ethane	2.3%	44
Hydrogen	0.3%	5
LNG	74.6%	1,440
LPG	8.2%	159
Methanol	6.2%	119
Nuclear	0.1%	1
Total	**100%**	**1,930**

Share of alternative fuel in overall orderbook (Number of vessels):

Fuel	% share	Number of vessels
Ammonia	3%	44
Biofuel	1%	13
CNG	0%	0
Ethane	4%	57
Hydrogen	2%	32
LNG	65%	1,026
LPG	8%	133
Methanol	18%	284
Nuclear	0%	0
Total	**100%**	**1,589**

Source: Clarksons

Why energy transition is now a port strategy issue

1 Ports as Multi-functional Nodes

- Ports are evolving from cargo gateways to multi-functional hubs enabling decarbonisation and new energy value chains

2 Policy and Regulatory Drivers

- Emerging policies mandate ports to upgrade capacity, digitalisation and security to support clean energy transitions. Eg The EU Ports Strategy mandates simultaneous expansion, decarbonisation, and digitalisation to achieve climate neutrality by 2050.

3 Electricity and Infrastructure Challenges

- Ports face grid capacity limits and economic challenges in adopting shore power, electrified equipment, harbour crafts etc.

4 Changing Land Use and Equity Issues

- Energy transition alters cargo patterns and creates funding challenges for smaller and developing country ports.

Changing demand for port facility

1 Electrification

- Ports need infrastructure readiness and commercial strategies including PPAs, renewables, and transparent tariffs to succeed. High electricity prices and grid connection delays can cause shore power projects to remain unused, risking asset redundancy.

2 Ports as Carbon Management Nodes and readiness

- Ports are becoming key nodes in carbon management through liquefied CO_2 handling and cross-border CCS logistics. Early mover ports near CO_2 pipelines and storage hubs can capture new industrial roles and growth in carbon management.

3 Low/zero carbon bunkering demand

- Early mover ports near CO_2 pipelines and storage hubs can capture new industrial roles and growth in carbon management.

Ports becoming energy hubs: alternative fuels and green corridors

1 Low-Carbon Ammonia Bunkering

- Pilbara Ports in Australia are developing ammonia bunkering hubs with infrastructure, stakeholder advocacy, and safety training.

2 Green & Digital Shipping Corridors

- Corridors like Rotterdam–Singapore aim to reduce emissions by 20-30% via sustainable fuels and efficient digital solutions.

3 Methanol Bunkering Scale-Up

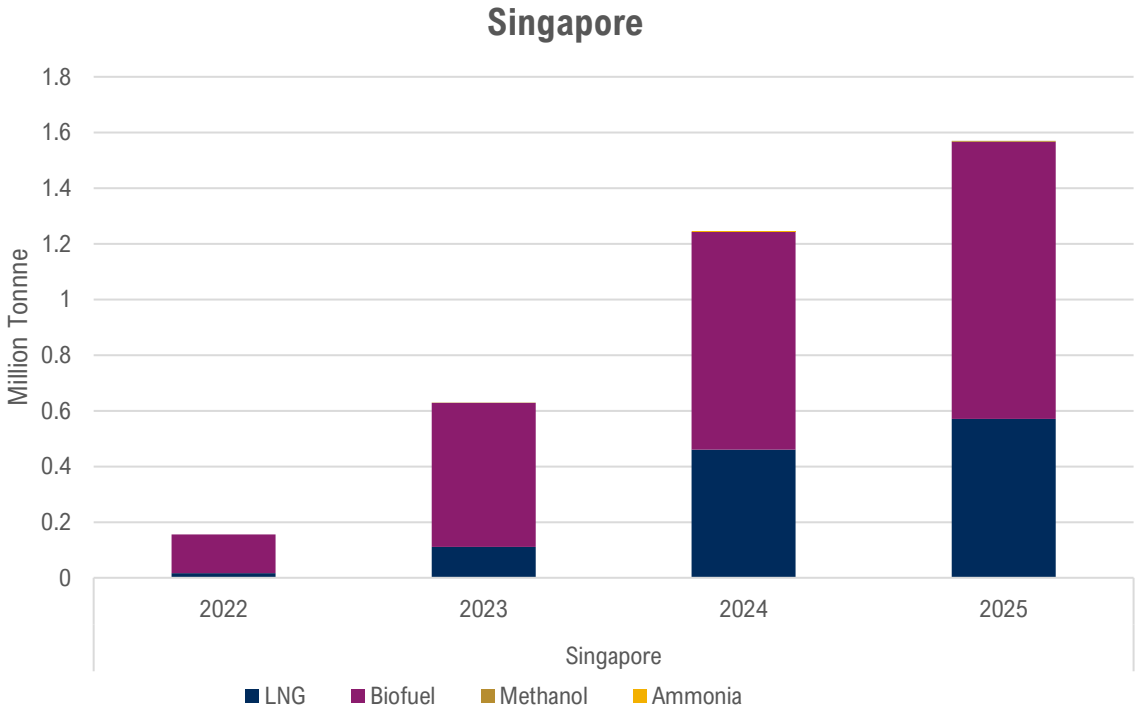
- India’s Kandla Port scales methanol bunkering to serve capable vessels using upgraded cargo handling and readiness assessments.

