

# Energy Supply Chain Issues

A Maritime Perspective

Keith Letourneau

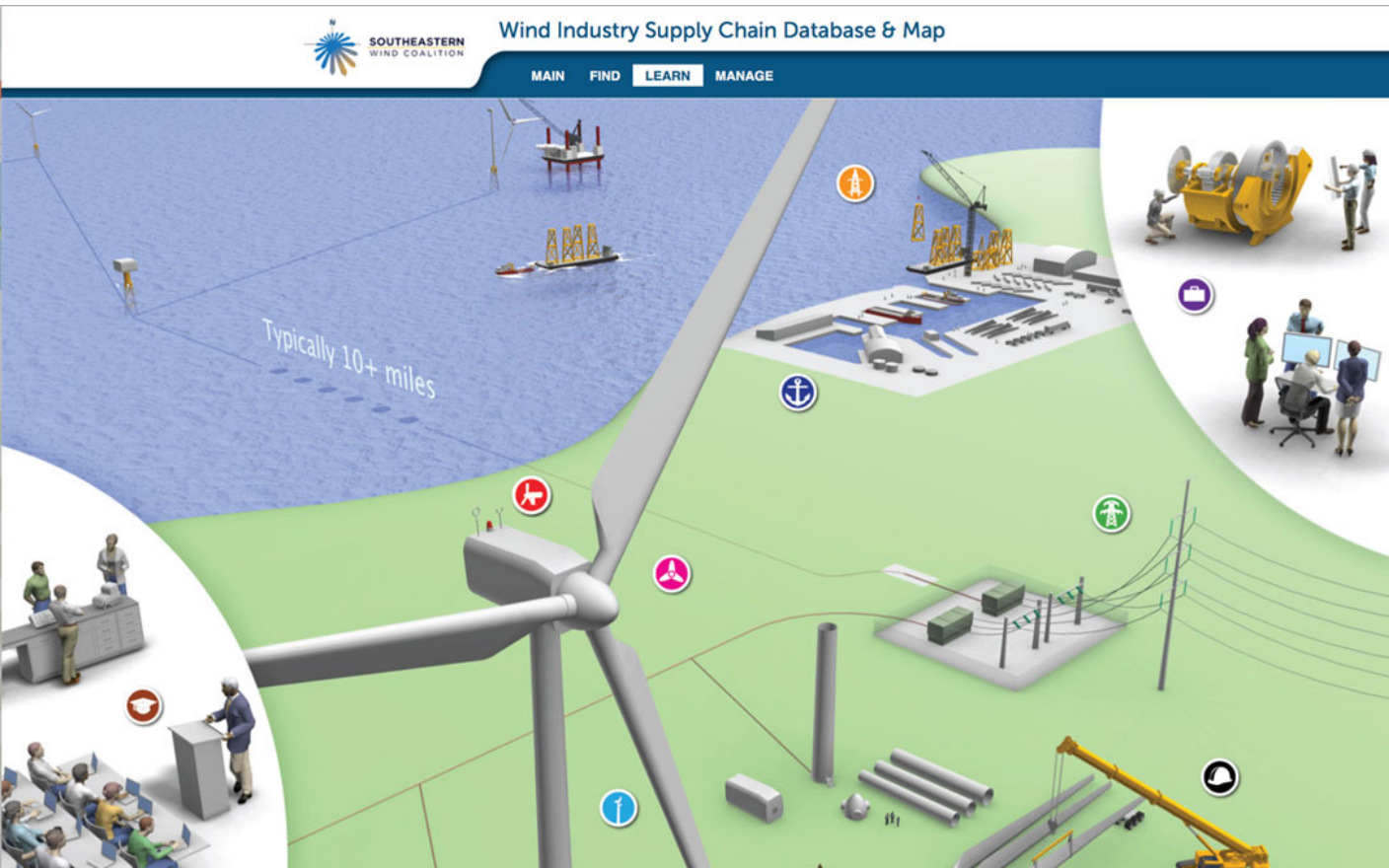
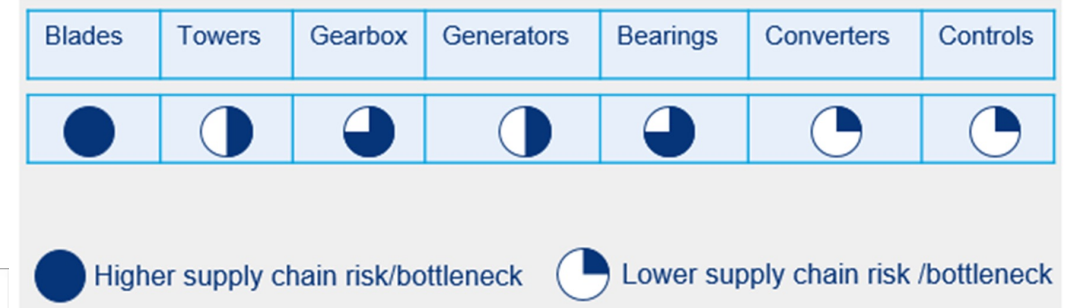
University of Houston  
Energy Conference  
April 27, 2023

