National Green Hydrogen Mission

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Why is in news? Coal Ministry organizes Seminar on “Blue Hydrogen-Energy Security & Hydrogen Economy”

- “Considering abundance of coal availability in the country, it’s time to **act on the diversified use of coal to ensure energy security of the country** to support Government’s decarbonising mission”,stated, Secretary,Ministry of Coalwhile delivering the key note addresson “**Blue Hydrogen-Energy Security and Hydrogen Economy**” organised by the Ministry.
- The Secretary said that the session must deliberate on the technologies available for coal to hydrogen, cost competitiveness, global experience and the way forward strategy.
- He further mentioned that the recommendations of the committee constituted by the Ministry of Coal to identify actionable points for coal sector to **support Green Hydrogen Mission** should be deliberated and action plan finalised
- **Blue Hydrogen** - It is the hydrogen produced from hydrocarbons where the emissions generated from the process can be captured and stored. They are stored underground by industrial carbon capture storage (CSS). This is a better alternative compared to grey hydrogen.

Colour code	The source or the process used
Green hydrogen	Produced through water electrolysis process by employing re reason it is called green is that there is no CO2 emission durin Water electrolysis is a process which uses electricity to decom gas and oxygen.
Blue hydrogen	Sourced from fossil fuel, the CO2 is captured and store sequestration). Companies are also trying to utilise the captu capture, storage and utilisation (CCSU). Utilisation is not ess hydrogen. As no CO2 is emitted, so the blue hydrogen categorised as carbon neutral.
Gray hydrogen	Produced from fossil fuel and commonly uses steam me method. During this process, CO2 is produced and eve atmosphere.
Black/brown hydrogen	Produced from coal- the black and brown colours refer to the and lignite (brown) coal. The gasification of coal is a n hydrogen- it is a very polluting process, and CO2 and carbon m by-products and released to the atmosphere.
Turquoise hydrogen	Extracted by using the thermal splitting of methane via methan though at the experimental stage, remove the carbon in a solid
Purple hydrogen	Made using nuclear power and heat through combined che splitting of water.
Pink hydrogen	Generated through electrolysis of water by using electricity fro
Red hydrogen	Produced through the high-temperature catalytic splitting of w thermal as an energy source.
White hydrogen	Naturally occurring hydrogen.

National Green Hydrogen Mission:

- It is a program to **incentivise the commercial production of green hydrogen** and make India a net exporter of the fuel.
- **Hydrogen is a clean source of energy for the future**. It can be an **important pillar of energy security** of the country. While India has to continue in R&D efforts to bring down the cost of production as well as storage and transportation, it has to be ready for pilot scale production and use for various applications.
- India has set its sight on **becoming energy independent by 2047 and achieving Net Zero by 2070**. To achieve this target, increasing renewable energy use across all economic spheres is central to India's Energy Transition.
- Green Hydrogen is considered a promising alternative for enabling this transition. Hydrogen can be **utilized for long-duration storage of renewable energy, replacement of fossil fuels in industry, clean transportation, and potentially also for decentralized power generation, aviation, and marine transport** .
- The mission is under the **Ministry of New and Renewable Energy**.
- The National Green Hydrogen Mission was **approved by the Union Cabinet on 4 January 2022**, with the intended **objectives** of:
- Making India a leading producer and supplier of Green Hydrogen in the world
- Creation of export opportunities for Green Hydrogen and its derivatives
- Reduction in dependence on imported fossil fuels and feedstock
- Development of indigenous manufacturing capabilities
- Attracting investment and business opportunities for the industry
- Creating opportunities for employment and economic development
- Supporting R&D projects

Components of the Mission:

- SIGHT (Strategic Interventions for Green Hydrogen Transition Programme) under this, two financial incentive mechanisms have been created:
- Targeting domestic manufacturing of electrolysers
- Production of green hydrogen
- Strategic Hydrogen Innovation Partnership (SHIP): Under this Public-private partnership framework for R&D will be facilitated under the mission.
- Green Hydrogen Hubs: Regions capable of supporting large-scale production and/or utilization of hydrogen will be identified and developed as Green Hydrogen Hubs
- Policy Framework: An enabling policy framework will be developed to support the establishment of the green hydrogen ecosystem.
- Standards and regulations framework will be also developed
- A coordinated skill development programme will also be undertaken
- Support pilot projects in emerging end-use sectors and production pathways

Mission's outcome:

- The mission outcomes projected by 2030 are:
- 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 Rs. Eight lakh crore in total investments
- Creation of over Six lakh jobs
- Cumulative reduction in fossil fuel imports over Rs. One lakh crore
- Abatement of nearly 50 MMT of annual greenhouse gas emissions