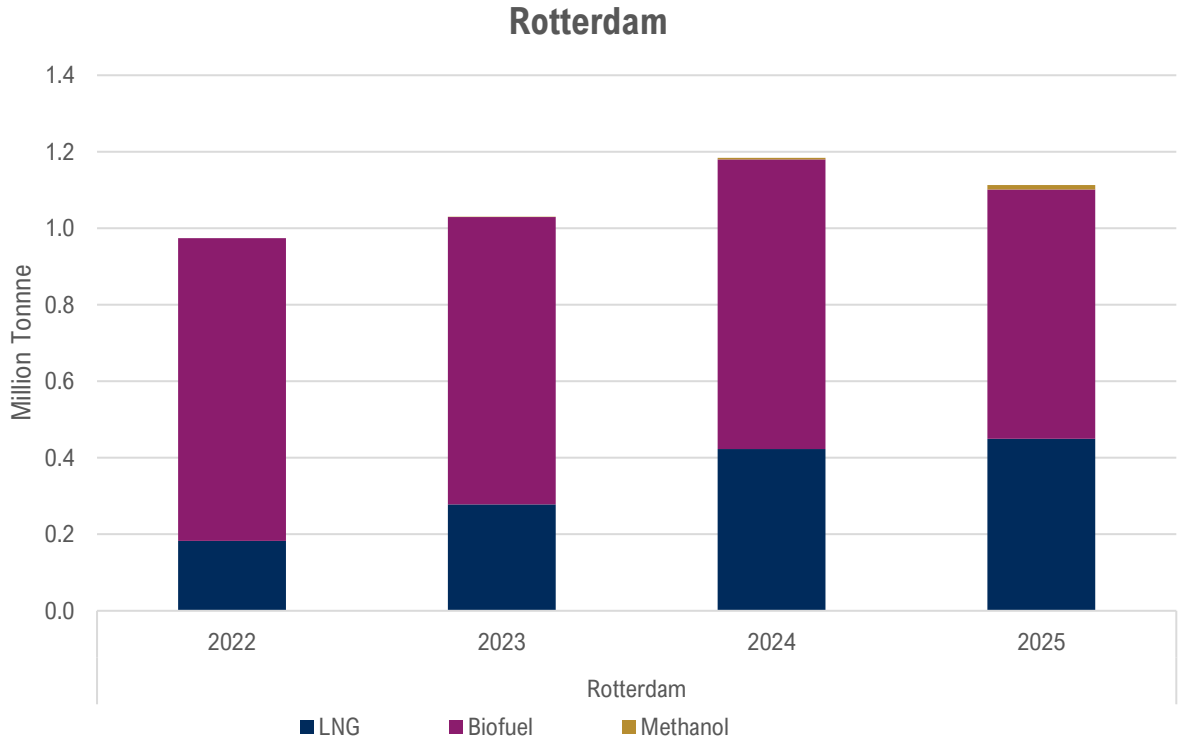
4 Multi-Stakeholder Collaboration

- Ports must build coalitions of fuel producers, shipowners, regulators, and insurers to ensure successful energy hub development.

