Green Finance Implementation Roadmap

Advisory

DIRECTORATE GENERAL OF SHIPPING
MUMBAI
सागराः सुपन्थानः सन्तु

Document control

Revision history

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List of Abbreviations

Abbreviation	Definition
ADB	Asian Development Bank
AI	Artificial Intelligence
AIIB	Asian Infrastructure Investment Bank
BRICS	Brazil, Russia, India, China, South Africa
CIF	Climate Investment Fund
DG Shipping	Directorate General of Shipping
DPIIT	Department for Promotion of Industry and Internal Trade
EIB	European Investment Bank
ESG	Environmental, Social and Governance
EU	European Union
EU ETS	European Union Emissions Trading System
FDI	Foreign Direct Investment
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIFT City	Gujarat International Finance Tec-City
ICMA	International Capital Market Association
IFSC	International Financial Services Centre
IFC	International Finance Corporation
IMO	International Maritime Organization
IMDF	India Maritime Development Fund
INR	Indian Rupee
IRENA	International Renewable Energy Agency
JICA	Japan International Cooperation Agency
LNG	Liquefied Natural Gas
MDB	Multilateral Development Bank
MDF	Maritime Development Fund
MoEFCC	Ministry of Environment, Forest and Climate Change
MoPSW	Ministry of Ports, Shipping and Waterways

MRV	Monitoring, Reporting and Verification
MSME	Micro, Small and Medium Enterprises
NABARD	National Bank for Agriculture and Rural Development
NBFC	Non-Banking Financial Company
NDB	New Development Bank
NGSP	National Green Shipping Policy
NLP	Natural Language Processing
OPS	Onshore Power Supply
PE	Private Equity
PPP	Public-Private Partnership
PSU	Public Sector Undertaking
RBI	Reserve Bank of India
RBF	Results-Based Finance
SBI	State Bank of India
SBFA / SBFAS	Shipbuilding Financial Assistance / Shipbuilding Financial Assistance Scheme
SEBI	Securities and Exchange Board of India
SIDBI	Small Industries Development Bank of India
SLL	Sustainability-Linked Loan
SLB	Sustainability-Linked Bond
SMFCL	Sagarmala Finance Corporation Limited
VC	Venture Capital
VGF	Viability Gap Funding

Contents

1. Introduction

1.1 Context for Green Financing in Maritime Sector

Green finance refers to a structured set of financial instruments, mechanisms, and capital flows that are specifically directed towards environmentally beneficial activities. It is central to global sustainability goals and maritime decarbonization strategies, supporting investment in renewable energy, low-emission transport, pollution control, energy efficiency, and circular economy solutions

For the Indian Maritime context Green Finance is defined as: A structured and verifiable financial mechanism including green bonds, loans, public-private partnerships, and ESG investments—dedicated to the funding of environmentally sustainable maritime projects. This includes projects such as green ship construction, repair and retrofitting, port electrification, clean fuel infrastructure, energy-efficient terminal equipment, and circular economy-driven ship recycling. Green finance in India shall align with international principles (e.g., ICMA Green Bond Principles, IFC Performance Standards, EU Taxonomy, IMO Zero-Net Framework), while being responsive to national sustainability priorities and regulatory frameworks.[1]

The table below summarises the key financing instruments for green maritime investments, highlighting their use cases, ideal beneficiaries, and potential applications in India.

Key Financing Instruments in Maritime domain:

Strategy	Use Case	Best For	How India Can Use It
Green Bonds	Dedicated funding for specific sustainability projects	Large corporations investing in green assets	Issuing green bonds to finance **green fuel bunkering stations, port electrification, and renewable energy integration**
Sustainability-Linked Bonds (SLBs)	General financing with penalties/incentives for ESG performance	Companies seeking flexibility while committing to sustainability targets	Encouraging **shipping companies to adopt SLBs for fleet modernization and emission reduction goals**
Sustainability-Linked Loans (SLLs)	Flexible loans with interest rates linked to ESG goals	Shipowners and operators investing in cleaner operations	Providing **low-interest SLLs for energy-efficient vessels, alternative fuel adoption, and fleet upgrades**

[1] Climate Policy Initiative. Landscape of Green Finance in India 2024
https://www.climatepolicyinitiative.org/publication/landscape-of-green-finance-in-india-2024/

