

F. No. 353/84/2023-NT
Government of India
Ministry of New and Renewable Energy
(Hydrogen Division)

Atal Akshay Urja Bhawan,
Lodhi Road, New Delhi 110003

Date: 14th February 2024

To

The Pay & Accounts Officer,
Ministry of New and Renewable Energy,
New Delhi- 110003

Sub: Scheme Guidelines for implementation of Pilot projects for use of Green Hydrogen in the Transport Sector under the National Green Hydrogen Mission (NGHM)

Sir/Madam,

I am directed to convey the sanction of the President of India for the implementation of the Scheme for Pilot projects for use of Green Hydrogen in the Transport Sector under the National Green Hydrogen Mission (NGHM).

2. Objectives: The Scheme has following objectives:

- (i) To support the deployment of Green Hydrogen as fuel in buses, trucks and four wheeler vehicles in a phased manner on a pilot basis
- (ii) To validate the technical feasibility and performance of Green Hydrogen operated vehicles under real-world operational conditions
- (iii) To evaluate the economic viability of hydrogen-based vehicles
- (iv) To assess the effectiveness of hydrogen refueling station
- (v) To evaluate the performance of hydrogen-based vehicles and identify the areas for improvement
- (vi) To demonstrate safe and secure operations of hydrogen-based vehicles and hydrogen refueling stations.

3. Implementation Methodology: The Scheme will be implemented as per the detailed Guidelines given at **Annexure**.



4. The expenditure on this scheme will be met from the budget provisions made under the National Green Hydrogen Mission Head.
5. The Implementing Agencies for this scheme shall be nominated by the Ministry of Road Transport and Highways (MoRTH).
6. This issues in exercise of the powers conferred on this Ministry and with the concurrence of IFD vide their Diary. No. 417 dated 14th February 2024.
7. This has the approval of Hon'ble Minister of Power and New and Renewable Energy.

Yours Sincerely,



(Anant Kumar)
Director

Enclosed: Annexure

Copy to:

1. Secretary, Ministry of Road, Transport and Highways (MoRTH)
2. All Central Government Ministries and Departments
3. All Members of the Empowered Group under the Mission
4. All Members of the Advisory Group under the Mission
5. CEO, NITI Aayog, Sansad Marg, New Delhi
6. State Nodal Agencies (SNAs) of all States/UTs
7. Major Public Sector Enterprises operating in Renewable Energy/Power Sector
8. Principal Director of Audit, Scientific Audit-II, DGCAR, I.P. Estate, Delhi-11002
9. Director General (Local Bodies), Office of the Comptroller & Auditor General, Deendayal Upadhyay Marg, New Delhi
10. Solar Energy Corporation of India (SECI), 6th floor, Plate-B, NBCC office, Block tower-2, East Kidwai Nagar, New Delhi. 110023
11. Indian Renewable Energy Development Agency Limited (IREDA), 3rd floor, August Kranti Bhavan, Bhikaji Cama place, New Delhi-110066

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Ministry of New & Renewable Energy (MNRE)
Government of India


Scheme Guidelines for Pilot Projects on use of Green Hydrogen in the Transport Sector

1. Introduction:

- 1.1 The National Green Hydrogen Mission, hereafter mentioned as 'Mission', was launched on 4th January 2023 with an outlay of Rs. 19,744 Crore with an aim to make India a Global Hub for production, usage and export of Green Hydrogen (GH₂) 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 GH₂. 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 GH₂ and its derivatives.
- 1.2 Transportation is one of the potential sectors where Green Hydrogen can replace fossil fuels. With the falling costs of renewable energy and electrolyzers, it is expected that Green Hydrogen based vehicles can become cost-competitive over the next few years. Future economies of scale and rapid technological advancements in the field of Hydrogen powered vehicles is likely to further enhance the viability of Green Hydrogen based mobility. To assess the potential for use of Green Hydrogen in the transportation sector, the Mission supports setting up of pilot projects in the transport sector. These pilot projects will be implemented through the Ministry of Road Transport and Highways (MoRTH) and the Scheme Implementing Agencies (SIAs) as elaborated under this scheme.

