



Green Hydrogen/Green Ammonia Policy

For Prelims: Green Hydrogen, Forms of Hydrogen, National Hydrogen Mission.

For Mains: Green Hydrogen and its significance in achieving India's target of becoming carbon neutral by 2070, Government Policies & Interventions, Environmental Pollution & Degradation, Conservation.

Why in News?

Recently, the **Ministry of Power has notified Green Hydrogen/Green Ammonia Policy** for production of Green Hydrogen or Green Ammonia using renewable sources of energy.

- **National Hydrogen Mission** launched in 2021 aims to aid the government in meeting its climate targets and making India a green hydrogen hub.

What are the Provisions of the Green Hydrogen/Green Ammonia Policy?

- Under the policy, the government is offering to set up **manufacturing zones for production**, connectivity to the **ISTS (Inter-State Transmission System)** on priority basis, and free transmission for 25 years if the production facility is commissioned before June 2025.
 - This means that a **green hydrogen producer will be able to set up a solar power plant** in Rajasthan to supply renewable energy to a green hydrogen plant in Assam and would not be required to pay any inter-state transmission charges.
 - Besides, **producers will be allowed to set up bunkers near ports** for storage of green ammonia for export by shipping.
- **Production target** has also been raised **five times** from 1 million tonnes (m) to 5 mt by 2030.
 - In October, 2021 it was announced that **India is targeting initially around 1 million tonnes** annual green hydrogen production by 2030.
- Manufacturers of Green hydrogen and ammonia are allowed to **purchase renewable power from the power exchange** or set up **Renewable Energy (RE) capacity** themselves or through any other developer, anywhere.
- Further, it **provides facility for producers to bank any surplus renewable energy generated with discoms** (power distribution companies) for upto 30 days and use it as required.
- **Discoms may also procure renewable energy to supply green hydrogen producers but will be required to do so at a concessional rate** which will only include the cost of procurement, wheeling charges and a small margin as determined by the state commission, under the new policy.
 - Such procurement **would also count towards a state's Renewable Purchase Obligation (RPO)** under which it is required to procure a certain proportion of its requirements from renewable energy sources.
- To **ensure ease of doing business** a **single portal for carrying out** all the activities including statutory clearances in a time bound manner will be set up by MNRE (Ministry of New and Renewable Energy).

What is Green Hydrogen?

- **About:**
 - It is produced by **splitting water into hydrogen and oxygen** using an electrolyzer powered by renewable energy sources such as wind and solar.
 - The fuel can be a **game-changer for the energy security of India**, which imports 85% of its oil and 53% of gas requirements.
 - To promote clean fuels, India is considering making it mandatory for fertilizer plants and oil refineries to purchase green hydrogen.
- **Significance:**
 - Green hydrogen energy is vital for India to meet its **Nationally Determined Contribution (INDC)** Targets and ensure regional and national energy security, access and availability.
 - Green Hydrogen can act as an **energy storage option**, which would be essential to meet intermittencies (of renewable energy) in the future.
 - In terms of mobility, for long distance mobilisations for either urban freight movement within cities and states or for passengers, Green Hydrogen can be used in railways, large ships, buses or trucks, etc.
 - Hydrogen has the potential to be the key renewable target **in supporting infrastructure as well.**

What is Green Ammonia?

- **About:**
 - Ammonia is a chemical which is **used mainly in the manufacture of nitrogenous fertilizers**, like urea and ammonium nitrate, but can be put to other uses too, such as to run engines.
 - Green ammonia production is where the process of making **ammonia is 100% renewable and carbon-free.**
 - One way of making green ammonia is by using hydrogen from water electrolysis and nitrogen separated from the air. These are then fed into the **Haber process (also known as Haber-Bosch)**, all powered by sustainable electricity.
 - In the Haber process, **hydrogen and nitrogen are reacted together at high temperatures** and pressures to produce ammonia, NH₃.
- **Significance:**
 - Green ammonia is intended to be used in the production of **carbon-neutral fertiliser products**, decarbonising the food value chain, and also has potential as a future climate-neutral shipping fuel.
 - Green ammonia production **makes use of renewable energy sources** such as hydro-electric, solar power or wind turbines.
 - Green ammonia is crucial to **tackle the existential challenges of producing enough food** to feed a growing global population and generating CO₂-free energy.

Way Forward

- India has the **potential to bring down the cost of green hydrogen** by using low-cost renewable generating plants and cost-curtailment experience gained through solar and wind reverse auctions.
 - **Huge market potential, owing to the young demography** and thriving economy, will be a long-term benefit for the government while pushing the application of hydrogen-based technologies.
- Hydrogen needs to be **considered as complementary** to its alternatives rather than **contemplating it as an ultimate** and stand-alone solution as it comes with its own constraints.
 - The present storage and transportation technologies are expected to be mature and cost-effective by 2030.
 - Hence, the **production and near-real-time utilization** of hydrogen at the same location can be promoted to safeguard investments against undesirable sunk costs.

Source: PIB

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