



IMO GloNoise URN Toolkit Workshop

Directorate General of Shipping

08th April 2026 | Mumbai, India

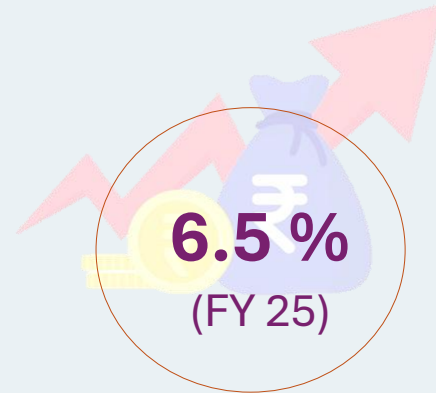


India's Economic Growth and the Significance of Maritime Domain



Indian GDP

World's 4th largest economy



GDP Growth

projected 6.3–6.7% annual growth through coming years



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



Global Competitiveness



2

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)



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



India's Vision for the Maritime Sector



MARITIME INDIA VISION 2030

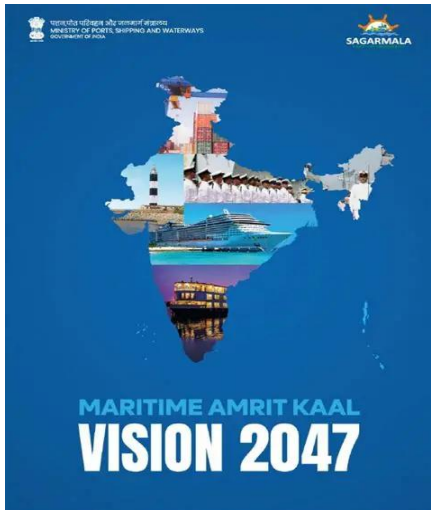


Maritime India Vision (MIV) 2030

- Position India Globally in the Top 10 Shipbuilding, repair nations (from 30k GT to 500k + GT).
- Renewable Energy Share at Major Ports : >60%
- Promote Waste to Wealth through ship recycling. India from #2 to #1 ship recycling nation.
- Encourage green belt development (plantations) : Atleast 33% of port area
- 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
- Carbon neutral ports (green fuel, electrification, SPS). $\geq 60\%$ renewable-energy share, create hydrogen hubs, emission & resource monitoring toolkits for ports.
- Promote Alternate/ Green Fuels, Bunkering infrastructure, green framework for terminal operations, introduce incentives in port duties for low emission vessels .
- 300+ Strategic Initiatives across 11 key maritime areas
- Financial Assistance: 20-30% assistance for green vessels (including retrofiting)





Mercantile Marine Legislation



5 New Acts 2025

Progressive policies and modernized regulations create an enabling environment for investment, ease of doing business, and global competitiveness.

Merchant Shipping Act, 2025 – Modernizes maritime regulations by broadening the definition of vessels, easing ownership norms, and aligning India’s shipping framework with global standards, thereby strengthening maritime capabilities.

Indian Ports Act, 2025 – Replaces the century-old 1908 Act, introducing a modern regulatory framework for port operations, management, and environmental safeguards. It ensures tariff transparency and mandates pollution control and disaster management plans at ports.

Coastal Shipping Act, 2025 – Enhances the role of coastal and inland shipping, promoting efficient use of waterways as a sustainable, cost-effective transport mode that reduces logistics costs and congestion.

Bill of Ladings Act, 2025 – Establishes a modern legal framework for electronic and physical bills of lading, enhancing transparency, traceability, and security in maritime trade documentation.

Carriage of Goods by Sea Act, 2025 – Updates liability and carriage rules to align with international conventions, ensuring fair, efficient, and standardized practices for transporting goods by sea.



The Merchant Shipping Act 2025 & Coastal Shipping Act 2025 into force wef. March 15, 2026



Two Pillars of Maritime Transformation



Technology & Sustainability

Technology Integration - Digital Platforms

1. Flagship platforms: e-Samudra, SAGAR SETU, Maritime Single Window (MSW).
2. e-Samudra integrates 60+ maritime services (MTO registration, shipbuilding aid).
3. AI-powered exams & simulations for seafarer training.
4. Real-time vessel/cargo monitoring via Command & Control Centre.
5. Digital Centre of Excellence (DCoE) promotes AI, IoT, blockchain.
6. Reduced cargo dwell time; enhanced port efficiency.
7. Swachh Sagar Portal







Sustainability Initiatives - Green Shipping Agenda

1. Targets: 500 GW non-fossil energy (2030), 1 billion-ton carbon cut, net-zero by 2070.
2. Policies encourage LNG, green hydrogen, biofuel vessels.
3. Mandates shore power, waste, and renewable port integration.










Sustainability Initiatives - Key Programmes

1. Harit Sagar Guidelines support 100% renewable energy, AI/IoT logistics in ports.
2. Green Tug Transition: 50% hybrid/electric tugs by 2030.
3. Green hydrogen plant at Deendayal Port scaling to 10 MW; 5 million tonnes by 2030 goal.

INDIA'S MARITIME TECHNOLOGY TRANSFORMATION IN 2025

-  CLOUD - NATIVE PLATFORMS
-  ARTIFICIAL INTELLIGENCE
-  BLOCKCHAINS
-  MARITIME SINGLE WINDOW
-  SIGNIFICANT REDUCTION IN CARGO DWELL TIMES
REAL TIME VESSEL TRACKING
-  DIGITAL CENTER OF EXCELLENCE

INDIA'S MARITIME SUSTAINABILITY INITIATIVES

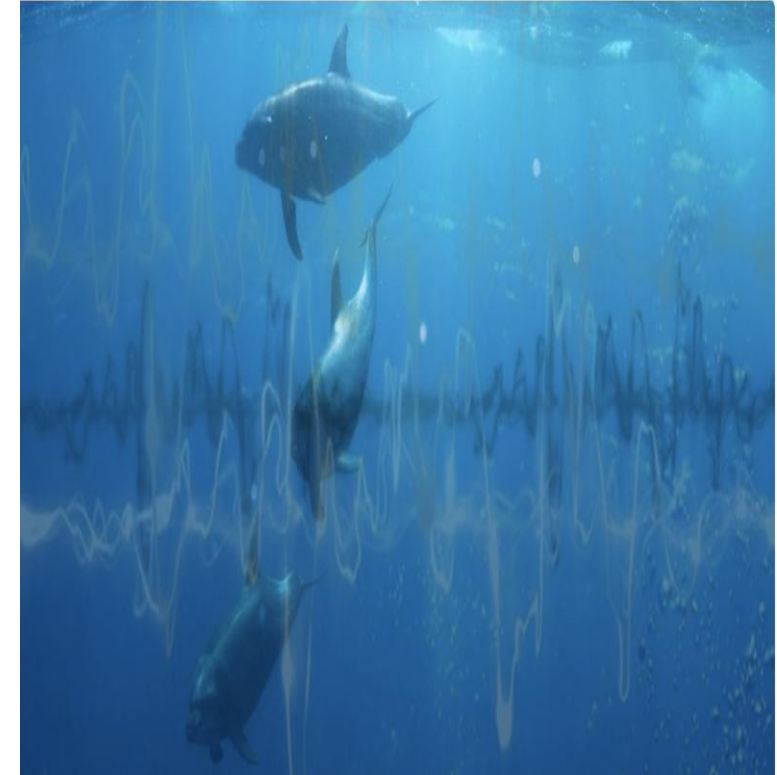
-  500 GW NON-FOSSIL ENERGY BY 2025
-  1 BILLION TONNE CARBON REDUCTION
-  LNG GREEN HYDROGEN VESSEL
-  100% RENEWABLE ENERGY PORTS
-  GREEN TUGS TRANSITION PROGRAMME
-  GREEN SHIPPING CORRIDORS
-  GREEN HYDROGEN
-  GREEN SHIPPING CORRIDORS
-  ₹ 25,000 CRORES MARITIME DEVELOPMENT FUND



Beyond Decarbonization: Emerging Environmental Priorities in Shipping



- The maritime sector is steadily moving towards **sustainable and responsible growth**
- While decarbonisation remains a key focus, **non-emission environmental impacts are now gaining attention**
- **Underwater Radiated Noise (URN)** has emerged as a critical concern
- With global shipping increasing at a steady pace, **underwater noise levels are rising across ocean regions**
- In the absence of mitigation measures, this will continue to impact **marine ecosystems and ocean soundscapes**



“Addressing underwater noise is essential for achieving holistic maritime sustainability”



Underwater Radiated Noise (URN)



What is URN?

