



Subsidies for Green Hydrogen Projects

Why in News?

Recently, the Uttar Pradesh cabinet approved its five-year [Green Hydrogen Policy](#), earmarking 50.4 billion rupees (USD 608 million) for a **subsidy programme** to incentivise enough capacity for the 2028 target.

Key Points


- If successful, the policy would make up **one fifth of India's target of reaching five million tonnes of annual production by 2030**, under its [National Green Hydrogen Mission](#).
 - This policy will **target existing demand** mostly in industrial processes such as chemicals and oil refining to **replace grey hydrogen** made using unabated fossil fuels.
 - So far, hydrogen production technology has relied on gas, known as **grey hydrogen**. A significant effort is now under way to **transition from grey hydrogen to green hydrogen**.
- The policy outlines an ambitious goal to produce **one million metric tonnes of green hydrogen annually** within the next four years, by 2028.
- Producers, who will be granted **fast-track environmental permitting**, will also be eligible for a full rebate on transmission charges associated with using the intrastate grid, as well as full exemption from electricity tax (for ten years) and stamp duty.
 - Fast Track Permitting incorporates a set of **sound environmental policies and procedures** that promote **smart growth and economic development** across the Commonwealth.
- The State government is also proposing to **lease land for a single rupee per acre per year to state-owned enterprises** setting up green hydrogen projects in the state.
 - **Private renewable Hydrogen investors** will be eligible for a **land lease rate of 15,000 rupees (USD 181) per acre per year**.

Hydrogen

- Hydrogen is one of the most abundant elements on earth for a **cleaner alternative fuel option**.
 - **Type of hydrogen** depend up on the process of its formation:
 - **Green hydrogen** is produced by **electrolysis of water using renewable energy (like Solar, Wind)** and has a **lower carbon footprint**.
 - Electricity splits water into hydrogen and oxygen.
 - **By Products:** Water, Water Vapor.
 - **Brown hydrogen** is produced **using coal** where the emissions are released to the air.
 - **Grey hydrogen** is produced from **natural gas** where the associated emissions are released to the air.
 - **Blue hydrogen** is produced from natural gas, where the **emissions are captured** using carbon capture and storage.
- **Uses:**
 - Hydrogen is an energy carrier, not an energy source and can **deliver or store a tremendous amount of energy**.
 - It can be used in **fuel cells** to generate electricity, or power and heat.

- Today, hydrogen is most commonly used in petroleum refining and fertilizer production, while transportation and utilities are emerging markets.
- Hydrogen and fuel cells can provide energy for use in diverse applications, including distributed or combined-heat-and-power; backup power; systems for storing and enabling renewable energy; portable power etc.
- Due to their high efficiency and **zero-or near zero-emissions operation**, hydrogen and fuel cells have the potential to **reduce greenhouse gas emission** in many applications.

NATIONAL GREEN HYDROGEN MISSION



NODAL MINISTRY

- ▶ Ministry of New and Renewable Energy

COMPONENTS OF NGHM

- ▶ Strategic Interventions for Green Hydrogen Transition Programme (SIGHT)
- ▶ Strategic Hydrogen Innovation Partnership (SHIP) (PPP for R&D)

GH₂ is not commercially viable at present; current cost in India is around ₹350-400/kg. The National Hydrogen Energy Mission aims to bring it down under ₹100/kg.

OBJECTIVE

- ▶ Decarbonise energy/industrial/mobility sector
- ▶ Develop indigenous manufacturing capacities
- ▶ Create export opportunities for GH₂ and its derivative

Expected Outcomes by 2030

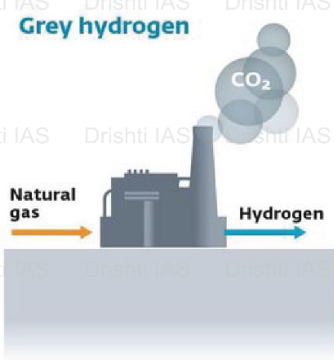
- ◆ Atleast 5MMT GH₂ annual production
- ◆ Rs 1 lakh crore fossil fuel import savings
- ◆ 6 lakh jobs
- ◆ 50MMT CO₂ annual emissions averted
- ◆ ₹ 8 lakh crore investment

HYDROGEN AND GREEN HYDROGEN

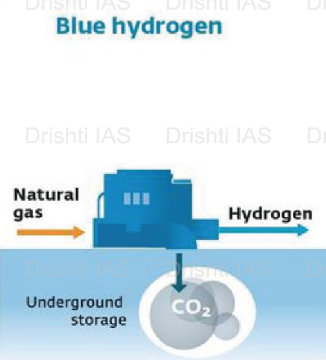
Hydrogen is the most common element in nature but exists only in combination with other elements. It has to be extracted from naturally occurring compounds (like water).

Green Hydrogen (GH₂) is made by splitting water through an electrical process called electrolysis, using an electrolyser powered by renewable energy (RE).

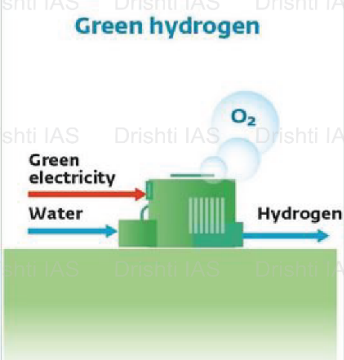
Grey hydrogen



Blue hydrogen



Green hydrogen



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