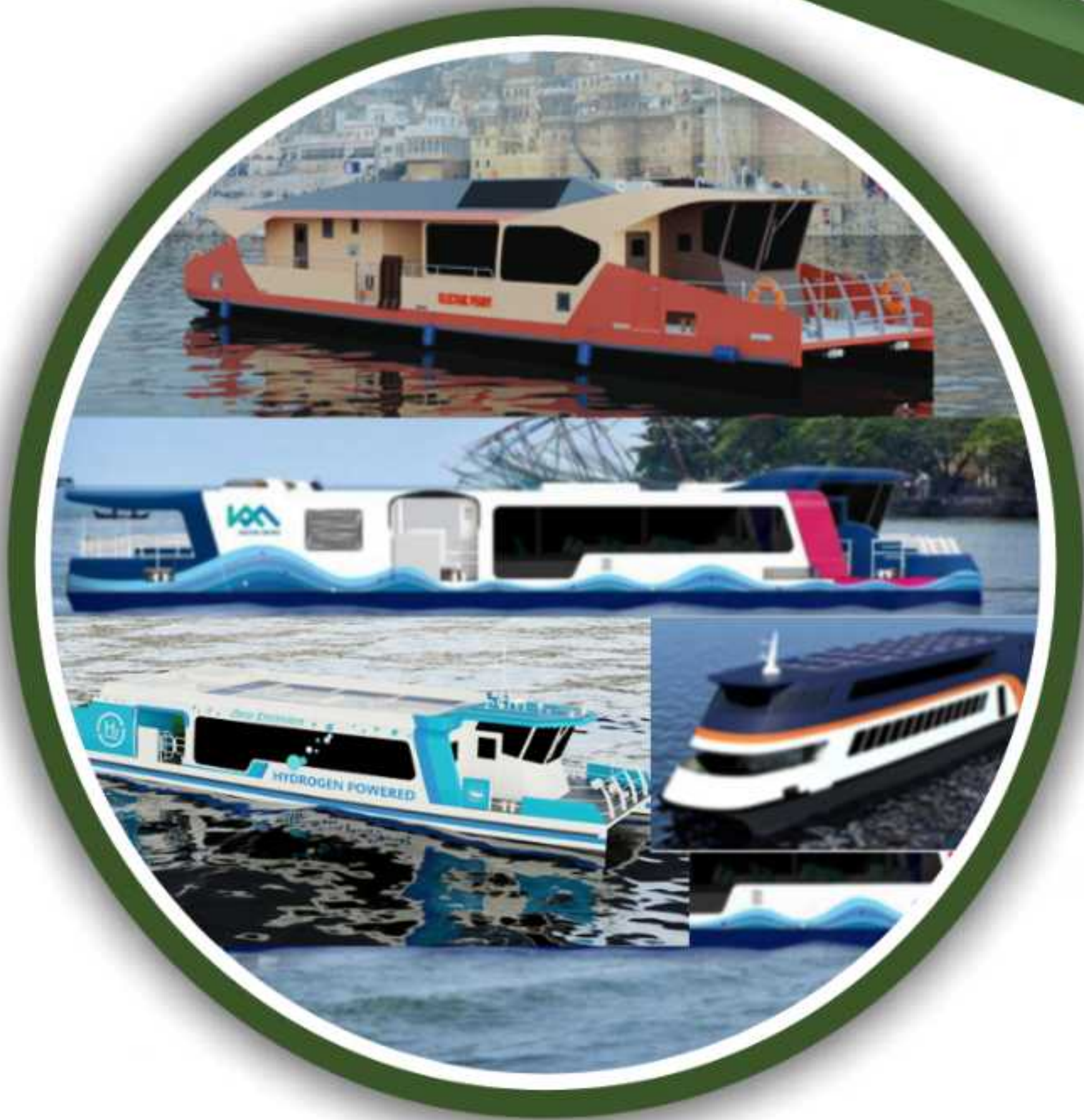




Ministry of Port, Shipping and Waterways
Government of India

“Harit Nauka”