- Sound generated by ships and maritime activities beneath the water surface

Primary Sources:

- Propeller cavitation
- Engine and onboard machinery vibrations
- Hydrodynamic flow around the hull

Key Characteristics:

- Predominantly **low-frequency noise**
- Travels efficiently over long distances underwater
- Intensifies with increasing vessel size and traffic density

Contribution from Commercial Shipping:

- Large vessels are the **dominant source of background ocean noise**
- Typical source levels range between **180–190 dB (re 1 μ Pa @ 1m)**





Impact on Marine Ecosystems and Global Sustainability

Why URN Matters?

A Growing but Invisible Challenge

Underwater noise is increasing with global shipping activity. Often unaddressed due to lack of visibility and awareness

Direct Impact on Marine Life

Interferes with communication, navigation and breeding
Affects whales, dolphins, fish and other marine species

Overlap with Biological Sound Systems

Shipping noise overlaps with natural frequency ranges
Disrupts critical life functions of marine organisms

Emerging Global Focus Area

Recognised by IMO through dedicated guidelines
Increasing attention in international maritime discourse

Need for Early Action

Rising shipping intensity will further amplify impacts
Timely mitigation is essential to prevent long-term ecosystem damage

SDG Relevance

The SDGs provide the global framework to integrate ocean sustainability and responsible maritime practices

SDG 14 – Life Below Water

Protection of marine biodiversity and ecosystems.
Reduction of underwater noise impacts



SDG 13 – Climate Action

Supports broader environmental sustainability in shipping. Complements decarbonization efforts

SDG 9 – Industry, Innovation & Infrastructure

Development of quieter ship designs and technologies. Sustainable maritime infrastructure



SDG 5 – Gender Equality

Inclusive capacity building and participation under global initiatives like GloNoise

SDG 17 – Partnerships for the Goals

Global collaboration through IMO, UNDP, GEF and partner countries





IMO Led Projects



GloLitter
partnerships

GEOGRAPHIC FOCUS
Asia, Caribbean, Latin America, Pacific and Africa.
Lead Partnering Countries: Brazil, Costa Rica, Côte d'Ivoire, India, Indonesia, Jamaica, Kenya, Madagascar, Nigeria and Vanuatu.
Partnering Countries: Argentina, Cabo Verde, Columbia, Ecuador, Gambia, Mozambique, Nicaragua, Panama, Peru, Philippines, Senegal, Sri Lanka, Solomon Islands, Sudan, United Republic of Tanzania, Thailand, Timor-Leste, Togo, Tonga and Viet Nam.

TOTAL BUDGET
NOK 40 million (about US\$ 4.5 million)

DONOR
Norwegian Agency for Development Cooperation (Norad)

IMPLEMENTING PARTNERS
The Food and Agriculture Organization (FAO)

PROJECT DURATION
2020 - June 2024

WEBSITE / CONTACT
GloLitter@imo.org

Reducing sea-based marine plastic litter

An IMO project under the Department of Partnerships & Projects (DPP)

17 member states
2 UN agencies
5 lead pilot countries
12 partner countries
14 UN agencies
8 international coastal states
100+ people

THE ISSUE

It is estimated that about 20% of total marine plastics comes from sea-based sources such as fisheries, shipping, recreation, oil and gas industry, and others. Plastic litter has devastating effects on our oceans, marine life and human health. Reducing and preventing marine plastic litter is vital to safeguard coastal and global marine resources.

OUR SOLUTION

- Equip partner countries with knowledge and tools to initiate legal, policy and institutional reforms.
- Establish public-private partnerships through Global Industry Alliance (GIA) to demonstrate best marine plastic litter management solutions.
- Engage women in tackling marine plastic litter problems through a grants program.
- Facilitate regional and global partnerships between countries to have a greater impact.

IMPACT

- Partner countries are leading the change on national, regional, and global levels and enforcing international conventions and regulations on marine plastic litter.
- Private sector is increasingly committed to supporting marine plastic litter related initiatives.
- Marine plastic litter originating from the shipping and fisheries sectors is reduced.



GREEN VOYAGE 2050

GEOGRAPHIC FOCUS
New Pilot Countries: Azerbaijan, Belize, Cook Islands, Ecuador, Kenya, Solomon Islands and Sri Lanka
Pioneer Pilot Countries: China, Georgia, India, Malaysia and South Africa

TOTAL BUDGET
7.15 Million USD

DONOR
Norwegian Ministry of Climate and Environment

PROJECT DURATION
2019-2022

WEBSITE / CONTACT
greenvoyage2050_imo.org
greenvoyage2050@imo.org

Supporting shipping's transition towards a low carbon future

An IMO project under the Department of Partnerships & Projects (DPP)

17 member states
5 lead pilot countries
14 UN agencies
9 sector services
7 international coastal states

THE ISSUE

According to the Fourth IMO GHG Study 2020, CO₂ emissions from shipping account for approximately 2.89% of global anthropogenic emissions, and if left unchecked, could rise significantly in the future. In 2016, IMO adopted the Initial IMO Strategy on reduction of GHG emissions from ships confirming IMO's commitment to reducing GHG emissions from international shipping and, as a matter of urgency, to phasing them out as soon as possible.

OUR SOLUTION

Supporting effective implementation of the Initial IMO GHG Strategy and in particular, providing support to developing countries in their efforts to reduce GHG emissions from ships, through enhancing government and port management capacities to:

- Undertake legal and policy reforms to effectively implement MARPOL Annex VI.
- Develop National Action Plans (NAPs) to address GHG emissions from ships.
- Catalyze private sector partnerships.
- Deliver pilot demonstration projects to facilitate technology uptake.

IMPACT

- High level commitment secured from all participating countries to progress on activities in their tailored workplans.
- Development of global capacity-building tools and training material to support decarbonization efforts.
- Initial dialogue with IFI's and other strategic partners to support pilot project implementation and other outputs.
- Reestablishment of the Low Carbon GIA under GreenVoyage2050, a public-private partnership to support low carbon shipping.



GloNoise Partnership

Reducing underwater radiated noise to protect marine life

Find out more

The GloNoise Partnership helps drive action on the implementation of the IMO Revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life (MEPC.1/Circ.906/Rev.1).

Lead Pilot Countries:
Argentina
Chile
Costa Rica
India
South Africa
Trinidad and Tobago

Twinning Countries:
Georgia
Madagascar
Malaysia



GloLitter :
Tackling Plastics and Marine Litter

Green Voyage 2050 :
Advancing IMO GHG Reduction Strategies

GloNoise :
Reducing Underwater Radiated Noise Pollution



GloNoise Partnership: Global Framework and India's Leadership

Global Partnership for Mitigation of Underwater Noise from Shipping (**GloNoise**) Led by **International Maritime Organization (IMO)** in collaboration with UNDP & Global Environment Facility (GEF)
Supports implementation of **IMO URN Guidelines (MEPC.1/Circ.906)**
Aims to reduce underwater noise and its impact on marine life

- Key Focus Areas:**
- Capacity building and training
 - Data generation and policy support
 - Adoption of mitigation technologies
 - Development of practical implementation tools



Global Participation
9 participating countries under the initiative

Lead Pilot Countries:
Argentina, Chile, Costa Rica, **India**, South Africa, Trinidad & Tobago

Twinning Countries:
Georgia, Madagascar, Malaysia

- India's Leadership**
- India is a **Lead Pilot Country** under GloNoise.
 - Actively driving **capacity building and implementation efforts.**
 - Hosting **URN Toolkit Workshop – Mumbai (April 2026)**



URN Toolkit and India Workshop

From Knowledge to Implementation



Underwater Radiated Noise (URN) Toolkit

Interactive **online platform and knowledge hub** for URN management

Supports stakeholders in:

- Understanding URN fundamentals
- Assessing noise impacts
- Implementing mitigation measures

Structured Learning and Tools

Three-level learning pathway:

- Level 1:** Foundations of URN
- Level 2:** Basic assessment (**RAINDROP Lite**)
- Level 3:** Advanced assessment (**RAINDROP**)

Enables:

- Noise modelling and risk assessment
- Policy development and national planning
- Capacity building across maritime stakeholders

India URN Toolkit Workshop

- URN fundamentals and IMO guidelines
- Toolkit walkthrough and application
- Hands-on training using RAINDROP tools

Key components:

- Demonstration of tools and outputs
- Data inputs and modelling approaches
- Country-level use case applications

Outcome

- Strengthening national capability for **URN assessment and management**
- Supporting effective implementation of IMO guidelines