# Overview

- Examples of Supply Chain Risks
- The Pandemic's Impact
- The Impact of Russia's War on Ukraine
- GHG Regulations

# Supply Chain Risks – Offshore Wind Power

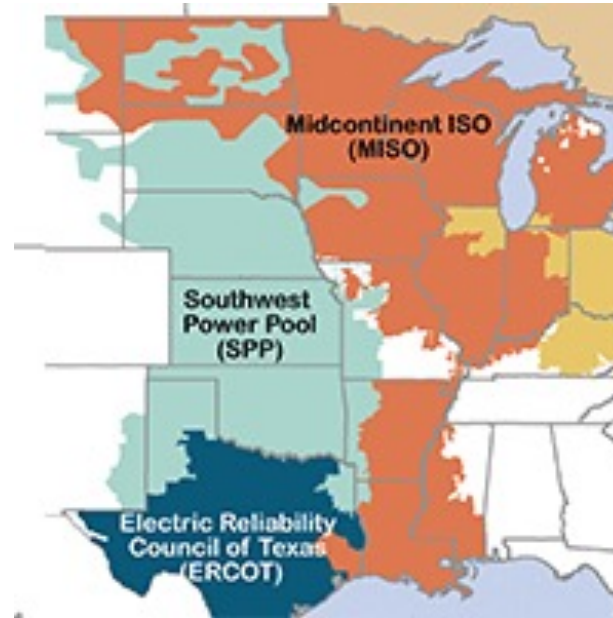
Global wind turbine supply chain impact in 2020 due to coronavirus



- Timely availability of parts
- Merchant seamen
- U.S. flag ships
- Federal, State and Utility Permits

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# GoM Offshore Wind – Permitting



Federal permitting

MISO and ERCOT  
Utility permit access

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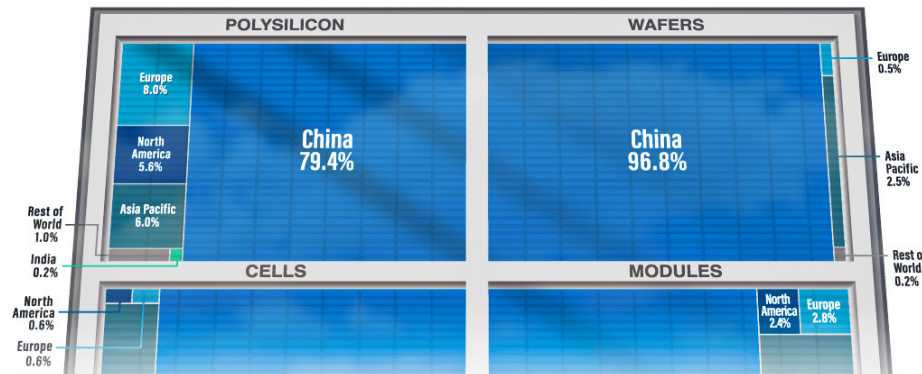


# Supply Chain Risks - Solar Power

- **Geopolitical Risks – China's Domination of Polysilicon, Wafer, Solar Cells and Modules Manufacturing**

- **Voyage Delays**
- **Higher Maritime Transportation Costs**
- **Potential Covid Manufacturing Interruptions**

