

# National Hydrogen Mission and Prospects for India-GCC Cooperation

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## Manifest pedagogy:

In a push for India's energy security, Prime Minister Narendra Modi in his Independence Day speech on Sunday announced a National Hydrogen Mission for the country. This comes against the backdrop of India spending ₹12 trillion annually to meet the energy needs. Similarly, the GCC countries have invested heavily in hydrogen energy and are looking at it as the holy-grail to a cleaner future.

**In news:** India's National Hydrogen Mission and Prospects for Cooperation with GCC

Placing it in syllabus:

- Foreign Affairs

## Dimensions

- National Hydrogen Mission (NHM)
- Why is Hydrogen so important for India?
- India's efforts into Hydrogen technology
- Hydrogen Energy and GCC
- India-GCC Cooperation
- Future opportunities for collaboration

## Content:

### National Hydrogen Mission (NHM):

- The proposal for the National Hydrogen Mission was made

in the Budget 2021 to launch NHM that would enable the generation of hydrogen “from green power sources”.

- It was the goal of controlling emissions that makes hydrogen fuel so attractive to policy-makers.
- whether it's used in a fuel cell or burned to create heat, wherever hydrogen replaces fossil fuels, it slows global warming,
- The plan involves India becoming a global hub for green hydrogen production and exports.
- The NHM, according to a draft paper prepared by the Ministry of New and Renewable Energy (MNRE), has identified pilot projects, infrastructure and supply chain, research and development, regulations and public outreach as broad activities for investment with a proposed financial outlay of Rs 800 crores for the next three years.
- It aims to leverage the country's landmass and low solar and wind tariffs to produce low-cost **green hydrogen** and ammonia for export to Japan, South Korea and Europe.

National Hydrogen Mission aims to cut down carbon emissions and increase the use of renewable sources of energy while aligning India's efforts with global best practices in technology, policy and regulation.

The Government of India has allotted Rs 25 crore in the Union Budget 2021–22 for the research and development in hydrogen energy and intends to produce three-fourths of its hydrogen from renewable resources by 2050.

## **Why is Hydrogen so important for India?**

- Hydrogen can be a “decarbonising agent” for industries like chemicals, iron, steel, fertiliser and refining, transport, heat and power.
- Hydrogen is seen as the game changer for becoming a low-carbon economy for India. Increasing concerns over the

issue of climate change have necessitated the use of hydrogen as an alternate clean fuel.

- Hydrogen energy is currently at a nascent stage of development, but has considerable potential for aiding the process of energy transition from hydrocarbons to renewables.
- It has huge potential in the transportation sector as a direct replacement for fossil fuels. Shipping and aviation have limited low-carbon fuel options available and represent an opportunity for hydrogen-based fuels.

### **India's efforts into Hydrogen technology:**

- At present, bulk of the global energy consumption comes from hydrocarbons.
- Hydrogen is at an early stage of entering the energy sector in India.
- Government as well as non-government funding agencies are engaged in R&D projects pertaining to hydrogen production, storage, utilisation, power generation and for transport applications.
- As early as in 2003, the National Hydrogen Energy Board was formed and in 2006 the Ministry of New and Renewable Energy laid out the National Hydrogen Energy Road Map identifying transport and power generation as two major green energy initiatives.
- India is participating in Mission Innovation Challenge for clean hydrogen and shares the objective to accelerate the development of a global hydrogen market by identifying and overcoming key technology barriers to the production, distribution, storage and use of hydrogen at gigawatt scale.
- By 2050 India intends to produce three-fourths of its hydrogen from renewable resources
- R&D projects in India focus on improving the efficiency of water-splitting reactions, and finding newer materials, catalysts and electrodes to accelerate the

reaction.

- Presently, more than 100 research groups are focusing on fuel cell technology.
- There are a number of foreign and Indian companies that are involved in hydrogen production, storage or delivery in India.

## **Hydrogen Energy and GCC:**

### ***Opportunities for India in GCC:***

- Rich in hydrocarbon resources, currently the GCC countries consume around 7 per cent of the grey hydrogen sourced from the natural gas.
- Qatar is the largest consumer of hydrogen in the region followed by Saudi Arabia, Kuwait, Oman, the UAE and Bahrain.
- UAE and Saudi Arabia, and more recently Oman, have embraced the concept of a hydrogen economy.
- They are keen to use it domestically as part of decarbonisation efforts as well as intend to use it as an alternative export commodity.
- There are other motivating factors including energy security and economic diversification.
- GCC countries are at the forefront of cost reductions in renewables and in shaping the energy transformation within as well as outside the region.
- GCC countries are looking at renewable energy as a job generating sector<sup>13</sup> for their young demography that is grappling with unemployment and the spillover effect might also impact the expatriate population positively

### ***Advantages available for GCC Countries:***

There are facilitating factors that make it convenient for the GCC countries to invest in renewable energy:

- These countries have the potential to become hydrogen producers as well as exporters as they have existing

industrial capacity and required capital to invest in the initial infrastructure.