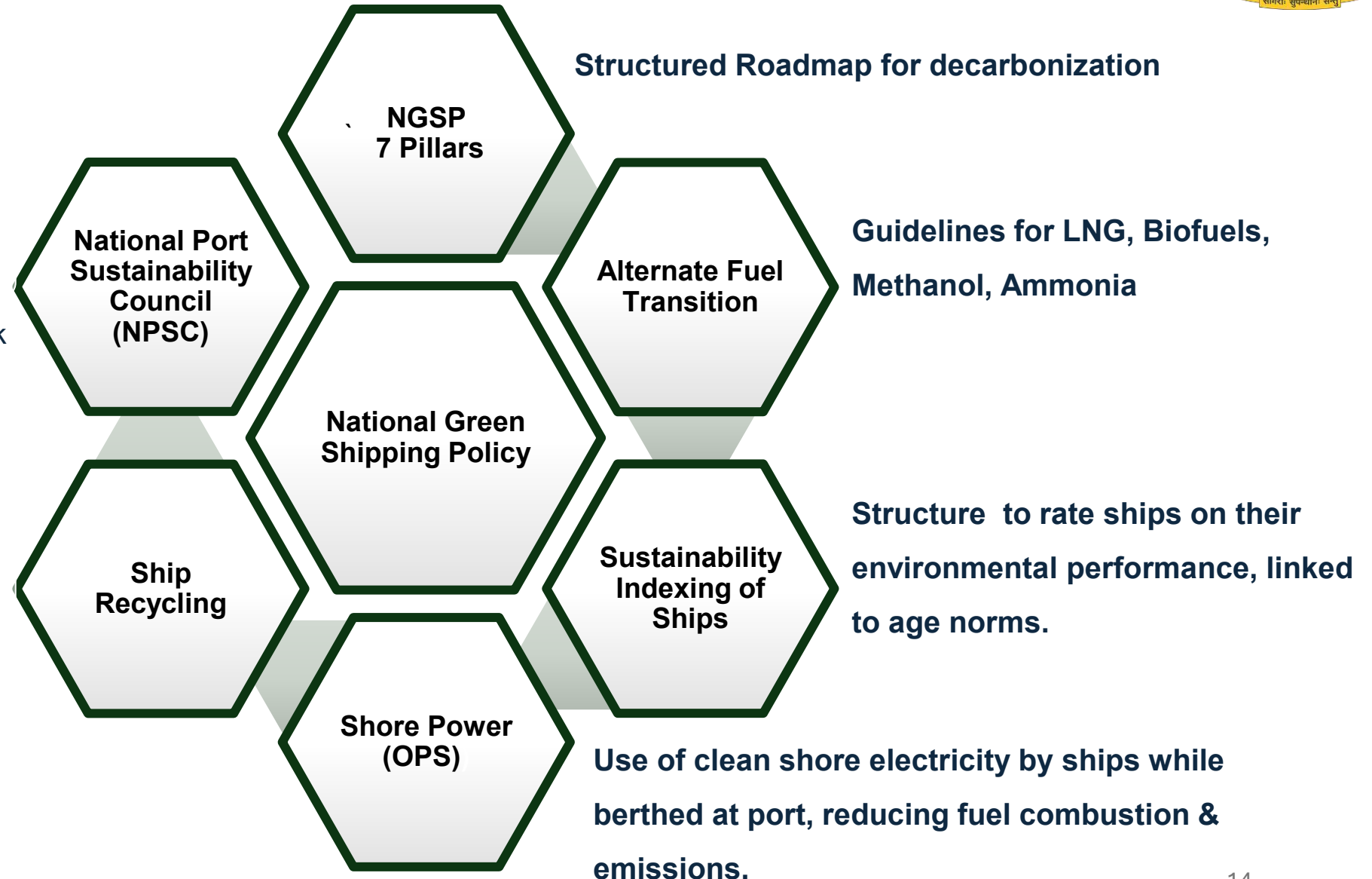


Green Shipping Initiatives



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.





Maritime INDIA @ Net Zero

14 – 15 January 2026, India Habitat Centre (Hybrid)



Maritime INDIA @ Net Zero was jointly organised by the Directorate General of Shipping (DGS) and NCoEGPS at TERI as a **high-level multi-ministerial action plan and governance workshop** to translate the National Green Shipping Policy (NGSP) vision into **phased, implementation-ready national pathways** aligned with India's climate commitments.

Way Forward

- **Conduct focused stakeholder webinars** to validate priority actions and implementation sequencing
- **Undertake inter-ministerial consultations** to finalise roles, timelines and coordination mechanism
- **Final submission of consolidated roadmap and action matrix to NITI Aayog** for strategic guidance and national rollout



MARITIME INDIA
@NET ZERO



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RESOURCES INSTITUTE
Creating Innovative Solutions for a Sustainable Future

7 PILLARS TOWARDS A NET ZERO MARITIME INDIA



1 GREEN SHIPS

Lifecycle-based decarbonization of India's fleet through energy-efficient, fuel-flexible and low- to zero-emission vessels, supported by green ship certification and lifecycle emissions accounting.



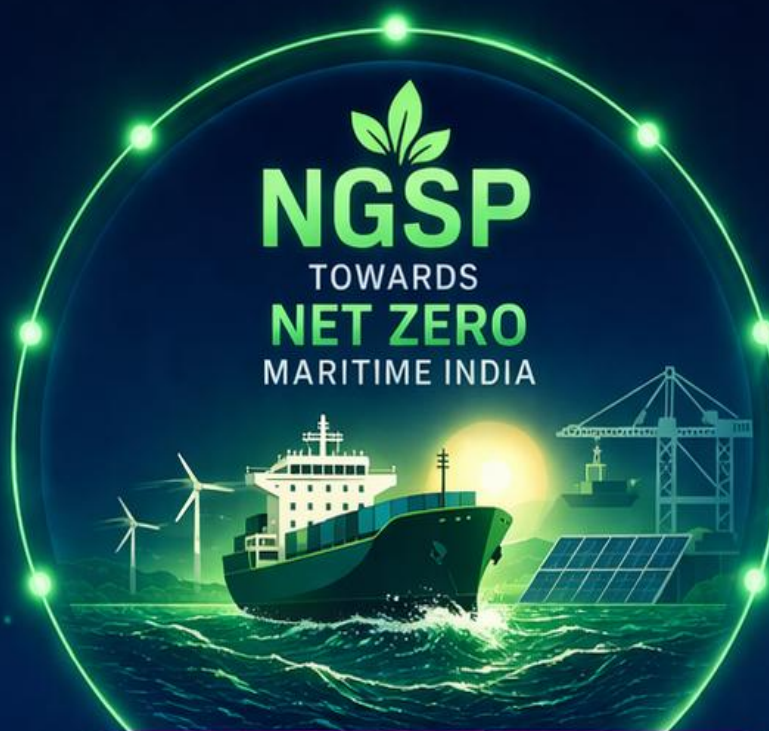
2 GREEN PORTS

Port-led decarbonisation by integrating clean energy, electrification and efficient operations, positioning Indian ports as competitive, low-carbon logistics gateways.



5 GREEN FINANCE

De-risking maritime decarbonisation by mobilising affordable, long-term capital through blended finance, risk-sharing instruments and ESG-aligned investment frameworks.



6 GREEN SKILL DEVELOPMENT & CAPACITY BUILDING

Preparing the maritime workforce and institutions for new fuels, technologies and regulatory requirements, ensuring a just, inclusive and execution-ready transition.



3 GREEN FUELS

A safe, phased and technology-neutral transition to alternative marine fuels, guided by lifecycle performance, bunkering safety and infrastructure readiness.



4 GREEN SHIP RECYCLING

Advancing safe, environmentally sound and circular ship recycling aligned with the Hong Kong Convention, strengthening worker safety, material recovery and digital transparency.

