India Netherlands Bilateral Session

Seas of Opportunity: India–Netherlands Collaboration for a Sustainable Maritime Future

Directorate General of Shipping

29th October 2025 | IMW 2025, Bombay Exhibition Centre, Mumbai

India's Economic Growth and the Significance of Maritime Domain

$4.19 Trillion

Indian GDP

World's 4th largest economy

6.5 %
(FY 25)

GDP Growth

projected 6.3–6.7% annual growth through coming years

$5 Trillion
by 2027-28

GDP Target

IMF projects India will surpass Germany by 2028, becoming the world's 3rd largest economy

The Maritime sector facilitates

95%
Trade by Volume

70%
Trade by Value

Maritime sector contributes to 4-5% of the GDP

Contribution of the Blue Economy

Towards Viksit Bharat 2047

India and its Blue Economy

95%
By trade volume

70%
By trade value

India's Infrastructure Leverages

12
Major Ports

200+
Non-major Ports

11,098 km
Total length of India's coastline

India's Vessel Advantage

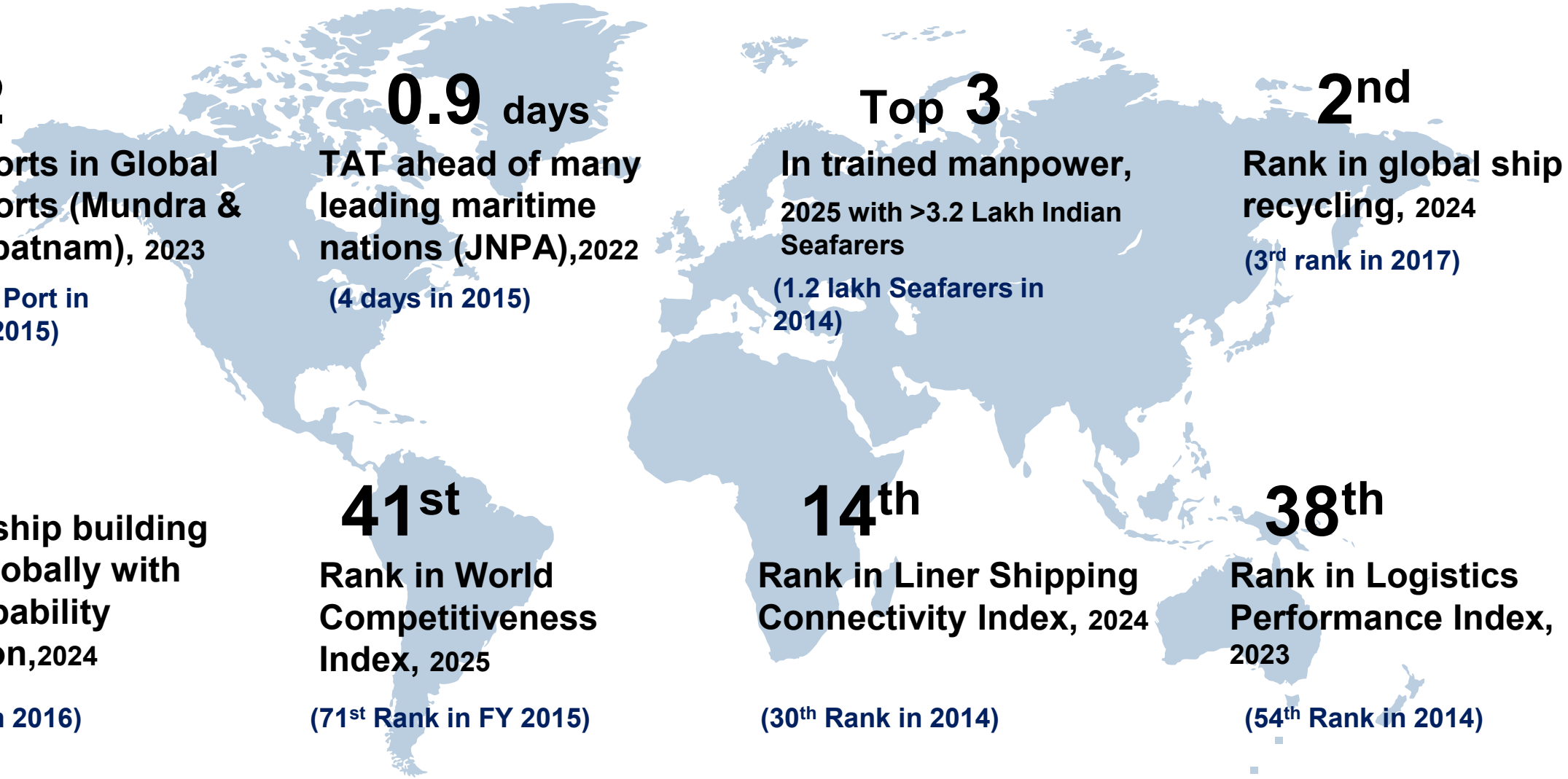
India has 1,520+ merchant vessels with 13 mn+ GT capacity

