

# National Green Hydrogen Mission

---

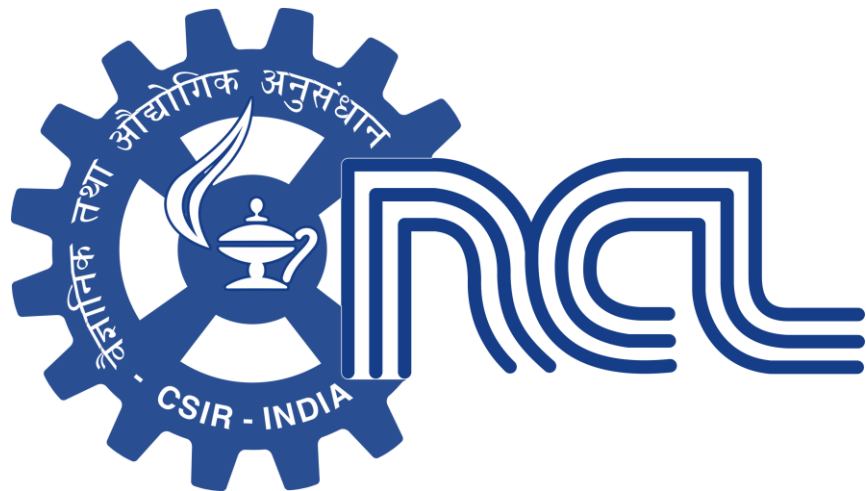
---

REGULATIONS CODES AND STANDARDS

07<sup>th</sup> October 2024

Ministry of New and Renewable Energy

# Key Ministries and Organizations Involved in Standardization



सड़क परिवहन  
एवं राजमार्ग मंत्रालय  
MINISTRY OF  
ROAD TRANSPORT  
AND HIGHWAYS