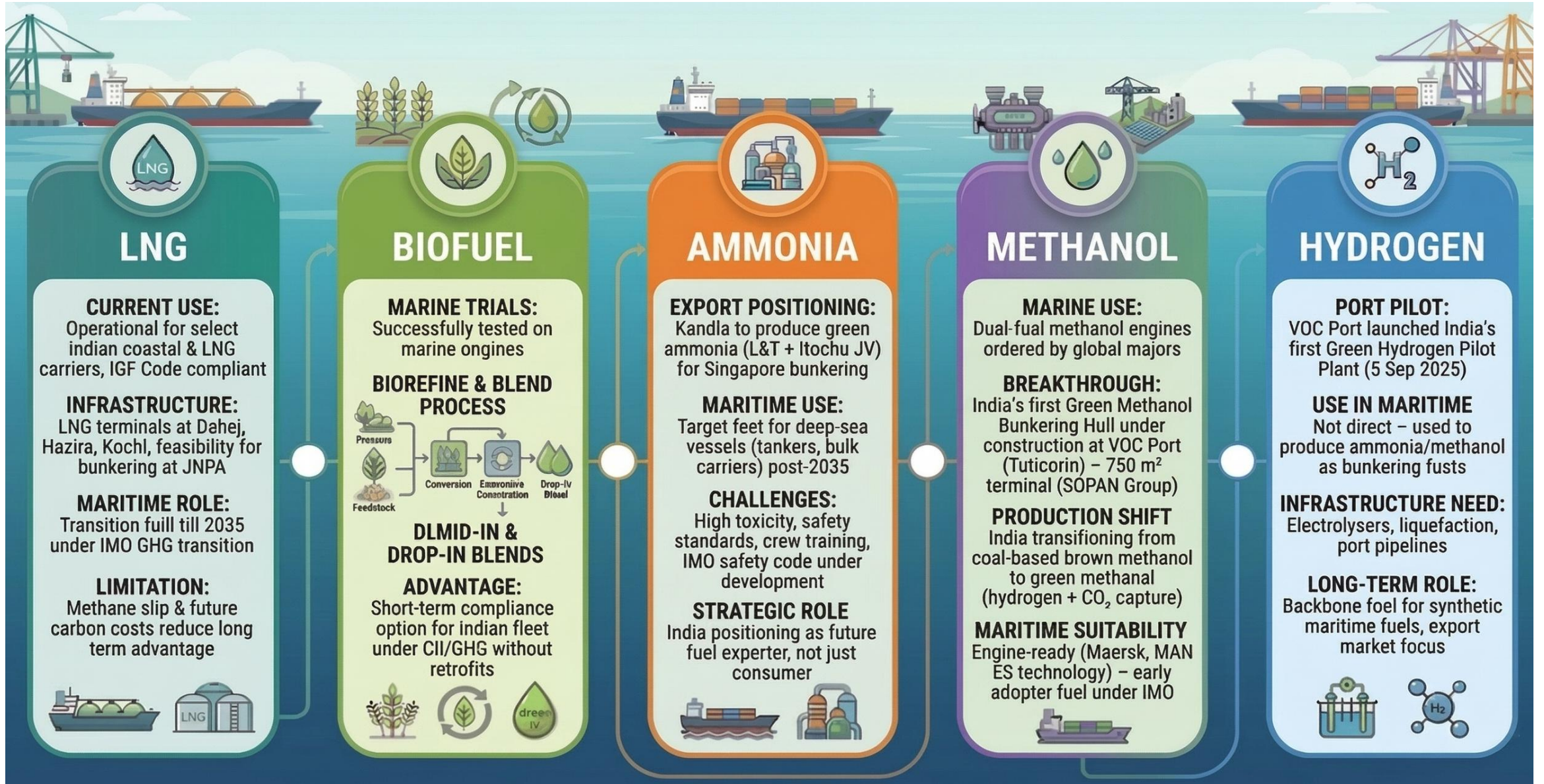


7 GREEN TECHNOLOGY & INNOVATION

Accelerating adoption and indigenisation of advanced maritime technologies through digitalisation, pilot projects and innovation sandboxes to enhance efficiency, safety and competitiveness.



Alternative Fuels for Maritime





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.



IMO – DNV Study on Alternative Maritime Fuels



What the Study Examines

- Joint analytical study by **DNV** in collaboration with **IMO**, undertaken with **DGS** and **MoPSW**
- Assesses **potential demand, pricing and competitiveness** of alternative marine fuels in India
- Uses **vessel traffic data, route analysis and port-call patterns** to assess realistic bunkering behaviour
- Evaluates alternative fuels through a **delivered-cost and total-voyage-cost lens**, not fuel availability alone
- Anchored in **India's port ecosystem**, rather than theoretical diversion of passing traffic

Why the Findings Matter for India

- Confirms that **credible near-term demand lies with cargo-calling vessels**, not passing traffic
- Identifies **container shipping** as the most predictable and scalable early adopter segment
- Shows that **price competitiveness, operational reliability and approval clarity** determine bunkering decisions
- Highlights India's opportunity to build **clustered, multi-port bunkering hubs**, rather than isolated pilots
- Provides an evidence base to prioritise **ports, fuels and pilots** under *upcoming NGSP and Maritime INDIA @ Net Zero*



Collaboration with DMA & Mærsk Mc-Kinney Møller Centre for Zero Carbon Shipping



India Green Shipping Corridors – Pre-Feasibility Study

What the Study Examines

- Identification & ranking of **potential Green Shipping Corridors in India**
- Assessment of:
 - **Alternative fuel availability & supply chains**
 - **Port readiness & bunkering infrastructure**
 - **Cargo flows & vessel characteristics**
 - **Regulatory ecosystem & transition pathways**
- Based on **data-driven analysis and stakeholder consultations**

Strategic Benefits for India

- Enables **early-stage deployment of green fuels & technologies**
- Supports development of **domestic green fuel supply chains**
- Positions India as a **key hub on global green shipping routes**
- Drives **investment, innovation and new business models**
- Provides a **clear pathway from pilot → scale-up of decarbonisation**



Green Ports

Driving Sustainable Maritime Growth

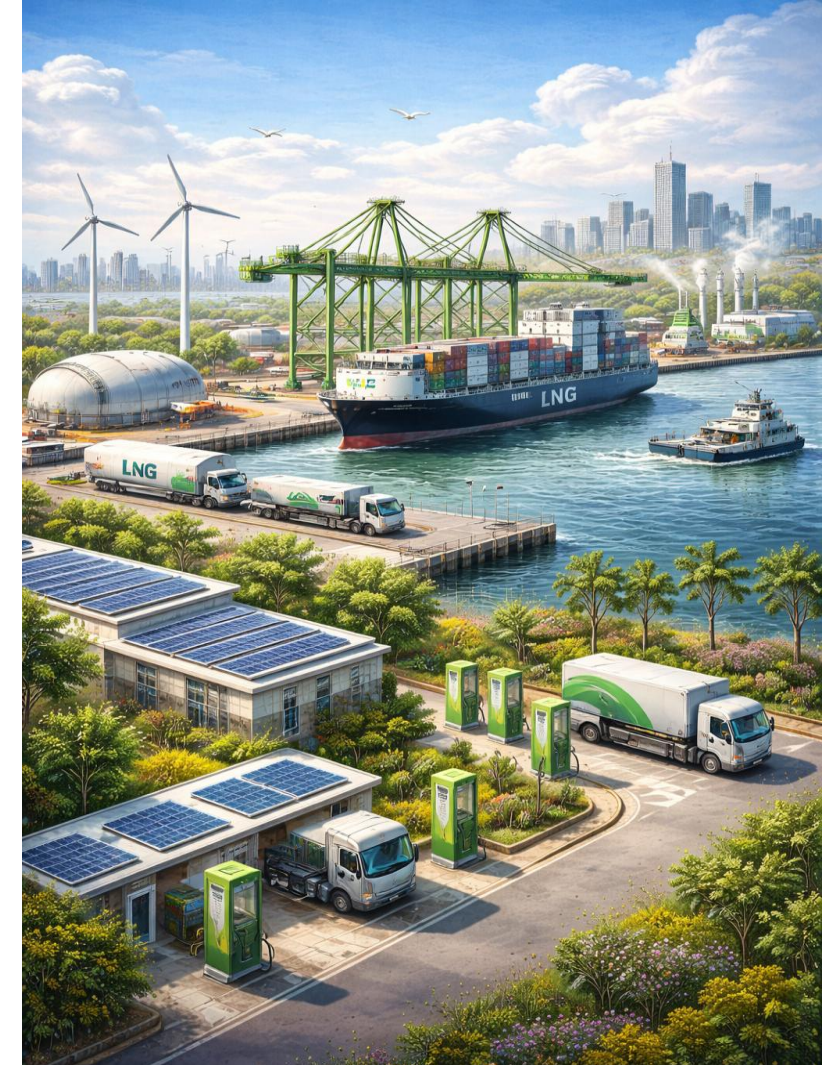


Concept of Green Ports

- Ports designed & operated with minimal environmental impact.
- Integration of clean energy, efficiency, and circular economy practices.

Key Initiatives in India

- Harit Sagar Guidelines (2023): National framework for green port development.
- Proposed National Port Sustainability Council (NPSC): Metrics for emissions, energy, waste, and community impact.
- Onshore Power Supply (OPS): Cut ship emissions at berth by connecting to shore electricity.
- Waste & Plastics Management: Port reception facilities for MARPOL Annex V compliance.