India ranks 18th globally in flag registration and 19th globally in carrying capacity

India is emerging as the leader of the Blue Economy in the world with multiple initiatives focusing on infrastructure, business and the overall economy

- Port-led Development
- Ports for Prosperity
- Policy reforms driving EoDB, modern infrastructure and multi-modal logistics

Global Competitiveness



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Indian Ports in Global top 30 Ports (Mundra & Visakhapatnam), 2023

(No Indian Port in Top 30 in 2015)

0.9 days

TAT ahead of many leading maritime nations (JNPA),2022

(4 days in 2015)

Top 3

In trained manpower, 2025 with >3.2 Lakh Indian Seafarers

(1.2 lakh Seafarers in 2014)

2nd

Rank in global ship recycling, 2024

(3rd rank in 2017)

16th

Largest ship building sector globally with rapid capability expansion,2024

(23rd Rank in 2016)

41st

Rank in World Competitiveness Index, 2025

(71st Rank in FY 2015)

14th

Rank in Liner Shipping Connectivity Index, 2024

(30th Rank in 2014)

38th

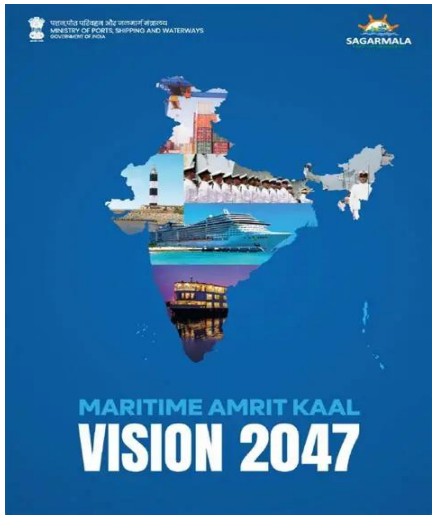
Rank in Logistics Performance Index, 2023

(54th Rank in 2014)

India’s Vision for the Maritime Sector

Maritime India Vision (MIV) 2030

- Position India Globally in the Top 10 Shipbuilding, repair nations
- Production Targets: Increase from current 30k GT to 500k+ GT annually by 2030
- Investment: INR 20,000+ Crores
- Employment Generation: 1,00,000+ additional jobs (direct and indirect)



Maritime Amrit Kaal Vision 2047

- Advanced phase targeting Top 5 global position in shipbuilding and maintaining 1 position in ship recycling
- 69% Indian-Built Ships Share (up from current 5%)
- 300+ Strategic Initiatives across 11 key maritime areas
- Financial Assistance: 20-30% assistance for green vessels (including retrofitting)

Current Indian Scenario

Current Scenario

1.2%
Share of global fleet (DWT)

2nd
Rank in global ship recycling, 2024

16th
Largest ship building sector globally with rapid capability expansion,2024

Top 3
In trained manpower, 2025 with >3.18 Lakh Indian Seafarers

MIV 2030

To achieve a global
Top 10
ranking in shipbuilding by rapidly expanding our industrial capabilities

Investment Requirement:
INR
3.5 lakh Crores
In 5 Years

MAKV 2047 Goals

To achieve a global
Top 5
ranking in shipbuilding by rapidly expanding our industrial capabilities

Investment Requirement:
INR
80 lakh Crores
by 2047

Challenges

1. Non-availability of long-term, low cost capital
2. Lack of domain expertise in existing financial institutions
3. Higher collateral requirement
4. Stringent terms of domestic loans