# Global Standard Issuing Authorities

## North America

Toronto, Canada



Illinois, USA



Massachusetts, USA



Pennsylvania, USA



New York, USA



Washington DC, USA



Virginia, USA



North Carolina, USA



## Europe

Kegworth, UK



Brussels, Belgium



Geneva, Switzerland



## Asia

Pune, India



New Delhi, India



Nagpur, India



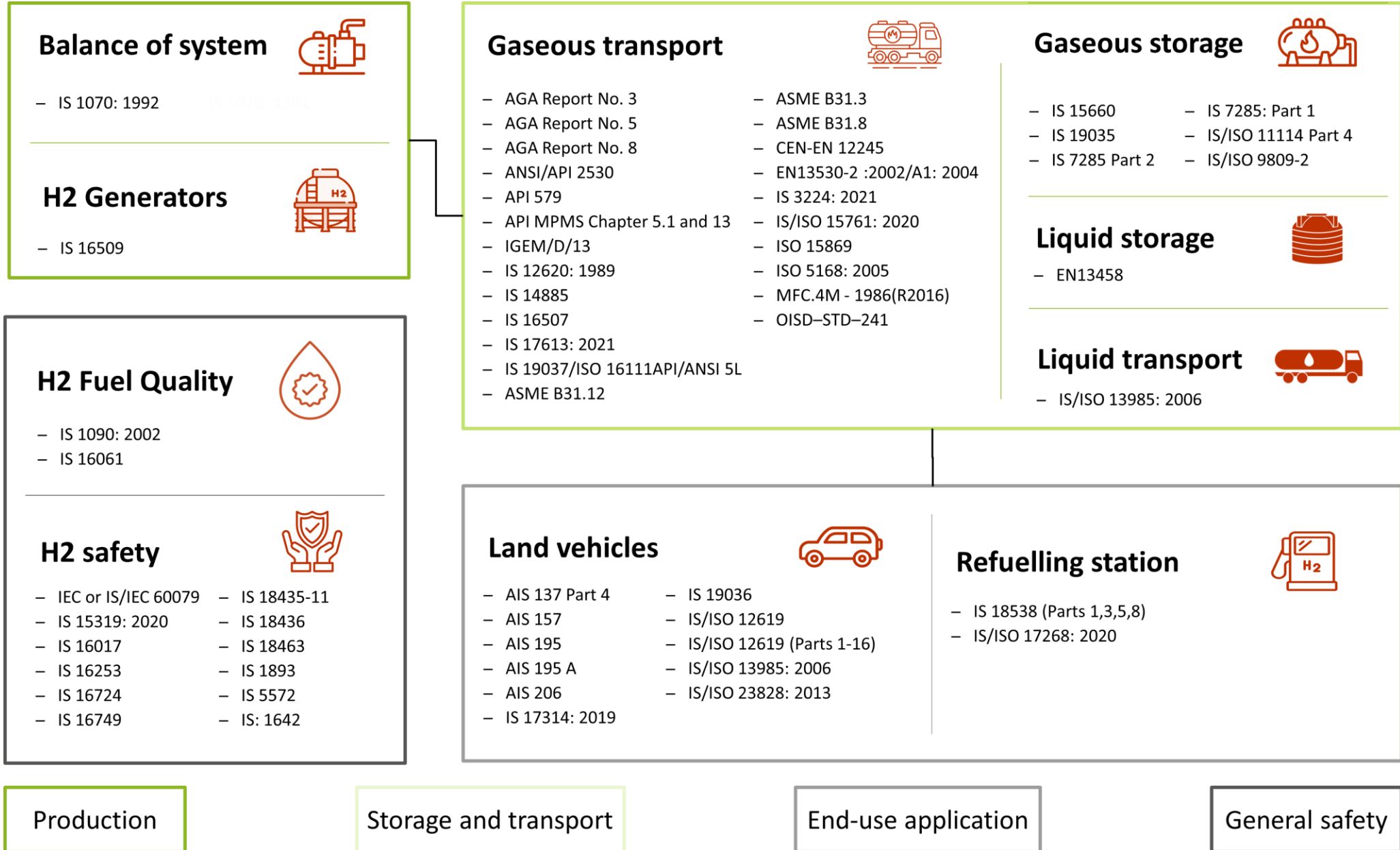
Beijing, China



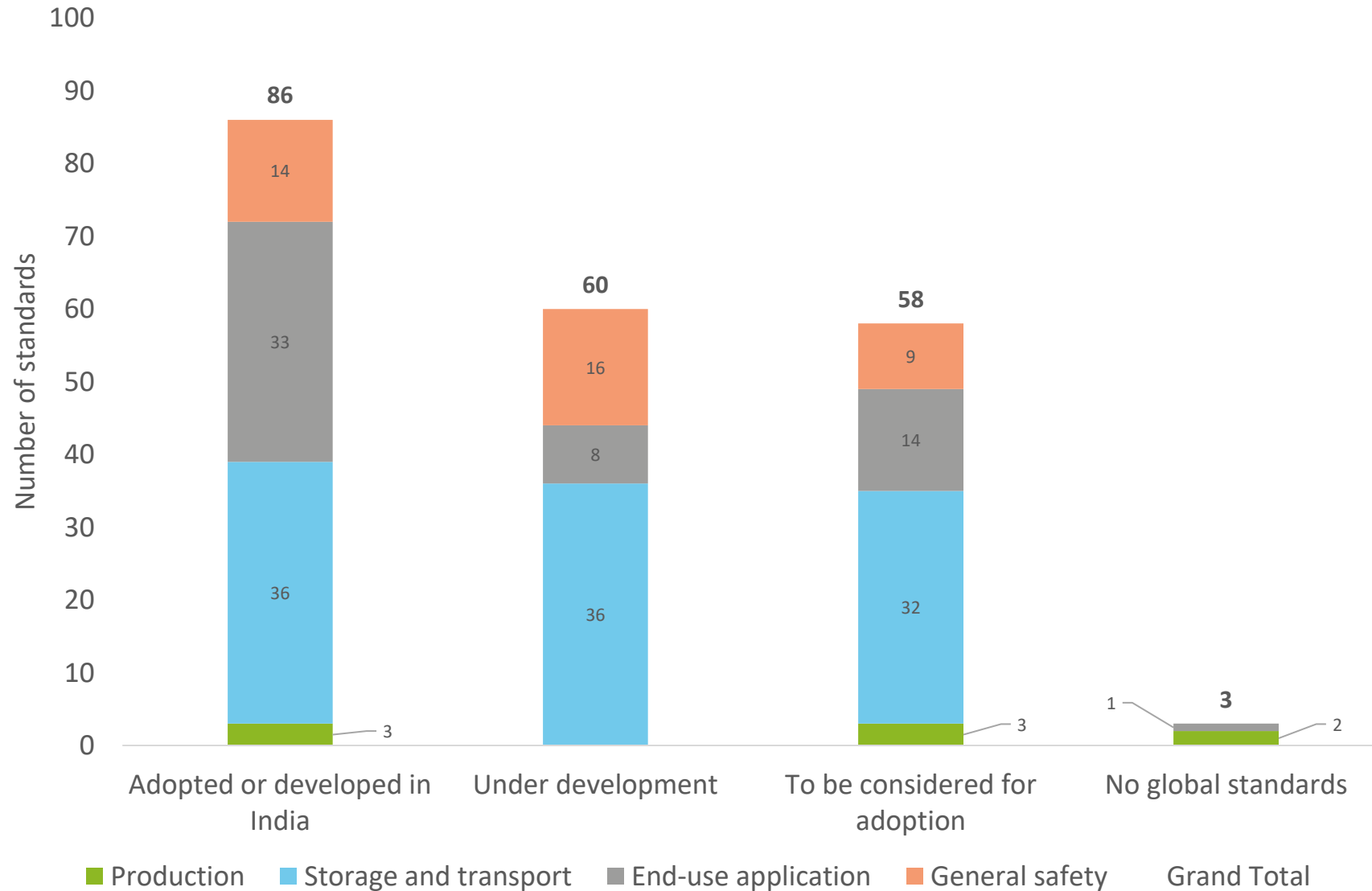
# Categories assessed for making standards