Sustainable Indicators for Indian Ports



Green Port Index (GPI)

Evaluates ports 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

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

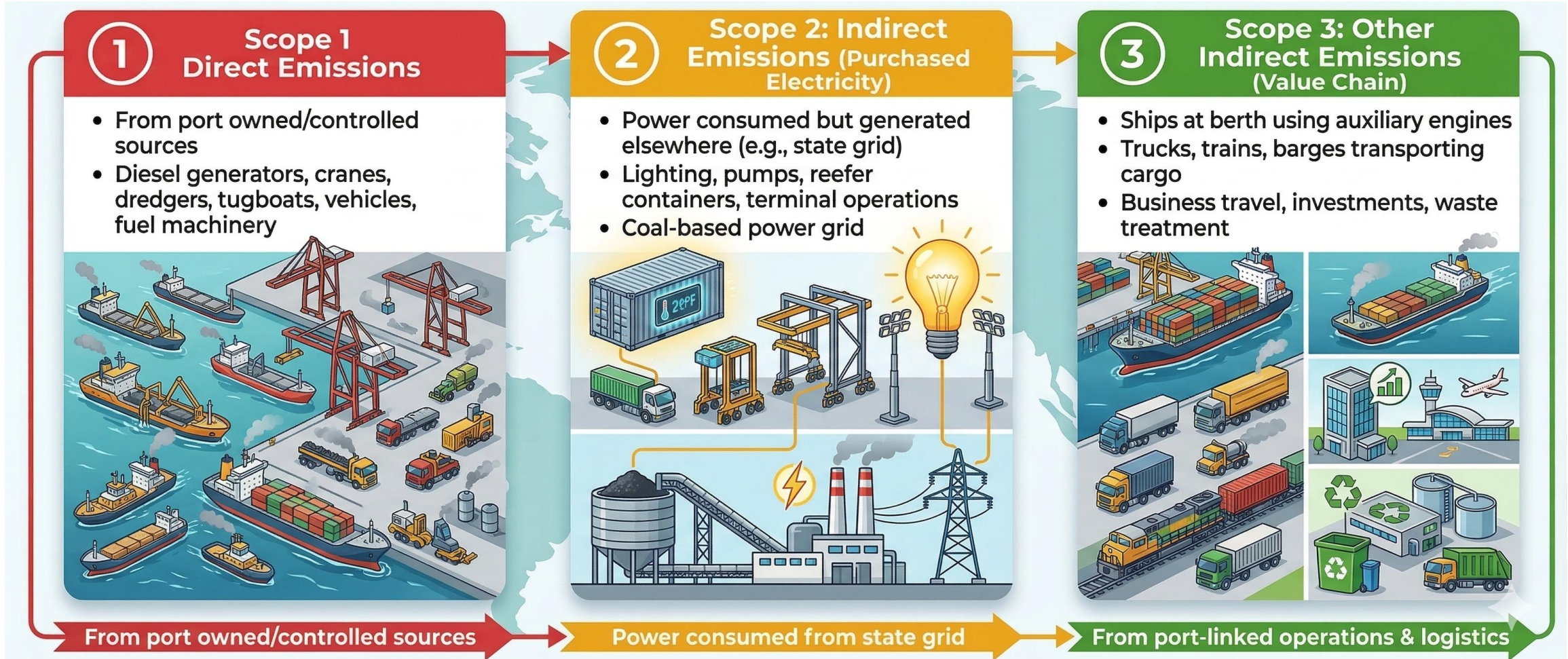


Environmental Ship Index (ESI)

Incentivizes ship operators to reduce emissions through a rating system that evaluates NO_x, SO_x, and CO₂ 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.



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 **CO₂, NO_x, SO_x 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)
- **Paradip Port** - Newly commissioned. Delivered full load power to MV APJ Indrani at CB1 Berth.



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.







Just Transition in Maritime



Just Transition: Putting People at the Core of Decarbonisation

Decarbonisation is not only a fuel shift. It is a workforce shift.

 ~3.23 lakh Indian seafarers (as of 2025) –
~12% of global maritime workforce

-  Alternative fuels introduce new safety risks
-  New technologies demand new competencies
-  Transition must protect jobs, safety and dignity



Skills & Training

- Large-scale upskilling for green fuels
- Modernised STCW standards
- Investment in maritime training infrastructure



Safety & Standards

- Health-and-safety-first approach
- Handling ammonia, hydrogen, low-flashpoint fuels
- Alignment with MLC 2006 & global labour norms



Equity & Inclusion

- Avoid widening global skills gaps
- Support developing maritime nations
- Promote diversity & gender inclusion

A green transition must also be a fair transition.



Integrated Vessel Traffic Management System (iVTMS)



Enhancing Navigational Safety, Efficiency and Environmental Governance

Regulatory Framework

Implemented in accordance with **Chapter V of SOLAS**

Compliant with relevant **IMO Guidelines & Circulars**

Ensures standardized vessel traffic monitoring and navigational safety

Coverage & Deployment

Implemented across **All Major Ports in India**

Additionally operated by **Directorate General of Lighthouses and Lightships (DGLL)** at **Gulf of Kutch**

Integrated surveillance for high-density and sensitive maritime zones

Developed by **IIT Madras – (NTCPWC)**

Integrates:

AIS

Radar

VHF

Meteorological & oceanographic data

CCTV surveillance

Centralized command and control platform for real-time situational awareness.

Strategic Significance

- Collision avoidance & Channel traffic regulation
- Emergency response coordination
- Optimized vessel sequencing
- Reduced congestion in port approaches
- Enables Just-in-Time arrival
- Supports speed optimization & Reduces anchorage emissions
- Improves incident-based environmental response



Just-in-Time & Digital Twin for Ports



Just-in-Time (JIT) Arrival

Objective:

Synchronize vessel speed with berth readiness to eliminate anchorage waiting.

Enables:

- Reduced fuel consumption at sea
- Lower port congestion
- Improved berth utilization
- Reduced emissions from idling vessels

Impact:

Speed optimization = Immediate CO₂ reduction

Integrated Operational Data Layer

Digital twins require:

- Real-time AIS, weather and berth data
- Terminal equipment data (cranes, yard, gates)
- Pilotage & tug scheduling inputs
- Hinterland (rail/truck) visibility
- As highlighted in Neugebauer et al., digital twins require **bi-directional real-time data exchange between physical and digital systems**

Reference : Digital Twins in the Context of Seaports and Terminal Facilities - Springer

Digital Twin of the Port

A virtual representation of the physical port, continuously updated through automated data exchange

Capabilities:

- Berth allocation simulation
- Crane scheduling optimization
- Yard congestion prediction
- Emission modelling
- Scenario testing (storm, delay, peak traffic)

Digital twins must provide:

- Situational awareness
- Intelligent decision support
- Multi-stakeholder coordination

This transforms port management from reactive to predictive.



Digital Twin at VOCPA Tuticorin



Prestigious Digital Twin System commissioned in record 6 months

Cost: ₹24.62 Crore

Executed by: IPRCL

Inaugurated by Hon'ble Minister of MoPSW Shri Sarbananda Sonowal (23 Feb 2026)

Salient Features

Complete 3D Port Visualization

The entire port ecosystem is displayed in real-time 3D on a holographic table, enabling intuitive and immersive operational oversight.

Integrated CCTV Surveillance (~400 Cameras)

Nearly 400 CCTV cameras are mapped to their exact physical locations, allowing centralized and location-specific monitoring of port activities.

VTMS Integration – Real-Time Vessel Intelligence

The Vessel Traffic Management System is fully integrated. With a single click on a vessel image, movement details and cargo information are instantly accessible.

Integrated Weather Monitoring

Live weather systems are embedded into the platform, enabling proactive monitoring of rainfall, cyclones and other atmospheric disturbances.





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**.





ISO Compliance



Strengthening India's Global Credibility

Enforcing ISO management systems ensures ship recycling operations at Alang are **system-driven, auditable and internationally benchmarked**, complementing HKC compliance and supporting EUSRRC recognition.

Key ISO Standards for Ship Recycling Yards

ISO 9001 – Quality Management: Streamlined processes, documentation and continual improvement.

ISO 14001 – Environmental Management: Pollution control, waste handling and eco-monitoring.

ISO 30000 – Ship Recycling Management: Integrates HKC principles for safe and compliant recycling.

ISO 45001 – Occupational Health & Safety: Worker safety, risk control and preventive culture.

Impact of Enforcement

- Builds **credibility and transparency** in global markets.
- Enhances **environmental, health and safety performance**.
- Improves **audit readiness** for IMO and EU inspections.
- Positions **Alang as a benchmark for responsible recycling**.



ISO 9001
Quality Management System (QMS)



ISO 14001
Environmental Management System (EMS)



ISO 30000
Ship Recycling Management System (RSMS)



ISO 45001
Occupational Health & Safety Management System (OHSMS)



Ship Recycling Portal



An upcoming unified national digital platform under DGS to implement the Hong Kong Convention (HKC) and Recycling of Ships Act (2019), ensuring real-time, transparent and accountable governance of India's ship recycling ecosystem.