Inland Vessels Green Transition Guidelines



January 2024

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



सत्यमेव जयते

**Ministry of Port, Shipping and Waterways
Government of India**

“Harit Nauka”

Inland Vessels Green Transition Guidelines

Ministry of Ports, Shipping and Waterways,
Government of India

सर्बानंद सोणोवाल
SARBANANDA SONOWAL



मंत्री
पत्तन, पोत परिवहन और जलमार्ग एवं आयुष
भारत सरकार
Minister
Ports, Shipping & Waterways and AYUSH
Government of India

MESSAGE

Guided by the visionary leadership of our Hon'ble Prime Minister, Shri Narendra Modi, robust initiatives are underway to assertively position India as a global hub for green shipbuilding and as a leader in a safe, sustainable and green maritime sector as envisioned under Maritime India Vision 2030 and Maritime Amritkaal Vision 2047. This proactive stance is reflected in endeavors such as the Green Tug Transition Programme and Harit Sagar Guidelines among others.

On the momentous occasion of the first Council Meeting of the Inland Waterways Development Council, I am happy to launch the **Harit Nauka - Green Transition Guidelines for Inland Vessels**.

The release of these **Guidelines** symbolizes the continued commitment of the Government to rejuvenate and transform the Inland Water Transport (IWT) sector into a clean and green space. I am hopeful that these Guidelines would serve as the guiding tool for both Government and private stakeholders in the IWT ecosystem, to align their development plans and actions with the envisaged transition to green fuel technology in the realm of inland vessel operations.

I extend my acknowledgement to the team for their concerted efforts in producing this document to promote sustainability of the IWT system.

(Sarbananda Sonowal)

Place: New Delhi
Date: 03rd January, 2024



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राज्य मंत्री
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
भारत सरकार



सत्यमेव जयते
शांतनु ठाकुर
SHANTANU THAKUR

Minister of State
For Ports, Shipping and Waterways
Government of India

Date:-04.01.2024

MESSAGE

Apart from logistics cost savings, Inland Water Transportation (IWT) offers societal benefits- its emissions, energy use, accident rates, and noise levels are lower compared with those of traditional modes. Owing to these characteristics of the IWT, there is an added emphasis on enhancing the modal share of inland waterways as an economical and sustainable mode of transportation under the Maritime Amrit Kaal Vision 2047 launched by our Hon'ble Prime Minister as part of Global Maritime India Summit 2023. However, to unlock the full potential of the IWT, a pivotal aspect is transitioning its energy source from conventional fuels to low emission green alternatives.

Harit Nauka- Green Transition Guidelines for Inland Vessels present a structured plan for realizing its specified objectives through a quantified shift of fleet size for inland vessel-based passenger transportation towards cleaner and greener fuels, coupled with reduction in emission and increased reliance on renewable energy for inland vessel operations within a defined timeframe. It lays down a concentrated approach for implementation and compliance mechanism towards realizing the net zero vision in the IWT sector.

I express confidence that these guidelines will effectively initiate the process of greening our IWT, thereby enhancing its environment friendliness.

(Shantanu Thakur)

श्रीपाद नाईक

राज्य मंत्री

पत्तन, पोत परिवहन, जलमार्ग एवं पर्यटन
भारत सरकार



SHRIPAD NAIK

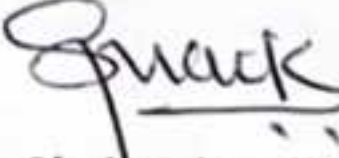
Minister of State for
Ports, Shipping, Waterways & Tourism,
Government of India

MESSAGE

In view of the escalating global concerns over climate change and increasing pollution levels, the Government of India has consistently taken a proactive stance in combating these challenges. The Mission LIFE (Lifestyle For Environment) spearheaded by our Hon'ble Prime Minister advocates an action oriented approach, urging the global community to embrace a pro-planet lifestyle.