Public-Private Partnerships (PPPs)	Large-scale green infrastructure projects	Governments & private investors in port development	**Developing clean energy-powered ports, zero-emission terminals, and hydrogen bunkering facilities** through PPPs
Multilateral Development Bank (MDB) Support	Concessional loans and grants for green projects	Developing nations, ports, and shipping firms requiring low-cost capital	Leveraging **World Bank & ADB funding for port electrification, green hydrogen production, and cleaner vessel operations**
Blended Finance	De-risking private capital by combining public and private funds	High-risk green technology ventures & sustainability initiatives	Creating **blended finance programs to de-risk private investment in green shipping corridors and alternative fuel infrastructure**
Government Grants & Subsidies	Direct funding and tax incentives for green shipping	National & regional maritime authorities, shipowners	Offering **subsidies for electric tugs, LNG-powered vessels, and shore power electrification**
Private Equity & Venture Capital	Financing for startups & tech firms developing green shipping solutions	Emerging maritime tech firms, alternative fuel startups	**Attracting PE/VC funding for Indian startups working on wind propulsion, hydrogen fuel cells, and AI-driven efficiency tools**
Leasing & Alternative Ownership Models	Access to eco-friendly vessels & propulsion tech without upfront costs	Shipowners and operators reducing CAPEX burden	Encouraging **leasing programs for LNG-fuelled ships and electric ferries to lower upfront investment costs**
Green Shipping Funds	Pooled funding from public & private sources for industry-wide sustainability	Governments, development banks, private investors	Expanding **India's Maritime Development Fund (IMDF) to support shore power, fleet modernization, and green hydrogen bunkering**
Carbon Pricing Mechanisms	Monetizing emissions reduction via carbon levies or trading	Shipping firms investing in low-carbon technologies	Implementing a **carbon pricing framework to encourage shipowners to adopt cleaner fuels and invest in emissions reduction technologies**

1.2 International cooperation

International cooperation plays a vital role in providing financial and technical support, bridging investment gaps, fostering innovation, and enhancing sustainable operations. By collaborating with global organizations, India can leverage concessional financing, international expertise, and policy support to modernize ports, integrate renewable energy, and develop low-carbon logistics systems,

driving a sustainable maritime transition. International funding agencies and organizations play a critical role in supporting green infrastructure, port electrification, and alternative fuel development. These collaborations help accelerate the deployment of sustainable solutions while ensuring alignment with global best practices and regulatory frameworks. By tapping into diverse funding sources, India can implement large-scale green maritime projects that contribute to national and global climate goals.

Key Global Funding Agencies and Partnerships for Advancing India's Sustainable Maritime Future

Funding Agency	Scope	Areas for Collaboration	Reasoning
Asian Development Bank (ADB)	Green infrastructure, port électrification, renewable energy integration	Electrification of ports and inland waterways; development of hybrid logistics systems	ADB has a strong focus on sustainable infrastructure in developing countries, including India's ongoing green corridor projects.
World Bank	Climate Investment Fund (CIF); renewable energy, logistics electrification	Port modernization, alternative fuel infrastructure, and inland waterway electrification	The World Bank has extensive expertise in sustainable infrastructure financing, offering grants and concessional loans.
New Development Bank (NDB)	Infrastructure development in BRICS nations	Financing of green logistics hubs and electrified multimodal networks	NDB focuses on collaborative funding among BRICS nations, making it suitable for large-scale green logistics projects in India.
Global Environment Facility (GEF)	Biodiversity conservation, international waters, and climate change mitigation	Funding alternative fuel infrastructure and port electrification	GEF's focus on climate change mitigation aligns with India's maritime decarbonization needs, especially in ports and alternative fuels.
Green Climate Fund (GCF)	Climate mitigation and adaptation in developing countries	Development of renewable energy infrastructure at ports and alternative fuel production facilities	GCF supports large-scale climate projects, making it ideal for funding India's renewable-powered port initiatives.
International Renewable Energy Agency (IRENA)	Renewable energy investments, technology transfer	Solar and wind energy systems at ports; energy storage solutions	IRENA's expertise in renewable energy and technology transfer can accelerate India's green transition in the maritime sector.