Importance of Portal

- **Transparency** : Digitally traceable inspections, certifications & audits
- **Accountability** : Role-based actions with time-stamped compliance trails
- **Real-time Monitoring** : Central oversight by DGS & State Authorities
- **Global Credibility** : Auditable records for IMO, foreign Flag States & shipowners
- **Stakeholder Integration** : Connects DGS, GMB, ROs, yards, service suppliers

Core Functional Modules

- Yard Registration & Licensing
- **Inventory of Hazardous Materials Inventory**
- **RRC Certification Registry**
- SRP Submission & Approval
- **Inspection, Audit & ISO Compliance Tracking (ISO 9001, 14001, 30000, 45001)**
- Incident & Non-Conformity Reporting
- Worker Training & Competency Records
- GISIS / IMO Reporting Integration



Ship Recycling Credit Note



- Introduced under **Ship Building Financial Assistance Scheme 2.0 (SBFA 2.0)**
- Incentivizes ship owners to **recycle in India** and **build new ships in Indian shipyards**

How It Works

- When a vessel is recycled in a certified Indian yard, the ship owner receives a **Credit Note for 40% of scrap value.**
- The Credit Note remains valid until the owner builds a new vessel/ ship in an Indian shipyard
- Redeemed as **financial assistance/ subsidy** under SBFA 2.0

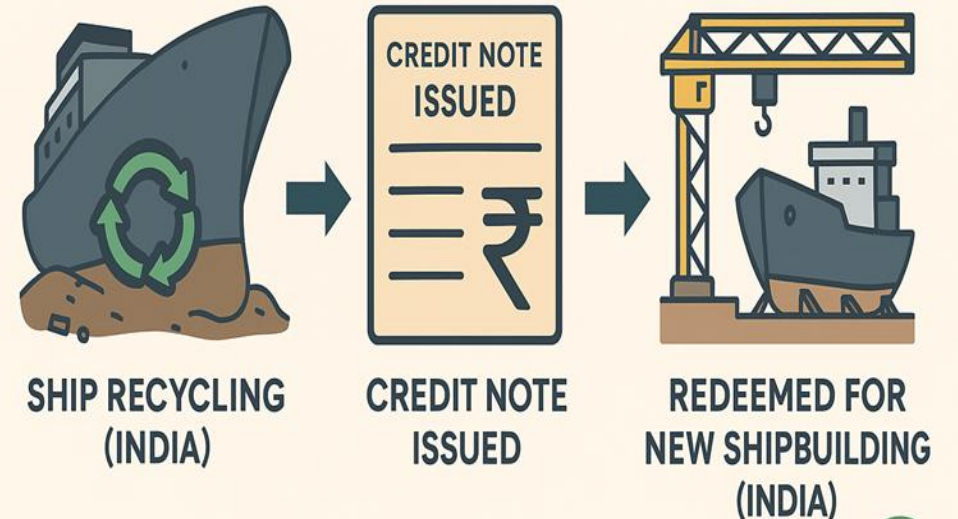
Expected Benefits

- Encourages **safe and HKC compliant ship recycling** in India
- Provides direct **business boost for Indian shipyards**
- Attracts **new players** to India's ship recycling and shipbuilding ecosystem
- Strengthens India's **circular economy** : recycling feeds into new shipbuilding
- Positions India as a leader in **Green and Sustainable Maritime Growth**

Allocation of : ₹ 4,001 crore
(under SBFA)

SHIP RECYCLING CREDIT NOTE

Linking Recycling with Shipbuilding



SHIP RECYCLING CREDIT NOTE



Shipbuilding Scenario in India



**30,000
GT**

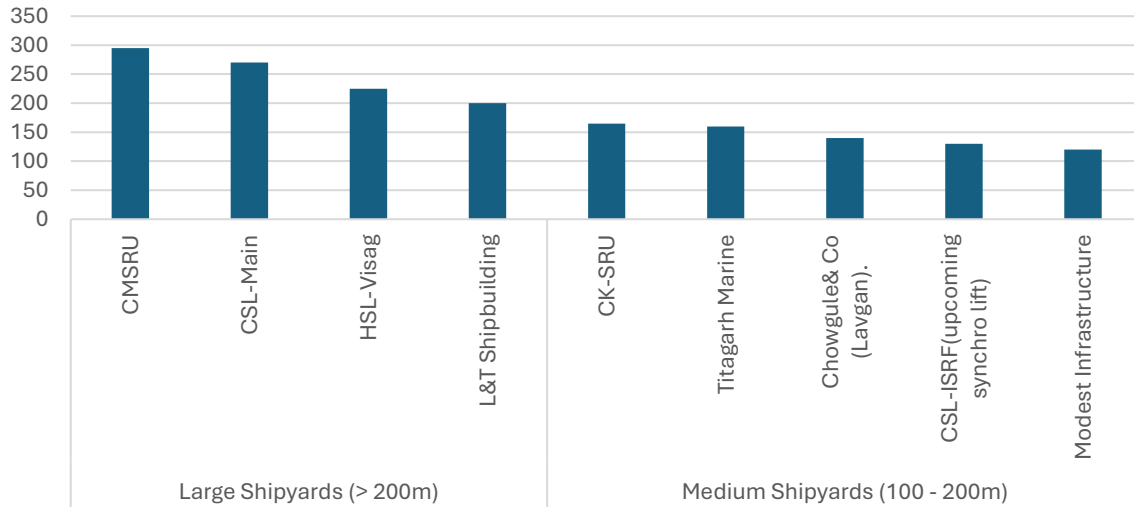
**Current Annual
Tonnage
Produced**

53*

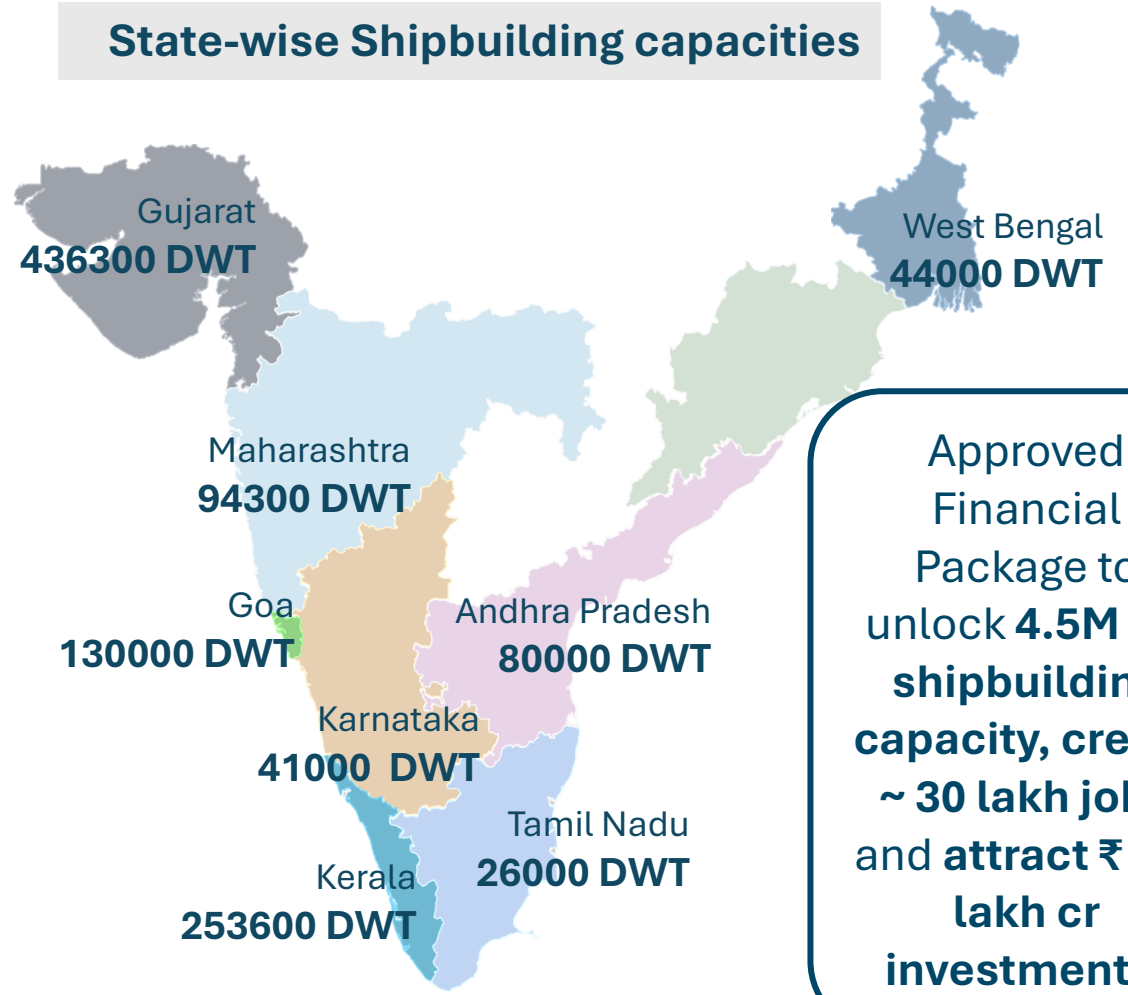
**Total Number of
Shipyards**

**Annual Report, MoPSW*

Shipyards with capacity based on Ship's length for docking



State-wise Shipbuilding capacities



Approved Financial Package to unlock **4.5M GT** shipbuilding capacity, create **~ 30 lakh jobs** and attract **₹ 4.5 lakh cr** investments.



