INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update Nov 2024 – April 2025: India

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The 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 1 Billion)*
- *Abatement of nearly 50 MMT of annual greenhouse gas emissions*

The Mission has made significant progress since the last country update in Q4 2024, as outlined below.

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

Electrolyser Manufacturing

A total capacity 3,000 MW per annum of electrolyser manufacturing has been awarded under Strategic Interventions for Green Hydrogen Transition (SIGHT) programme[1](Tranche II).

Green Hydrogen Production

The scheme guidelines for "implementation of SIGHT Programme – Component II: Incentive Scheme for Green Hydrogen Production (under Mode 1) – Tranche-II" was released by MNRE on 3rd July 2024. Solar Energy Corporation of India (SECI) floated a Request for Selection (RfS) of Green Hydrogen Producers for Setting up Production Facilities for Green Hydrogen in India under the SIGHT Scheme (Mode-1-Tranche-II) on 11th July 2024. A total of **412,000 tonnes per annum** (TPA) of Green Hydrogen production capacity have been awarded to 10 companies under Mode 1 Tranche I, and **450,000 TPA** have been awarded under Mode 2 Tranche II.

[1] 1500 MW per annum of electrolyser manufacturing has been awarded under SIGHT scheme (Tranche-I) in January 2024.

Demand Aggregation of Green Ammonia

On 7th June 2024, 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**). **The tender for 7,000 TPA** Green Ammonia for use in fertilizer sector is currently live. 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. This RfS offers a key opportunity to aggregate demand and identify green ammonia producers through a transparent, competitive bidding process—an essential milestone in India's path toward sustainable energy solutions.

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 **42,000 TPA** have been floated by various refineries so far.

Skilling

The guidelines for **scheme on skilling, up-skilling and re-skilling** was issued on 16th March 2024 and approx. 4300 trainees have been upskilled 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.

Testing

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. Subsequently NISE received 40+ proposals out of which 3 projects worth INR 62.04 cr (USD 7.75 M) have been awarded.

Green Hydrogen Certification Scheme of India (GHCI) was launched on 29th April 2025. The GHCI aims to provide a holistic framework for the measurement, monitoring, and certification of Green Hydrogen production in India. It emphasizes transparency, accountability, aligning with national energy transition and climate goals, contributing to the overall success of the NGHM.

2. Hydrogen and Fuel Cell R&D Update

Ministry of New and Renewable Energy (MNRE) is actively driving the growth of Green Hydrogen technology in India through targeted research and development (R&D) initiatives. 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 50 Million. MNRE issued a Call for Proposal under R&D Scheme on 16th March 2024, under which more than 400 proposals have been received and 23 projects have been awarded. The key thematic R&D areas are illustrated in Fig 1.

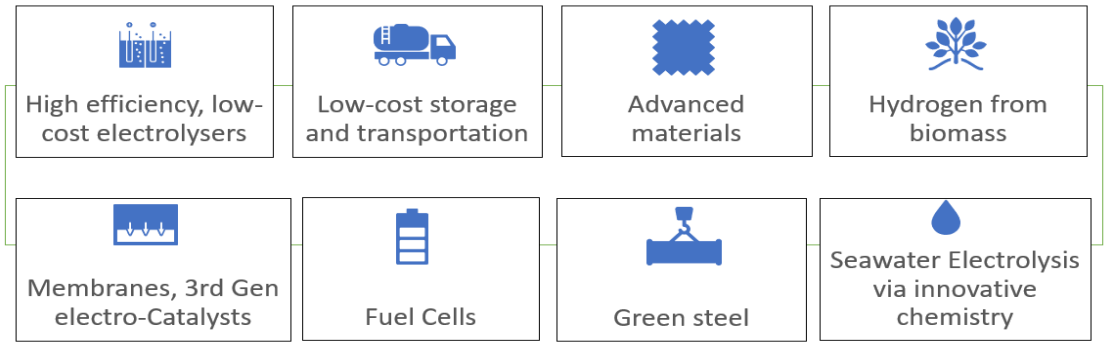

Fig 1: Key Thematic R&D Areas

3. Demonstration, Deployments, and Workforce Developments Update

India has initiated 3 pilot projects to explore the feasibility of Green Hydrogen in the Shipping, Steel manufacturing, 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. The government is supporting these pilots financially 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. Under that 13 bids have been received and awarded 5 projects worth ₹208 crore (approx. USD 24.5 M), including 37 buses/trucks and 9 Hydrogen refuelling stations across 10 different routes. These projects will commence trials from March-June 2025 and complete by September 2026.