By developing and integrating our Inland Water Transport (IWT) grid with other traditional transportation modes, we can develop an environmentally sustainable transport system. Further, the evolution towards clean fuels envisioned under **Harit Nauka-Green Transition Guidelines for Inland Vessels**, furthers the IWT system's potential as an environmentally sustainable mode of passenger transportation, offering clean, safe and affordable means of travel for people. This not only aligns with the goals of Mission LIFE but also contributes significantly to preserving the ecological health of the IWT ecosystem.

These Guidelines aim to promote the transformation of infrastructure, ancillary facilities and skill sets required for enabling the development and operationalization of low-emission, clean-fuel based vessels for passenger transport in the IWT ecosystem.


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जलमार्ग मंत्रालय
MINISTRY OF PORTS,
SHIPPING AND WATERWAYS

MESSAGE

India's unwavering commitment to sustainable economic development is evident through its ambitious net-zero emission targets set for 2070. Notably, India is the fourth leading-nation in Renewable Energy installed capacity and which is one of the fastest-growing globally. Against this backdrop, the integration of low-emission green fuels into our transport and mobility sector becomes equally crucial for tapping its benefits to the fullest.

The Ministry of Ports, Shipping and Waterways has already initiated steps in this direction for the country's maritime sector with the Harit Sagar Guidelines 2023 and the Green Tug Transition Programme, among others. Augmenting the country's inland waterways and coastal shipping sectors and undertaking carbon neutral initiatives to emerge as global sustainability leaders have also been identified as focus areas of the **Maritime Amrit Kaal Vision 2047**.

Building on the above, the "**Harit Nauka- Green Transition Guidelines for Inland Vessels**" has been formulated for commencing the greening of the country's IWT sector in a phased manner. Discussions with relevant stakeholders from Central Government, State Governments, the World Bank and private sector have been instrumental for developing these guidelines.

These guidelines aim to provide a comprehensive framework for the envisioned transition of inland vessels from conventional fuel based operations to greener alternative fuels while promoting the development of an enabling ecosystem for such vision.

I am hopeful that the measures listed under these guidelines will contribute to the nation's endeavors towards accomplishing the long-term goal of net-zero emission.

I would like to extend my compliments to the team for the efforts put in towards bringing together these guidelines for the greening of our IWT sector in a short time frame.

Date: January 4, 2024
Place: New Delhi


(T.K. Ramachandran)



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Green Transition Guidelines for Inland Vessels

1. Introduction

- 1.1. Inland Water Transportation (IWT) is positioned as an energy efficient and economical mode that essentially operates as a multi-modal system in combination with other transportation modes. It therefore has the potential to boost the cost efficiency and sustainability of the logistics ecosystem in the country. The Ministry of Ports, Shipping and Waterways (MoPSW) intends to increase modal share of IWT to 5% from the present 2%, as laid out under the Maritime India Vision 2030 and further enhance the existing IWT cargo volume of ~120 MTPA to > 500 MTPA as envisaged under the Maritime Amrit Kaal Vision 2047.
- 1.2. With adverse climate change and pollution raising serious concerns at a global level, India has displayed strong commitment towards promoting sustainable development for combating these issues. India, as a part of its commitment in COP 26 towards Climate Action, has pledged to reduce the emission intensity per unit GDP by 45 percent by year 2030, from 2005 level (when emission intensity was ~508.53 tCO₂e per INR crore GDP¹). The logistics sector has an important role in contributing towards the decarbonization efforts of the country.
- 1.3. Currently, the substantial majority of inland vessel fleet in India operates on fossil fuels such as diesel (“Conventional Fuel”). For realizing the complete potential of IWT as an environment friendly and sustainable transportation mode, the transition of inland vessels from Conventional Fuels to alternative clean fuels (such as LNG/CNG, electricity, Green Hydrogen, Green Methanol, etc.) is essential (“Green Transition”). This resonates with the strategic focus of MoPSW on increasing usage of alternate fuels to reduce Green House Gas (GHG) emissions as per Maritime Amrit Kaal Vision 2047
- 1.4. While the Green Fuel technologies exhibit dynamism characterized by ongoing research and development initiatives at both national and global levels, the technologies remain in their nascent stage on various aspects (related to storage, safety, handling among others) and are still evolving. This thus highlights the need for comprehensive policies, robust support mechanism, technical inputs and strategic guidance to make optimal advancements to support the Green Transition.
- 1.5. The existing inland vessel ecosystem is centered around Conventional Fuel. It requires significant transformation to facilitate integration with the emerging technologies and enable operationalization of vessels based on alternative clean fuels (“Green Vessels”).
- 1.6. The maritime sector, owing to its significant share in the logistics sector, has an important role in the decarbonization of the sector. In acknowledgement of the same, the MoPSW