European Investment Bank (EIB)	Concessional financing for low-carbon technologies and zero-emission vessels	Hydrogen and ammonia bunkering infrastructure; financing zero-emission ships	EIB specializes in financing cutting-edge low-carbon technologies, providing access to advanced solutions for India's maritime sector.
Japan International Cooperation Agency (JICA)	Concessional loans for sustainable infrastructure	Pilot projects for green shipping technologies and electrified ports	JICA's focus on innovative green technologies aligns with India's need for alternative fuel infrastructure and pilot projects.
International Maritime Organization (IMO)	Maritime Research Fund; Market-Based Measures (MBMs)	R&D in low-carbon technologies and capacity building	IMO initiatives provide funding and policy guidance, aligning with India's goals for equitable decarbonization in the maritime sector.
Horizon Europe (EU)	R&D grants for innovative green technologies	Collaborative research on hydrogen-powered vessels and energy-efficient hull designs	Horizon Europe supports cutting-edge R&D initiatives, fostering collaboration between India and EU nations on green maritime solutions.
Danish Maritime Authority (Denmark)	Sustainable shipping practices, green technologies	Hydrogen bunkering pilot projects; joint ventures in green fuel technologies	Denmark's expertise in green shipping makes it an ideal partner for advancing India's maritime decarbonization projects.

1.3 Broad Financial Strategy for the Indian Maritime Sector

A successful transition to greener and more sustainable maritime operations in India requires a solid financial framework that connects investment needs with appropriate funding sources. This section outlines a structured approach to aligning projected expenditures with viable financing options, identifying areas where government support or other incentives may be necessary. It also provides a clear rationale for funding requirements and actionable steps to secure the necessary resources.

Investing Requirements and Financing Instruments

Investment Area	Projected Requirement (INR)	Sustainable Financing Instruments	Gap Funding / Incentives Required
Port Infrastructure	60,000 crore ($7.5 billion)	Green bonds, PPPs for renewable-powered ports, MDB loans for electrification, blended finance for alternative fuel infrastructure.	Government grants, tax incentives for shore power systems, and funding for hydrogen/ammonia bunkering infrastructure.

Shipping Fleet Modernization	90,000 crore ($11.2 billion)	Sustainability-linked loans (SLLs), corporate green bonds, leasing models for LNG/hybrid vessels, MDB funding for retrofitting, green shipping funds.	Subsidies for retrofitting older vessels, low-interest financing for zero-emission vessels, and R&D grants for new designs.
Logistics and Inland Waterways	30,000 crore ($3.7 billion)	MDB loans for multimodal hubs, PPPs for hybrid/electric barges, carbon pricing revenues, green bonds for low-emission logistics infrastructure.	Tax rebates for electric/hybrid barge projects, incentives for battery swapping and charging infrastructure.
Research and Development	23,000 crore ($2.8 billion)	Government R&D grants, private equity/venture capital for clean-tech startups, global climate finance, blended finance for pilot projects.	Government co-funding for alternative fuels, advanced hull materials, and wind-assisted propulsion research.
Training and Capacity Building	8,000 crore ($1 billion)	Capacity-building grants, PPPs for maritime training centres, MDB technical assistance, corporate funding for sustainability training.	Direct government funding for training facilities, skill development curricula, and scholarships for maritime upskilling.
Total	211,000 crore ($26 .2 billion)	Mixed financing from sustainable models combined with public sector contributions.	Structured government incentives to address gaps and de-risk early-stage projects.

2 Indicative Action Pathway

2.1 Key Pillars

The green transition of India's maritime sector requires not only regulatory alignment and technological innovation, but also a robust and sector-specific financial architecture that can de-risk climate related financing. Recognizing this, the NGSP positions Green Finance as a core pillar to unlock transformative growth. **In September 2025, the Indian Union Cabinet approved a ₹69,725 crore (INR) package** to boost the domestic shipbuilding and maritime sector. There are few important pillars of the financial architecture for maritime decarbonization that should be utilised to implement actions proposed under NGSP

1. **Maritime Development Fund (MDF) : Sector-Specific Blended Finance Platform:**

The existing INR 25,000 crore Maritime Development Fund (MDF)[2] (has been **increased to INR 70,000 crores** as announced by the Hon'ble Prime Minister in his Independence Day address to the nation on the 15 August 2025) is being restructured under NGSP to serve as a blended finance window for:

- Green vessel retrofits and newbuilds.
- Port electrification and OPS (Onshore Power Supply) systems.
- Circular economy-linked ship recycling infrastructure.
- Digital traceability solutions (e.g., MRV platforms, NLP-Marine enhancements).

Instruments under the fund include:

- Green Bonds (SEBI-compliant),
- Concessional Loans (via SMFCL or IFSC),
- Results-Based Finance (RBF) for emission reduction per tonne of cargo,
- Carbon Credit Advance Purchase Agreements (linked to India's Voluntary Carbon Market framework under MoEFCC).

