DECARBONISING GLOBAL SHIPPING – ENVIRONMENT

NEWS: **Global shipping** aims to **decarbonise** by **2040–50**, transitioning from **fossil fuels** like **Very Low Sulphur Fuel Oil (VLSFO)** and **LNG** to **green fuels** such as **ammonia**, **e-methanol**, and **biofuels**.

WHAT'S IN THE NEWS?

What is Green Shipping?

- **Definition**: Green shipping (or sustainable shipping) refers to the implementation of technologies, fuels, and practices in maritime transport aimed at **reducing environmental impact** and promoting sustainable trade routes.
- **Core Objectives**:
    - **Reducing Carbon Emissions**: Aims to decarbonize maritime transport by reducing CO_2 emissions from ships.
    - **Minimizing Air and Water Pollution**: Controls SOx, NOx, and manages ballast water to prevent marine biodiversity loss.
    - **Ecological Protection**: Seeks to protect **marine ecosystems**, coastal livelihoods, and reduce noise and oil spills.

Global Status of Maritime Emissions

- **GHG Emissions Share**: Maritime transport accounts for nearly **3% of total global greenhouse gas emissions**.
- **Paris Agreement Alignment**:
    - Target to **reduce carbon intensity by 40% by 2030**, 70% by 2040 (from 2008 levels).
    - Achieve **net-zero emissions by 2050**, aligning with the **IMO's GHG Strategy**.

Understanding Green Fuels

- **Definition**: Green fuels are **carbon-neutral or synthetic fuels** made using **renewable energy sources**, reducing reliance on fossil fuels.
- **Significance**: Vital for decarbonizing **hard-to-abate sectors** like shipping, aviation, and heavy industry, where battery electrification is impractical.

Green Fuel Types & Production Techniques

- **Green Hydrogen**:
    - Produced via **electrolysis** using **renewable electricity** (solar, wind).
    - Not preferred directly in shipping due to **volatility and storage challenges**.
- **Green Ammonia**:

    - Created using **green hydrogen and nitrogen**.
    - More stable than hydrogen, emits **no GHG** during combustion.
    - Requires new **engine and fuel systems**.
- **Green Methanol (e-Methanol)**:
    - Formed using **green hydrogen** and **captured CO_2** from industrial sources.
    - Near drop-in replacement for **Very Low Sulphur Fuel Oil (VLSFO)**.
    - 360+ methanol-compatible ships are in service/order globally.
- **Power-to-X (P2X) Fuels**:
    - Converts **green hydrogen** into synthetic fuels like **e-methane**, **e-kerosene**.
- **Biofuels (by generation)**:
    - **1st-gen**: Food crops like sugarcane, corn.
    - **2nd-gen**: Agri-waste, woody biomass.
    - **3rd-gen**: Algae-based.
    - **4th-gen**: Engineered microbes for CO_2 capture and conversion.

Challenges with Green Fuels in Shipping

- **High Cost Differential**:
    - **Sustainable e-methanol** costs around **$1,950/tonne**, compared to **$560/tonne for VLSFO**.
    - Driven by expensive **renewable electricity (10–11 MWh/tonne)** and **capital-heavy electrolyser setup**.
- **Demand-Supply Gap**:
    - Estimated demand for green methanol: **14 million tonnes by 2028**.
    - Expected supply: **only 11 million tonnes**, leading to **price pressures**.

India's Green Shipping and Decarbonization Strategy

- **Domestic Commitment**:
    - India is committed to decarbonizing its **shipping sector** using **green fuels** and **domestically built vessels**.
- **Infrastructure Development**:
    - **Green fuel bunkering hubs** being established in ports like **V.O. Chidambaranar (Tuticorin)** and **Kandla**.
- **Export Potential**:

- India plans to become a **green fuel exporter**, targeting hubs like **Singapore**.
- Leverages its **solar energy expertise** and land availability.

How India Plans to Achieve Maritime Decarbonization

- **Scale-Up Green Fuel Production**:
  - Increase import of **electrolysers** and **solar panels** to expand green hydrogen capacity.
- **Solar Growth Backbone**:
  - Solar capacity grew from **2.82 GW in 2014 to 105 GW by 2025**.
  - Backed by **sovereign guarantees**, **off-take assurance**, and **PLIs** for electrolyser manufacturing.
- **Financial Support Measures**:
  - **Production-linked incentives (PLI)** to reduce supply-side bottlenecks.
  - **Carbon capture, utilization, and storage (CCUS)** incentives to enable CO_2 reuse in green methanol.
- **Low-Cost Green Finance**:
  - **Multilateral development banks** offer loans at **4% interest**, compared to **11–12% from Indian banks**.

Reviving Indian Shipbuilding through Green Fuel Shift

- **Demand-Side Interventions**:
  - Government committed **$10 billion** to purchase **110 ships**, encouraging Indian-built, Indian-flagged vessels.
- **Green Incentives**:
  - Target to make **10–20% of these ships green-fuel compatible**.
- **Global Collaboration**:
  - Seeking partnerships with **South Korean and Japanese shipbuilders** to bring advanced technology and scale.
- **Retrofitting Plans**:
  - Alongside new builds, older ships will be **retrofitted** to accommodate **methanol or ammonia engines**.

Global Policy Discussions – COP28 & UNCTAD Initiatives

- **COP28 Focus on Maritime Sector**:

    - Shipping, which accounts for **80% of global merchandise trade**, is under pressure to decarbonize.
    - Sector's GHG emissions have increased **20% in the last decade**.
- **UNCTAD's Policy Recommendations**:
    - **Universal regulatory framework**: To avoid conflicting or fragmented global rules.
    - **Certainty in regulations**: Clear timelines and goals encourage private investment.
    - **Boost R&D**: Focus on clean fuel innovation and supportive infrastructure.
    - **Carbon pricing/levy**: To make green fuels price competitive and fund transition in developing economies.
- **IMO–UNCTAD Partnership**:
    - Launched at COP28 to assess **GHG pricing's impact on trade and GDP** in developing countries.
    - Backed by a **$500,000 IMO grant**, project runs until **March 2025**.

Source: https://www.thehindu.com/business/Industry/how-is-global-shipping-trying-to-decarbonise-explained/article69816234.ece