## Who Controls the Solar Panel Supply Chain?



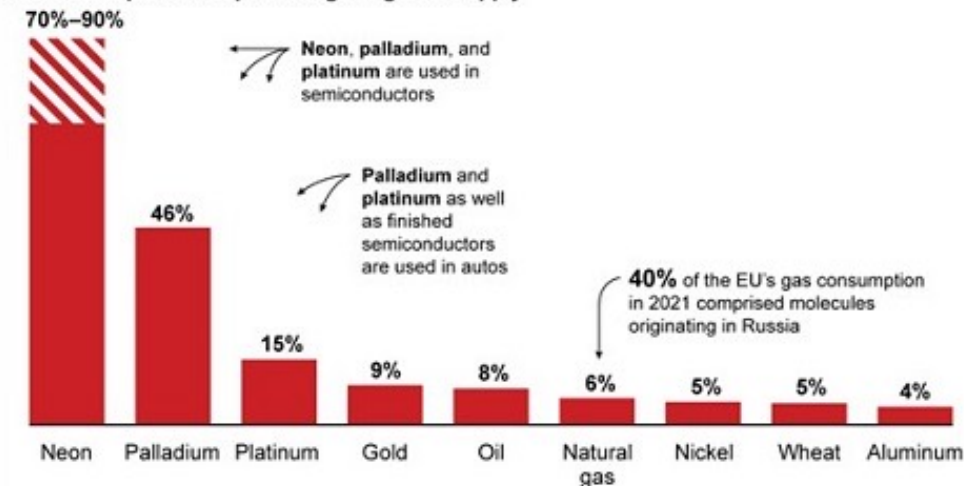
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# Supply Chain Risks – Semiconductors, Catalytic Converters and Batteries - Russia

## Geopolitical Risks

Makers of semiconductors and automobiles have relied on Russia for some commodities

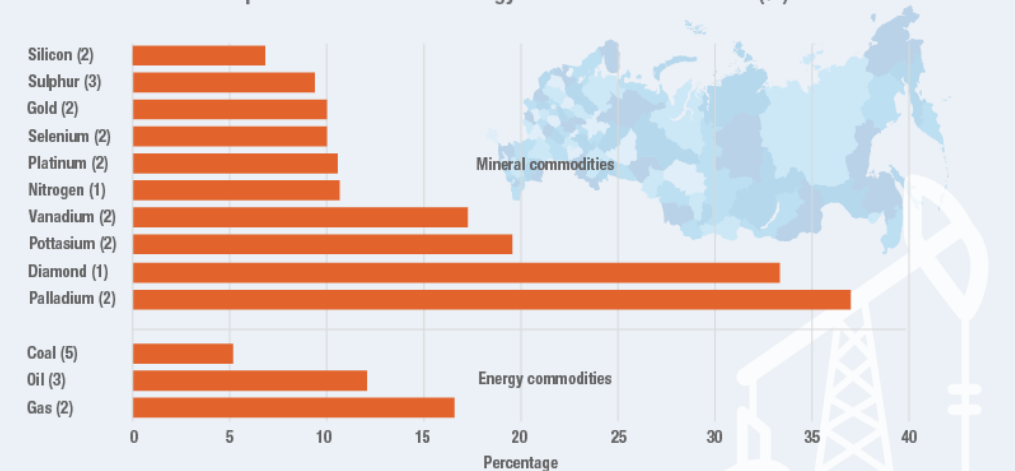
Russian exports as a percentage of global supply



Notes: US semiconductor-grade neon is produced in Russia as a byproduct of steelmaking and purified in Ukraine; 2021 data  
Sources: JPMorgan; Eurostat; Reuters; CNBC; Techcet CA LLC; Bain Macro Trends Group

## Russia's top positions in energy and mineral production will exacerbate global supply chain pressures

Russia's production of selected energy and mineral commodities (%)



Notes : Figures indicate percentage of world total. Data on energy commodities as of 2020 and mineral commodities as of 2021. Figures in brackets denote Russia's position globally against other producers.  
Source: TA Blindsight, BP Statistical Review of World Energy, US Geological Survey of Mineral Commodities