Four Pillar Approach



Cabinet approves ₹ **69,725** crore Package to Revitalize India's Shipbuilding and Maritime Sector



Shipbuilding Financial Assistance scheme

Allocation: ₹24,736 crore

- Overcome cost differential vis-a-vis foreign shipyards.
- Credit note for new builds against ship scrapping in India
- Establish National Shipbuilding Mission



Maritime Development Fund

Allocation: ₹25,000 crore

- Enable long-term financing to maritime sector through equity & debt-based funding:
- Maritime Investment Fund
 - Interest Incentivization Fund
 - Credit Guarantee Fund



Shipbuilding Development Scheme (SbDS)

Allocation: ₹19,989 crore

- Greenfield cluster creation
- Brownfield capacity expansion to **4.5 million GT**
- Risk outlay for shipyards
- Setting up of India Ship Technology Centre (ISTC) as Apex body under IMU



Legal, Policy and Process Reforms

- Demand aggregation
- Large Ships as infrastructure
- Taxation issues
- Flagging reforms

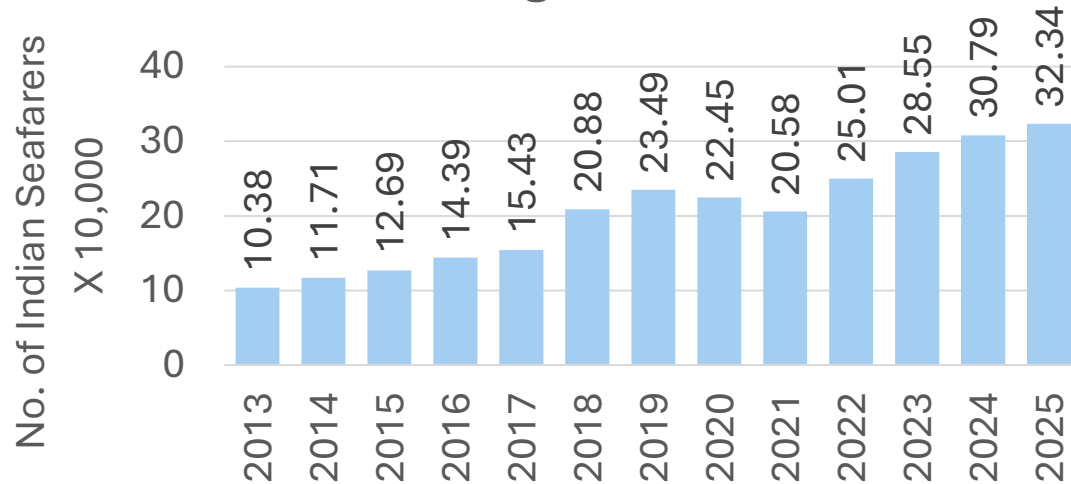


India's Seafaring Scenario

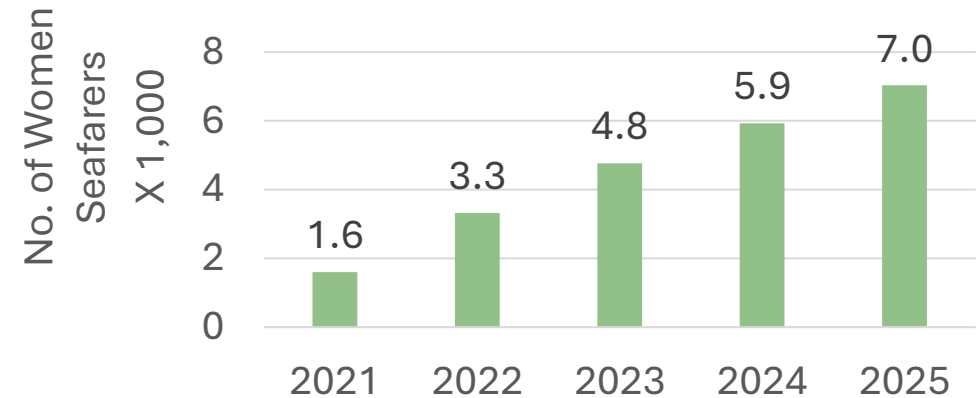


- **India among top 5 maritime nations** in seafarer supply
- **Contributes ~ 12%** of the global seafarer workforce
- **MIV 2030 target:** Increase India's share to **20%** by 2030
- Current share of women seafarers in India: < **0.5%**
- **MIV 2030 target:** Raise women participation to **2-3%** by 2030
- **Growth achieved: 339%** rise since 2021

Year on Year growth of Seafarers



Year on Year growth of Women Seafarers





Sagar Mein Yog & Sagar Mein Samman



Wellness at Sea & Gender Inclusion in Maritime

Sagar Mein Yog

Sagar Mein Yog is a **comprehensive wellness program** built on the integration of yoga, mindfulness, emotional resilience, physical health, and spiritual well-being.

- In partnership with **NUSI** and knowledge partner Trijog
- Linked with MIV 2030 **Deliverable 10.16.3**
- A pilot 3 day ToT Programme was conducted in December with participations of ~56 trainers



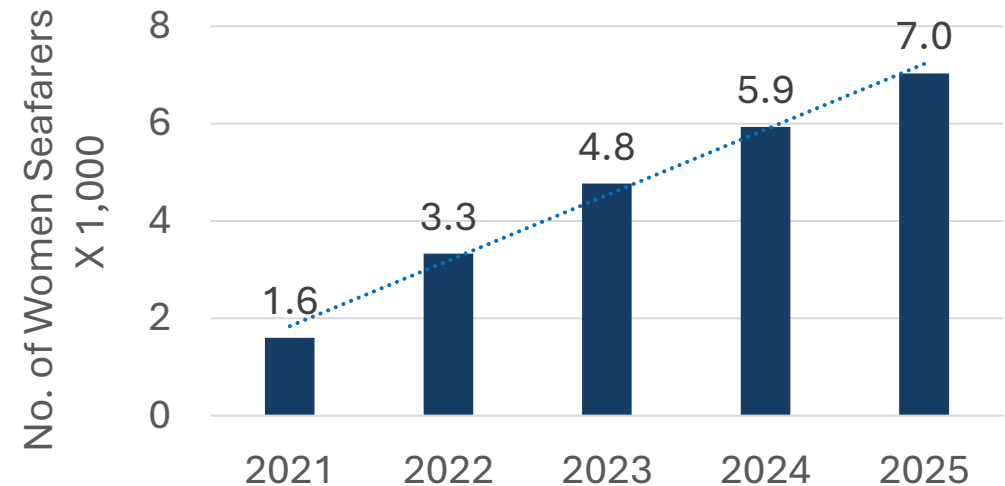
[LMS Link](#)



Sagar Mein Samman

Sagar Mein Samman (Honor at Sea) is the flagship initiative, **designed to transform India's maritime sector into a more inclusive, equitable, and aspirational ecosystem.**

Year on Year growth of Women Seafarers



- **National average:** < 0.5% women seafarers in India
- **Maritime India Vision 2030:** 2–3% women participation by 2030.

Zero Tolerance in Crewing

- DG Shipping follows a Zero Tolerance policy against fraud, cheating, and illegal recruitment of seafarers.
- A nationwide digital awareness campaign was launched through DG Shipping’s social media platforms, publishing multiple videos on:
 - Fraudulent agents and fake job offers
 - Illegal payments to RPSL companies
 - Seafarers’ rights
 - 24x7 Grievance redressal
- To strengthen outreach, DG Shipping conducted symposiums on seafarer recruitment and welfare.
 - Successfully held: Mumbai, Delhi
 - Planned next: Chennai, Kolkata
- The campaign combines digital engagement and on-ground awareness to protect seafarers and prevent exploitation.



DG Shipping Reaffirms Zero Tolerance Towards Fraud and...



Rescue at Sea: True Stories of Protecting Indian Seafarers | Capt. P.C. Meena



Empowering Seafarers: Inside DG Shipping's Crew Branch & Its Vital Role in Maritime Welfare | Capt. P.C. Meena



Empowering Seafarers: Inside DG Shipping's Crew Branch & Its Vital Role in Maritime Welfare | Capt. P.C. Meena



Seafarers' Rights—Know and Protect Yourself | Capt. Nitin...

