Moving the Marine Economy

The Energy Transition and Shipping

Marine Money Dubai

6th March 2024

Moving the Marine Economy

March 2024

Agenda

Contact Details

Tim Smith

Director

tim.smith@msiltd.com

1. A Decade of Disruption (so far...)

Disruption (1): 2020

COVID-19: global pandemic

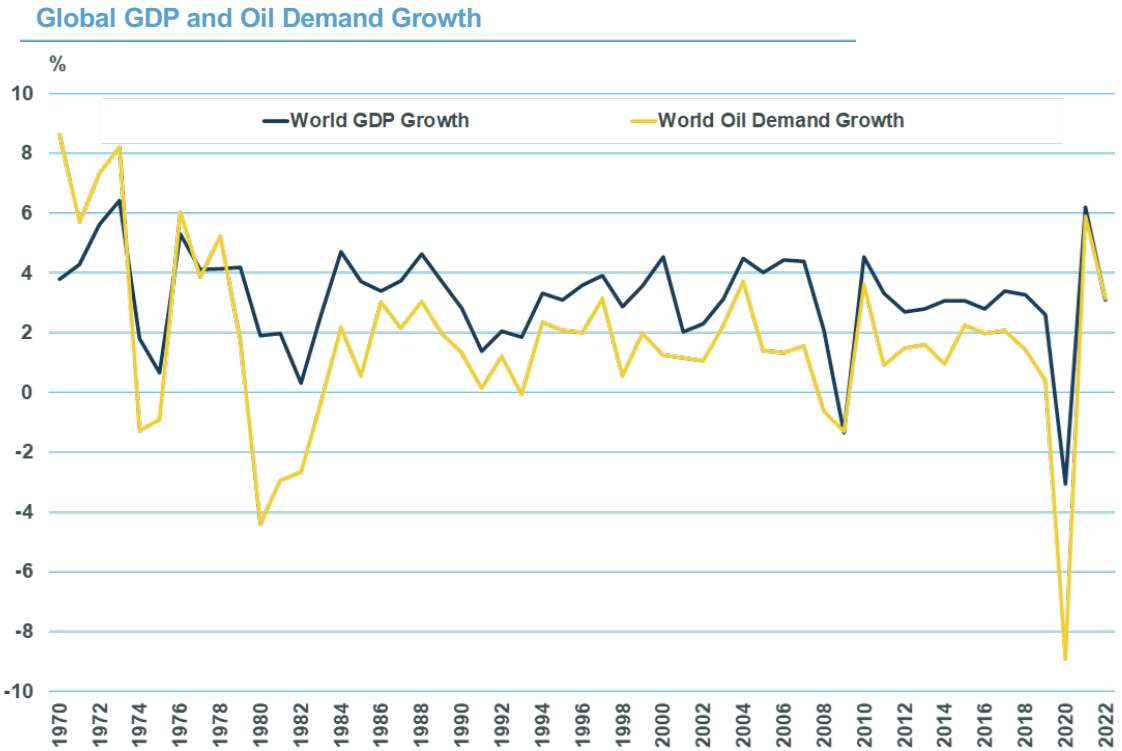
Disruption

Energy Transition

Marine Economy

Fuel and Propulsion

- The 2020s have been characterised by major disruptions to shipping markets, starting with the COVID-19 pandemic
- Unlike typical recessions, which tend to be uniformly bad for shipping demand, the COVID-19 pandemic had varying impacts
- Some shipping markets, such as containerships, saw massive profits which, in the form of a huge orderbook, still influence markets today