# Supply Chain Risks - Semiconductors

## Geopolitical risks

Dependence on Taiwanese semiconductors

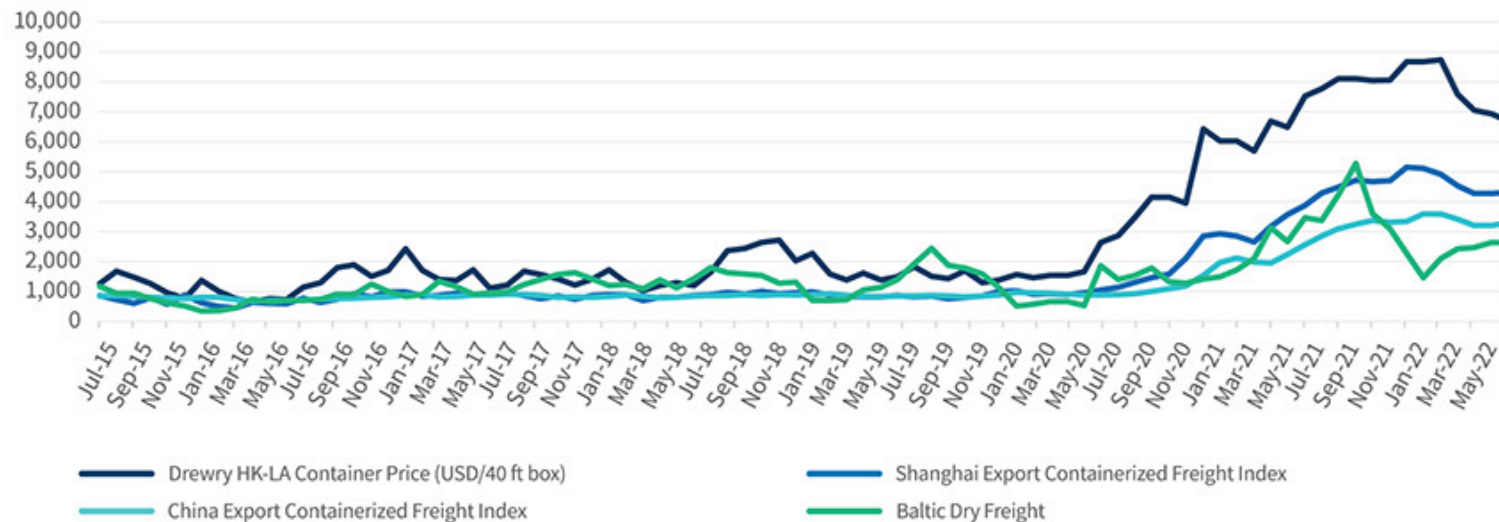
China's Ambition to Acquire Taiwan



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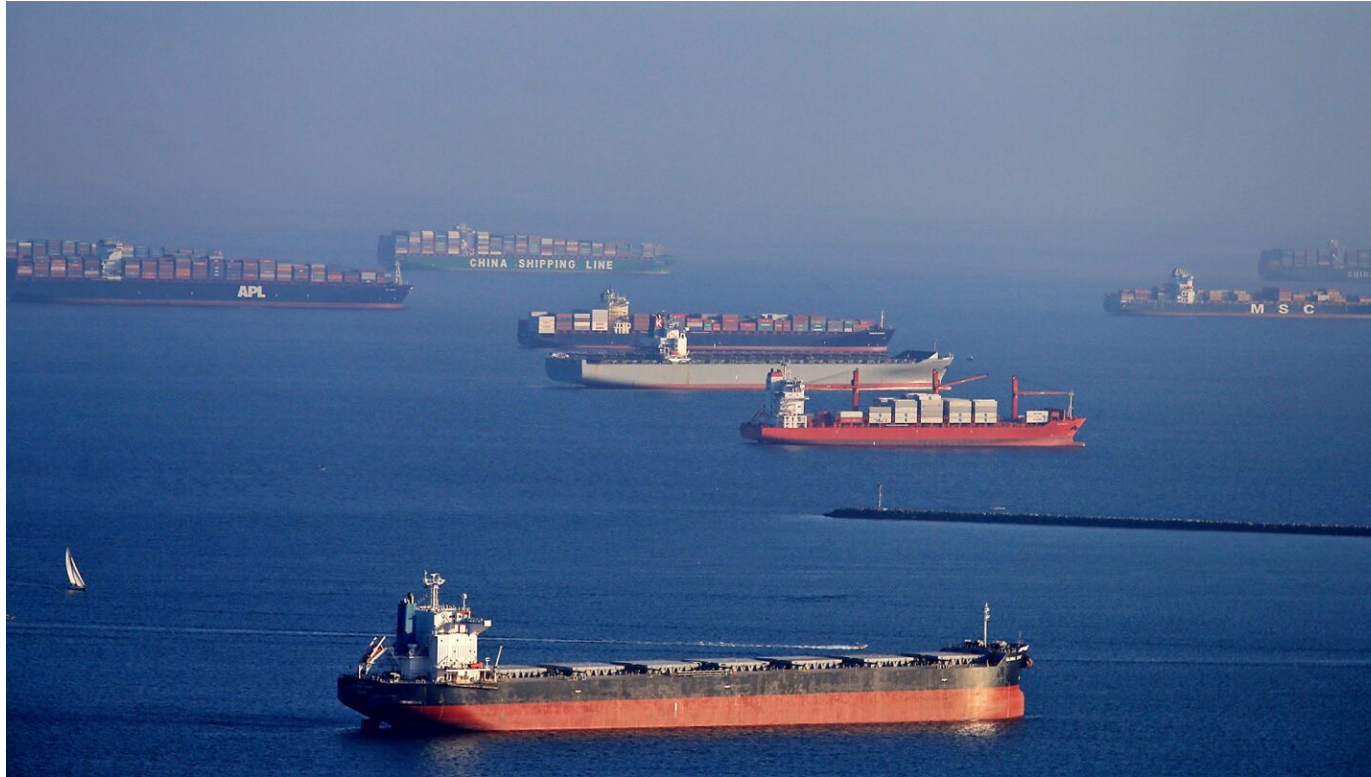
# The Pandemic's Impact

