



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

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India

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National Green Hydrogen Mission (NGHM) was launched on 4th January 2023 with an outlay of INR 19,744 Crore (USD 2.4 B) and an aim to make India a Global Hub for production, usage, and export of Green Hydrogen and its derivatives. The Mission will result in the following likely outcomes by 2030:

- *Development of Green Hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum with an associated renewable energy capacity addition of about 125 GW in the country*
- *Over INR Eight lakh crore (USD 100 Billion) in total investments*
- *Creation of over 600,000 jobs*
- *Cumulative reduction in fossil fuel imports over INR One lakh crore (USD 12.5 Billion)*
- *Abatement of nearly 50 MMT of annual greenhouse gas emissions*

The Mission has made significant progress since the last country update in Q1 2025, as outlined below.

1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

Demand Aggregation of Green Ammonia

On 7th June 2024, Solar Energy Corporation of India (SECI) floated RfS for selection of Green Ammonia producers for production and supply of Green Ammonia in India through cost-based competitive bidding under SIGHT Scheme Mode-2A (**Demand Aggregation of Green Ammonia**).

SECI shall be the Intermediary Procurer for procurement of Green Ammonia supplied by the Green Ammonia Producers and sale of such Green Ammonia to the Procurers (fertilizers) entirely on back-to-back basis, based on due performance by the Green Ammonia Producers as well as the Procurers. SECI shall enter into a Green Ammonia Purchase Agreement (GAPA) with the successful Bidder(s)/ producer(s) selected based on this RfS for purchase of Green Ammonia for a period of 10 years based on the terms, conditions and provisions of the RfS and GAPA.



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The Reverse auction for this tender with total capacity of 724,000 TPA of Green Ammonia has been completed and price of INR 53.27/Kg (~600/Ton of Green Ammonia, Weighted mean) has been discovered.

Demand Aggregation of Green Hydrogen

Under SIGHT Mode-2B (**Demand Aggregation of Green Hydrogen**), a total production capacity of 200,000 TPA is allotted to refineries. The tenders for a total capacity of **37,000 TPA** was floated by various refineries out of which **20,000 TPA** has been awarded.

The guidelines for **scheme on skilling, up-skilling and re-skilling** was issued on 16th March 2024 and approx. 6336 trainees have been upskilled and certified so far. The scheme aims to develop skills of youth, considering the emerging employment opportunities in growing Green Hydrogen sector in India. The scheme shall focus on skilling, up-skilling and re-skilling to help develop an ecosystem for carrying out training covering key aspects of Green Hydrogen value chain in alignment with industry.

Also, the guidelines for **funding testing facilities, infrastructure, and institutional support** aimed at developing standards and regulatory frameworks under the Mission was released on 4th July 2024. National Institute of Solar Energy (NISE) is the implementing agency of this scheme and floated a CfP on 16th August 2024. **5 projects worth INR 113.73 Cr (USD 14.2 M) have been awarded under various categories.**

Hydrogen Valley Innovation Cluster (HVIC) Scheme: This scheme aims to establish regional hydrogen ecosystems—referred to as "hydrogen valleys"—that serve as living labs for demonstrating hydrogen technologies across mobility, industry, and energy sectors. Four HVICs have already been approved with a funding of ₹172 crore (USD 21.5 M)

2. Hydrogen and Fuel Cell R&D Update

MNRE is actively driving the growth of Green Hydrogen technology in India through targeted R&D initiatives under the Mission. These efforts are critical in supporting the country's transition towards a sustainable hydrogen economy. The guidelines for the implementation of R&D Scheme were notified on 15th March 2024 with an outlay of USD 45 Million. MNRE issued a Call for Proposal under R&D Scheme on 16 March 2024, under which more than 400 proposals have been received and 23 projects have been awarded across Safety & Integration, Hydrogen Production (Biomass), Hydrogen Applications and Hydrogen Production (Non-Biomass) categories. The key thematic R&D areas are illustrated in Fig1.