Disruption (2): 2022

Ukraine invasion: trade maps redefined

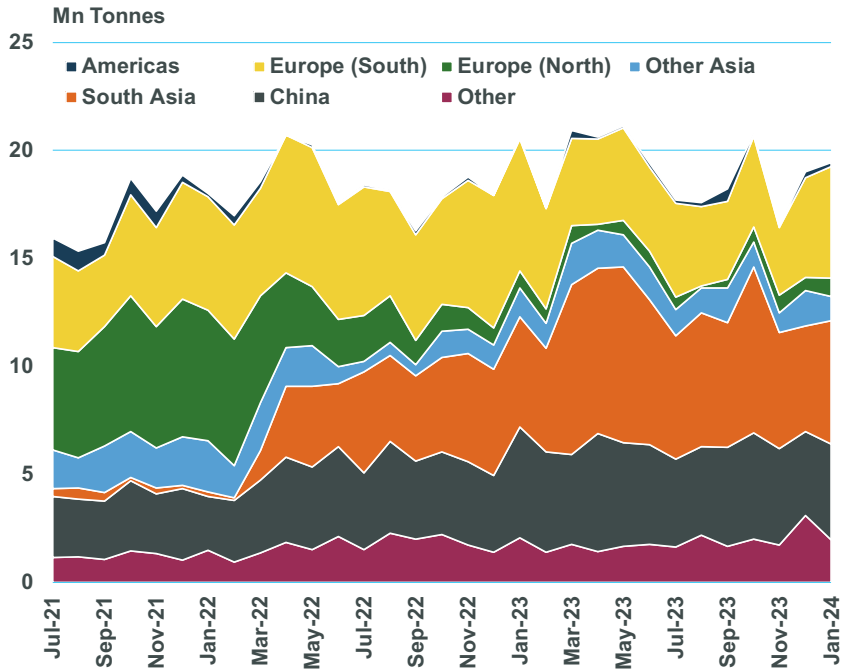
Disruption

Energy Transition

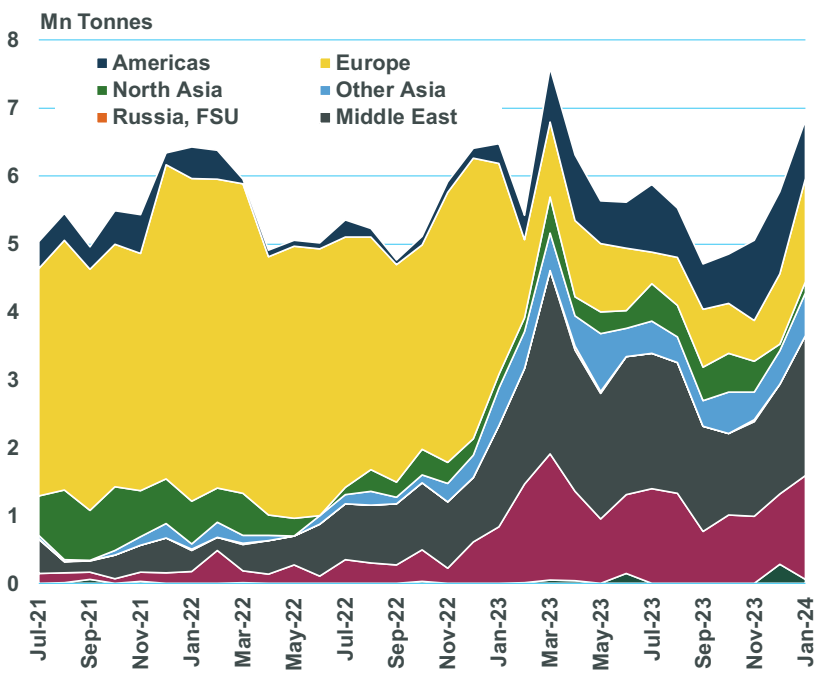
Marine Economy

Fuel and Propulsion

Russian Seaborne Crude Oil Flows by Importer



Russian Seaborne Clean Product Flows by Importer



Disruption (3): 2023

Suez Canal/Red Sea: vessels re-routed

Disruption

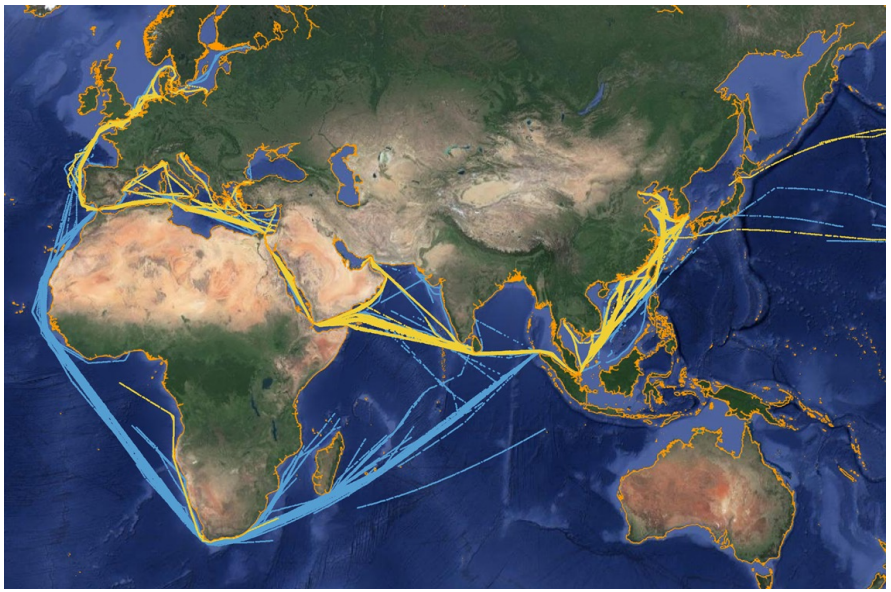
Energy Transition

Marine Economy

Fuel and Propulsion

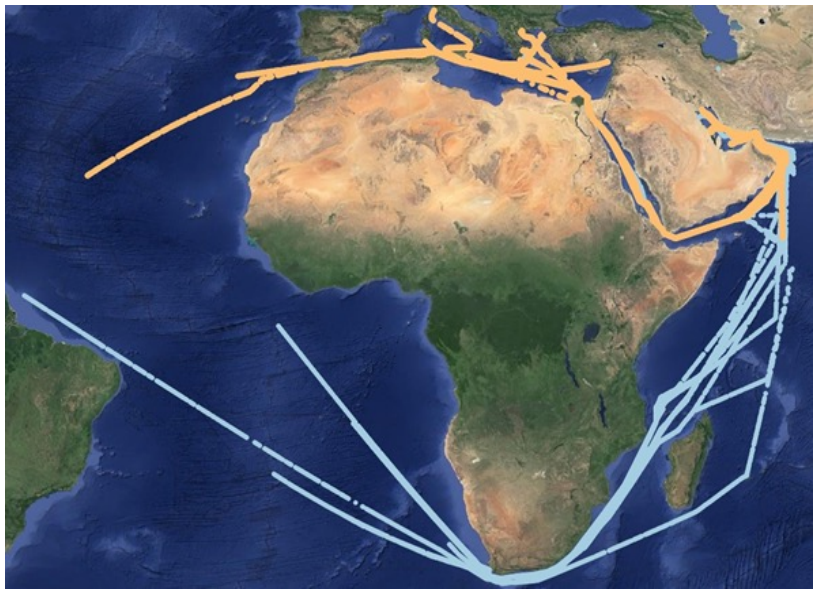
Asia – Europe: Containership Movements

Final Week Dec 23 vs Final Week Sep 23



Middle East – West: Crude Tanker Movements

Jan 24 vs Dec 23



2. The Energy Transition

Energy as shipping demand

'Structural' changes to demand will matter more than economic or geopolitical events over the lifetime of an asset

Disruption

Energy Transition

Marine Economy

Fuel and Propulsion

Global Final Consumption

What – fuel type

Disruption

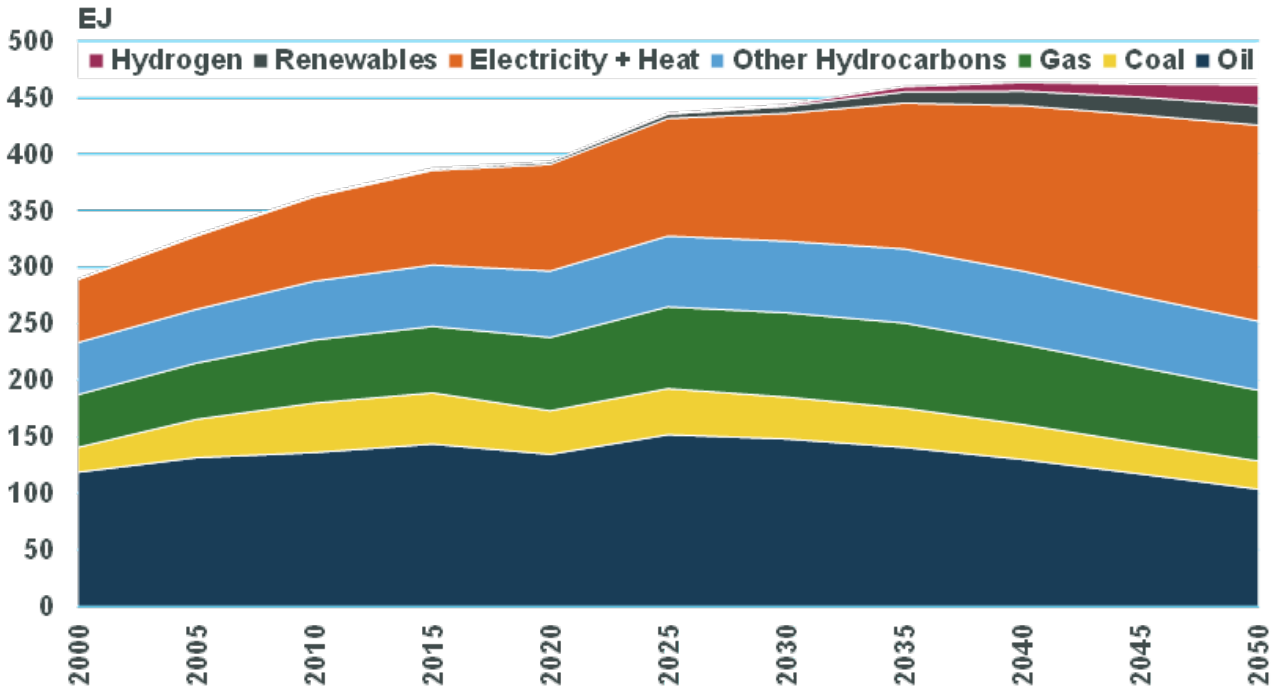
Energy Transition

Marine Economy

Fuel and Propulsion

- Looking at global final consumption of energy (use at the point of consumption), several key themes are evident in our global outlook.
- Firstly, the share of hydrocarbons will decline, dropping from about 75% currently, to just over half by 2050. Overall end-use hydrocarbons is expected to peak around 2030, but will remain a large part of the global energy mix by 2050.
- Electricity use will continue to grow in both absolute terms and market share through the forecast.
- In turn this will require significant increases in, and changes to, electricity generation to meet this requirement in an increasingly sustainable way.