¹ Trend analysis of GHG emissions in India (2005 to 2013), GHG Platform India, 2017

has been ardently pursuing the agenda of sustainable development in the sector and has launched various initiatives including the Harit Sagar Guidelines 2023 and Green Tug Transition Programme to this effect. It is in continuation of this spirit that the **Harit Nauka - Green Transition Guidelines for Inland Vessels** (“The Guidelines”) have been formulated.

1.7. The Guidelines aim at laying down the Central Government’s directional intent, implementation focus and envisaged means and measures for bringing about the said shift of inland vessels to greener technologies and for developing a functional ecosystem supporting the end-to-end operations and maintenance of such Green Vessels.

1.8. Further, the Guidelines are intended to assist the relevant State agencies, vessel operators and other ecosystem stakeholders in shaping their action plans to suitably account for the envisioned Green Transition in the sector.

2. Vision and Objectives

The Government envisions complete transition to Green Vessels by 2047 with the objectives of:

- i. Developing and operationalizing new age vessels with standardized designs/ infrastructure that are green and safe
- ii. Creating an enabling ecosystem for the operation of such Green Vessels
- iii. Promoting safe, convenient and green inland waterway-based passenger transport
- iv. Developing indigenous capacity and promoting “Make in India” policy in shipbuilding
- v. Enabling financial assistance for development of Green Vessels and related ecosystem

3. Applicability

At present, these Guidelines shall be applicable to all passenger vessels and Ro-Pax vessels plying on inland waterways and select coastal waterway routes across different ownership types². These shall include both new and retrofitted vessels.

Exclusions: cargo vessels, cruise vessels, ocean-going vessels and any other vessel categories not specified above are not covered within the ambit of these Guidelines and the Green Transition of these vessels may be effected through a separate set of guidelines.

4. Focus Areas

The components that have the potential to enable the transition of inland vessels to alternative clean fuels and the creation of an ecosystem catering to the development, operation, maintenance and handling of such Green Vessels, have been summarized below as the “Focus Areas” of these Guidelines:

² These Guidelines shall be applicable to all the Central Government, State Government(s), Private sector entities and other stakeholders associated with the inland waterway based passenger transport.

The concerned Central and State Government authorities shall identify and nominate appropriate department, agency, officials to execute the roles and responsibilities and exercise the rights with regard to these Guidelines.