- **Steel Sector:** On 12th June 2024, MECON Limited (Scheme Implementing Agency of Ministry of Steel) has issued a RfP for Green Hydrogen pilot projects to facilitate Hydrogen injection in a Direct Reduced Iron (DRI) plant, existing Blast Furnace, and existing DRI vertical shaft. Based on the evaluations of the proposals received, MNRE has sanctioned a total of three pilot projects in the steel sector. Another RfP for “Hydrogen injection in

existing blast furnace and existing DRI vertical shaft" has been issued by MECON Limited on 7th October 2024. Three pilot projects have been awarded totalling ₹347 crores (USD 41 M) for two projects on DRI production with 100% Hydrogen and one to introduce Hydrogen in a Blast Furnace to cut coal/coke use. In the second round, one project for use of Hydrogen in Blast Furnace to reduce coal/ coke consumption under scheme B and 3 projects for injection of Hydrogen in vertical shaft based DRI making unit under scheme C were finalised.

- **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, Shipping Corporation of India (SCI), the concerned Scheme Implementing Agency has selected ships for retrofitting and completed feasibility studies. RFP document for undertaking the project on EPC reimbursable basis issued to GRSE. GRSE earmarked a Drydock in main yard in Kolkata for executing the work and has engaged a design firm for carrying out basic design & detail engineering.

Under Component B, the tender for Consultancy services to develop a Green bunkering and refuelling facility at V.O. Chidambaranar Port has been awarded. DPR has been prepared by VOCPA for development of bunkering and refuelling facility with 750m3 Green Methanol bunkering, as pilot project at VOCPA. The project would be completed by January 2026.

4. Events and Solicitations

MNRE has organized several key outreach activities to advance the Green Hydrogen ecosystem in India. Highlights include "Workshop on National Green Hydrogen Mission – Opportunities for MSMEs" on 29th April 2025, "World Hydrogen Day" on 8th Oct 2024, and the second "International Conference on Green Hydrogen" (11-13 Sep 2024, New Delhi), which drew over 8,500 participants and 240 speakers from across the globe. The conference featured 22 technical and 7 plenary sessions, CEO roundtables, a youth session, an exhibition, and a poster and quiz competition. The next edition is tentatively scheduled for November 2025, marking a significant step toward establishing India as a global Green Hydrogen hub.

India has also participated in the World Hydrogen Summit 2025, Rotterdam during 20-22 May 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 outlay

S. No.	Name of Component	Financial Outlay
1	SIGHT programme	USD 2.18625 Billion
1.1	Incentives for Electrolyzer Manufacturing	USD 375 Million
1.2	Incentives for Green Hydrogen production	USD 1.81125 Billion
2	Pilot Projects	USD 133.25 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 38.125 Million
	Total	**USD 2.46 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 (Fig 2) from relevant ministries and government agencies, standardization bodies, and industry stakeholders. The Working Group has six sub-groups (Fig 3) to work on different aspects of the Green Hydrogen value chain. A total of 163 standards (some subjects are common) have been recommended and about 111 have been published/adopted by various associated organisations.

Fig 2: Members of the working group

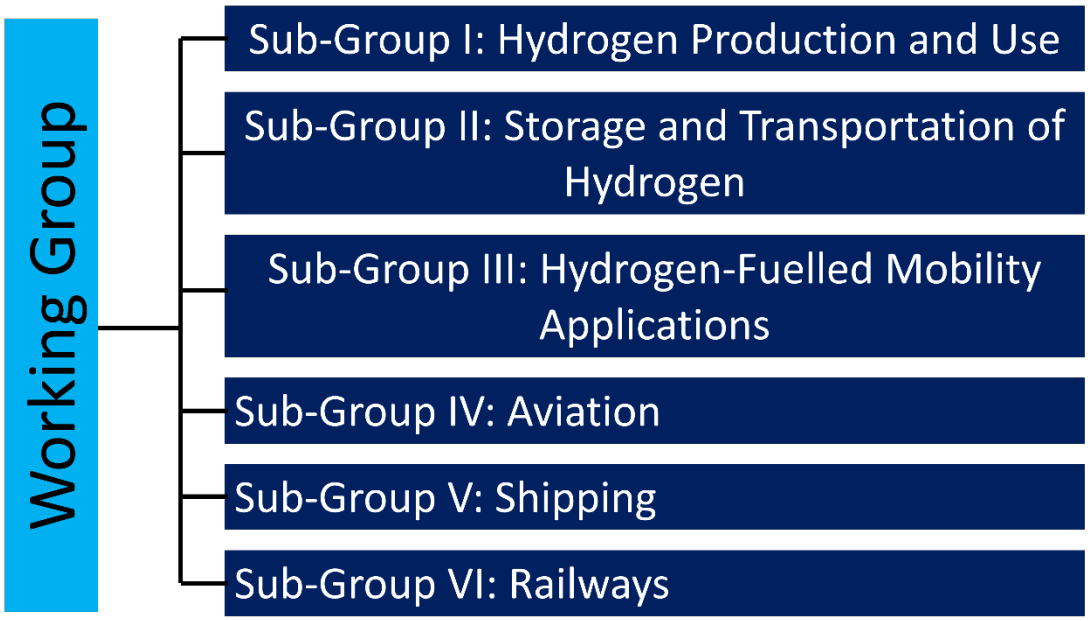

Fig 3: Sub-committee under WG on RCS