Production		Storage and distribution				End-use applications							General safety
Balance of system	H2 generators	Gaseous storage	Gaseous transport	Liquid/ cryogenic storage	Liquid/ cryogenic transport	Aviation	Land vehicles	Marine vehicles	Refuelling stations	Fuel cells	H2 fuel quality	Distributed applications	H2 safety
CO analyser in SOEC	Water electrolysis systems	Gas cylinders and tanks	Cryogenic vessels	Cryogenic vessels	Cryogenic vessels	Aviation turbine fuel	Compressed gaseous FCEV	Bulk liquid	Dispensing equipment	Micro fuel cells	Fuel for vehicle or stationary applications	Gas-fired central heating	Electrical installations
Power system	Natural gas or biomass pyrolysis	Portable containers	Gas infrastructure	Bulk liquid	Fuel tanks	Aviation safety	Energy consumption measurement		Fuelling protocol	Portable fuel cells		Iron and steel (blast and shaft furnace)	Fire and explosive safety
PSA		Stationary containers	Metering	Cryogenic storage	Shipping vessels		Fuel system components	Gaseous H2 refuelling stations	Stationary fuel cells	Heating boilers		Materials safety	
Pump	Underground storage	Piping and pipelines	Reversible metal hydrides	Vehicular tanks	Hydrogen-based railways	Vehicle safety	Process safety						
Water electrolysis systems													