Impacts of Climate Change

Economic Loss
8.7% of India's GDP

As per ADB, global failure to addresses climate chat could result in economic losses

Sea Level Rise & Flooding
36 Million People

Flooding & sea level rise could displace millions of people along the coasts in INdia

Agricultural Productivity
30% Decline

As per Intergovernmental Panel on Climate Change, agricultural production in India could fall if emissions remain high

Water Scarcity
40% of Population

If trends continue, the population facing water scarcity in India would increase from 33% to 40%

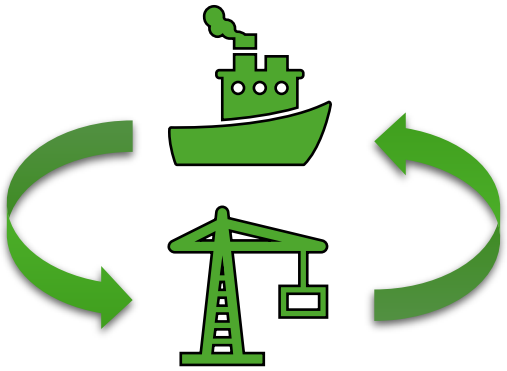
Glacier Reserves
70% Decline

A huge decline in western Himalayan reserves could be faced

Session Focus

Zero-Emission Maritime Transport

- Transitioning shipping towards **low- and zero-carbon fuels** such as hydrogen, ammonia, methanol, and bio-LNG.
- Advancing **vessel electrification and hybrid propulsion** technologies for short-sea and inland operations.
- Promoting **digital optimisation and predictive analytics** for monitoring, route efficiency, and emission reduction.
- Creating a framework for **green vessel certification, financing, and policy incentives** to support early adoption.



Smart & Sustainable Port Development

- Building **climate-resilient and energy-efficient ports** integrating renewable power and smart grids.
- Adopting **digital twins, automation, and AI systems** for real-time operations and maintenance efficiency.
- Implementing **green dredging, waste management, and water recycling** for circular port ecosystems.
- Establishing **clean-fuel bunkering and shore-power infrastructure** to support next-generation vessels