Final Consumption – Fuel Type



Electricity

Global final use and power generation

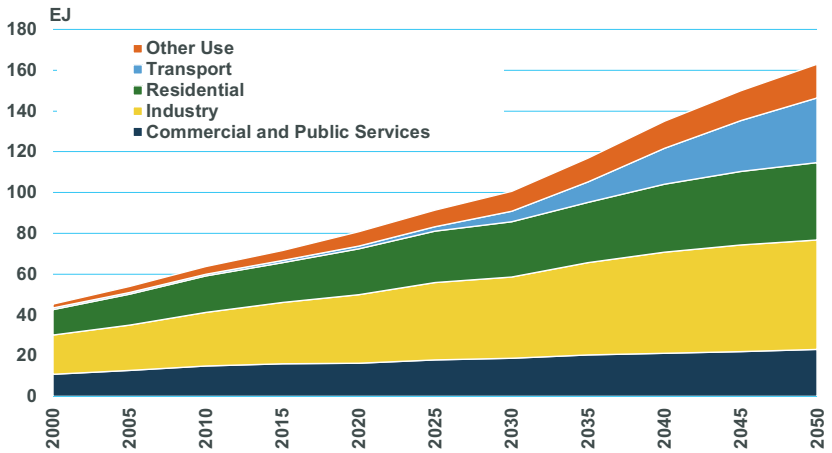
Disruption

Energy Transition

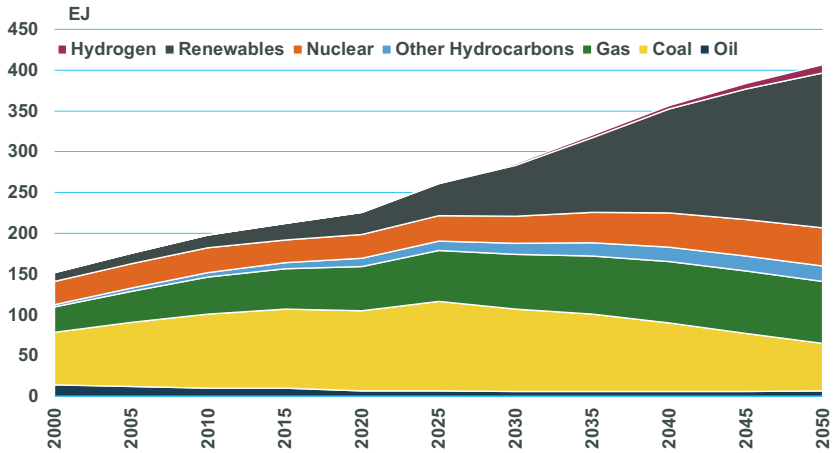
Marine Economy

Fuel and Propulsion

Electricity Final Consumption by Use



World Power Generation by Fuel Type



Overview and Outlook

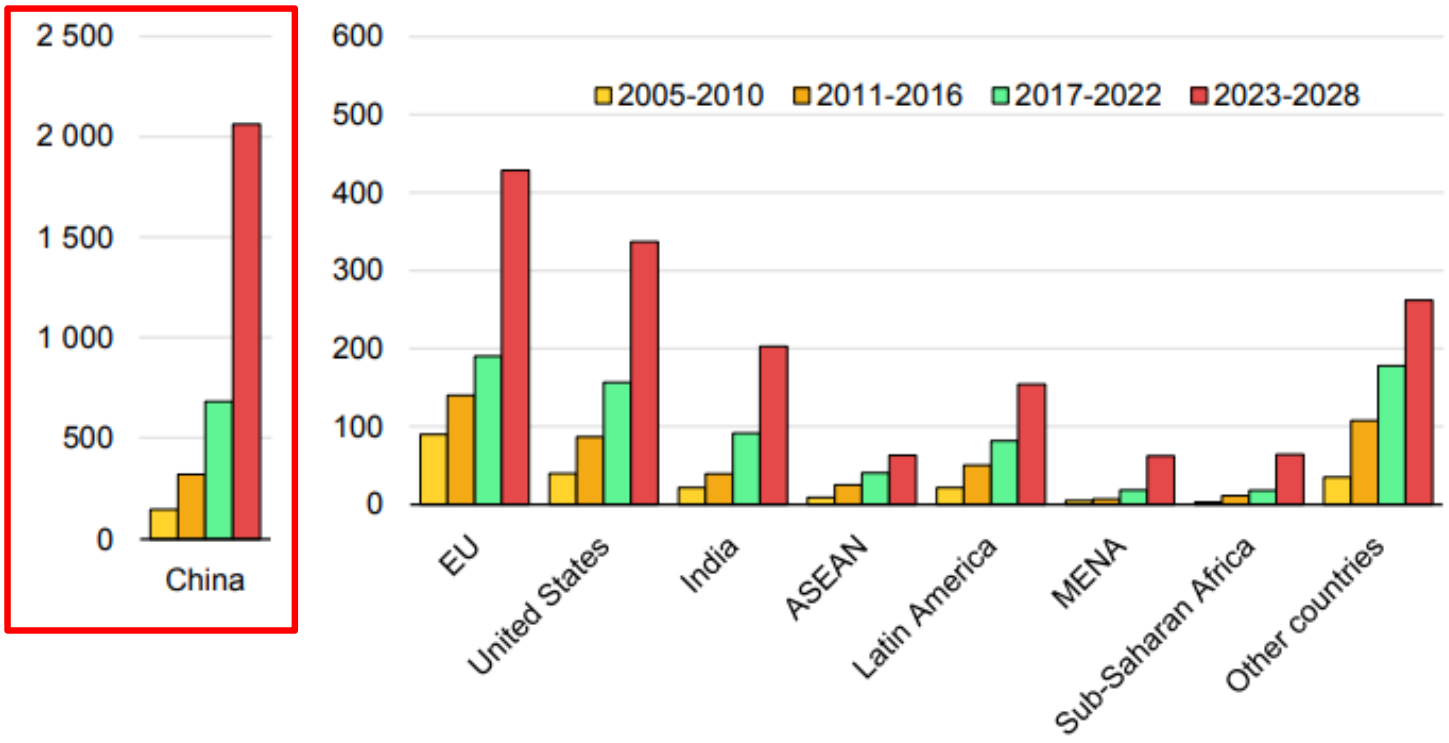
- Electricity demand is forecast to grow rapidly over the forecast, with final demand effectively **doubling** from current levels by 2050 to about 160 EJ
- The strongest delta will be in transportation
- Currently transport demand accounts for relatively little final consumption of electricity, which is dominated by industry and residential usage
- Vehicle electrification will increase transport's share of global electricity demand change. By 2030, transport is forecast to account for 5% of global electricity demand, rising to 19% by 2050
- Electric vehicle (EV) sales increased by 31% yoy in 2023. Fully electric or battery electric vehicles (BEVs) comprised 9.5 Mn of the 13.6 Mn EVs
- Increasing electricity demand requires growing power generation capacity. We expect renewables to drive growth as traditional sources, particularly coal, decline

* BEV+PHEV vehicles, source: Rho Motion

Renewable electricity capacity

China is on a different scale to other regions

Renewable Electricity Capacity (GW, source: IEA)



Regional Dynamics

China

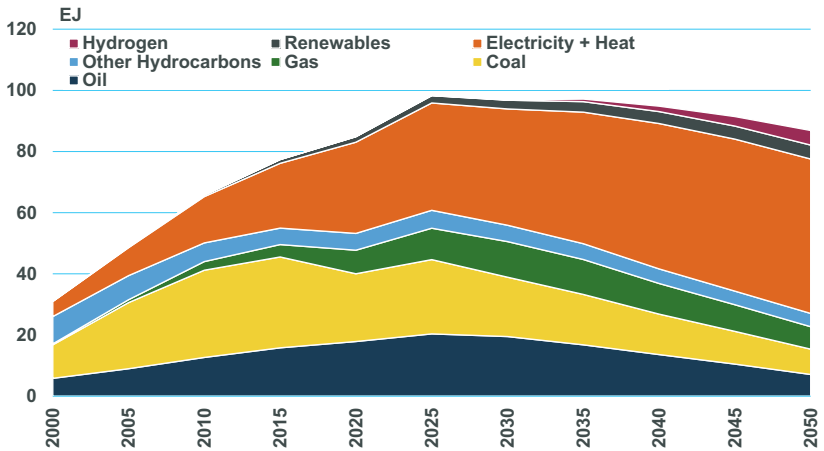
Disruption

Energy Transition

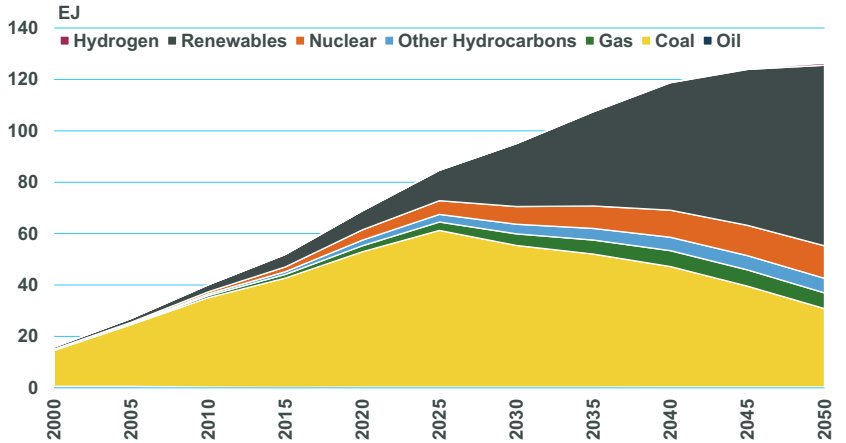
Marine Economy

Fuel and Propulsion

Final Energy Consumption



Electricity Generation



Overview and Outlook

- China's final energy consumption is forecast to plateau in the second half of this decade, trending lower in the latter part of the forecast period. Electricity will comprise the majority of China's final energy consumption, by 2050
- Coal and oil consumption are expected to lose their share's in China's final energy consumption
- At COP28, China confirmed its ambitions to reach a peak in carbon emissions before 2030. China is by far the largest carbon emitter, exceeding the US, EU and India combined.
- China also has by far the largest solar and wind power capacity.
- Projections for China's renewable energy growth are strong, and will account for over half of China's electricity generation by 2050, up from a projected 14% in 2025. Over the same period, coal power generation will drop from 72% to 24%.