2. Institutional Anchoring: Sagarmala Finance Corporation Ltd (SMFCL)

In a landmark move, the Ministry of Ports, Shipping and Waterways (MoPSW) launched Sagarmala Finance Corporation Limited (SMFCL) in June 2025 as **India's first dedicated NBFC** for the maritime sector. Registered with the RBI, SMFCL is designed to:

- Fill credit and equity gaps in green port and shipbuilding infrastructure.
- Offer tailored financing for MSMEs, renewable energy startups, and maritime technology innovators.
- Act as a lead financier for ESG-certified projects, including offshore wind, green hydrogen, and low-emission logistics.
- Facilitate long-tenure debt and viability gap funding (VGF) for emerging segments like e-methanol bunkering and zero-emission vessel R&D.

Initial capitalization: ~INR 5,000 crore, with expansion planned via partnerships with multilateral institutions such as the Asian Infrastructure Investment Bank (AIIB) and Climate Fund Managers**.**

[2] Ministry of Ports, Shipping and Waterways, Government of India. Maritime Amrit Kaal Vision 2047. New Delhi: Government of India, 2024. https://shipmin.gov.in/sites/default/files/MAKV_2047_Report.pdf

3. Green Investment Ecosystem: India Maritime Investment Meet & IFSC GIFT City

At the India Maritime Investment Meet 2025 in London[3], MoPSW showcased India's maritime green finance pipeline and attracted global interest through:

- 100% FDI allowance in shipping and shipbuilding under automatic route.
- Zero GST on ship imports and clean fuel infrastructure.
- 10-year tax holiday for maritime entities registered under the International Financial Services Centre (IFSC) at GIFT City.
- No withholding tax on maritime capital gains and transactions—positioning GIFT City as India's Green Maritime Finance Gateway

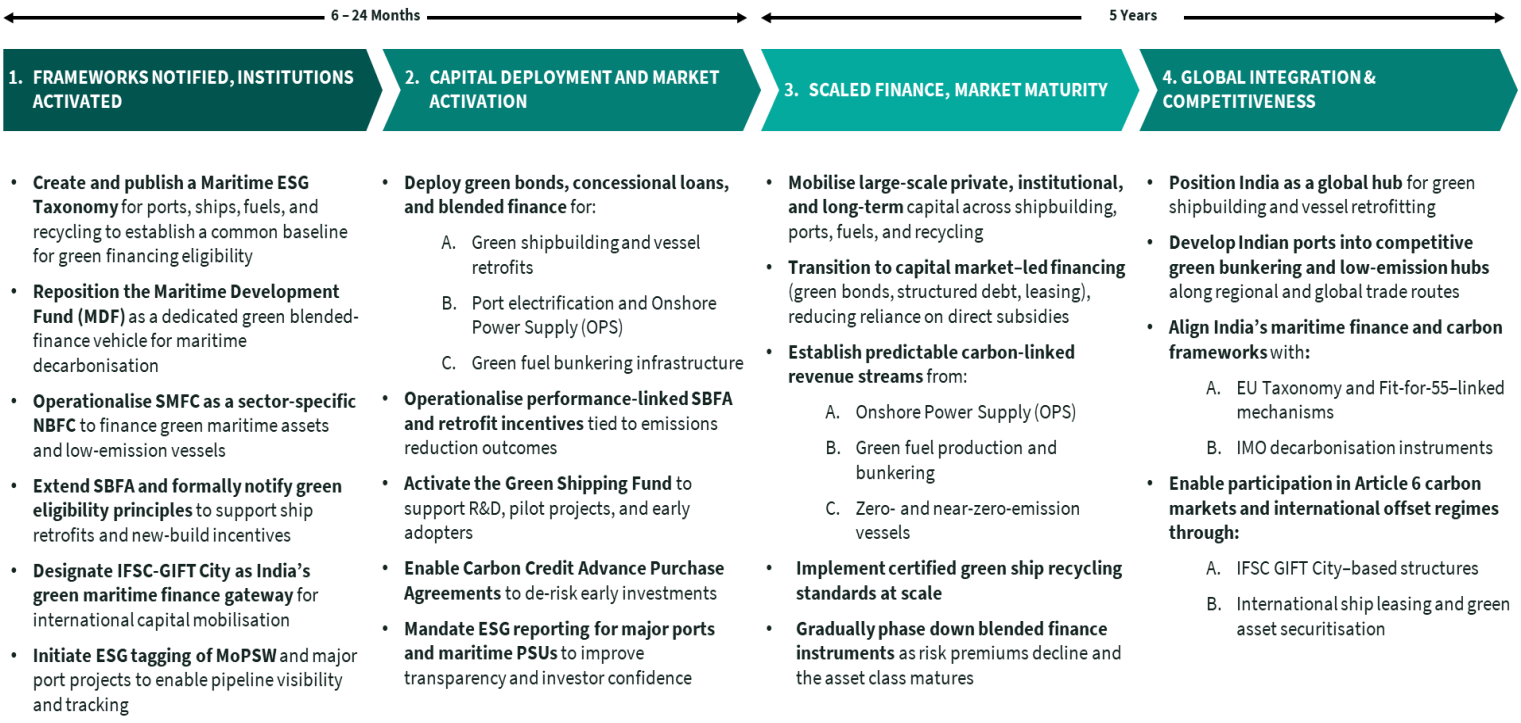
2.2 Policy Action and Implementation plan