Early action towards decarbonisation will lead to competitiveness

Alternate fuel bunker sales continue unabated despite the net-zero framework not being adopted in October 2025. The energy transition has been driven by a range of factors rather than a unilateral approach by a government/institution. Therefore, the energy transition will continue despite attempts at pushback by some countries. It is imperative for the ports to take action early to gain competitiveness.





Source: MPA Singapore, Port of Rotterdam

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Rigorous analysis – Practical advice

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Drewry

About Drewry

Drewry: Maritime Research and Consulting Services

Rigorous analysis, practical advice

01 **Drewry** is the leading international provider of research and consulting services to the maritime and shipping industry

50 Founded in **1970**: More than **50** years continuously charting and assessing the world's maritime markets

90 More than **90** FTEs and associates serving our clients from offices in London, Delhi, Shanghai and Singapore

04 We serve our clients through **four** business units:

Maritime Research Maritime Advisors Supply Chain Advisors Maritime Financial Research

The primary source of market insight, analysis and advice trusted by a global audience of maritime and shipping industry stakeholders.

Drewry

What we do

We combine rigorous analysis with practical advice

In boardrooms across the globe, decisions are made based on the analysis and insight provided by our Maritime Research teams. This rich industry knowledge and understanding provides the unique intelligence that underpins our advisory services.

RESEARCH

Maritime Research

Independent, market-leading research on every key maritime sector

Maritime Financial Research

An Investment Research Service on listed companies operating in the industry

ADVISORY

Maritime Advisors

Expert project-based advisory services to the shipping industry and financial institutions

Supply Chain Advisors

Ocean freight procurement support and cost benchmarking services to global retailers and manufacturers

A SPECIALIST THAT COMBINES **RICH MARKET INSIGHT** WITH **EXPERIENCE** AND **EXPERTISE**

What we do

Our combination of sector knowledge, rich market insight and commercial awareness enables us to deliver the performance, profitability and competitive advantage our clients seek.

Drewry

Independence	Heritage	Market Insight	Sector Expertise
Our voice is our own and is not defined by others	A trusted brand for 50 years	Rich insight – unrivalled market intelligence	Industry knowledge

The primary source of market insight, analysis and advice trusted by a global audience of maritime and shipping industry stakeholders.

Ports and Terminals Capabilities

Drewry provides expert advice to Financial Institutions, Port Authorities, Terminal Operators, and Governments covering the full spectrum of commercial and technical aspects of ports and terminals. Our team includes industry professionals, economists and technical experts who together bring rich experience and practical understanding of the global ports industry.

The global Ports and Terminals team provide strategic, commercial and technical advisory services. Our rich industry knowledge and expertise are complemented by the practical, hands-on experience of our advisors.

For every project, we take care to craft a bespoke package that focuses on your core objectives and commercial needs whilst answering the fundamental project-specific questions you may have.

Whether commissioning our commercial advisory team to provide **strategic analysis, commercial due diligence** or **market analysis**, you can rely on our independence and rigour to provide sound professional advice. We can provide an in-depth assessment of the chara**cteristics, dynamics and trends of the port market**, conduct **customer analysis** or **evaluate the port's competitive environment** to help you overcome challenges or realise asset opportunities. Given the breadth and depth of experience across the team, we are well placed to support both strategic goal setting and business planning processes.

Drawing on our extensive in-house databases we can help you assess the impact of liner **network strategy**, vessel upsizing and the development of key trade lanes within the ports and terminal sector.