Figure 1: Focus Areas under the Green Transition Guidelines for inland vessels

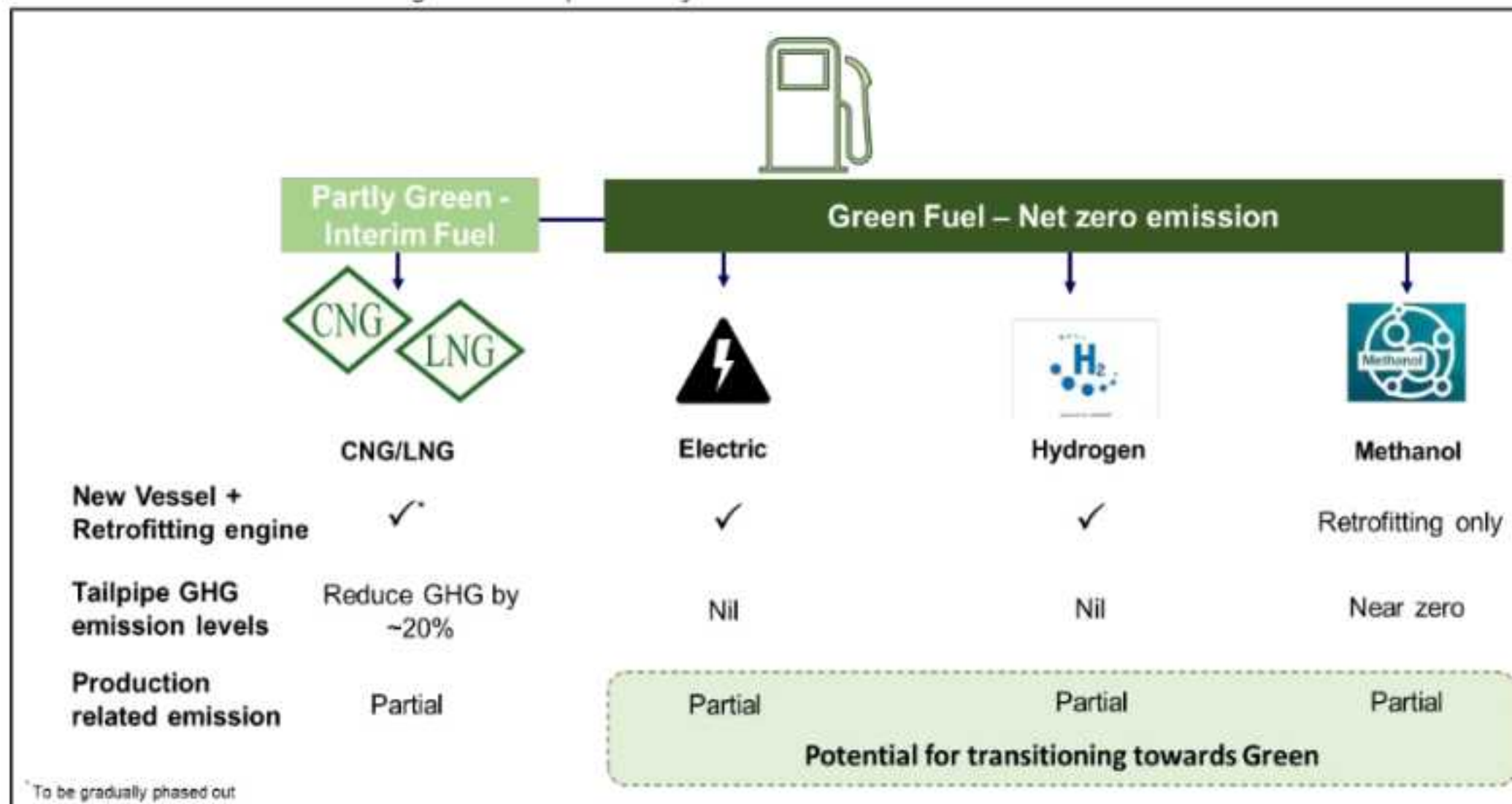


4.1. Promotion of alternative clean fuels in inland vessel operation

i. Acknowledging and incentivizing use of alternative clean fuels

Under these Guidelines, CNG/LNG are recognized as partly green “Interim Fuel” while electricity, Green Hydrogen and Green Methanol are recognized as complete “Green Fuels”, and both collectively as alternative clean fuels for the purpose of inland vessel operations.