Green Shipping – The Big Picture

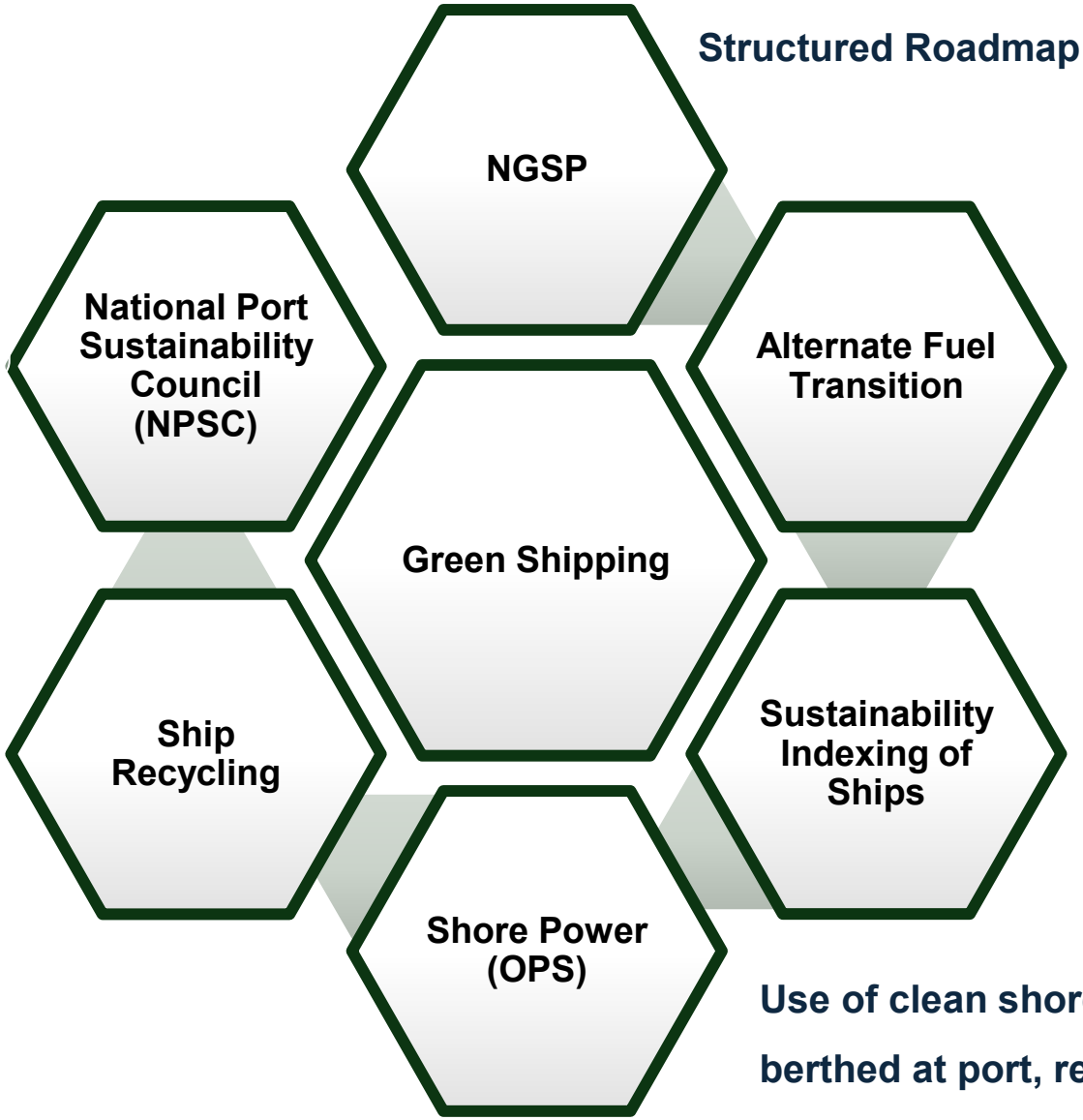
- Shipping is the **backbone of global trade** – carrying 80% of goods worldwide.
- Shipping contributes to ~3% of global CO_2 emissions.
- Green Shipping = *making ships, ports, and supply chains cleaner, smarter, and future-ready.*
- It's not just about compliance — it's about **staying competitive in a low-carbon economy.**
- **Vision & Commitments:**
  - Aligned with *Maritime India Vision 2030 & Maritime Amrit Kal Vission 2047*.
  - Supports IMO's **Net Zero 2050** ambition.
  - Anchored in India's **Panchamrit Pledge** – 500 GW non-fossil capacity by 2030, Net Zero by 2070.

"The future of shipping is green — by necessity, not by choice."

India’s Green Shipping Initiatives

NPSC metrics include **Green Port Index (GPI), Port Readiness Level (PRL), Smart Port Shore Power Index (SPSPI), Environmental Ship Index (ESI), and GHG Emissions Inventory** to benchmark sustainability and readiness of Indian ports

With the Hong Kong Convention now in force, India leads globally with 115 compliant yards at Alang.



Structured Roadmap for decarbonization

Guidelines for LNG, Biofuels, Methanol, Ammonia

Structure to rate ships on their environmental performance, linked to age norms.

Use of clean shore electricity by ships while berthed at port, reducing fuel burning.

Swachh Sagar Portal

Monitoring & Reporting – First Step towards Green Future

Port Reception Facility

- Module for vessel waste declaration, vendor linkages and disposal coordination

Fuel Consumption Reporting

- Enables MARPOL Annex VI fuel consumption reporting for vessels.

Single Use Plastics

- Enables ships to report plastic usage and disposal via SEP plans, ensuring compliance with National sustainability mandates

E- BDN & Bunker Suppliers

- Central database of approved bunker suppliers with electronic BDN records for transparency and fuel quality assurance

Ballast Water Reporting

- Real time Ballast Water data submission by all ships and compliance oversight

National Green Shipping Policy

Maritime Vision for a Green Future

The NGSP is India's strategic response to the global decarbonisation mandate, a policy blueprint designed to secure maritime growth while transitioning towards clean energy, sustainable ships and climate-resilient ports.

