Annexure

Ministry of New & Renewable Energy (MNRE)
Government of India
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Scheme Guidelines for implementation of Pilot projects for use of Green Hydrogen in the Shipping Sector

1. Introduction

1.1. The National Green Hydrogen Mission, hereafter mentioned as the 'Mission', was launched on 4th January 2023 with an outlay of Rs. 19,744 Crore and aim to make India a Global Hub for production, usage, and export of Green Hydrogen and its derivatives. It will contribute to India's goal to become Aatmanirbhar (self-reliant) through clean energy and serve as an inspiration for the global Clean Energy Transition. The Mission will lead to significant decarbonization of the economy, reduced dependence on fossil fuel imports, and enable India to assume technology and market leadership in Green Hydrogen. Under the Mission, along with other initiatives, the Ministry of New & Renewable Energy (MNRE) proposes to implement pilot projects for replacing fossil fuels and fossil fuel-based feedstock with Green Hydrogen and its derivatives.

1.2. Shipping and port operations are among the key sectors likely to drive the future Green Hydrogen demand and trade. Maritime transport and Ports have significant potential for decarbonization through the use of Green Hydrogen or its derivatives such as Green Ammonia / Green Methanol as fuel for propulsion and other operations. Prospects in the sector include the development of refueling hubs of Green Hydrogen and its derivatives at Indian ports; development and operation of Green Hydrogen or its derivatives based ship propulsion systems; use of Green Hydrogen or its derivatives to fuel zero-emission technologies for vehicles and terminal equipment at ports; and development of supply chains and capabilities to support the export of Green Hydrogen and its derivatives from India. To assess the potential for the use of Green Hydrogen and its derivatives in the shipping sector, the Mission enunciated the need for taking up pilot projects in the sector. These pilot projects will be implemented through the Ministry of Ports, Shipping and Waterways (MoPSW) and the Scheme Implementing Agencies (SIAs) nominated under this Scheme.

2. Pilot Projects in the Shipping Sector

2.1. Para 7.7.3 of the Mission Document states that the Shipping Corporation of India (SCI) or in case of its disinvestment, its successor private entity will retrofit at least two ships to run on Green Hydrogen or its derivatives by the year 2027. The Mission also provides for setting up Green Ammonia bunkers and refueling facilities in at least one port by the year 2025.

2.2. Thrust areas under this Scheme for providing support for development/ selection/ validation of commercially viable technologies, for the utilization of Green Hydrogen in shipping sector, are as follows:

(a) Retrofitting of existing ships to run on Green Hydrogen or its derivatives *(Component-A)*

(b) Development of bunkering and refueling facilities on ports for Green Hydrogen based fuels *(Component-B)*

3. Objectives of the Scheme

(i) To support the deployment of Green Hydrogen and its derivatives as fuel for ship propulsion, including bunkering and refueling, on a pilot basis

(ii) To validate the technical feasibility and performance of Green Hydrogen and its derivatives based ship propulsion in real-world operational conditions

(iii) To evaluate the economic viability of the use of Green Hydrogen and its derivatives in the shipping sector

(iv) To assess the effectiveness of Green Hydrogen and its derivatives in ship propulsion and bunkering & refueling systems on ports

(v) To evaluate the performance of Green Hydrogen and its derivatives based propulsion system, bunkering and refueling systems, and identify the areas for improvement

(vi) To demonstrate safe and secure operations of Green Hydrogen and its derivatives based propulsion system, bunkering and refueling systems

4. Budgetary Outlay: Rs. 115 Crore till FY 2025-26

5. Rationale, Salient Features and Scope

5.1. These pilot projects will help identify operational issues and gaps in terms of current technology readiness, regulations, implementation methodologies, infrastructure and supply chains. These will serve as valuable inputs for future scaling and commercial deployment of Green Hydrogen in the shipping sector.

5.2. The use of Green Hydrogen and its derivatives in the shipping sector, through the proposed pilot projects, will lead to the development of necessary infrastructure including refueling stations, storage, and distribution networks, resulting in establishment of a Green Hydrogen ecosystem in the shipping sector. With the expected reduction in the cost of Green Hydrogen production over the years, the utilization in the shipping industry is expected to increase.

5.3. Salient features of the Scheme are given below:

(i) Projects with an intention to develop Pilot Scale/ Demonstration Plants for replication of technology will be supported.