# Standards already in place

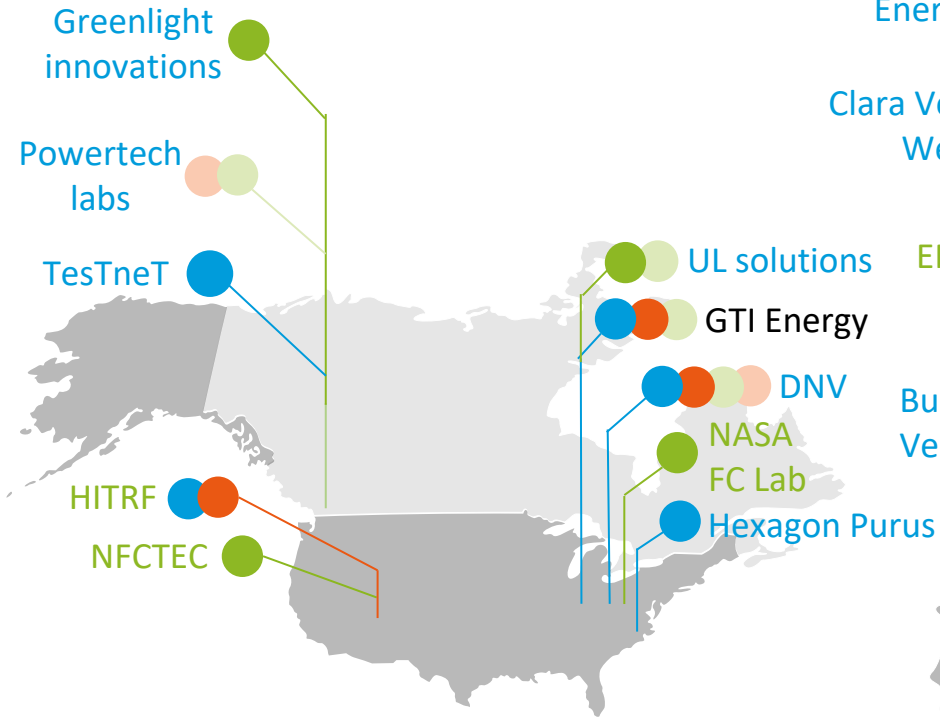


# India can develop and adopt about 207 standards across the Green Hydrogen value chain

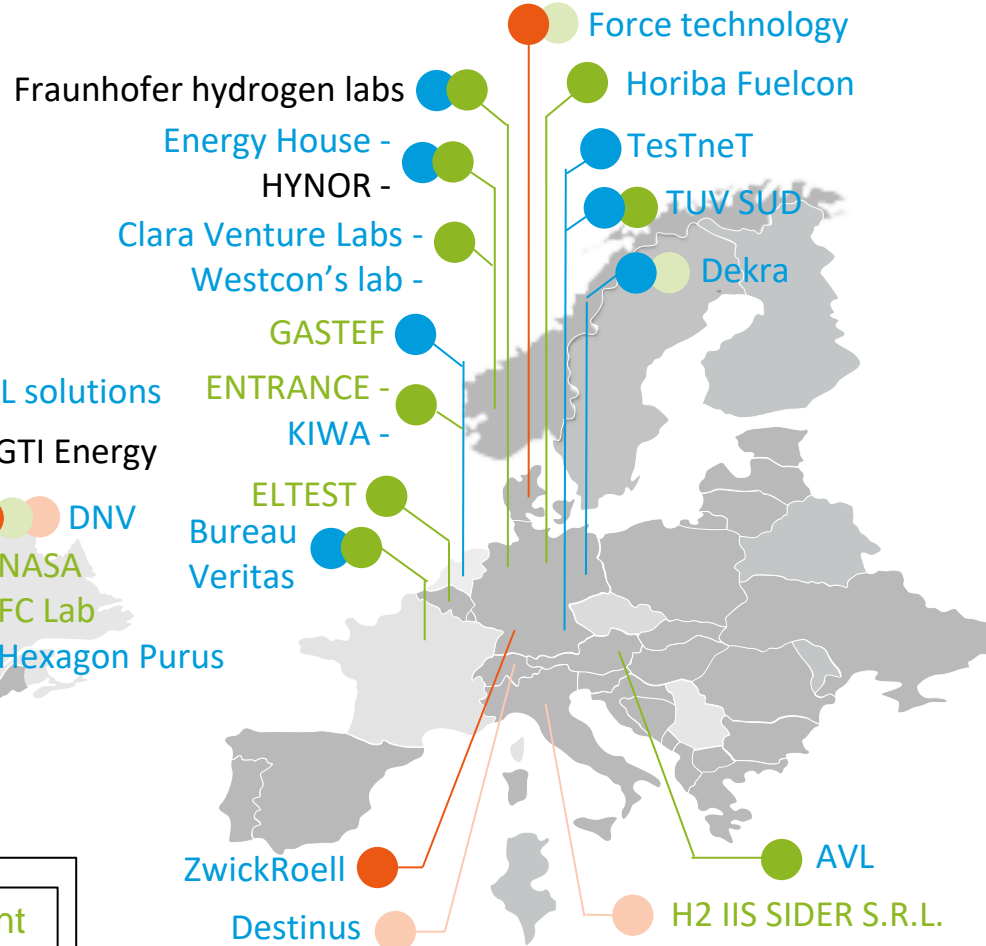


# Global Testing Facilities for Green Hydrogen

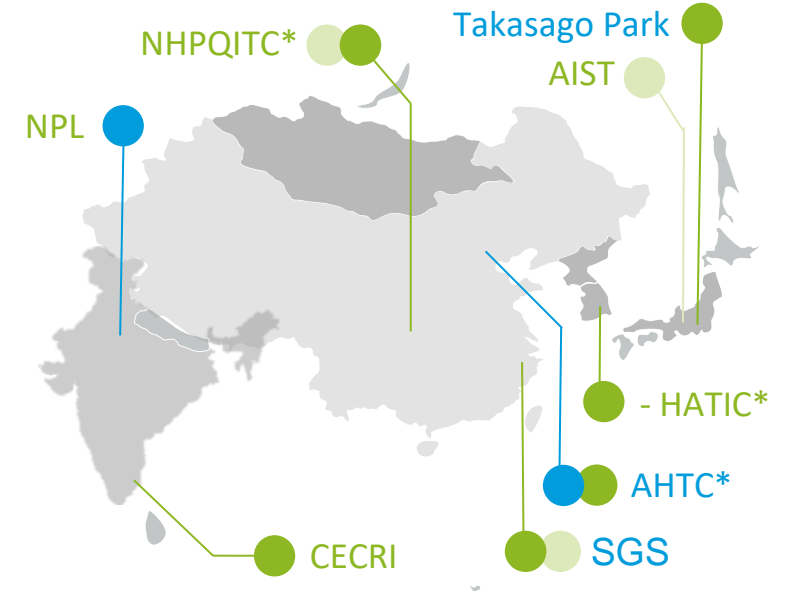
## North America



## Europe (without UK)



## Asia

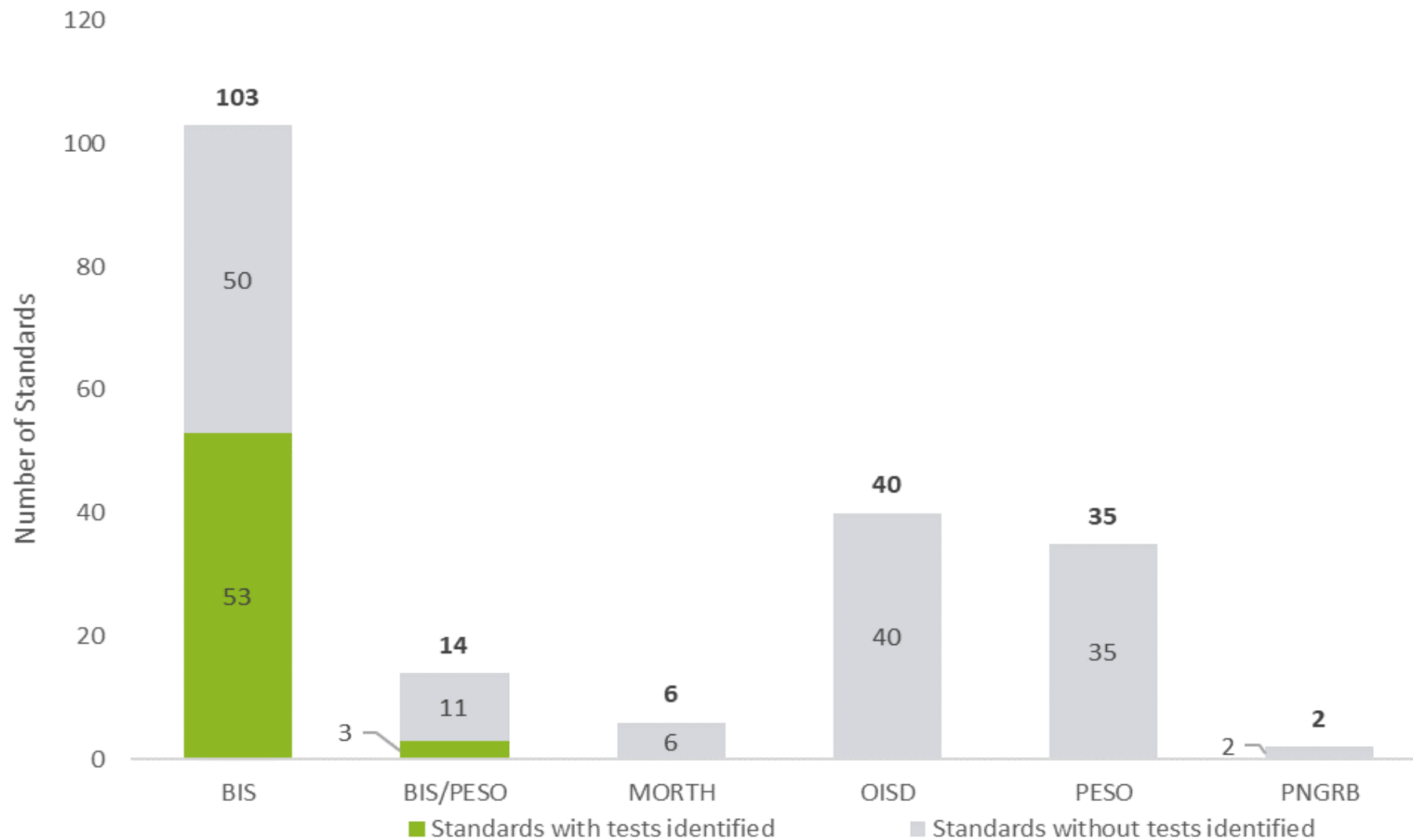


## UK

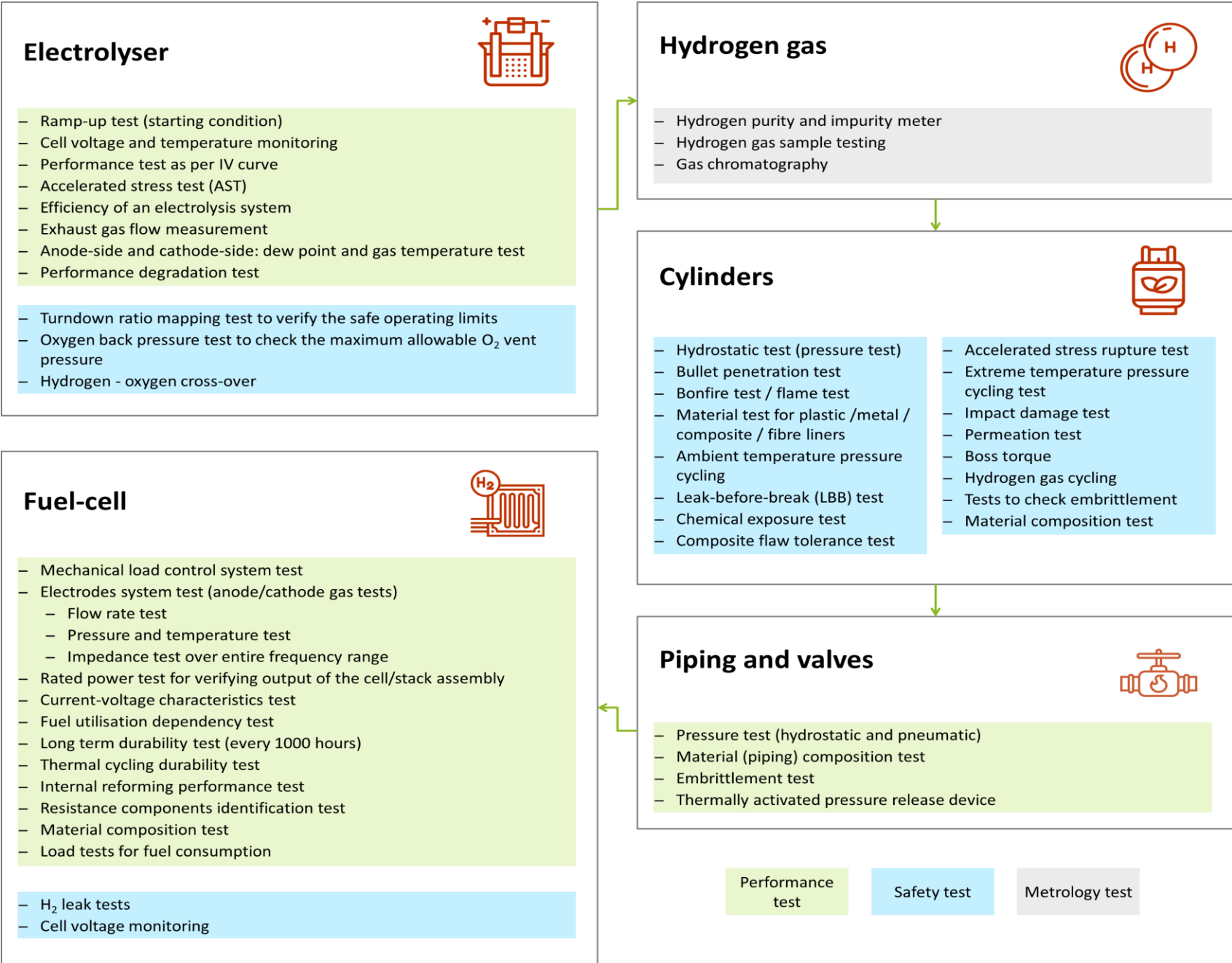


<span style="color: green;">●</span> Production	<span style="color: orange;">●</span> Safety	<span style="color: green;">■</span> Government
<span style="color: red;">●</span> End Use	<span style="color: lightgreen;">●</span> Others	<span style="color: blue;">■</span> Private
<span style="color: blue;">●</span> Storage & Transportation		<span style="color: grey;">■</span> Non-Profit

## Testing requirements related to green hydrogen are yet to be fully identified in India



# INDICATIVE TESTS



# Funding and Development of Testing Facilities under the National Green Hydrogen Mission



## Objectives of the Scheme

- **Create and Upgrade Testing Facilities:** Identify gaps and develop new infrastructure for testing technologies in the Green Hydrogen value chain.
- **Ensure Safety and Quality:** Ensure safe operations of equipment and validate the components used in the production, storage, and transportation of Green Hydrogen.
- **Encourage Collaboration:** Involve both private and government entities in establishing world-class testing facilities.



## Budget and Implementation


- **Budget:** ₹200 crores will be allocated for testing facilities until 2026.
- **Executing Agency:** National Institute of Solar Energy (NISE) will oversee implementation.
- **Funding Pattern:**
  - Up to **100%** funding for government entities.
  - Up to **70%** for private entities.