2 Pilot Projects in Transport Sector

- 2.1 Para 7.7.2 of the Mission Document states that considering Hydrogen's advantages for heavy-duty, long-haul vehicles, certain routes would be designated as Hydrogen Highways. The necessary Green Hydrogen production projects, distribution infrastructure and refueling stations will be built along such highways. This will enable Hydrogen fueled inter-state buses and commercial vehicles to ply on such routes. The Mission proposes to support deployment of FCEV and Hydrogen ICE buses and trucks, in a phased manner on pilot basis. Financial assistance will be provided to close the viability gap due to the relatively higher capital cost of FCEV AND HYDROGEN ICE vehicles in initial years. The learnings from the pilot projects will help inter-city bus and truck operators (including State Transport Undertakings) in gaining experience with the deployment and usage, of Hydrogen fuel vehicles and refueling technologies. The mission will explore possibilities of blending Green Hydrogen based methanol/ethanol and other synthetic fuels derived from Green Hydrogen in automobile fuels.



2.2 Thrust areas for providing support under the scheme are as follows:

- i. Development of commercially viable technologies for the utilization of hydrogen in transport sector through:
 - a. Use of Green Hydrogen as fuel in buses and trucks. *(Component A)*
 - b. Supporting infrastructure like Hydrogen refueling stations. *(Component B)*
- ii. Any other innovative use of Hydrogen for reducing Carbon emissions in transport sector like blending Green Hydrogen based Methanol/Ethanol and other synthetic fuels derived from Green Hydrogen in automobile fuels.

3. Objectives of the scheme:

- i. To support the deployment of Green Hydrogen as fuel in buses and trucks, in a phased manner on a pilot basis.
- ii. To validate the technical feasibility and performance of Green Hydrogen operated vehicles under real-world operational conditions
- iii. To evaluate the economic viability of hydrogen-based vehicles
- iv. To assess the effectiveness of hydrogen refueling station
- v. To evaluate the performance of hydrogen-based vehicles and identify the areas for improvement
- vi. To demonstrate safe and secure operations of hydrogen-based vehicles and hydrogen refueling stations.

4. Budgetary Outlay: Rs. 496 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 transport sector.

5.2 The use of Green Hydrogen in the transport sector, via the proposed pilot projects, will lead to development of necessary infrastructure including the refuelling facilities and distribution infrastructure, resulting in establishment of a Green Hydrogen ecosystem in the transport sector. With the expected reduction in the Green Hydrogen production cost over the years, the utilization in the transport sector is expected to increase. Further, the learnings from the pilot projects will help inter-city bus and truck operators, (including State Transport Undertakings) in gaining experience with the deployment and usage of Hydrogen fuel cell vehicles and refuelling technologies.



5.3 Salient features of the Scheme are as follows: -

- i. Projects with an intention to develop Pilot Scale/ Demonstration systems for replication of technology will be supported.
- ii. Ministry of Road, Transport and Highways (MoRTH) shall finalise a Scheme Implementing Agency (SIA). MoRTH nominated SIA along with the executing agency to identify the routes covering different terrains and climatic conditions across India and MoRTH shall finalize the same.
- iii. The SIA will issue call for proposals and select Executing Agency (EA) through a transparent process.
- iv. MNRE will issue administrative sanctions for the projects under the Scheme based on recommendations of Project Appraisal Committee.
- v. The SIA will share knowledge and outcome of the pilot projects through Project Completion Report, monitoring reports, workshops, and publications to disseminate findings, best practices, and lessons learnt from the pilot.
- vi. The Scheme aims to leverage existing resources and infrastructure available with MoRTH and its agencies for transport, storage and use of GH₂ and its derivatives in the transport sector.
- vii. The scheme will provide financial assistance to close the viability gap due to the relatively higher capital cost of hydrogen powered vehicles and the infrastructure for hydrogen refueling stations in the initial years. Expenses on account of hydrogen production, land, etc. will not be funded under this scheme.
- 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: -

a. *Component A*: Development/selection/validation of technologies for use of Green Hydrogen as fuel in the following categories of vehicles: -