(ii) Shipping Corporation of India (SCI) or its successor, in case of disinvestment, will be the SIA for retrofitting of the existing ships under Component-A. MoPSW shall finalize the SIA for Component-B of the Scheme.

(iii) The SIAs shall award the projects under the scheme through a transparent process. Provisions of General Financial Rules (GFRs) shall be followed in all selections/ procurement.

(iv) MNRE will issue administrative sanctions for the projects under the Scheme based on the recommendations of Project Appraisal Committee (PAC).

(v) The Executing agencies (EAs) selected for the projects will share knowledge and the outcome of the pilot projects through project completion report, monitoring reports, workshops, and publications to disseminate findings, best practices, and lessons learned from the pilot.

(vi) The Scheme aims to leverage existing resources and infrastructure available with MoPSW and its agencies for transport, storage and use of Green Hydrogen and its derivatives in the shipping sector.

(vii) The Scheme would fund capital expenditure on retrofitting of existing ships with Green Hydrogen and its derivatives based propulsion system and creating bunkering and refueling facilities on port(s). Expenses on account of production of Green Hydrogen or its derivatives, land, etc. will not be funded.

(viii) Financial support for projects will be evaluated and granted taking into consideration the specific needs, merits, and feasibility of each project.

5.4. Scope of the Scheme is as follows:

5.4.1. Component-A: Under this component, the following activities are included:

(i) Retrofitting of an existing ocean-going vessel (ship), having engine with electronic fuel injection system, with Green Methanol/ Green Ammonia based propulsion system.

(ii) Retrofitting of an existing ocean-going vessel (ship), not having electronic fuel injection system, with an appropriate green fuel based propulsion system.

(iii) Retrofitting/ Development of an inland waterways vessel/ coastal waters ship with indigenously developed Green Methanol/ Green Ammonia/Hydrogen Fuel cells-based propulsion system.

Note: Only the cost of retrofitting/ development of the propulsion system would be covered under this component.

5.4.2. Component-B: Under this component, SIA nominated by MoPSW will develop bunkering and refueling facilities on a pilot basis at atleast one port on international shipping route. Financial support for the pilot project will exclude the component related to the production of Green Hydrogen.

6. Implementation Methodology

6.1. **Selection of ships and port(s):** Under Component-A of the Scheme, the SIA will identify the ships suitable for retrofitting, considering factors like size, route, and existing technology, ensuring a diverse representation to assess different scenarios. The selected ships shall have sufficient residual operational life beyond commissioning of the retrofit. Under Component-B of the Scheme, MoPSW will identify suitable port(s) and the SIA(s) for setting up of Green Hydrogen and its derivatives based bunkering & refueling facilities.

6.2. **Call for proposals:** The SIAs will issue Call for Proposals for the projects. The proposal shall be submitted directly to the SIAs. In case of a

consortium/partnership-based proposal, a lead agency should be mentioned, which shall function as EA for that project.

(i) The eligible EAs would include CPSUs, State-PSUs, Private sector, State Corporations, Indian R&D institutions/Research labs/academic institutions, JVs/Partnerships/Consortiums of such entities.

(ii) The necessary capabilities need to exist with the EAs for taking forward the completed pilot projects towards commercialization.

6.3. **Evaluation and Award:** The proposals will be evaluated by a Project Appraisal Committee in accordance with the criteria specified in the call for proposals. The letter of Award shall be issued to the EA by the SIA upon receipt of administrative sanction from MNRE.

6.4. **Execution and Commissioning:** Work shall be executed as per the approved scope of work. The SIAs shall make all necessary efforts to complete the pilot project, in all aspects, before 31.12.2027 for Component-A and before 31.12.2025 for Component-B.

6.5. **Technical and Regulatory approvals:** The EA shall be solely responsible for obtaining the safety, environmental and regulatory approvals, as required.

6.6. **Testing and Certification:** The EA shall get necessary testing and certification compliance from concerned agencies.

7. Funding and Disbursement

7.1. Based on the preliminary estimates, component-wise allocation is as follows:

Component	Allocation*
Component-A: Retrofitting of Existing Ships	Rs. 80 Crore
Component-B: Creation of Bunkers and Refueling Facilities	Rs. 35 Crore

* Component-wise allocation of funds shown in Para 7.1 is indicative and fungible. Inter-se transfer of funds from one component to the other may be made by MNRE, in consultation with MoPSW.