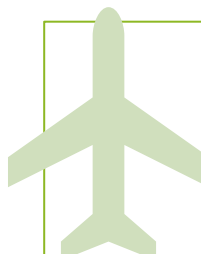
## Key Achievements

- **Call for Proposals:** Deadline to submit proposals is October 14
- **World-Class Facilities:** Emphasis on the creation of **Center(s) of Excellence** for testing and certification.

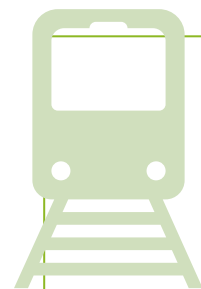
# Overview of Key Implementations



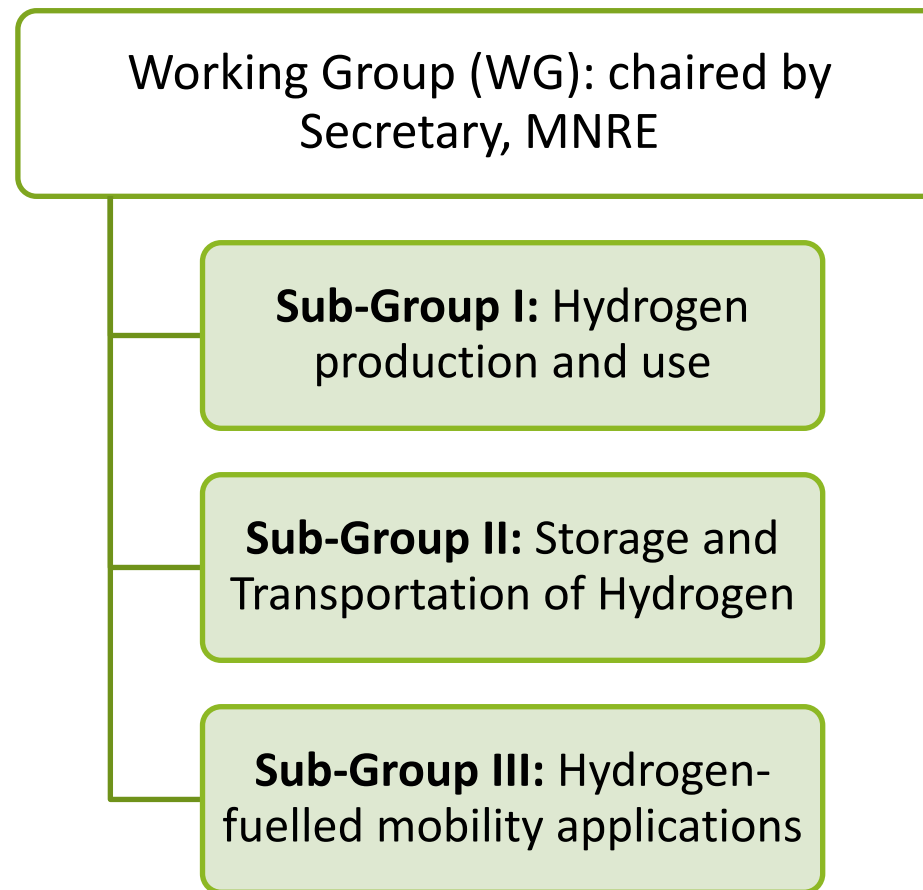
Second set of 58 standards recommended.