Regional Dynamics

Middle East

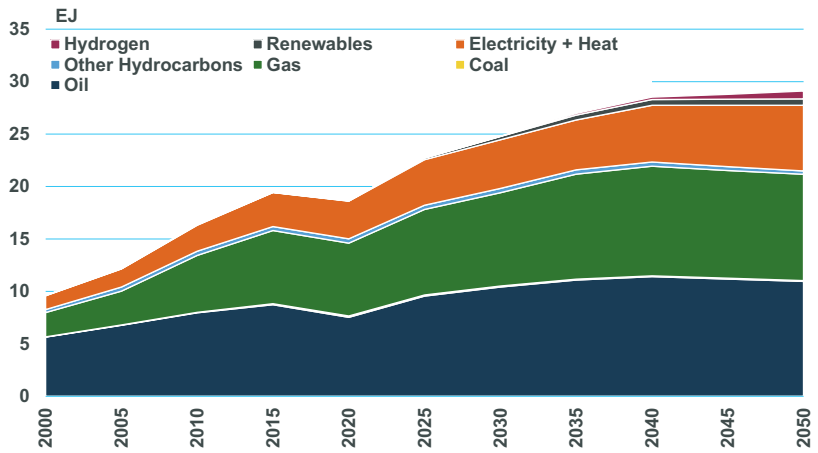
Disruption

Energy Transition

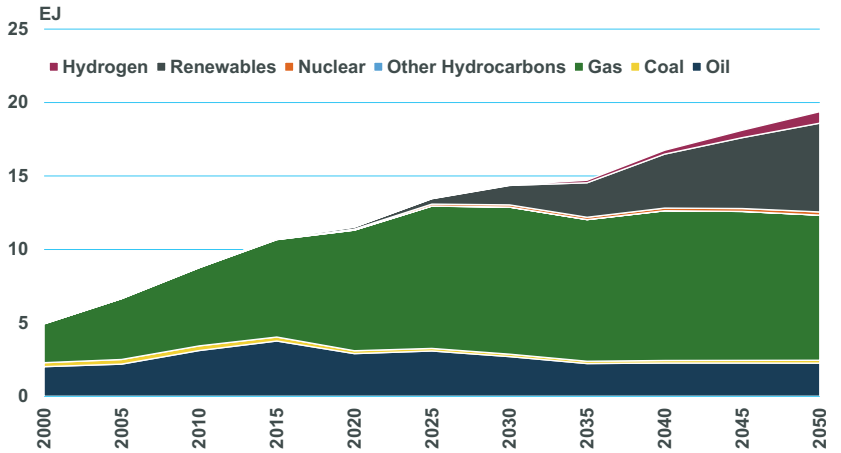
Marine Economy

Fuel and Propulsion

Final Energy Consumption



Electricity Generation



Overview and Outlook

- The Middle East sees total final energy consumption grow at 1% p.a. between 2025-2050. The overall share of oil and gas sees relatively little change, dropping from 78% in 2025 to 75% by 2050. The Middle East's abundant hydrocarbon production streams clearly plays a role in sustaining hydrocarbon demand.
- In power generation, the change in the mix is more pronounced with significant increase in renewables to meet growing electricity demand. This is coming from a low base, but will be driven by solar as well as wind. Saudi Arabia is the largest solar operator in the region. At the Saudi Green Initiative Forum at COP28, Saudi officials stated an aim for balancing electricity production equally between gas and renewables by 2030.
- In the UAE, Emirates Nuclear Energy Corporation (ENEC) announced in December 2023 that the final unit, Unit 4, of the Barakah nuclear energy plant was complete. Under construction since 2012, once operational ENEC say that the plant will provide 25% of the UAE's electricity needs.

Middle East

Energy investment

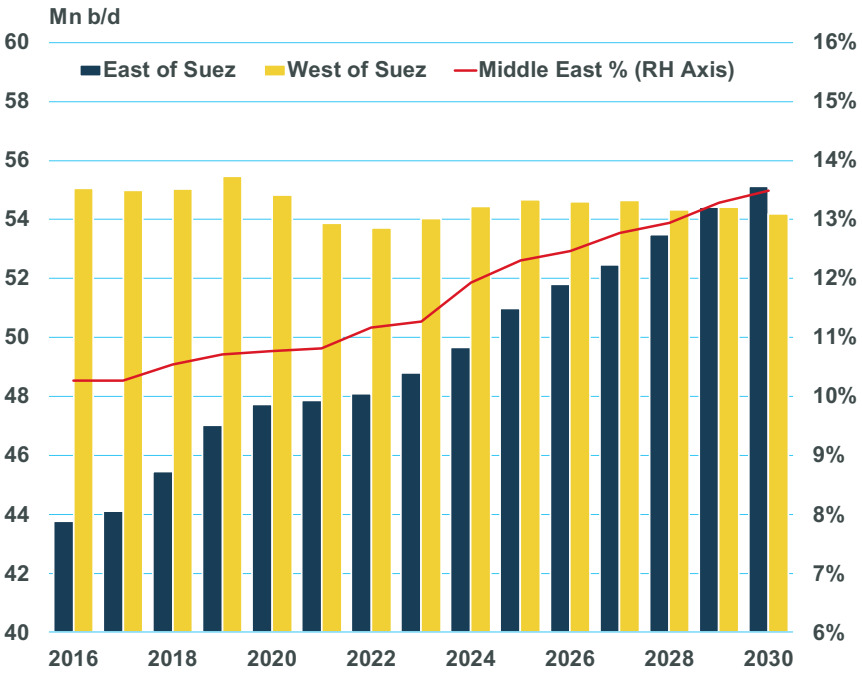
Disruption

Energy Transition

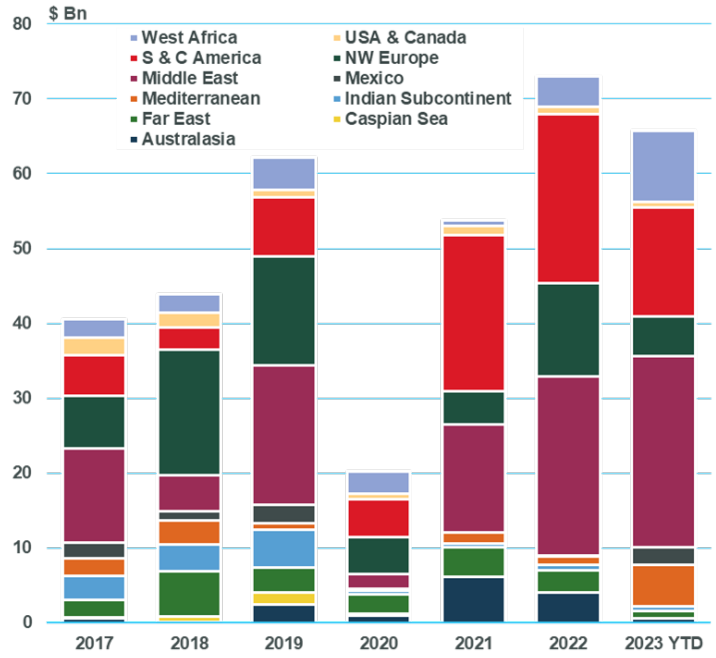
Marine Economy

Fuel and Propulsion

Refinery Capacity



Offshore O&G Project Awards



Energy Outlook

New on MSI HORIZON

Disruption

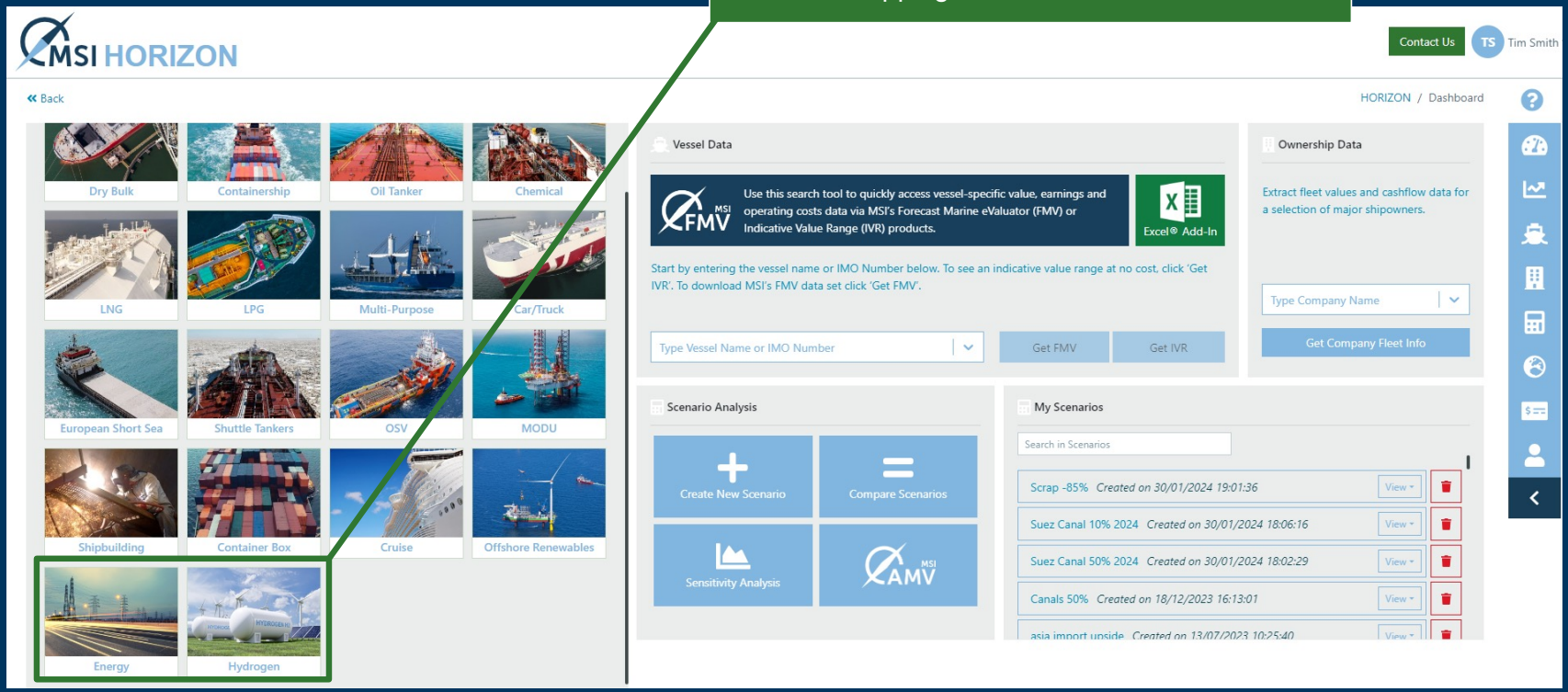
Energy Transition

Marine Economy

Fuel and Propulsion

MSI has added Energy and Hydrogen content to the **HORIZON** platform, including reports, data and forecasts