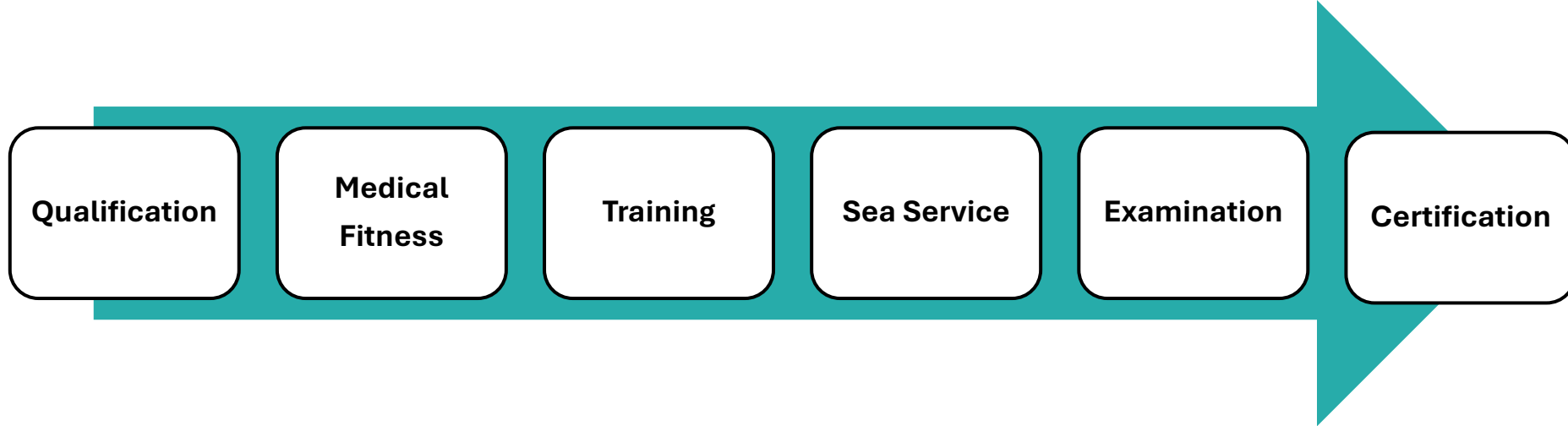


झूठी भारतीय समुद्रकर्मियों नौकरियों से सावधान रहें | नौवहन महानिदेशालय...

Redefining Future Maritime Training & Education

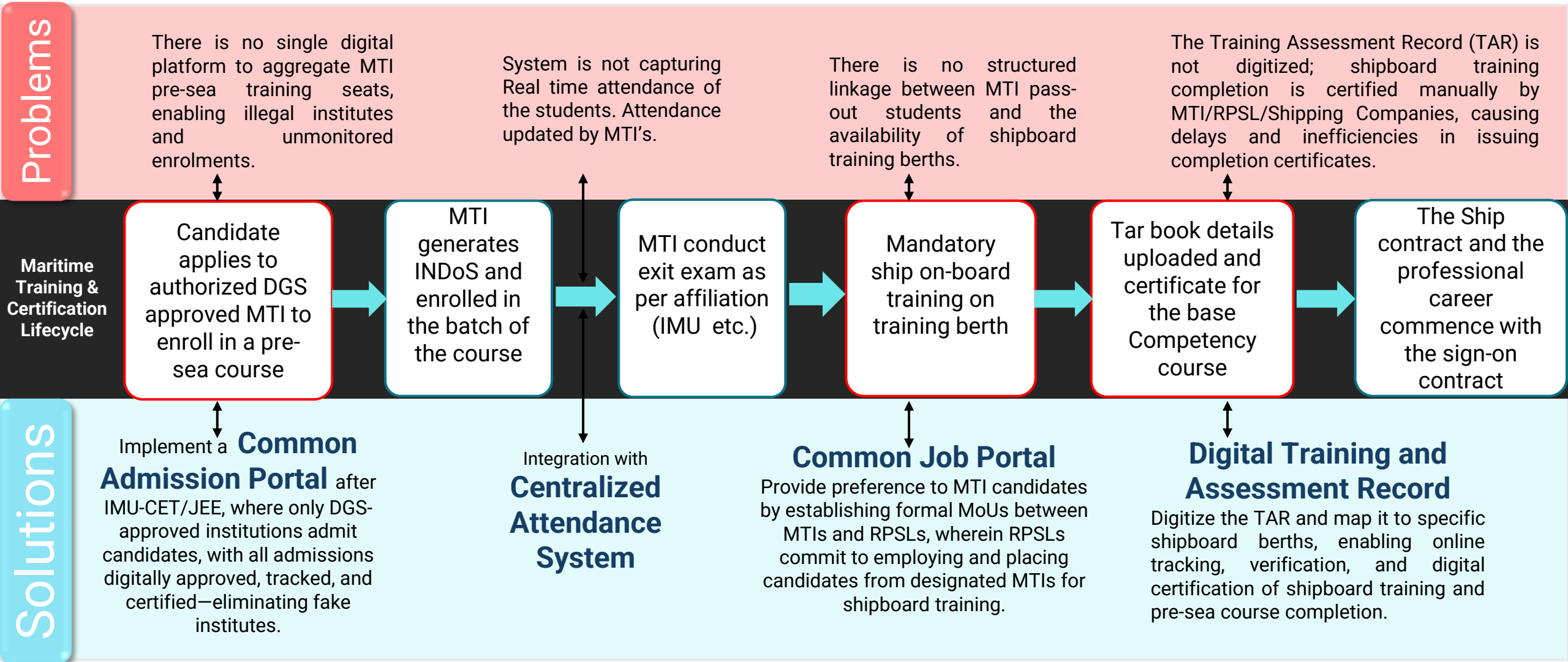


“While compliance with standards is essential for serving on board ships, the skills and competence of seafarers can only be adequately underpinned, updated and maintained through effective Maritime Education, Training, Assessment and reliable Certification of their Competency.” - (General Arsenio Dominguez - IMO Secretary)





Maritime Training and Certification Lifecycle



Digital Initiatives in Training



Examination Reforms



**MTI Modules- 3 +
helpline and
escalation
matrix**



**Learning
Management
System**



**Web based
simulation**



**Digitization of
Training and
Assessment
Record (TAR)**



**Centralized
Attendance
system CAS 2.0**



**Online Maritime
Certificate
Validation
System**



**Use of new analytics tools
for insight building and
effective decision making**



**Placement portal and
authentic job portal**



**AI & Immersive
technology strategy**



**Faculty
development
Program**



Transparency and Zero Tolerance for Fraud



A Digital Transformation for Maritime Education

Raising issue over the Call/SMS/WhatsApp

Helpline between 09:00 AM – 06.00 PM

Escalation mechanism for resolving query

Follow-up
Support and right guidance

Analysis & Correction and recurrence



For any queries on Maritime Training, course details, Guidance. Please reach out to the Official helpline.

CONTACT: 8655798737

- ✓ Stay Informed
- ✓ Stay Compliant
- ✓ Stay Safe





HSSE Appraisal Standard Overview



Importance: Critical role of shipbuilding, repair, and recycling in national maritime capability and employment.



ISO 45001:2018: Occupational health & safety.

ISO 14001:2015: Environmental management..

ILO Code of Practice: Safety in shipbreaking.

OSHA Standards: Operational safeguards.

Indian Legal Framework: Recycling of Ships Act, Dock Workers Regulations, EPA.



Suraksha Sarvapratham



Safety First

DGS is focused on promoting safety on vessels and is set to launch a campaign called the Suraksha Sarvpratham, ensuring that the seafarers are able to discharge their duties in a risk-free manner.

To reduce accidents and minimize risks aboard ships.

Detailed documentation of incidents that occur at sea and during port operations.

Systematic recording and analysis of incidents will help identify patterns, understand root causes, and implement preventative strategies.

Instill a culture of safety among seafarers.

Web-based learning management systems for training.

Free online courses will be developed.

To create a safer working environment for seafarers by reducing the frequency and severity of accidents at sea and in ports.

Comprehensive incident documentation, strict adherence to safety protocols, and innovative AI-based safety videos--- to establish Safety Culture



Humans as the Paramount Element in the Maritime Industry

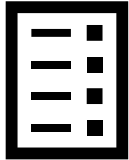


Human element is of paramount importance in the maritime industry as human skills, judgement and welfare drive maritime safety.

Issues of Criminalisation

- Seafarers face legal threats or undue blame for operational incidents, often without due process.

Digital Records



Creation transparent digital records, ensuring fair accountability and reducing wrongful criminalisation

Certification and Assessment



Certification and Assessment and global data sharing detect and respond quickly to abandonment or criminalisation cases

Issues of Abandonment

- Seafarers stranded without pay, support, or repatriation, due to company financial/ legal issues

Digital Platforms



support real-time crew tracking, payroll management, and welfare monitoring, reducing the risks of abandonment

Communication and Grievance Platforms



Support for distress situations, with human-centered policies and tech tools for a just and humane maritime ecosystem

Technology acts as an enabler for protecting seafarer rights, supporting welfare, and strengthening accountability in line with the document's focus on human-centric maritime development



“India remains firmly committed to shaping a responsible, inclusive and forward-looking global maritime transition—while preparing its domestic ecosystem to adapt and lead.”

Thank you



सत्यमेव जयते

**Ministry of Ports,
Shipping & Waterways**
Government of India