Key Transition Pillars:

- Green Ships
- Green Ports
- Green Fuels
- Green Recycling
- Green Financing & Collaborations

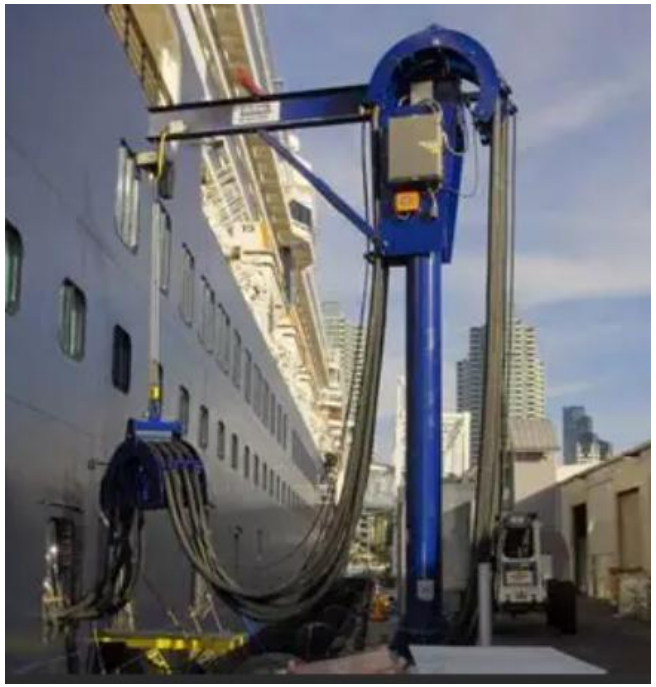
Strategic Intent

To position India as a **global hub for green shipping and future fuels**, enabling industry to move from regulatory compliance to global competitiveness and leadership.

Draft NGSP Document under Review

Shore to Ship

What is Shore Power?
Electricity supplied from the shore to berthed ships, allowing engines to be switched off and eliminating fuel combustion while docked.



Why It Matters

- Cuts **CO_2, NOx, SOx and Particulate Matter** emissions in port zones
- Improves **Air Quality and ESG scores** for Indian ports
- Supports compliance with **IMO CII, GHG & Green Port Index**

Implementation Status in Indian Ports

- **Kamarajar Port** - 500 kW, 400V, 50-60 Hz in Coal Berth 1 & 2
- **VO Chidambaranar Port** - 305 kW, 400V 60Hz in VOC Berth 2 & 3
- **Jawaharlal Nehru Port Authority** - SPS used for Tugs. SPS for all terminals planned (45MVA; INR 600 crore expected)

Possible Financing options

Blended finance → *govt + MDBs + private capital.*

Green/blue bonds → *specifically earmarked for OPS infra.*

PPP models → *private players co-invest in OPS roll-out.*

Alternate Fuels for Maritime (1/2)

LNG

- **Current Use:** Operational for select Indian coastal and LNG carriers; IGF Code compliant
- **Infrastructure:** LNG terminals at **Dahej, Hazira, Kochi**; feasibility for bunkering at JNPA
- **Maritime Role:** Transition fuel till 2035 under IMO GHG transition
- **Limitation:** Methane slip & future carbon costs reduce long-term advantage

Biofuel

- **Marine Trials:** Successfully tested on marine engines
- **Supply Base:** Drop in Blends. Domestic production. **Blending with FAME, HVO**
- **Distribution:** Can use existing bunkering infrastructure without port redesign
- **Advantage:** Short-term compliance option for Indian fleet under CII/GHG without retrofits

Ammonia

- **Export Positioning: Kandla to produce green ammonia** (L&T + Itochu JV) for **Singapore bunkering**
- **Maritime Use:** Target fuel for deep-sea vessels (tankers, bulk carriers) post-2035
- **Challenges:** High Toxicity, safety standards, crew training, IMO safety code under development
- **Strategic Role:** India positioning as **future fuel exporter**, not just consumer