The indicative action pathway outlines the sequencing of Green Financing initiatives under the NGSP to support structured and phased implementation. The pathway has been broken down into:

1. Short-term actions (0–6 months):
2. Medium-term actions (up to 2 years):
3. Long-term actions (up to 5 years)

Below is a representation of the actions to be proposed under NGSP summarized as high level outcomes:

[3] Ministry of Ports, Shipping and Waterways, Government of India. "India Maritime Investment Meet Held in London to Strengthen Global Maritime Partnerships." Press release, July 9, 2025: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2143453



To operationalise the Green Finance pillar, the following policy actions and financial instruments are proposed as implementable measures to directly mobilise capital, de-risk investments, and accelerate adoption of low-carbon and zero-emission technologies across shipbuilding and associated green maritime value chains.

2.2.1 Policy Area: Green Ship Building

- **Action 1: Shipbuilding Financial Assistance (SBFA) Scheme:** Shipbuilding Financial Assistance Scheme (SBFAS) is extended until 31 March 2036 with a total corpus of Rs.24,736 crore
    - Objective: Improve financial viability and competitiveness of Indian shipyards
    - Incentives aimed at accelerating adoption of low-carbon and zero-emission technologies in shipbuilding
        - Direct financial support linked to shipbuilding contracts[4]

[4] https://shipmin.gov.in/sites/default/files/Draft%20guidelines%20for%20Pillar%201i.e.%20SBFAS%20%20NSbM__0.pdf

Vessel Category	Contract Price Range	Assistance Rate on Contract/Fair Price (INR)
Non-specialized Vessel – Small Normal Vessel	Up to INR 100 crore	**15%** of the value
Non-specialized Vessel – Large Normal Vessel	Value above INR 100 crore	**20%** on the value above INR 100 crore (15% on first INR 100 crore + 20% on remainder)
Specialized Vessel [5]	Any value	**25%** on the value above INR 100 crore (15% on the first INR 100 crore + 25% on remainder)

- SBFA includes **Shipbreaking Credit Note** with allocation of ₹4,001 crore; 40% of ship's scrap value to be issued to the ship-owner when the vessel is scrapped in an Indian yard. Credit note would be reimbursable against cost of construction of new vessel at an Indian shipyard.
- Way Forward: Transition from **upfront subsidies to performance-linked, capital-market-enabled green financing**, where public support is tied to verified emissions reductions and used primarily to crowd in private capital.
- Tiered Incentives for Higher Environmental Standards: Introduce a performance-based subsidy structure, where funding increases based on the ship's energy efficiency and emissions reduction capability:
    - 30% base subsidy for ships meeting current green ship eligibility criteria.
    - 35-40% subsidy for vessels with higher fuel efficiency and lower lifecycle emissions, integrating technologies such as:
        - Hydrogen propulsion systems.
        - Wind-assisted propulsion.
        - Next-generation battery systems.
    - 45% subsidy for ships achieving net-zero emissions, utilizing:
        - Full electrification.
        - Hydrogen or ammonia fuels.
        - Hybrid renewable energy solutions.

[5] Appendix 1 – List of Specialised Vessels

2.2.2 Policy Area: Green Technologies

- **Action1:** Expansion of the SFBA to retrofitting incentives: financial risk-sharing mechanisms for retrofitting existing Ships by extending SBFA support to retrofitting existing vessels by offering a 20-25% subsidy for:
    - Installation of hydrogen fuel cells or hybrid propulsion systems.
    - Conversion to LNG, ammonia, or methanol-based propulsion.
    - AI-driven fuel optimization and emissions monitoring.
    - Energy-efficient hull coatings and waste heat recovery systems
- **Action 2:** Incentive schemes for companies engaged in manufacturing green maritime components and ancillaries (e.g.: direct financial incentives of 10-20% on incremental sales revenue). Following are some key components to be considered
    - Energy Storage Systems
    - Cryogenic Tank Manufacturing
    - Advanced Materials
    - Propulsion and Renewable Systems
    - Digital and Automation Technologies
    - Coatings and Treatments
- **Action 3: Specialized Design and Manufacturing Hubs**