These projections also feed into MSI forecasts for individual shipping sector demand



MSI HORIZON is a comprehensive shipping market platform providing data, analysis, forecasts, simulation and asset earnings and price projections across all major shipping and marine sectors

3. Global Cargo – Trends in Trade

Seaborne Trade

‘Conventional’ Liquid Markets

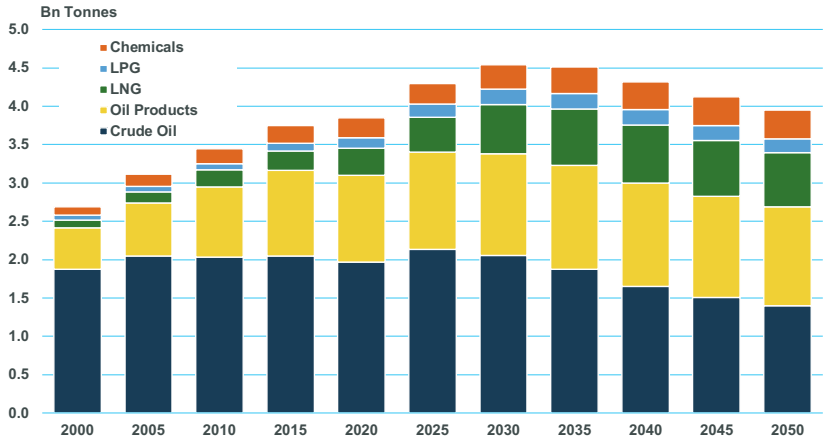
Disruption

Energy Transition

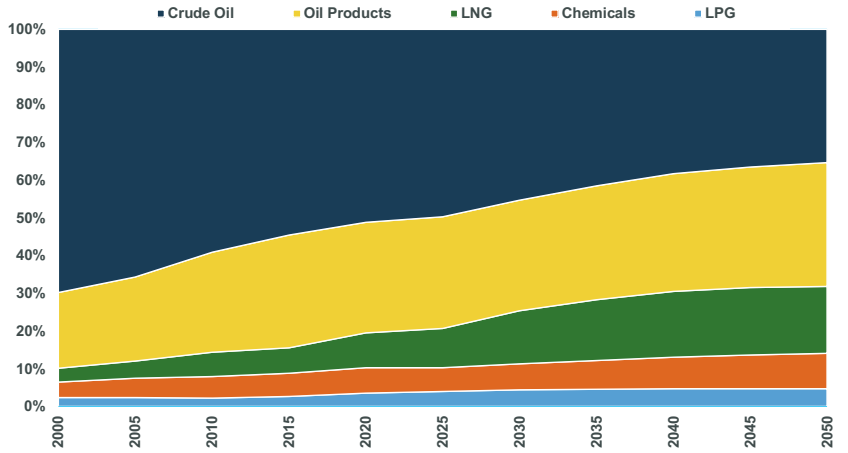
Marine Economy

Fuel and Propulsion

Cargo Volume – ‘Conventional’ Liquids



Cargo Share – ‘Conventional’ Liquids



Overview and Outlook

- Focusing on liquids markets, including oil, gas and chemical cargoes, we expect to see an overall peak in volumes by 2030, with a decline thereafter.
- The drop is not precipitous, partly because changes in cargo volumes won’t be perfectly aligned with end user volume changes.
- Crude oil sees the largest drop, falling by 35% between 2025 and 2050. Its share of liquids cargo drops to 35%, from about half currently.
- Seaborne products trade proves more resilient as a combination of oil demand growth driven by demographic trends and more limited electric vehicle expansion in regions such as Africa meets a lack of refinery capacity development. This is augmented by growing refinery capacity in producing regions (such as the Middle East) and the potential for refinery capacity/demand mismatch in regions with declining oil demand (e.g. US, Europe), which will potentially either support products imports or provide additional capacity for exports.
- Gas and chemical cargoes will continue to see substantial growth into the 2030s, increasing their share of liquid bulk shipping markets

Liquid vs. Dry

Commodity components

Disruption

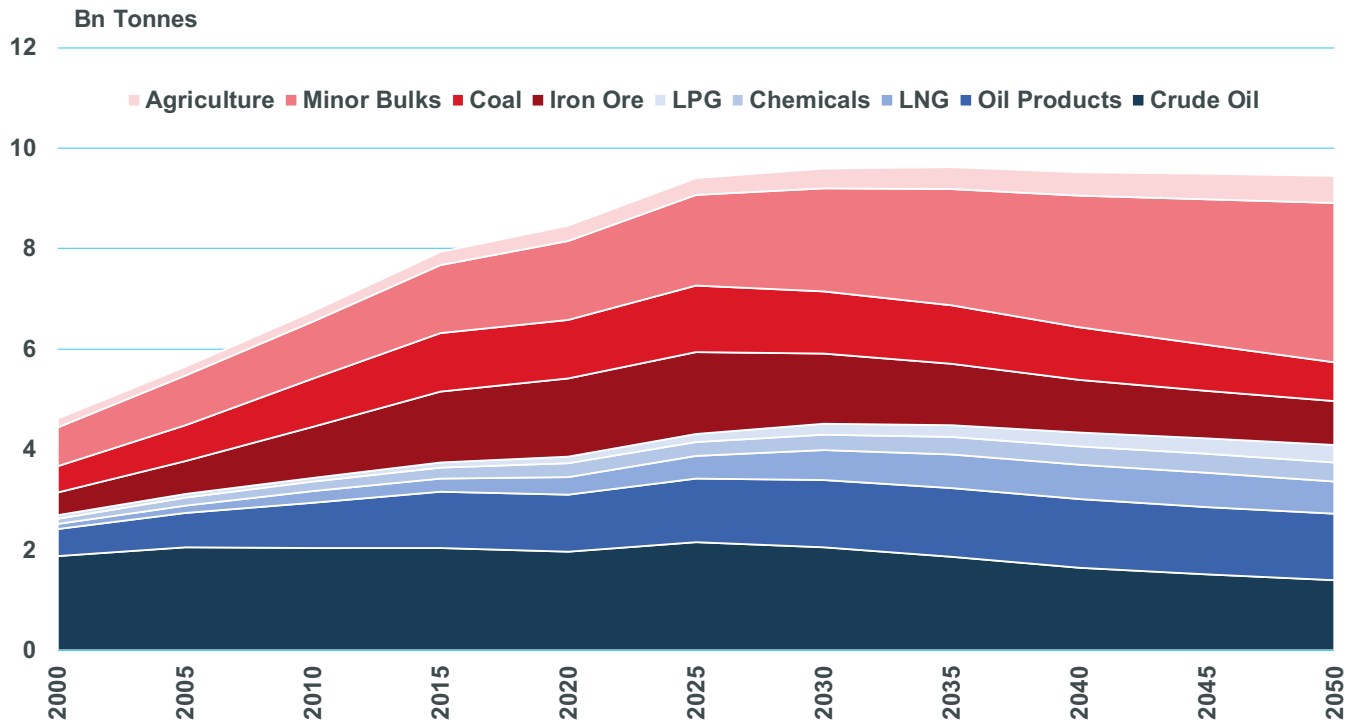
Energy Transition

Marine Economy

Fuel and Propulsion

- Overlay Dry Bulk cargoes (red) with liquids (blue)
- Overall volume plateaus in 2030s
- Major changes in components
- Dry bulk market shifts from iron ore and coal, to 'minor bulks'
- Agriculture hold minority but growing share
- Minor bulk cargo growth driven by a wide range of cargoes including direct reduced iron (DRI), agri-bulks, minor ores, minerals, fertilisers, scrap steel