Methanol

- **Marine Use**: Dual-fuel methanol engines already ordered by global majors
- **Breakthrough: India's first Green Methanol Bunkering Hub** under construction at **VOC Port (Tuticorin)** – 750 m^3 terminal (SOPAN Group)
- **Production Shift:** India transitioning from coal-based brown methanol to green methanol (hydrogen + CO_2 capture)
- **Maritime Suitability:** Engine-ready (Maersk, MAN ES technology) – early adopter fuel under IMO
- **Role:** Likely first large-scale alternative fuel to enter Indian ports post-2030

Hydrogen

- **Port Pilot: VOC Port launched India's first Green Hydrogen Pilot Plant** (5 Sep 2025)
- **Use in Maritime:** Not direct – used to produce ammonia/methanol as bunkering fuels
- **Infrastructure Need:** Electrolysers, Liquefaction, port pipelines; **High CAPEX**

Long-Term Role: Backbone fuel for synthetic maritime fuels; export market focus

Alternate Fuels for Maritime (2/2)

Shipping today contributes around **3% of global CO_2 emissions**. The IMO has locked in a target of **net-zero by 2050** → which means fuels like HFO and MDO are on their way out.

For India, the next 25 years are about **switching the fuel mix**:

Fuel	Demand in 2030	Demand in 2050
Hydrogen	**0.026 MT**	**0.3 MT**
Ammonia	**0.025 MT**	**4.4 MT**
Methanol	**0.037 MT**	**0.272 MT**
LNG	**0.66 MT**	**0.3 MT** (to be replaced by bio/e-LNG).

India can produce these fuels cheaper than almost anyone.
Green Hydrogen cost by 2030:
India $1.5–2.0/kg.
Middle East: $2.0–2.5/kg.
Europe/East Asia: $3.0–6.0/kg.
This is the base case for India becoming **the lowest-cost Global hub for Green Maritime Fuels and an Energy Surplus Nation.**

Nuclear – Long Term Option

- **Current Readiness :** No commercial maritime Nuclear vessel. Only Indian Navy operates Nuclear vessels.
- **No policy framework** yet for nuclear fuel for maritime.
- **Strategic Potential :** Ultra long endurance fuel, zero CO2 emission
- **Financial : Very High CAPEX** Estimate **$700-900 million per vessel (3x cost of LNG vessel)**
- **No IMO civilian Nuclear code** (under development)

India as a Net Green Energy Exporter & Bunkering Destination

From energy importer to future maritime fuel hub

Strategic Advantage

- Long coastline with major ports on **East–West shipping lanes**
- Abundant renewable energy for **green hydrogen, ammonia, methanol**
- Cost advantage in **solar + wind production**, lowering fuel export price

Fuel Export Readiness

- **Green Ammonia :** Kandla supply to Singapore (L&T–Itochu JV)
- **Green Methanol :** VOC Port bunkering hub under development
- **Hydrogen Derivatives :** Mission to export through maritime corridors

Port Infrastructure Transformation

- Dedicated **Green Bunkering Terminals** (VOC Port, Kandla, JNPA)
- Upcoming **Green Shipping Corridors**: Tuticorin – Kandla – Singapore – Rotterdam
- Integration of **renewable power, storage & safety systems**

Economic & Diplomatic Impact

- Reduces dependency on oil imports
- Positions India as **fuel supplier to global shipping lines**
- Enhances maritime influence under **Global South leadership**

Policy Backing

- Supported by **National Green Hydrogen Mission & NGSP**
- Incentivized by **Harit Sagar & MIV 2030**
- Aligned with **Make in India & Energy Security Vision 2047**

India is not just preparing for Green Fuels — it is preparing to Fuel The World.

Ship Recycling

- Process of dismantling end-of-life ships to recover **steel and other valuable materials**.
- India is a **global leader**, with Alang–Sosiya in Gujarat being the **world's largest ship recycling cluster**.
- Governed internationally by the **Hong Kong Convention (HKC)**, which came into force on **26 June 2025**.
- Integral to the **circular economy**, reducing the demand for virgin raw materials.

India's Role & Importance

- Handles **30% - 35% of global ship recycling tonnage** annually.
- Provides **20 - 25% of India's ferrous scrap requirement**, reducing dependence on imports.
- India is the **only country with 100+ HKC Compliant Recycling Yards. [115 HKC Compliant Yards at Alang]**
- Supplies input material for the **Green Steel ecosystem**, boosting India's low-carbon transition.
- Generates **direct employment for 15000+ workers** and **indirect livelihood opportunities** for thousands more in logistics, scrap processing, and allied services.
- Strengthens India's position in **global maritime sustainability.**

Green Steel

- "Green Steel" is defined by its CO_2 emission intensity — less than 2.2 tonnes CO_2 emission per tonne of finished steel (tfs).