7.2. Stages of disbursement of Central Financial Assistance (CFA) for both the components are given below:

S.No.	Stages of Disbursement	Percentage of CFA to be released
1	Issue of Letter of Award (LoA)	20%
2	Milestone based disbursements^	70%
3	On completion	10%
	Total	**100%**

^ The milestones for the disbursement of funds shall be specified in the Call for proposals to be issued by the SIA.

7.3. Funds will be released to the SIAs by MNRE on the recommendation of the Project Appraisal committee, received through MoPSW.

7.4. MoPSW may also specify further terms and conditions for the grant of financial assistance for general financial prudence.

8. Timelines and Penalty Provisions

8.1. The grants released shall be exclusively earmarked for the project and should not be diverted for any other purpose.

8.2. The Terms and Conditions framed by the SIA for the award of the work shall include suitable provisions, as per the extant Government of India guidelines/directives applicable in the matter, to protect the interest of the Government of India in the event of EA failing to utilize the grant for the purpose for which it has been sanctioned or fails to complete the project as per DPR.

8.3. The Call for proposals should indicate a suitable timeline for completion of the project. Extension of up to six months may be granted for completion of the project on the basis of adequate justification with the approval of the Steering Committee, without any penalty. Any extension beyond six months shall only be granted with the approval of the Hon'ble Minister of New and Renewable

Energy, with suitable penalties which shall be specified by the SIAs in the Call for Proposals issued.

8.4. MNRE reserves the right to retract sanction or cancel or short-close projects in consultation with the Steering Committee in cases where the EA(s) or the project(s) face unreasonable delays or fail to comply with the objectives/ provisions of this Scheme or the Mission.

9. Monitoring Framework

9.1. Steering Committee

9.1.1. Overall monitoring of the scheme and projects undertaken will be carried out by a Steering Committee (SC) under the co-chairpersonship of Secretary, MoPSW and Secretary, MNRE. The Steering Committee shall be responsible for overall monitoring and implementation of this scheme and suggest modifications and course corrections for its successful implementation.

9.1.2. In case of any ambiguity in the interpretation of any of the provisions of this scheme, the decision of MNRE shall be final. The SC will also facilitate/ recommend measures to resolve difficulties, if any.

9.2. Project Appraisal Committee

9.2.1. A Project Appraisal Committee (PAC) under the chairpersonship of Additional Secretary/ Joint Secretary, MoPSW, with Mission Director, National Green Hydrogen Mission (NGHM) as a member and other members nominated by MoPSW shall monitor/review/evaluate the project proposals and recommend projects for sanction of CFA. The PAC shall monitor sanctioned projects on a quarterly basis for the allocation of funds based upon the progress of the project. The PAC shall send recommendations to MNRE for the release of CFA through MoPSW.

9.3. The SIAs shall also devise a monitoring mechanism to track the progress under the pilot projects. The same may be shared with MoPSW and MNRE.

9.4. Quarterly monitoring reports shall be submitted by the SIAs to MoPSW and MNRE.

9.5. Expenditure of funds will be monitored by MNRE. Utilization Certificates shall be provided by the SIA as per the provisions of GFR.

10. Project Completion

10.1. The SIAs shall submit the Project Completion Report (PCR) to the PAC within one month from the completion of project. PCR shall include the following:

(i) Technical aspects of the project, including the hardware, software, and other technologies used.

(ii) Technical challenges encountered during the project, and how they were overcome.

(iii) Outcome of the project comprising of technical know-how generated along with the data collected during the execution of the project.

(iv) Recommendations for future projects, based on the lessons learned from project.

11. Guidelines for safeguarding Intellectual property

11.1. MoPSW shall encourage generation of Intellectual Property (IP) by domestic institutions under the Scheme. For this, MoPSW shall issue the necessary guidelines for the safeguard of any Intellectual Property Rights such as Publications, Patents, Registered Designs or Trademarks etc. which are generated through projects funded under this scheme.

12. Power to amend Scheme Guidelines

12.1. MNRE may make the necessary amendments in the Scheme Guidelines, as and when required, with the approval of the Hon'ble Minister of New & Renewable Energy.

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