- On Durable Goods
  - U.S. Consumer demand shifted from Services to Household Goods
  - U.S. Government economic relief legislation heightened demand
  - Container carriers responded by maximizing capacity from Asia to the U.S.
  - Container freight rates skyrocketed





# The Pandemic's Impact



Container Ships Stacked Up Outside Long Beach



Ocean Shipping Reform Act of 2022

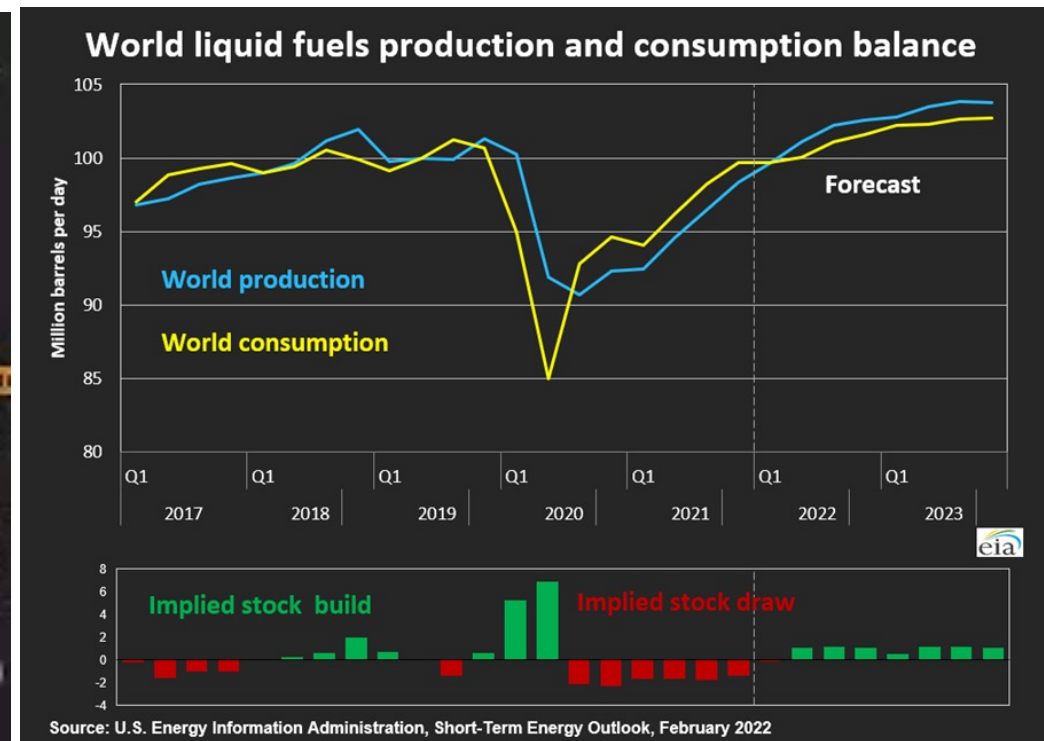
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# The Pandemic's Impact on the Oil & Gas Market