- GCC has an abundance of inexpensive land and water along with solar and wind resources that can help in production of Green Hydrogen.
- The countries are situated in geographical proximity to the emerging and future markets for cleaner fuel.
- The GCC countries can easily be producers of Blue Hydrogen due to availability of hydrocarbons and the carbon capture, utilisation and storage (CCUS) capacity.

## **India–GCC Cooperation:**

- India and GCC countries share robust energy cooperation.
- In 2017–18 India imported nearly 53 per cent of its energy from the Persian Gulf, and UAE and Saudi Arabia were third and fourth largest trading partners of India.
- India and the GCC are natural energy partners and have huge potential for extending cooperation in cleaner fuels like hydrogen.
- India has signed MoUs on renewable energy with most of the GCC countries.
- India is looking at developing Hydrogen collaboration with Bahrain and even invited Bahrain to participate in the Hydrogen Roundtable
- The two countries agreed to engage more in renewable energy capacity-building and focus on cooperation between their governments as well as the private sector, particularly in the field of solar, wind and clean hydrogen.
- In 2019, India signed an agreement with Saudi Arabia about cooperation in renewable energy including hydrogen. The two countries are collaboratively exploring Hydrogen Energy as a future source of energy.
- Saudi companies like Alfanar and Aljomaih that have invested in India's wind and solar energy projects may

be roped in for collaboration on production of Green Hydrogen.

## **Future opportunities for collaboration:**

### ***Robust political will on both sides:***

- The **political will** to promote hydrogen energy and collaborate with regional and international actors exists on both sides.
- Prime Minister Modi announced NHM on Independence Day and said that Green Hydrogen will give India a quantum jump in achieving its renewable energy targets and help in becoming Aatmanirbhar (self-reliant) in energy.
- In 2018, he had invited GCC business leaders to invest in India's energy sector
- Similarly GCC leaders too have stated the importance of clean fuel and their willingness to collaborate on hydrogen energy.

### ***Interest in investment and technology sharing:***

- One of the major challenges faced by GCC countries in production of hydrogen fuel is the incompatibility of electrolyzers with salt water.
- Sea water needs to be desalinated before it becomes feasible for electrolysis. There is a potential for collaboration between India and these countries on this issue.
- A number of Indian research groups are working on hydrogen generation from sea water.
- For instance, Central Electrochemical Research Institute, Karaikudi is conducting research on design of electrodes and electrolytes for hydrogen generation using sea water

### ***Academic and R&D Cooperation***

- The GCC countries especially Saudi Arabia and UAE have

invested in enhancing carbon capture, utilisation and storage and there is potential for Indian institutes working on the same to collaborate in terms of knowledge sharing.

- Similarly, these countries have made considerable investments in Fuel Cell Electric Vehicles and Indian research groups can benefit from the collaborations.

### ***Energy Self reliance and reducing carbon footprint***

- Introducing hydrogen to import basket would help in reduction of carbon footprint as well as reduce India's import bill till the time we become self-reliant.
- GCC countries are focusing on exporting hydrogen to European countries and Southeast Asian countries;
- Therefore, the need of the hour is to act fast in order to reap the benefits of cost competitiveness.
- Collaboration with the GCC countries will accelerate India's hydrogen mission and reduce the time for New Delhi to export hydrogen.

### ***Historical close ties***

- GCC countries are India's age-old energy partners and have experience in energy production and distribution.
- Since this is an emerging field, India can ask for partnership on equal terms. India can aim to benefit from the abundant potential of GCC, and the GCC countries can depend on its long-time reliable partner while benefiting from R&D and skilled human resources.
- The Middle East Green Initiative 2021 to be held in October 2021 in Riyadh can be a platform to further India's hydrogen cooperation with the region.

Geographical proximity and robust trade ties in conventional energy calls for proactive measures to collaborate with GCC countries especially Saudi Arabia, UAE and Oman for research and development pertaining to hydrogen energy.

***Mould your thought:***

1. Discuss the importance of the National Hydrogen Mission for India. Why should India look at enhancing hydrogen cooperation with GCC countries?

***Approach to the answer:***

- Introduction
- Discuss the importance of Hydrogen for India
- Mention how National Hydrogen Mission helps achieve these needs
- Mention the needs of GCC and India related to Hydrogen
- Discuss the future opportunities available for India in GCC
- Conclusion