Figure 2: Comparison of Interim and Green Fuels



All relevant Central and State Government agencies³ as well as private sector operators shall endeavor to retrofit existing vessels or purchase/procure new vessels with technology for propulsion on Green Fuels and such endeavors may suitably be incentivized.

ii. Phasing out of Conventional Fuels and Interim Fuels

The Central Government shall, through appropriate regulatory changes and legal reforms, promote the discontinuation of Conventional Fuels in a phased manner. An indicative timeline for the phasing out of Conventional and Interim Fuel based vessels has been provided below:

Table 1: Proposed cut-off/timelines for phasing out of Conventional Fuels and Interim Fuels

#	Activity	Cut-off date
1	Registration of Conventional Fuel based inland vessels	31 Dec 2033
2	Operation of Conventional Fuel based inland vessels	31 Dec 2045
3	Registration of Interim Fuel based inland vessels	31 Dec 2045
4	Operation of Interim Fuel based inland vessels	31 Dec 2055

The MoPSW intends to promote communication and synchronization with other Ministries (such as MNRE, MoHUA, among others) and relevant agencies at, both the Central and State levels, to ensure that future policies and programs are not developed in isolation but rather complement each other.

iii. Standardization of vessel designs

To promote the operation, transfer and overall adoption of Green Vessels across different regions in India, the safety, stability and bunkering/ recharging/refueling interface related requirements within the vessel design shall be made uniform through appropriate technical standards in this regard.

4.2. Creation of a holistic Green ecosystem

i. Shore-side infrastructure to support operation of Green Vessels

All relevant Central and State Government agencies as well as private sector operators shall make efforts to include projects involving shore-side infrastructure development and upgradation for supporting Green Vessel operations within their development and implementation plans. Such shore-side projects may include:

- a. Storage and bunkering stations for Interim/Green Fuel,
- b. Repair & maintenance facilities and dry-docking facilities for Green Vessels,
- c. Terminals designed/equipped to handle such Green Vessels

ii. Support infrastructure to improve service quality in this domain

Concerned Government agencies and stakeholders shall explore possible means for installation and/or upgradation of support set-up to achieve improvement in service quality and reliability. This may include:

- a. Navigational aids,

³ State Government shall identify and nominate the appropriate authority, department, agency to execute the roles and responsibilities and exercise the rights of the State with regard to these Guidelines.

- b. Control-command centers,
- c. Digital infrastructure,
- d. Safety equipment, emergency response system
- e. Any other support facility deemed necessary

The Central Government along with the State Government(s) and other relevant stakeholders shall work towards standardization of infrastructure design, financial assistance and knowledge sharing in reference to the Green ecosystem through appropriately structured mechanisms.

4.3. Capacity building initiatives

To enable timely availability of qualified and skilled human resources, it will be important that capacity building runs in parallel with the developments in the sector. To this extent the Central Government intends to promote capacity building and upskilling initiatives for training on the technology, process, safety protocols surrounding:

- i. the development, operation, maintenance and handling of Green Vessels
- ii. the storage, bunkering and handling of Green Fuels
- iii. the establishment and operationalization of Green ecosystem

The Central Government shall enable these initiatives through designated nodal agencies – the Indian Maritime University (IMU) and the National Inland Navigation Institute (NINI), by providing support in terms of strategic guidance, financial support and enabling knowledge sharing frameworks and mechanisms, including but not limited to, knowledge exchange with other countries.

Similar capacity building efforts at the State level may also be incentivized by the State Government(s) basis appropriate evaluation by them.

4.4. Promoting Research and Development for technological advancements

The Central Government shall endeavor to facilitate national and international scale collaboration amongst various research organizations, eminent research professionals, educational institutions, multi-lateral institutions and industries, in India and abroad, to promote knowledge sharing, interdisciplinary approaches in the research and development space pertaining to Green Vessel technology in inland waterways sector. The Government also intends to suitably expand the mandates of institutions such as the NCoEGPS, to foster Green technology development in the inland waterways sector.

Collectively, the Research and Development endeavors of such institutions may be directed towards promoting technological advancements in the following areas:

- i. the development, operation, maintenance and handling of Green Vessels
- ii. the storage, bunkering and handling of Green Fuels
- iii. the establishment and operationalization of Green ecosystem

4.5. Creation of Special Working Groups (SWGs)

Considering the nascency of the Interim/Green Fuel technology solutions as well as the sector, the Central Government shall constitute Special Working Groups (SWGs) for providing technical inputs and guidance towards formulation of standards, rules, formats with respect to the Green Transition. Each SWG shall comprise experts and personnel in the relevant domain with the designated nodal agency serving as the Chair.