Liquid (Blue) vs. Dry Bulk (Red) Seaborne Cargoes



New Markets

Offshore wind

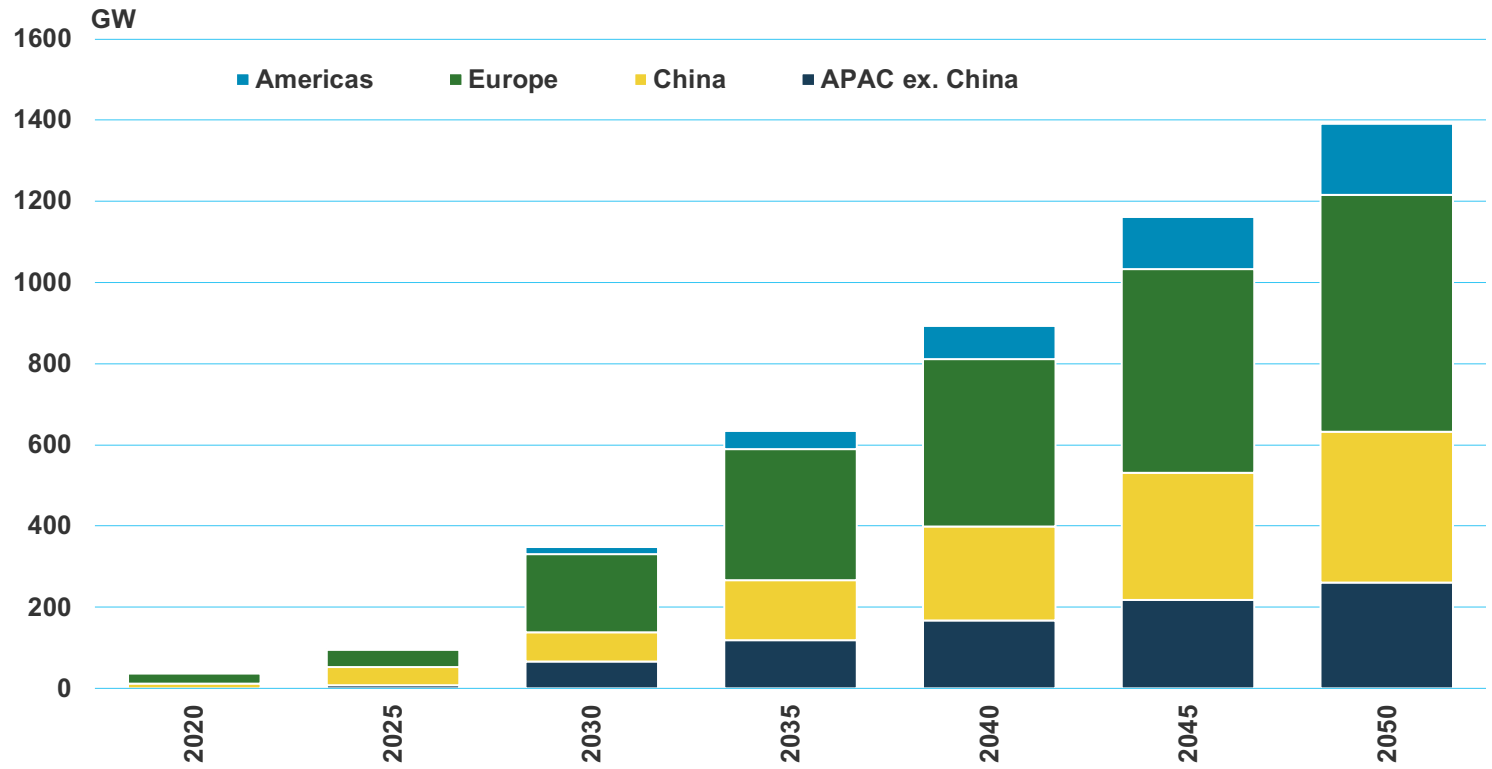
Disruption

Energy Transition

Marine Economy

Fuel and Propulsion

Offshore Wind Capacity



New Markets

Hydrogen economy

Disruption

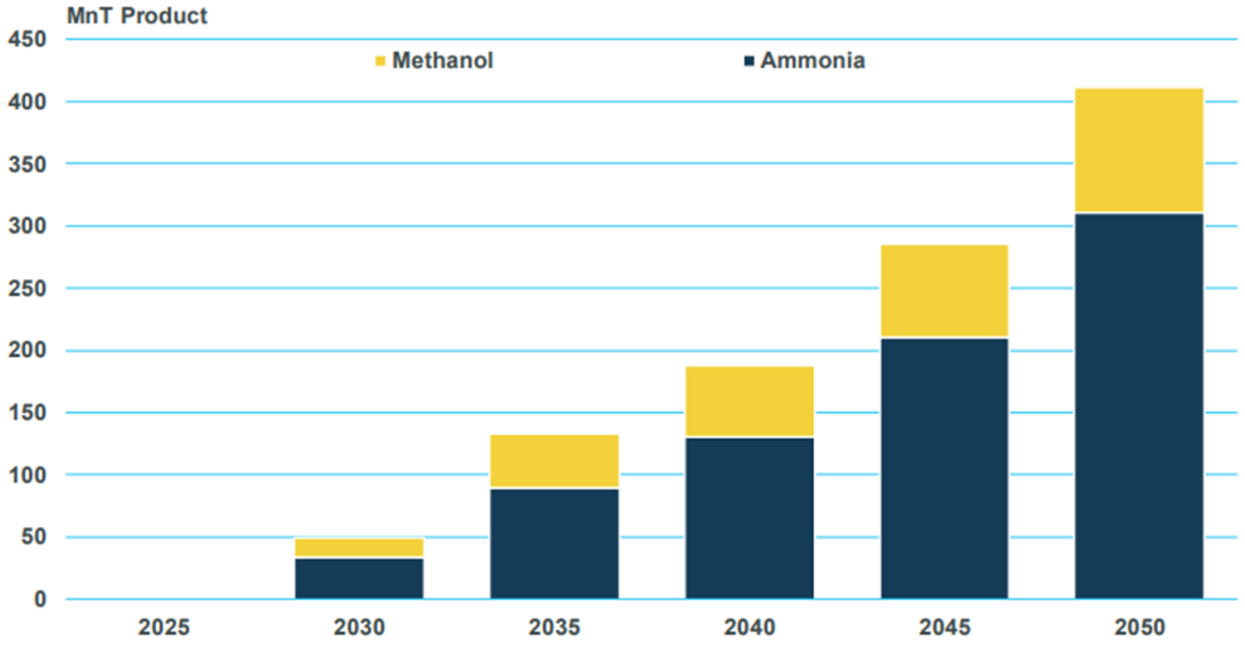
Energy Transition

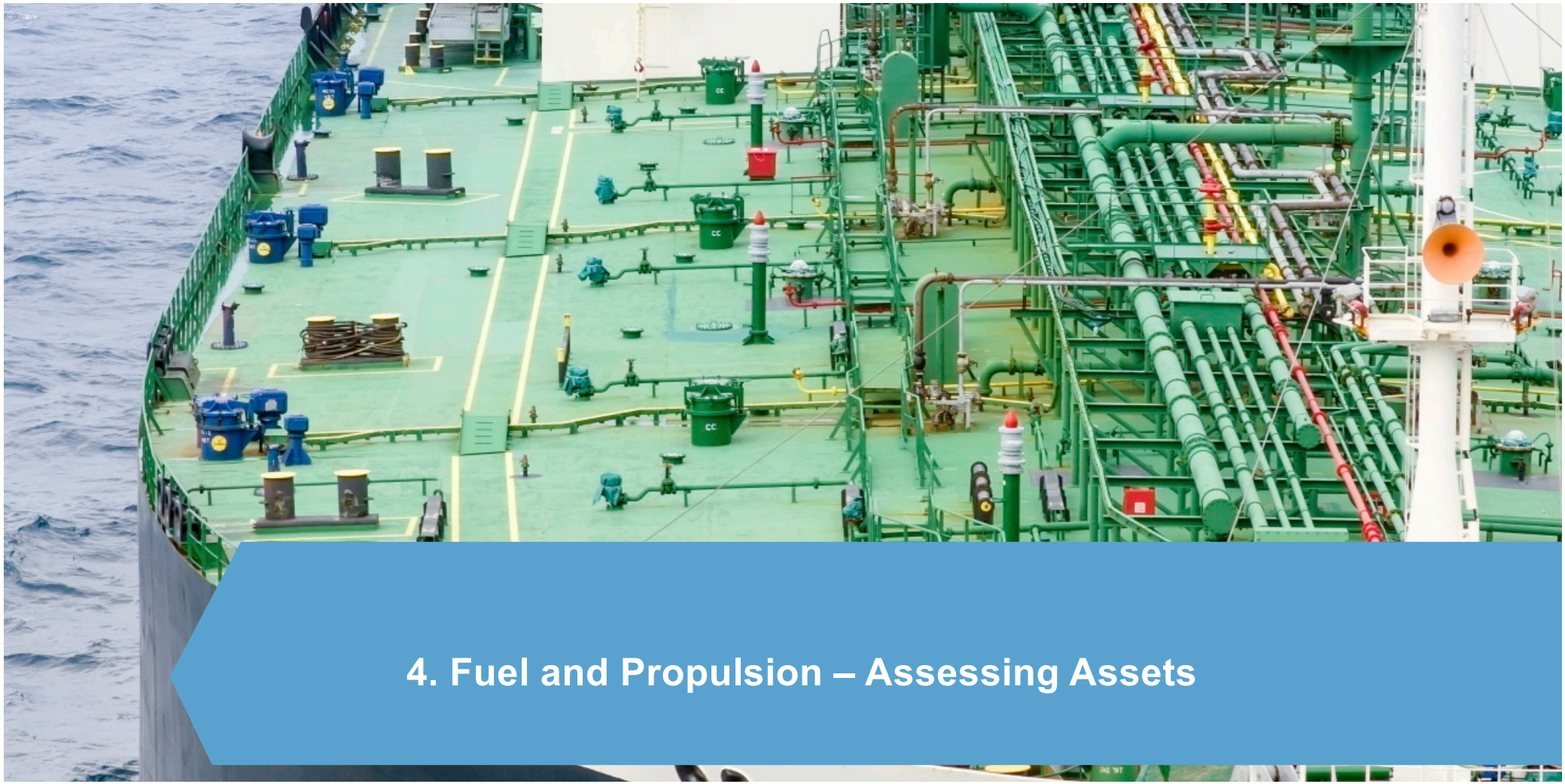
Marine Economy

Fuel and Propulsion

- MSI has developed new modelling capability to assess the future potential for the global hydrogen economy and its implications for the shipping industry, both as cargo and fuel.
- There is a widespread assumption that, in the first instance, ammonia and methanol will be the 'hydrogen carriers' produced from clean hydrogen.
- The ammonia industry, which has been focused on fertilizer production, will transform to one driven by energy markets. Future volumes of clean ammonia are set to dwarf the existing grey trade. The nascent industry is anticipated to achieve clean exports in the region of 34 MnT by 2030, and over 300 MnT by 2050.
- Our modelling indicates a surge in green ammonia seaborne trade from 2030 to 2050, driven by the Middle East and South Asia. By 2050, these two regions are positioned to supply the market with over 78 MnT of green ammonia, accounting for just under one-third of exports.