- Greenness is expressed as a percentage reduction below the threshold of 2.2 2.2 tonnes CO_2 emission per tonne of finished steel

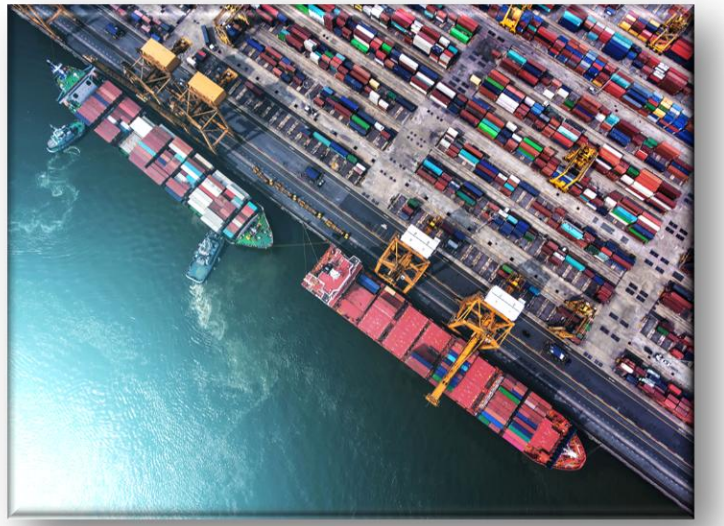
- The certification done via NISST (National Institute of Secondary Steel Technology) under the Bureau of Energy Efficiency (BEE) Measurement, Reporting and Verification (MRV) methodology.

Star Rating System

- Five-Star: < 1.6 tCO_2e/tfs ★★★★★
- Four-Star: 1.6 – 2.0 tCO_2e/tfs ★★★★
- Three-Star: 2.0 – 2.2 tCO_2e/tfs ★★★
- > 2.2 tCO_2e/tfs → Not eligible for green rating
  (Threshold reviewed every 3 years)

National Port Sustainability Council (NPSC)

India's port sector, with over 200 ports including 12 major ports, is at the cusp of a major transformation driven by global imperatives on decarbonization, climate resilience, and sustainable maritime trade. To lead this transition, the National Port Sustainability Council (NPSC) is proposed as a centralized institutional framework.



Key Highlights:

- **Apex Regulatory Body:** Serves as the top advisory and regulatory institution for maritime sustainability.
- **Aligned with Global Benchmarks:**
  - IMO's **Revised GHG Strategy**
  - EU **Fit-for-55 Package**
  - **India's Maritime Vision 2030**
- **Core Functions:**
  - Oversee **emissions monitoring**
  - Ensure **alternative fuel readiness**
  - Drive **port electrification**
  - Advance **digital port transformation**

Sustainable Indicators for Indian Ports

Green Port Index (GPI)

Evaluates ports based on carbon footprint, alternative fuels adoption, energy efficiency, sustainable logistics, and waste management practices.

Port Readiness Level (PRL)

Assesses ports' preparedness for energy transition, digitalization, and compliance with global environmental regulations.

Shore Power Readiness Indicator (SPRI)