## U.S. Crude Prices Plummeted



## Consumption and Production now exceed pre-pandemic levels



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# Impact on the Tanker Trade by Russia's War on Ukraine

- Sanctions
  - Tankers
  - Oil
  - Price Cap
- EU's Response
- Shadow fleet
- Tanker charter hire rates are rising



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# GHG Regulations - What's happening, and who is doing what?

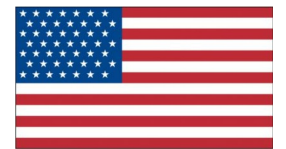


Where we are:

MARPOL Annex VI

Where we're going:

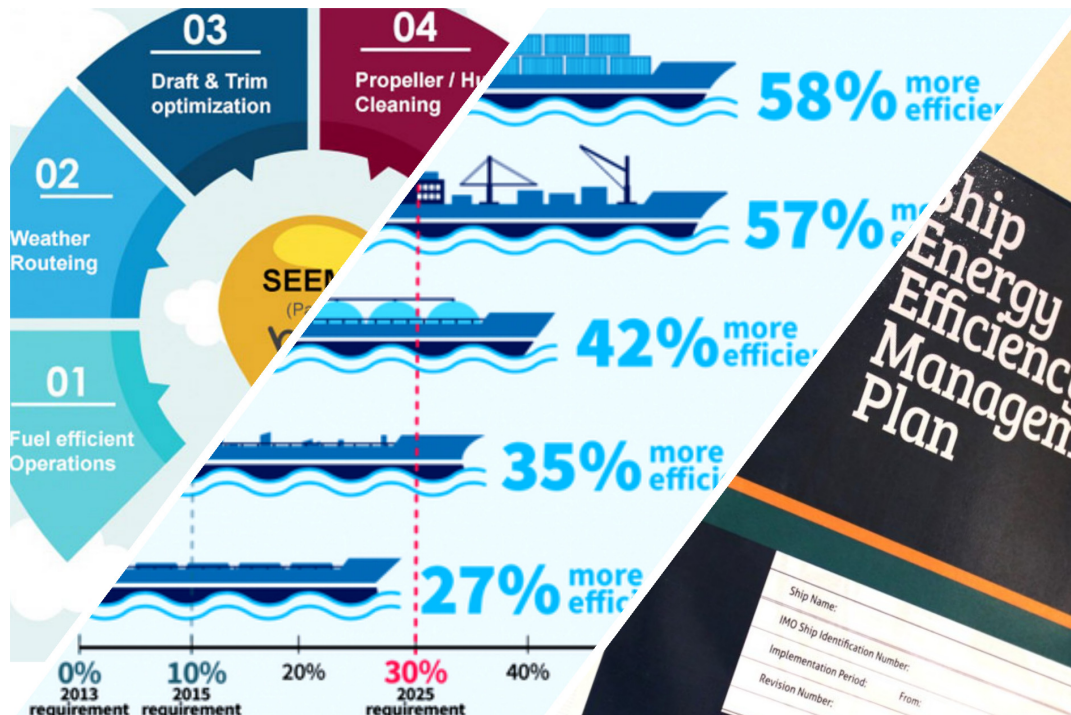
- IMO's Approach
- EU's Approach
- USA's Approach