Our approach to **financial modelling** and **forecasting** utilises our rich market intelligence and analysis, producing models that reflect the unique competitive environment in which your asset resides. The advisory team can provide volume, revenue, B/S, P&L, cash flow forecasts and asset valuations. This work can also support **investment and divestment appraisals**, which can advise on market entry strategies and financial return projections.

Our in-house technical experts, who are port engineers, are also able to support the feasibility and **pre-feasibility studies** as well as offer **technical due diligence** and asset risk services. This combination of technical and commercial expertise ensures a consistent and coordinated approach, whilst providing an independent view of the asset infrastructure, key material risk and capacity expansion plans.

Strategic and commercial

- Commercial due diligence
- Market analysis and outlook
- Strategic analysis and planning
- Asset risk analysis
- Investment and divestment appraisals
- Competitive assessments
- Feasibility and pre-feasibility studies
- Concession design
- Bid process support
- Financial modelling
- Tariff assessments and structures
- Maritime policy
- Network analysis

Operational and technical

- Capacity assessment, capacity bottlenecks and expansion assessment
- High level assessment of technical risks of project
- Maintenance strategy review and repex strategy review
- Capex review
- Opex review
- Lenders Technical Advisor, Vendor's Technical Advisor, Buyer's Technical Advisor

Project Experience: Philippines

Project: Vessel Ownership Study

Client: Filipino conglomerate

Description: The client is engaged in the import of dry bulk products. In this regard the client was interested in dry bulk vessel acquisition.

Project: Philippines ferry due diligence

Client: Private Equity firm

Description: Drewry conducted commercial due diligence on behalf of Hong Kong based private equity firm. It involved assessment of fleet deployment, tariff and revenue assessment and future prospects of the company.

Project: Philippines Ropax technical due diligence and valuation

Client: Private Equity firm

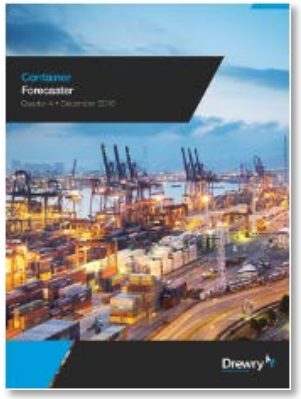
Description: Drewry was entrusted with the technical due diligence of 10 Ropax vessels trading within the coastal waters of the Philippines. Besides technical due diligence Drewry representative also conducted physical inspection of five assets. In addition, Drewry was also asked to conduct valuation of all the assets. As a conclusion, Drewry also proposed areas of improvement after acquisition of the target.

Project: Shipping market entry

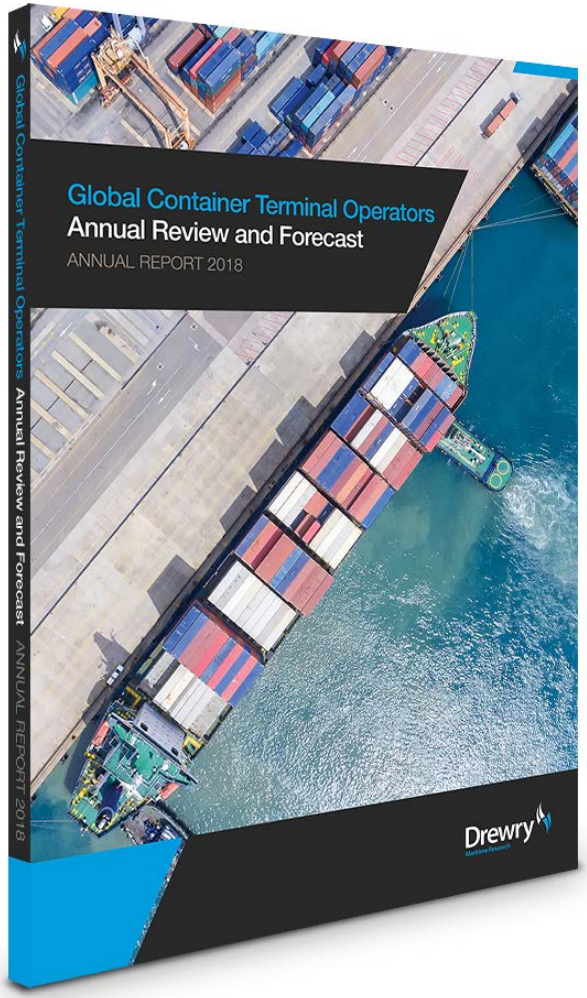
Client: One of the largest diversified companies