- i. Bus with Fuel Cell based propulsion technology
- ii. Bus with Internal Combustion Engine based propulsion technology
- iii. Truck with Fuel Cell based propulsion technology
- iv. Truck with Internal Combustion Engine based propulsion technology
- v. Four wheeler vehicles with Fuel Cell/Internal Combustion engine based propulsion technology

b. *Component B*: Development/selection/validation of technologies for supporting infrastructure like Hydrogen refueling stations will be carried out.

6. Implementation Methodology

6.1 **Selection of Routes**: MoRTH nominated SIA along with the executing agency to identify the routes covering different terrains and climatic conditions across India and MoRTH shall finalize the same.

6.2 **Call for proposals**: SIA will issue Call for Proposals for the projects. The proposals should be submitted directly to SIA. Each submitted project should contain the name of Executing

Agency (EA). In case of consortium, a lead agency should be identified, which shall function as Executing Agency.

- (i) The eligible entities to submit proposal would include CPSUs, State-PSUs, Private sector, State corporations, JVs/Partnerships of such entities.
- (ii) Necessary capabilities need to exist with the EAs for taking forward the completed pilot projects towards commercialization.
- (iii) Proposals submitted by EAs should include details covering vehicle type, vehicle technology, planning of mileage coverage, etc. in the prescribed format.

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 mentioned in the proposal. The SIA shall make all necessary efforts to complete the pilot project, in all aspects, within 24 months from the date of awarding the project.

6.5 Technical/ Regulatory approvals: The EA shall be solely responsible for obtaining the safety, environmental and other 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 MoRTH may decide the allocation of the budget between different types of pilot projects envisaged to be taken up under the scheme.

7.2 Stages of disbursement of Central Financial Assistance (CFA) is as follows:

SN.	Stages of Disbursement	Percentage of CFA to be released
1	On issuance of LOA	20%
2	Milestone based disbursement*	70%
3	On completion	10%
	Total	100%

*The milestones for disbursement of funds shall be specified in the Call for proposals to be issued by the SIA based on parameters like Kilometers run, Kilograms of hydrogen dispensed, number of vehicles deployed, etc.

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

- 7.4 MoRTH nominated SIA may also specify further terms and conditions for grant of financial assistance for general financial prudence.
- 7.5 SIA will be eligible for service charges at 0.5 % of CFA released under the projects.

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 If the EA fails to utilize the grant for the purpose for which it has been sanctioned or fails to complete the project as per DPR, it shall refund the entire amount of the grant, with interest as per GFR to MNRE.
- 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 for New and Renewable Energy, with suitable penalties which shall be specified by SIA 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-chairmanship of Secretary, MoRTH and Secretary, Ministry of New and Renewable Energy (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:** A Project Appraisal Committee (PAC) under the chairpersonship of Additional Secretary/Joint Secretary, MoRTH, with Mission Director, National Green Hydrogen Mission (NGHM) as a member and expert members nominated by MoRTH 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 milestone achieved/ progress of the project. The PAC shall send recommendation to MNRE for the release of Central Financial Assistance through MoRTH.



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

9.4 Quarterly monitoring reports shall be submitted by PAC to MoRTH and MNRE.

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

10. Project Completion

10.1 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 knowhow 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 safeguard of Intellectual property:** MoRTH 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. The guidelines should also be a part of the Call for Proposals to be issued by the SIA.

12. **Power to amend guidelines:** MNRE may make the necessary amendments in the Scheme Guidelines, as and when required, with the approval of the Hon'ble Minister for New & Renewable Energy.