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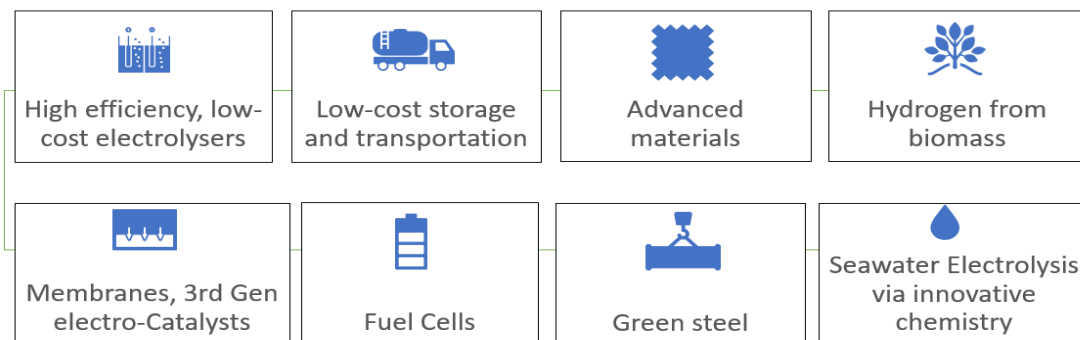


Fig 1: Key Thematic R&D Areas

2nd round under R&D was invited on 14 July 2025 and the proposals are currently under evaluation. Further, 100 proposals have been received for setting up **Centres of Excellence (CoE)** under the scheme. As part of EUTTC collaboration, joint R&D proposals were invited on 6th May 2025 from EU/ Indian research institutions on Hydrogen production from waste water.

3. Demonstration, Deployments, and Workforce Developments Update

India has initiated 3 pilot projects to explore the feasibility of Green Hydrogen in the shipping, steel, and transport sectors. This move marks a significant step toward demonstrating technical viability, building hydrogen infrastructure, and driving demand in these key hard-to-abate sectors. Government is supporting these pilots by providing capital expenditure grants for shipping and steel infrastructure enhancements and offering viability gap funding for hydrogen-powered vehicles and refuelling stations.

- **Transport Sector:** Automotive Research Association of India (ARAI) which is the concerned Scheme Implementing Agency issued an RfP on 19th February 2024 for Pilot Projects for use of Green Hydrogen in the Transport Sector. 5 projects awarded (around INR 208 Crore/USD 26 M) for deploying **37 Hydrogen fuelled vehicles** (10 Buses and 27 Trucks) and **9 Hydrogen Refuelling Stations** across **10 different routes. Trials are under progress.**
- **Steel Sector:** 5 projects have been awarded (around INR 131.4 Crore/ USD 16.5 M). Expression of Interest have been floated for new projects.
- **Shipping Sector:** The following two components have been identified under this scheme:
 - A. Retrofitting of vessels
 - B. Establishment of Bunkering and Refuelling Facility of Green Hydrogen
 - Under Component A of the scheme, it has been decided to acquire methanol based (dual fuel capability) new ships. The price bids for 2 Nos. new building PSVs capable of running on Green Methanol is invited. Expected completion of the project, 3 years from the signing of contract.
 - Under Component B, DPR prepared by VOCPA for development of bunkering and refueling facility with 750m³ Green Methanol bunkering,



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as pilot project at VOCPA. Work has been awarded and Project is expected to completed by January 2026.

4. Events and Solicitations

MNRE has organized several key outreach activities to advance Green Hydrogen ecosystem in India including the R&D Conference on 11 -12 September 2025 which featured dedicated sessions on Green Hydrogen R&D and brainstorming roundtable discussions aimed at fostering collaboration and innovation. MNRE will also organize the third edition of its flagship event “International Conference on Green Hydrogen (ICGH)” during 11-12 Nov 2025 at New Delhi.

India has also participated at key global events including World Hydrogen Summit during 20-22 May 2025 at Rotterdam and European Hydrogen Week 2025, Brussels during 29 Sep-3 Oct 2025.