Description: The client had plans to enter into shipping market in order to ensure supply chain security. Drewry conducted the study covering demand, supply, earnings and asset values analysis. It also included market entry strategy.

Drewry Maritime Research Reports cover all shipping sectors

Sample Reports		Overview	Key Content
	**Ports and Terminal Insight** Annual Subscription Quarterly updates Monthly supplements	Drewry's quarterly appraisal of the global ports sector	• Spotlight thought leadership section: • Analysis of liner service and port call trends. • Analysis of quarterly container port throughput trends on a region by region basis • Summary and explanation of selected new port projects and concessions. • Comparative analysis of the financial performance of 11 stock market listed terminal operators.
	**Container Forecaster** Annual Subscription Quarterly updates Monthly supplements	Drewry's quarterly appraisal of the container shipping market. Detailed analysis and 5 year forecasts	• World container trade and regional port volumes forecasts • Global supply and demand outlook • Trade route supply and demand analysis • Global and East-West trade freight rate forecasts • Carrier profitability analysis • Charter market and sales & purchases

Annual Review of Global Container Terminal Operators



One of the most detailed assessments of the global container ports and terminals market, with unrivalled coverage and depth of insight, analysis and commentary.

Key areas of analysis covered by this long-standing Drewry 'annual' include:

- Global container terminal industry structure
- League tables and performance of global/international terminal operators
- Detailed analysis of operator strategies, portfolios and risk profiles
- Forecast capacity by terminal operator to 2022
- Port industry financial analyses
- Individual analysis of 33 terminal operators and investors
- Regional "top 10 owners/operators" analysis
- Terminal supply / demand forecasts for 20 world regions to 2022

This market defining annual report has become something of an "industry bible". Used not just within the port and shipping industry but also further afield by banks and financial institutions. It provides a level of quality and depth of analysis not available elsewhere.

Intra-Asia Container Market Insight

Keep up to date with the vast Intra-Asian container shipping markets

Provides insights into trade route fundamentals, port performance and liner fleet strategies, both at the aggregate level as well as for each of the 15 sub-trade routes that connect the six key sub-regions: Greater China, North, South and Southeast Asia, the Middle East and Oceania:

The service comprises of 5 sections:

1. **SUMMARY:** Monthly summary providing detailed analysis of a topical market 'theme' or development.
2. **INTRA-ASIA CONTAINER INDEX:** a weighted average of regional spot container freight rates (updated fortnightly).
3. **TRADE ROUTE ANALYSIS:** Powered by our proprietary AIS feeds to provide accurate estimates for effective capacity and demand development for each trade route and spot rate data from CFRI
4. **CARRIER ANALYSIS:** Identify the main carriers by trade lane and their vessel deployment strategies.
5. **PORT PERFORMANCE ANALYSIS:** Provides essential port-related metrics and port call performance to understand pre-berth waiting and berthing time development at sub-region and for each leading port within sub region.

Key Features:

- Online-only service via **Drewry OnDemand** platform
- Updated monthly
- Analysis/commentary in English and Mandarin
- Download data within tables to Excel
- Historical time series from Jan 2019

FURTHER INFORMATION WITHIN EACH SECTION

- 5 metrics for Trade Route Analysis: supply, demand, utilisation, freight rates, and HHI
- 5 Carrier Analysis metrics: market shares and capacity shares by trade route, Floating capacity per operator, Number of voyages per trade route.
- 5 regional Port Performance metrics for throughput, congestion, vessel calls by vessel size, port call performance and port productivity.