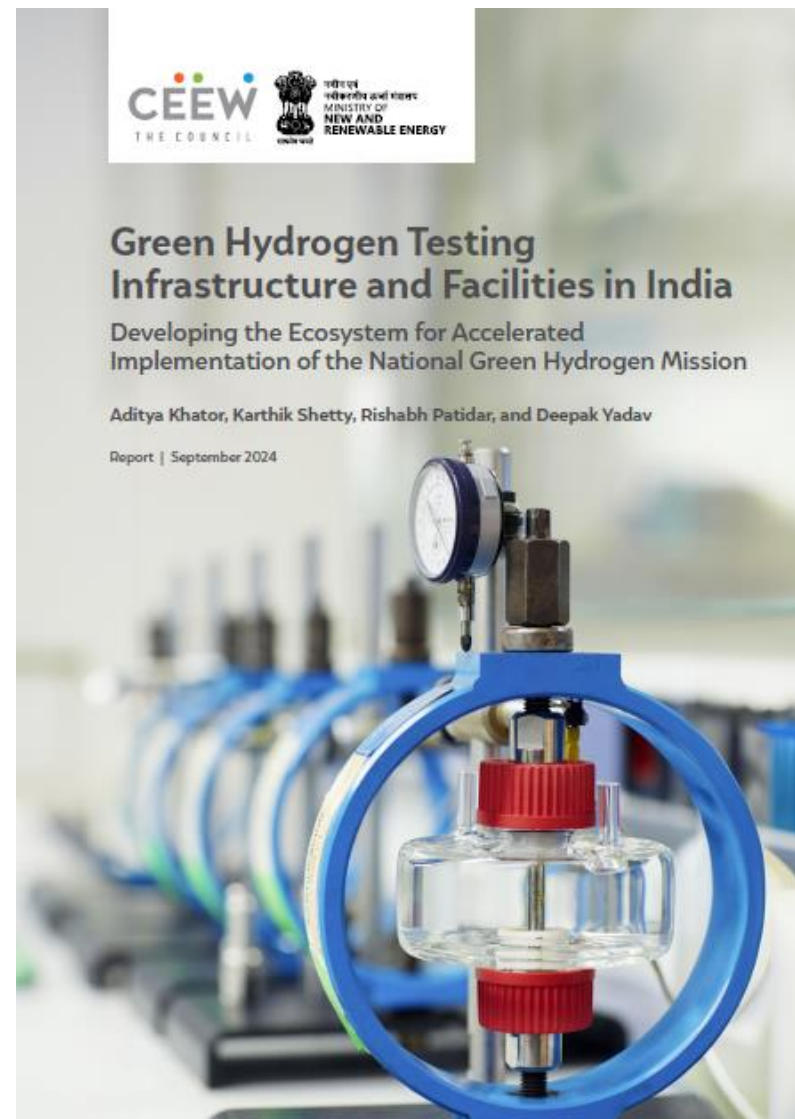
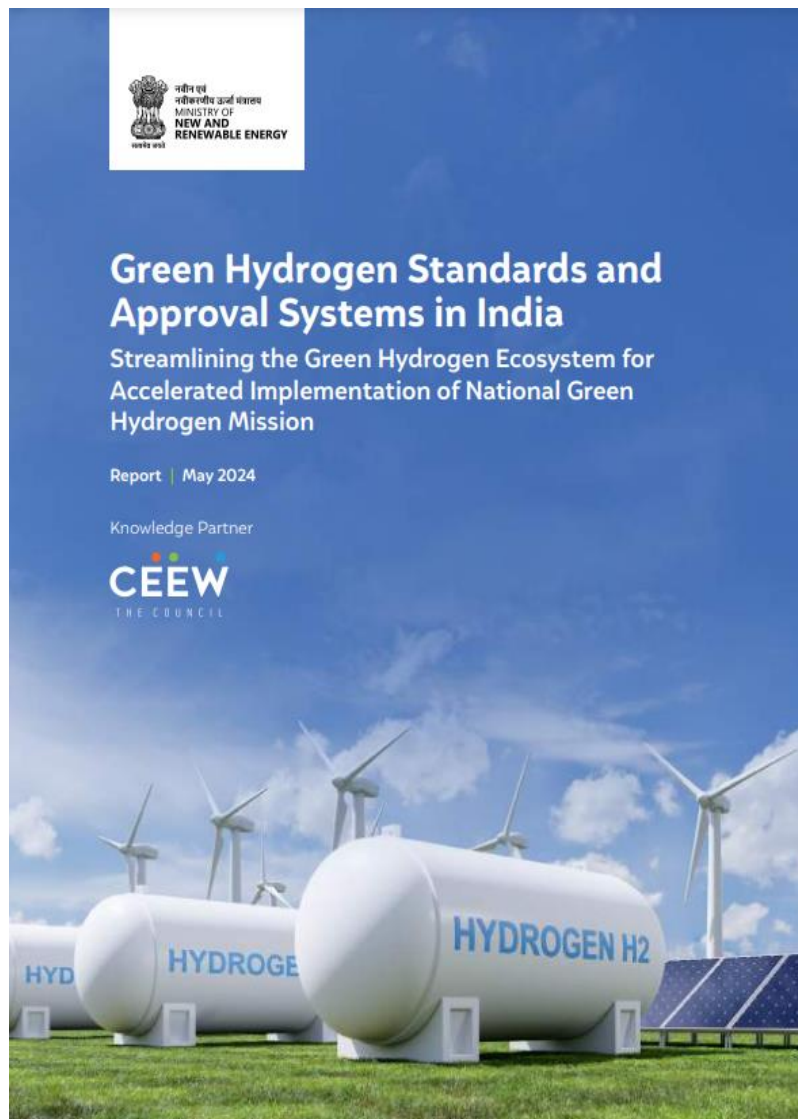
Additional Sub-groups on Shipping and Aviation constituted on 7<sup>th</sup> August 2024.



Sub-group on Railways constituted on 30<sup>th</sup> September 2024.



# Reports on Standards and Testing published by MNRE



**Thank you**