Methanol and Ammonia Cargo





4. Fuel and Propulsion – Assessing Assets

Future Fuel for Shipping

Moving in the right direction

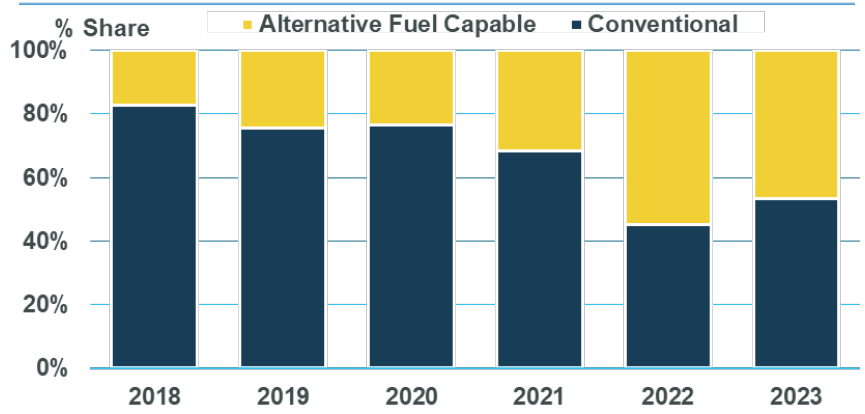
Disruption

Energy Transition

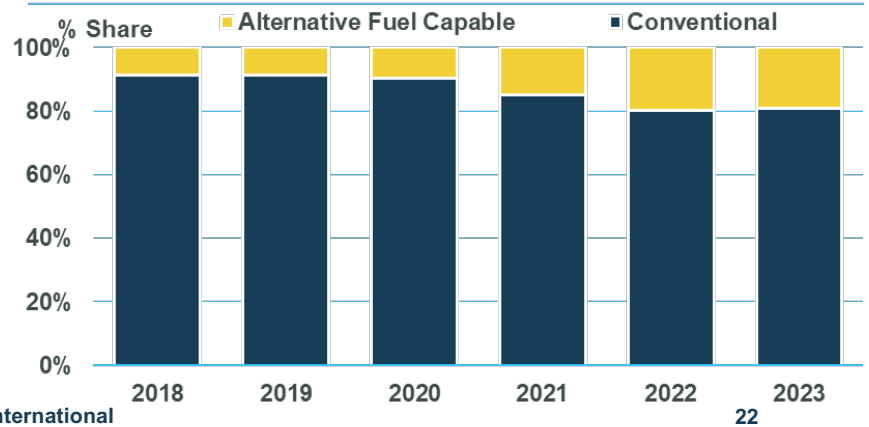
Marine Economy

Fuel and Propulsion

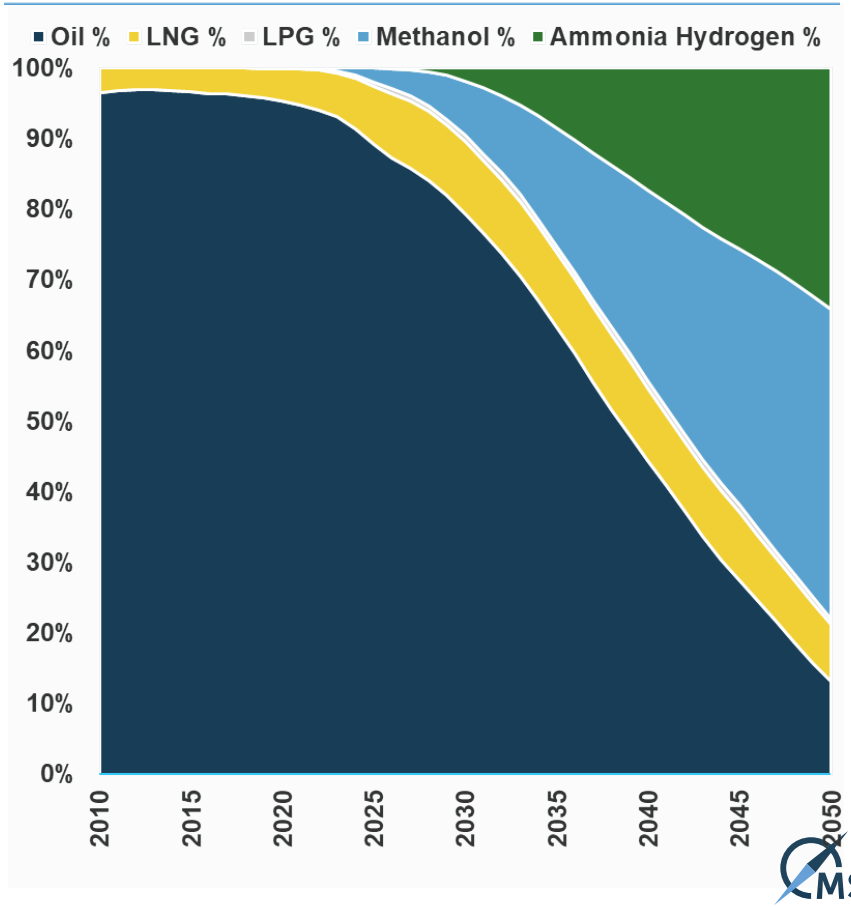
Dual Fuel Orders - MnGT



Dual Fuel Orders - # of Vessels



Future Fuel Demand



MSI FMV

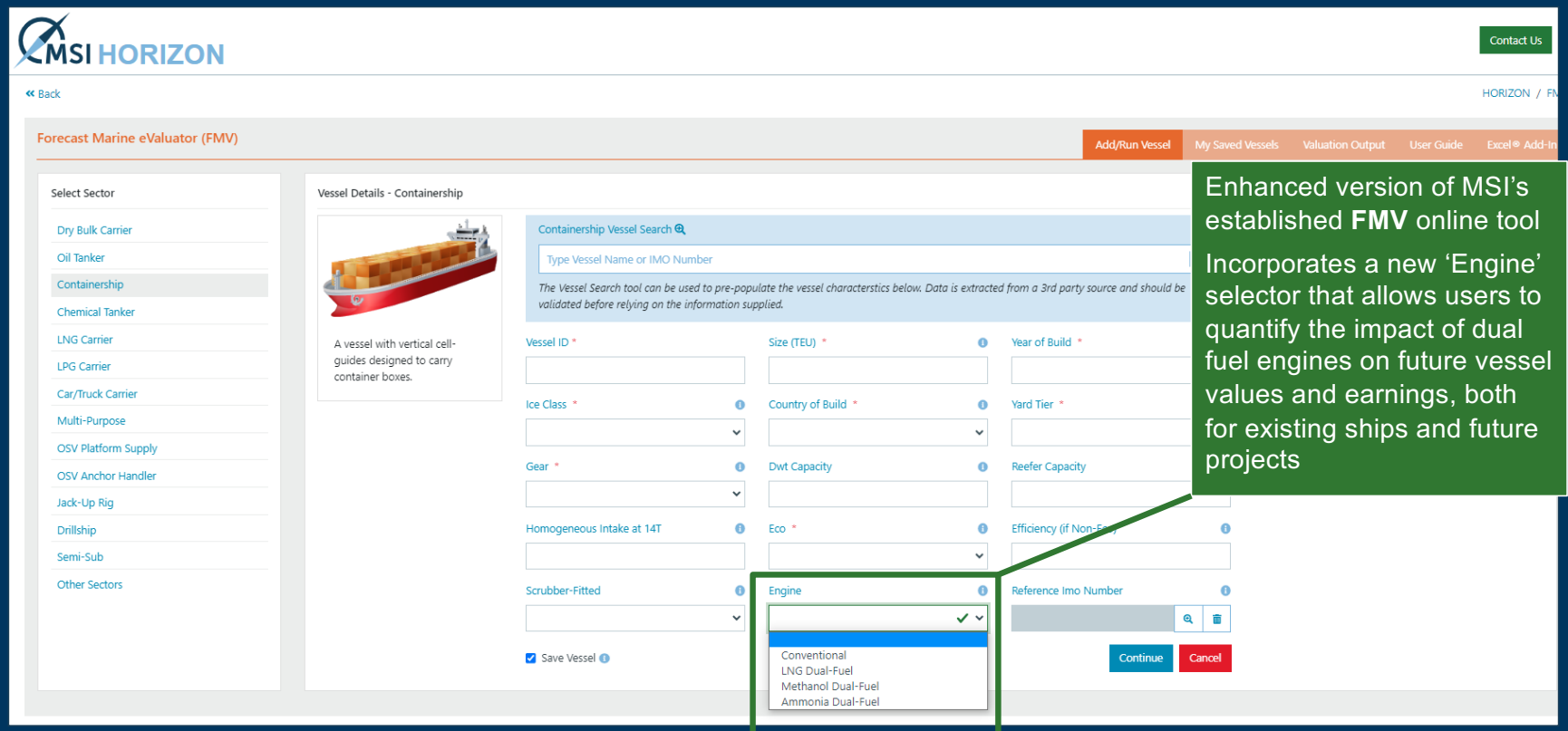
Enhanced capabilities for future fuels

Disruption

Energy Transition

Marine Economy

Fuel and Propulsion

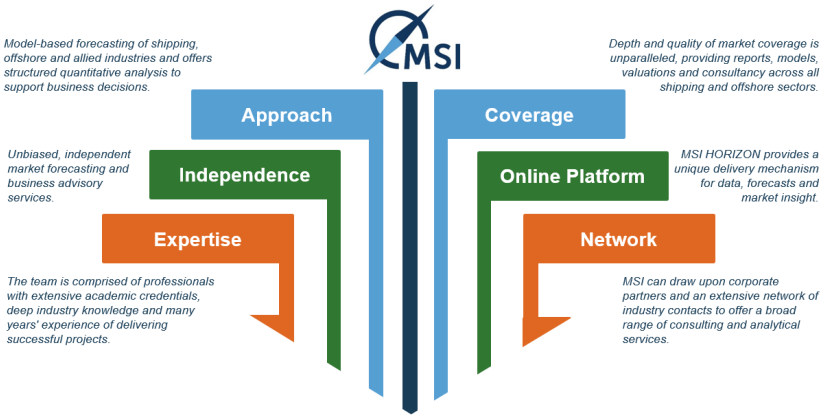


Forecast Marine eValuator (FMV) is MSI's leading vessel valuation and earnings forecast tool, available on MSI HORIZON

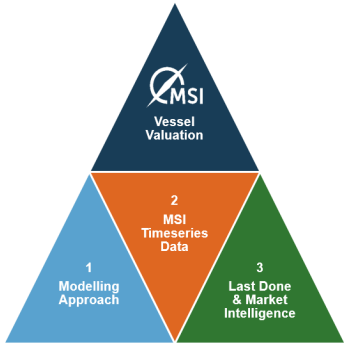
Introduction to MSI

Boutique maritime consultancy offering forecasts, modelling, data, asset valuation and strategic advisory services

MSI's Strategic Advantage



Current and Forecast Asset Valuations



MSI independent valuations are derived by applying a meta-analysis approach using:

1. MSI's proprietary econometric modelling processes and algorithms developed over the last 25+ years
2. Vessel benchmarked and analysed in relation to MSI published timeseries data
3. Vessel directly compared to last done sales and current market intelligence on likely sale candidates and prices.

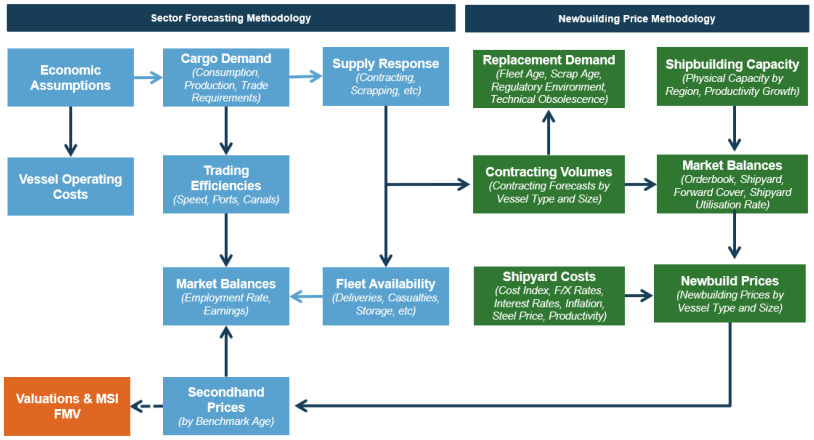
MSI's valuation services include:

- Certificated spot valuations
- Vessel forecasts (value, earnings, nb price and opex)
- Charter attached valuations
- Option price valuations
- Forecast value sensitivity and stress testing
- RVI support including soft value, forced value, recessionary value, cautious plausible value, 1 in 100 value etc.
- Historical value development and static age data
- Valuation briefing notes
- Valuation reports
- Expert witness/Expert testimony

MSI is a member of:

Baltic Exchange Baltic Expert Witness — A Baltic Exchange Association

Forecasting Models (All Marine Markets) & Market Reports



Advisory Services

1. How do the Company's assets and market position benchmark against MSI's forecasts?