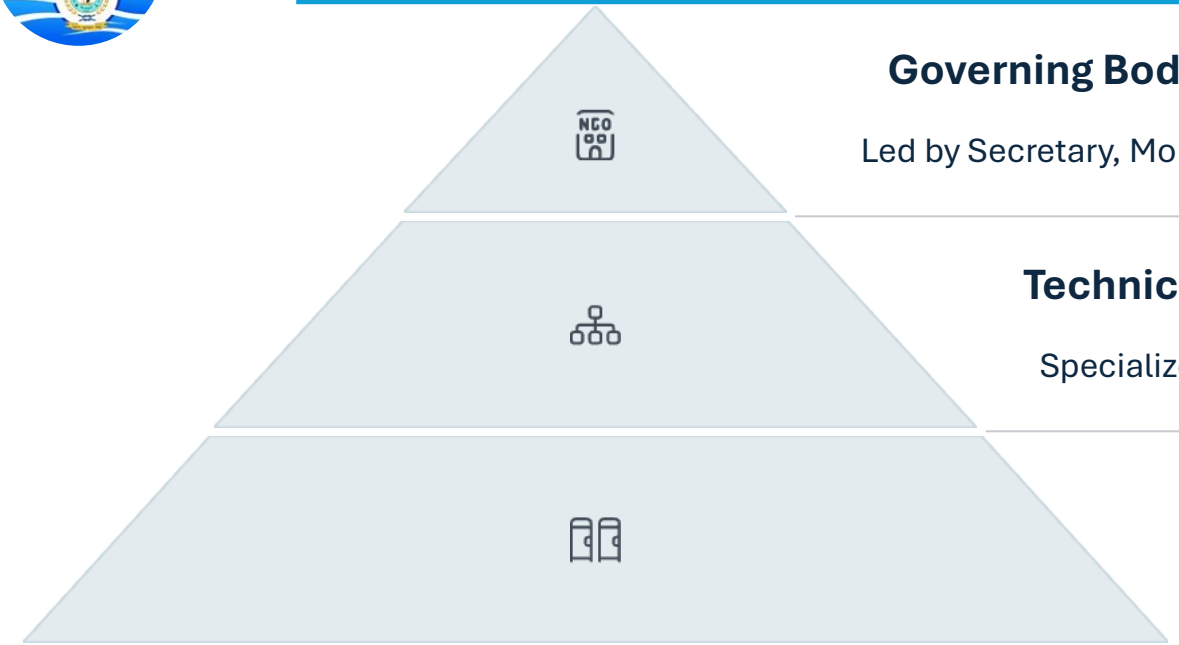
Measures infrastructure for cold ironing and renewable energy integration to reduce emissions from berthed ships.

Environmental Ship Index (ESI)

Incentivizes ship operators to reduce emissions through a rating system that evaluates NOx, SOx, and CO_2 emissions.

These indicators create a robust framework to measure and enhance the environmental performance of Indian ports. By institutionalizing them, India positions itself as a global frontrunner in green maritime logistics & unlocks access to international green shipping corridors and drive long-term net-zero ambitions.

NPSC Structure and Governance



Governing Body

Led by Secretary, MoPSW with DGMA as Vice-Chair

Technical Committees

Specialized focus on safety, emissions, digitalization

Port Authorities

Implementation at major and non-major ports

The NPSC operates under a robust governance model led by the Ministry of Ports, Shipping and Waterways (MoPSW). Supported by specialized technical committees, it ensures oversight on safety, emissions, digitalization, infrastructure, and regulatory compliance. *It complements the expanded scope of the Directorate General of Maritime Administration (DGMA), which will subsume the Directorate General of Shipping.*

Members include:

- Chief Hydrographer
- DGLL & IPA
- State Maritime Boards
- Major port authorities & private operators
- Academic institutions
- Global maritime experts

Outcome: Ensures comprehensive oversight of India's maritime sustainability initiatives.

India – Netherlands Partnership Outlook

- **Green & Digital Shipping Corridors (GDSCs)** launched between **Rotterdam and Mumbai** at *India Maritime Week 2025*.
- Framework for **clean fuel trade**, **port digitalisation**, and **technology collaboration**.
- Strengthening India's goal to **reduce 70% emissions per ton of cargo by 2047**.

Strategic Synergies :

- **Green Corridors & Zero Emission Routes :** Rotterdam–Mumbai corridor enabling **green hydrogen, ammonia, methanol exports** from India. Collaboration builds on the **April 2025 Indo-Dutch agreement** to develop the **Rotterdam–Kandla corridor** for hydrogen and e-fuel logistics.
- **Innovation Ecosystems for Fuels & Digitalisation :** Joint R&D on **vessel retrofits, digital twins, emission monitoring**.
- **Capacity Building & Regulatory Collaboration :** Bilateral Working Groups on Policy, Standard and workforce training

Just as the seas connect nations, partnerships connect possibilities. Turning waves of collaboration into currents of sustainable growth.

Thank you