  GIFT IFSC (Gujarat International Finance Tec-City) already provides a tax-efficient, and globally competitive hub for maritime activities, particularly ship leasing and financing
    - 10-year tax holiday
    - No withholding tax
    - 100% FDI under automatic route

2.2.3 Policy Area: Green Ports

- **Action 1: Financial Incentives for Renewable Infrastructure**

  Encourage the adoption of renewable energy and energy-efficient technologies at ports through subsidies, tax benefits, and green bonds to reduce dependency on fossil fuels and improve environmental sustainability.
- **Action 2: Viability Gap Funding (VGF) for Green Infrastructure and Port Projects**
    - Develop and publish a National Green Corridors Map identifying priority shipping routes and port nodes, to be formally adopted by port authorities and planners for

phased development of alternative fuel bunkering and supporting infrastructure at designated locations.

- Develop EV charging infrastructure for electric trucks, cranes, and shore power for vessels to reduce emissions and fuel use.

2.2.4 Policy Area: Green Fuels

- **Action 1: Subsidies for Green Fuel Production:**

  Capital Subsidies: Provide high tax-based capital subsidies of 30–35% to support the establishment of green hydrogen, ammonia, methanol, and biofuel (e.g., Bio-LNG, Bio-Methanol) production facilities, with enhanced incentives for early adopters to accelerate initial market development.
- **Action 2: Tax Incentives for Green Fuel Producers & Suppliers**:
  - Corporate Tax Holiday (10 years): Full or partial tax exemptions on profits from green fuel production to encourage investment.
  - GST Waivers & Reductions: Lower GST rates for green fuels and critical inputs, including renewable electricity, biomass, methane abatement, and ammonia synthesis
- **Action 3: Green Shipping Fund for Research, Innovation, and Market Development**:

  Provide low-interest loans, grants, and risk mitigation support to:
  - Fuel producers developing green fuels.
  - Port authorities investing in green bunkering infrastructure.
  - Shipping companies transitioning to low-carbon operations

2.2.5 Policy Area: Green Recycling

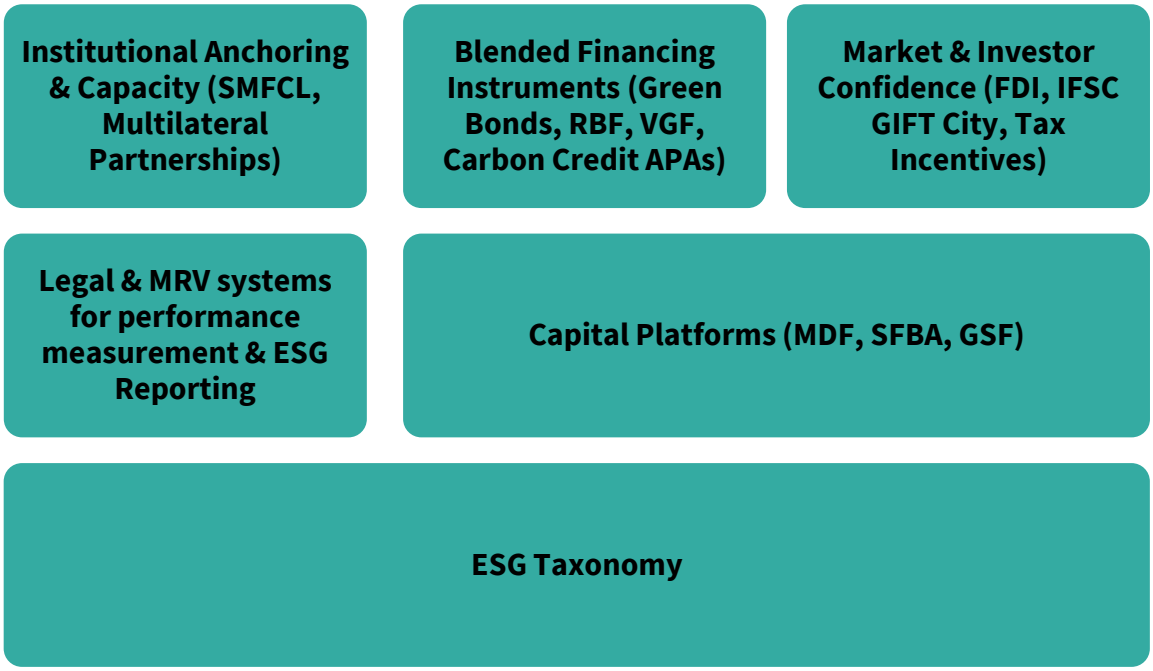
- **Action 1: Subsidies & Viability Gap Funding (VGF):**
  - Provide financial assistance for shipyards investing in pollution control technologies, worker safety measures, renewable energy adoption, and scrapping older vessels by recycling and replacing them with new, energy-efficient ships built in India
  - Green Tax Incentives: Offer tax breaks to ship recycling companies adopting zero-discharge dismantling and hazardous waste recycling innovations.
  - Green Certification-Linked Benefits: Shipyards achieving Level 3 and Level 4 compliance under the Green Ship Recycling Framework should receive preferential financing and insurance premium discounts.