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

India has made significant strides in promoting the production and use of Green Hydrogen which has the potential to revolutionize various sectors. A comprehensive set of incentive schemes has been designed under NGHM to stimulate investment and innovation in the Green Hydrogen sector (Table 1).

Table 1: NGHM Budget outlay by 2030

S. No.	Name of Component	Financial Outlay
1	SIGHT programme	USD 2.1 Billion
1.1	Incentives for Electrolyzer Manufacturing	USD 550 Million
1.2	Incentives for Green Hydrogen production	USD 1.64 Billion
2	Pilot Projects	USD 175 Million
3	Hydrogen Hubs	USD 25 Million
4	Research and Development	USD 50 Million
5	Testing Infrastructure	USD 25 Million
6	Other Mission components (Emerging Technology, Awareness, Skill development)	USD 50 Million
	Total	USD 2.4 Billion

The Mission is also supported by a range of state level policies which are crucial to mobilize investment and to achieve NGHM targets by 2030.

6. Regulations, Codes & Standards, and Safety Update

A strong framework of Regulations, Codes, and Standards (RCS) is essential for the development of the Green Hydrogen ecosystem. To initiate this, MNRE has constituted a Working Group (WG) comprising members from relevant ministries and government agencies, standardization bodies, and industry stakeholders. The Working Group has six sub-groups (Fig 2) across all key sectors to work on different aspects of the green hydrogen value chain. A total of 164 subjects/standards have been recommended by the sub-groups and about 128 have been published/adopted by various standard issuing organisations. A snapshot of the status of the standards development and adoption is illustrated in Table 2 below.

Further, MNRE has recently constituted a safety panel with the following terms of reference

- i. To support the development and harmonization of Hydrogen safety standards across value chain including identification of global best practices.
- ii. To suggest measures to promote awareness, training, and knowledge-sharing regarding Hydrogen safety among target groups.
- iii. To identify gaps in safety practices in the country and recommend areas for improvement.
- iv. To engage with stakeholders to ensure safety considerations are integrated across the Hydrogen value chain.
- v. To recommend codes, standards, protocols and model guidelines for commissioning and operation of hydrogen projects in the country.

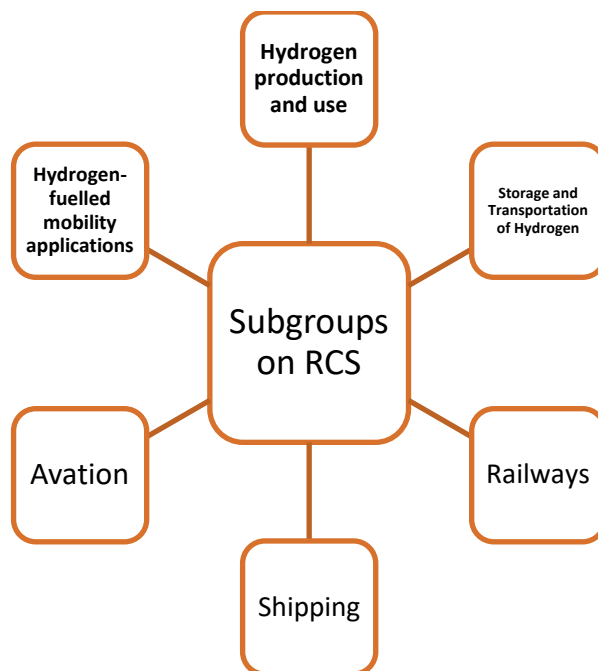


Fig 2: Working Group on RCS



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Table 2: Status of the standards development and adoption, as on July 2025

Organisation	Number of subjects recommended	Action taken			
		Adopted/ Published	In Review/ Under Discussion	New Standard to be developed/to be transferred to other body	Not considered
BIS	75	65	7	0	3
PESO	61	47	0	3	11
OISD	1	1	-	-	-
PNGRB	20	8	1	1	10
MoRTH	7	7	-	-	-
Total	164	128	8	4	24