Specific areas that shall be driven through SWGs for ensuring technical reliability, may include but not limited to:

Table 2: Specific subjects to be driven through SWGs

S. No.	Subject Matter	Brief Terms of Reference
1	Vessel design and specification	<ul style="list-style-type: none"> • Mandates on safety and stability requirements • Standards on refueling interface within vessel design • Recommendatory design specifications for standardization
2	Terminal Infrastructure	<ul style="list-style-type: none"> • Standards and specifications on terminal design for catering to the proposed Green vessel ecosystem
3	R&M facilities	<ul style="list-style-type: none"> • Standards and specifications with regards to R&M facilities for catering to the proposed Green vessel ecosystem
4	Safety standards and requirements	<ul style="list-style-type: none"> • Development of standards and training modules on safety protocols and procedures across value chain - Green Vessel related constructions, operations, repairs and fuel handling, storage, bunkering
5	Procurement	<ul style="list-style-type: none"> • Drafting project contours for optimal risk sharing, promotion of guideline objectives and healthy competition. • Development of Model Bidding Documents ("MBD")

4.6. Strengthening of institutional capacity

These Guidelines aim to promote creation of adequate institutional capacity in terms of structured institutional framework, empowered groups, committees, Standard Operating Procedures (SOPs) for the Green Transition, at the level of Central Government as well as State Governments.

5. Procurement for the Green Transition

5.1. While formulating their action plans, project development plans or PPP projects, the relevant Central Government and State Government agencies shall endeavor to align them with the Focus Areas identified under these Guidelines to facilitate transition to Green Vessels such that one or more of the following components constitutes the core theme:

- i. Purchase/procurement of inland vessels and/or retrofitting existing vessels to operate on Interim/ Green Fuels
- ii. Development of shore-side infrastructure to support Green Vessel operation
- iii. Installation/upgradation of support infrastructure for enabling the Green Transition
- iv. Capacity building including training and R&D related to green technology

- v. Developing a Green Vessel based passenger/ public transport system on waterways
- 5.2. Both Government and private sector entities may undertake Green Transition projects such that enabling procurement/operation of Green Vessels and developing related ecosystem forms the central theme of their undertaking
- 5.3. SWGs constituted in this regard shall, in discussion with other relevant stakeholders, prepare MBDs for undertaking procurement processes and PPP projects pertaining to the Green Transition. The State Government(s) may make project specific changes in the MBD to suit their specific context and requirement, while retaining its basic structure and essence, provided approval for the changes is taken from the designated nodal agency for this purpose as the case maybe.
- 5.4. Concerned State Government agencies may constitute different committees comprising relevant personnel & experts, chaired by appropriate authority to facilitate various aspects of the Green Transition, such as:
- i. Undertaking Baseline studies (as indicated under clause 7.2 below)
 - ii. Initiative/Project preparation, assessment and planning for meeting implementation targets set out in the guideline
 - iii. Project implementation, monitoring and management
 - iv. Procurement process management
 - v. Stakeholder management
 - vi. Tariff regulation
 - vii. Revenue monitoring and collection
 - viii. Capacity building
 - ix. Research and Development, Knowledge management

6. Implementation Targets

- 6.1. All Central and State Government agencies shall endeavor to formulate an action plan in reference to the targets provided hereunder, within 6 months from the date of launch of the Guidelines.
- 6.2. Reduction in Carbon intensity by 30 percent of its current levels of waterways based passenger transport (Baseline FY 2022-23) by the year 2030 and 70 percent by year 2047.
- 6.3. States shall make efforts to transition 50% of their current inland waterway based passenger fleet size to Green Fuels by 2033 and to transition 100% of their complete fleet size to Green Fuels by 2045.
- 6.4. The States shall make an action plan and endeavor to establish a comprehensive Green Fuel based recharging/refueling facility in at least 1 (one) city by 2030.
- 6.5. The States shall endeavor to establish the complete support infrastructure system for Green Fuel based operations in the State by 2035.
- 6.6. The Guidelines endeavor to achieve greening of at least 1,000 inland vessels over the next 10 years and 100% Green Vessels in all Indian water bodies by 2047.