2. Is there a clear strategic vision for the development of the business?
3. Does the market, customer and competitor analysis in the Business Plan align with MSI's assessment?
4. Does the market, customer and competitor analysis in the Business Plan align with MSI's assessment?
5. What external stakeholders will influence the business plan's success or failure?
6. Are the financial projections realistic considering MSI's forecasts?
7. What are the key enablers for success and where do the key risks and considerations lie?

- Based on the results of the analysis, MSI will review the Company's existing business plan to assess:
  - Viability relative to external market conditions
  - Feasibility based on the Company's likely ability to deliver upon it
- The review will focus on the following factors:
  - Market- related
  - Financial
  - Organisational structure
  - Office locations
  - Operating cost benchmarking
  - Overhead costs
  - Management team experience
  - Business development process
  - Opportunity red flag report

MSI Background and Disclaimer

For over 35 years, MSI has developed integrated relationships with a diverse client base of financial institutions, ship owners, shipyards, brokers, investors, insurers and equipment and service providers.

MSI's expertise covers a broad range of shipping sectors, providing clients with a combination of sector reports, forecasting models, vessel valuations and bespoke consultancy services.

MSI's team is comprised of professionals with extensive academic credentials, deep industry knowledge and many years experience of delivering successful client projects.

MSI balances analytical power with service flexibility, offering a comprehensive support structure and a sound foundation on which to build investment strategies and monitor/assess exposure to market risks.

Contact Us

Maritime Strategies International Ltd

24 Southwark Bridge Road
London SE1 9HF
United Kingdom

Tel: +44 (0)207 940 0070

77 Robinson Road
#31-01 Robinson 77
Singapore 068896

Tel: +65 8754 3450

Email: info@msiltd.com