2.2.6 Policy Area: ESG Linked Initiatives

- **Action 1: To scale green finance, NGSP proposes a Maritime ESG Taxonomy that:**
    - Defines "green" vs "transitional" vs "brown" activities for finance eligibility.
    - Aligns with the EU Taxonomy, ICMA Green Bond Principles, and IFC Performance Standards.
    - Enables classification and tagging of all MoPSW and port projects as per ESG criteria.

  In addition, a Maritime Carbon Credit Registry will be developed (linked with MoEFCC) to allow:
    - Emission offsets from green fuel use, OPS, zero-emission vessels, and ship recycling.
    - Port-wise GHG reduction accounting under a national MRV framework.
    - Participation in international offset markets and carbon trading under Article 6 of the Paris Agreement.
- **Action 2: Mandate ESG reporting for major ports and public shipping entities by 2026.**
    - Mandate annual ESG reporting by 2026 for all major ports and public shipping entities, with disclosures aligned to a notified maritime ESG framework, published on a central MoPSW portal, and subject to independent third-party verification to ensure data credibility for regulators, financiers, and investors.

To summarize, the building blocks for the Green Finance pillar implementation are as indicated in the diagram below:



3 Responsibility Mapping

The implementation of the Green Finance pillar under the NGSP requires coordinated action across a diverse set of stakeholders. Below is a draft version of the responsibility matrix of all involved stakeholders

Responsibility Matrix

Category	Stakeholder	Primary Role
Policy & Core Governance	Ministry of Ports, Shipping and Waterways (MoPSW)	Overall owner of NGSP; policy direction for green finance, guarantees, MRV systems, and port/ship incentives
	Ministry of Finance	Fiscal policy, sovereign guarantees, climate finance access (incl. GCF), oversight of public financial institutions
	Directorate General of Shipping (DG Shipping)	Regulatory certification of vessels, retrofits, fuel use, and MRV data integrity
	Reserve Bank of India (RBI)	Prudential regulation of banks and NBFCs; enabling green lending frameworks
	DPIIT	Oversight of strategic investments, FDI policy, and circular economy enterprises
Dedicated Maritime Finance Institutions	Sagarmala Finance Corporation Ltd. (SMFCL)	Sector NBFC; green bonds, project finance, partial guarantees, long-tenure debt for maritime assets
	Maritime Development Fund (MDF)	Blended finance platform; anchor capital for ships, ports, fuels, recycling
Public Financial Institutions & Banks	EXIM Bank of India	Performance-linked loans/equity for ships, ports, offshore and export-linked maritime assets
	State Bank of India (SBI)	Large-scale debt financing for green ports, vessels, and bunkering infrastructure
	SIDBI	Financing MSMEs, shipyards, and retrofit supply chains
	NABARD	Credit lines for inland waterways, small ports, and regional green maritime assets
	NSIC / Startup India	Credit support and risk-sharing for maritime fuel and technology startups
Capital Markets & Investment Platforms	SEBI	Regulation of green bonds, ESG disclosures, capital market integrity