- 6.7. The States shall endeavor to share case studies or knowledge artifacts on the challenges faced, solutions devised, research based developments in the Green technology space through public portals.

7. Methodology for Implementation and Compliance

- 7.1. The Central Government shall identify and nominate the appropriate nodal authority for monitoring and implementation of these Guidelines
- 7.2. All State Government agencies shall identify and nominate the appropriate authority, department and official(s) within the department for the purpose of coordination and communication with reference to the implementation of these Guidelines.
- 7.3. Conduct a baseline study, by engaging an expert agency, in respect of implementation targets listed, taking FY2023-24 as base year, and share the report to MoPSW within a period of 5 months from the date of launch of these Guidelines. The study shall establish baseline, using internationally/nationally accepted protocols/methods for passenger vessel based GHG emissions per annum, Interim/Green Fuel based fleet size etc.
- 7.4. All State Government agencies may make suitable efforts to develop and install a Continuous Monitoring System (CMS) with reference to the parameter(s) highlighted under these Guidelines with digital dashboard and, if already installed, the same is to be connected with MoPSW server/portal/Sagarmanthan dashboard for monitoring and feedback within a tentative period of 12 months from the date of launch of Guidelines.

8. Financial Support

- 8.1. The Central Government may in discussion and collaboration with the State Government(s) identify/devise potential means and mechanisms for providing financial support for the Focus Areas for Green Transition.
- 8.2. Some of the underlying principles in drafting potential models for financial support (such as subsidies, VGF, annuity payments, etc.) inter-alia, may include:
 - i. methodology adopted for transitioning to Interim/Green Fuels
 - ii. significance of adopted fuel solutions in reducing GHG emissions
 - iii. maturity of the fuel technology solution
 - iv. revenue potential of the project
 - v. socio-economic viability of the project

9. Interpretation and Relaxation of Provisions

- 9.1. In case of any ambiguity or doubt regarding any provision of the Guidelines, MoPSW has the power to interpret and clarify within the overall framework and spirit of the Guidelines.
- 9.2. The Central Government is empowered to relax the provisions of these Guidelines, in public interest, within the overall framework and spirit of the Guidelines, in case of difficulties in implementation.

10. Review of Guidelines

The Central Government may renew / amend / modify the provisions of these Guidelines from time to time.

GLOSSARY

COP 26	The 26 th United Nations Climate Change Conference or Conference of the Parties of the UNFCCC
GDP	Gross Domestic Product
Green Fuel	This shall include Green Hydrogen, Green Methanol and electricity for the purpose of these Guidelines
GHG	Green House Gases
Green Transition	The shift of inland vessels from Conventional Fuels to Green Fuels as well as the transformation of the inland vessel ecosystem to enable operationalization of such Green Fuel based inland vessels
IMU	International Maritime University
IWT	Inland Water Transportation
Interim Fuel	This shall include CNG and LNG for the purpose of these Guidelines
MBD	Model Bidding Document
MNRE	Ministry of New And Renewable Energy
MoHUA	Ministry of Housing and Urban Affairs
MoPSW	Ministry of Ports, Shipping and Waterways
NCoEGPS	National Centre of Excellence for Green port and Shipping
NINI	National Inland Navigation Institute
PPP	Public Private Partnership
R&D	Research and Development
R&M	Repair and Maintenance
SOP	Standard Operating Procedure
tCO ₂ e	Tonnes of carbon dioxide equivalent
TERI	The Energy and Resources Institute
VGF	Viability Gap Funding



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