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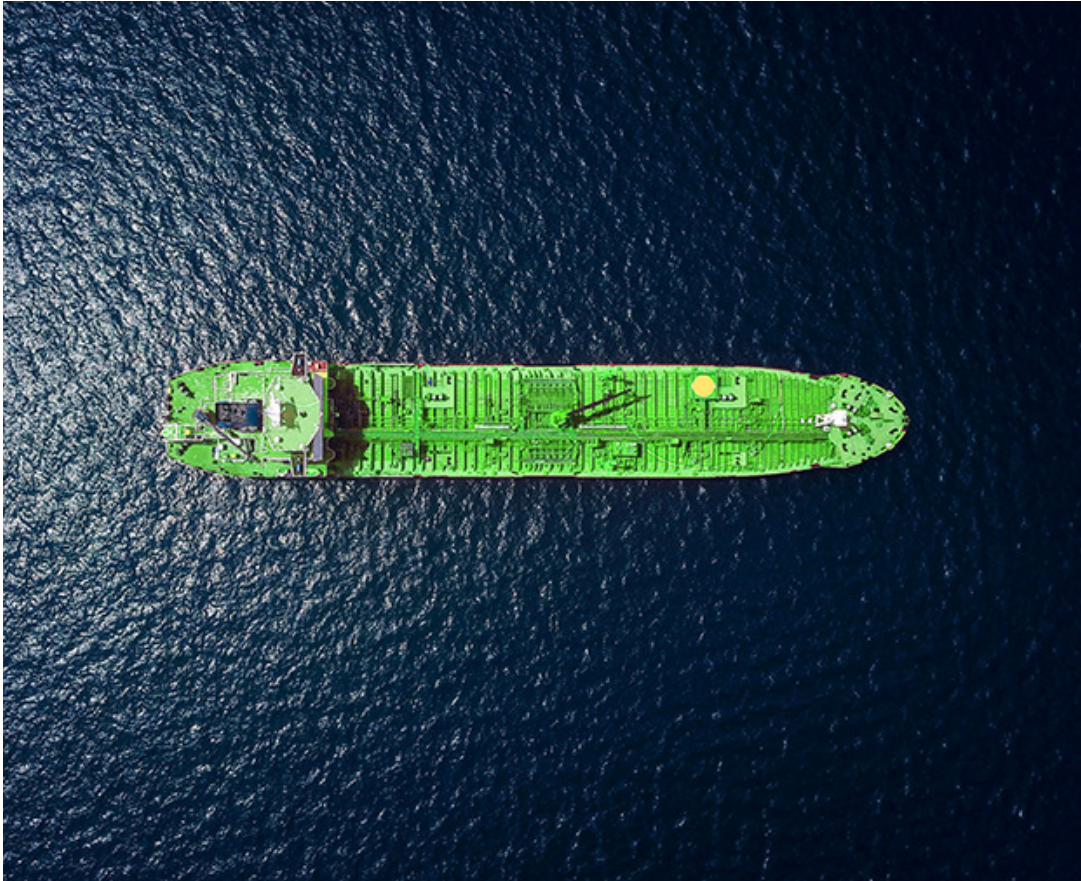


# GHG Emissions Regulations – IMO's Approach



- IMO near term goal – 40% reduction by 2030 from 2008 levels
  - EEDI – Energy Efficiency Design Index – for new builds
  - EEXI – Energy Efficiency eXisting ships Index – for existing merchant ships
  - CII – Carbon Intensity Indicator

# GHG Regulations – IMO's New Developments



- MEPC 79 (Dec 2022)
  - Bunker Levy
  - GFS Standard
- MEPC 80 (July 2023)
  - GHG Reduction Framework

# GHG Regulations – EU's Approach

- EU's near-term goal – 55% reduction by 2030 from 1990 levels
  - ETS – Emissions Trading System
  - Fuel EU Regulation



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# GHG Regulations - Current Status and New Developments

EU – reached agreement to include maritime transport in the EU's Emissions Trading System (ETS) starting in 2024

Applies to GHG, and from 2026 to Methane and Nitrous Oxide emissions



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# GHG Regulations - USA's Approach

- US announced that it will join IMO efforts to achieve zero carbon emissions
- GHG Regs not yet promulgated
- U.S. flag vessels that operate exclusively in national waters – not presently subject to MARPOL ANNEX VI, Chapter 4
- USCG-EPA Enforcement
  - MOU – cooperate in enforcing MARPOL Annex VI



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# GHG Regulations - ESG Issues

## US SEC's newly proposed ESG reporting requirements

- Scope 1, 2 and 3 GHG Emissions
- EU ESG Rules



# GHG Emissions Regulations – Likely Supply Chain Impacts

- Operational Costs
- EU bunker regulation
- Impact on the EU
- Impact on Voyages
- Impact on Manufacturers
- Impact on the World's Merchant Fleet



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