	IFSC GIFT City Authorities	Tax-efficient hub for ship leasing, green bonds, structured maritime finance
	National Investment and Infrastructure Fund (NIIF)	Equity investments in green ship recycling, ports, and coastal infrastructure
	Climate Fund Managers / Multilateral Funds	Concessional capital, equity, and results-based finance
Ports & Sub-National Authorities	Major Port Authorities	Project sponsors for OPS, electrification, green bunkering, MRV deployment
	State Maritime Boards	Co-financing and facilitation of green infrastructure at non-major ports
Industry & Project Developers	Shipping Companies / Shipowners	Adoption of green vessels, fuels, and MRV-linked finance
	Shipyards & Retrofit Yards	Execution of SBFA-supported green shipbuilding and retrofits
	Ship Recycling Yards	Green recycling investments and circular economy integration
	Green Fuel Producers & Suppliers	Development of methanol, ammonia, biofuels, and bunkering infrastructure
	Terminal Operators & Port Service Providers	Implementation of port-side green infrastructure
Data, Assurance & Market Enablers	Digital MRV & Technology Providers	Emissions tracking, reporting platforms, data assurance
	ESG Rating & Assurance Providers	Verification of ESG and performance-linked finance outcomes
	Carbon Registries & Market Platforms	Issuance and tracking of carbon credits; Article 6 linkage
	Insurers & Classification Societies	Risk underwriting, certification, and insurability of green assets

4 Critical Barriers

India faces several barriers to scaling green finance, including high initial capital costs, limited access to affordable financing, and an underdeveloped green bond market. The absence of a robust green taxonomy and weak carbon pricing mechanisms create uncertainty for investors, while regulatory and policy inconsistencies add to the risk. Financial institutions often lack the expertise to assess green projects, and fragmented ownership structures make large-scale investments complex. Additionally, reliance on emerging technologies increases perceived risk, and inadequate ESG transparency hinders investor confidence. Addressing these challenges requires clear national policies, blended finance models, stronger carbon pricing, and enhanced financial innovation to unlock the full potential of green investments.

Below are some high-level risks identified in the implementation of the Green Finance initiatives

A. **High perceived technology, demand, and underwriting risk** for green fuels and zero-/near-zero-emission vessels due to limited operating history and bankable performance data.
B. **Elevated cost of capital** driven by long tenors, currency exposure, counterparty risk, and limited availability of suitable risk-mitigation and hedging instruments.
C. **Subsidy transition and policy predictability risk**, including premature withdrawal, inconsistent tapering, or non-performance-linked incentives that could distort markets and deter private investment.
D. **Misalignment with international regulatory and ESG frameworks**, particularly evolving EU and IMO standards, creating risks of compliance gaps, double counting, or incompatibility in carbon accounting and Article 6 mechanisms.
E. **Infrastructure and supply-chain readiness constraints**, including uneven green bunkering availability, fuel supply bottlenecks, and reliance on imported propulsion and fuel technologies.
F. **Cross-border financing frictions**, such as currency convertibility, tax and legal barriers to ship leasing and structured finance, and competitive pressure from established global green maritime hubs.

5 Conclusion

Effective implementation of the Green Finance pillar is critical to translating India's green shipping ambition into bankable, scalable outcomes. By anchoring financing in a clear ESG taxonomy, robust MRV and carbon integrity frameworks, and dedicated maritime financial institutions, NGSP can systematically de-risk early investments and crowd in private and institutional capital. Implementation must focus on rapid operationalisation of institutions, instruments, and eligibility frameworks to enable immediate capital deployment. Priority actions include activating SMFCL and the restructured MDF, and rolling out performance-linked incentives across ships, ports, fuels, and recycling. In the medium term, consistent use of blended finance, guarantees, and carbon-linked mechanisms should be used to scale bankable project pipelines and reduce risk premiums. Over the longer term, a calibrated shift toward capital-market-led financing and global regulatory alignment will ensure durability, investor confidence, and sustained decarbonisation outcomes.

Appendix 1

LIST OF SPECIALIZED VESSELS

1. LNG Carrying Vessels.
2. LPG Carrying Vessels.
3. All Passenger Vessels under MS Act/SOLAS with a minimum capacity of 500 passengers.
4. Chemical Tankers.
5. Floating or Submersible Drilling or Production Platforms. \
6. Floating, Production, Storage and Offloading (FPSO) units.
7. Floating, Storage and Offloading (FSO) units.
8. Floating, Storage, Regasification Units (FSRUs).
9. Mobile Offshore Drilling Unit (MODU) Rigs.
10. Mobile Offshore Production Units.
11. Self-Propelled Dredgers
12. Wind Turbine Installation Vessel.
13. Windfarm Service and Maintenance Vessel.
14. Self-Propelled Semi-Submersible Heavy Lift and Heavy Transport Vessel.
15. Cable laying Vessel.
16. Green vessels
17. Hybrid vessels
18. Vessels powered by Dual-fuel main engine (methanol, ammonia, LNG).
19. Diving support vessels with a moonpool