Container Capacity Insight

Port congestion, freight rates and cancelled vs scheduled sailings

- Weekly assessment of global container capacity and cancelled vs scheduled sailings on the following four main trades routes for the next 5 weeks:
  - Transpacific Eastbound, Asia-North Europe & Mediterranean, South Asia-North Europe & Mediterranean, Transatlantic Westbound
- Global map of the container market forecasts for the next month (capacity and spot rate fluctuations, as well as cancelled vs scheduled sailings) for main E-W trade lanes
- Effective capacity and 'Ease of access to capacity' indicators for the main trade routes
- Port congestion and import container dwell time trend analysis at selected ports
- Average CO2 emissions and the most eco-friendly carrier on the major E-W routes
- Download example report

SUMMARY FEATURES

- Annual subscription
- Interactive online service via Drewry Container Freight Portal: view demo
- Weekly PDF Insight reports and ZIP file of full data set
- Accompanying each weekly report includes detailed data sets covering:
  - List of the cancelled vessels, including name of the ships, capacity, operator and routing.
  - Weekly cancelled and scheduled sailings for the next 5 weeks.
  - Year-on-year monthly cancelled sailings by trade lane and alliance

Powered by Drewry AIS

- Cancelled vis scheduled sailings and effective capacity for the next 5 weeks
- Monthly year-on-year effective headhaul capacity broken down by alliance and trade lane
- Monthly year-on-year cancelled sailings broken down by alliance and trade lane
- Port congestion and transit times
- Utilisation trend on major E-W routes
- Average CO2 emissions and best performing carrier on major E-W routes

BENCHMARKING CLUB PACKAGE

Preferential pricing available to CFRI/BMC subscribers.

Drewry Benchmarking Club

Exclusive, shipper-only, freight cost benchmarking user group

- Complete ocean freight cost benchmarking solution, all rate benchmarking services accessed via Drewry's new Container Freight Portal
- Gives members visibility and detailed cost saving advice to respond to price volatility, prepare for carrier negotiations and track spend through a powerful and easy to use online interface
- Access to container **contract and spot market rates**, unique freight rate forecasts, indices, comprehensive market assessments and industry best practice intelligence

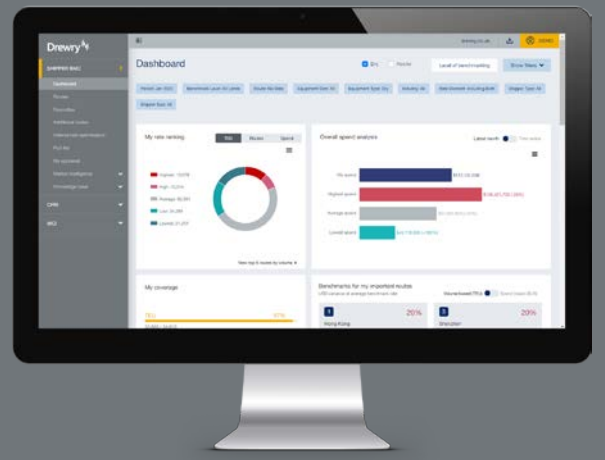
MEMBERSHIP BENEFITS

- Secure the best rates in the market and reduce spend
- Understand short, medium and long term market developments
- Market intelligence at your fingertips
- Understand procurement best practices to maximise efficiencies
- Gain internal stakeholder support and approval
- Determine whether the bids you receive in your Bid Events / Tenders are in-line with the market

FAST FACTS

125	Countries
900+	Ports
15,000	Port pairs
~125	Exclusive shipper members
5m	TEU per annum
$8.5bn	Spend per annum

"Confidentially benchmark your shipping costs and service agreements against your peers."



"We selected Drewry's Benchmarking Club to benchmark our ocean rates with other retail industry leaders and to gain insight into container shipping market trends, forecasts and best practices.."

Global electronics and home entertainment brand

CONFIDENTIALITY ASSURED

All contract rates and conditions remain confidential. Only aggregate freight rate data is shared amongst club members.

