

Green Hydrogen Superpower

Why in news?

Green hydrogen is a critical industrial fuel of the 21st century and India is well-positioned to show leadership.

What is green hydrogen?

- It is a type of hydrogen produced by splitting water through electrolysis, using electrolyser powered entirely by renewable power sources.
- **Advantages** - It could replace fossil fuels and decarbonize a range of sectors such as petroleum refining, fertiliser production, steel production, chemicals, transport, etc.
- **Disadvantages** - It is not commercially viable at present and is expensive to be manufactured.

	Terminology	Technology	Feedstock/ Electricity source	GHG footprint*
PRODUCTION VIA ELECTRICITY	Green Hydrogen		Wind Solar Hydro Geothermal Tidal	Minimal
	Purple/Pink Hydrogen	Electrolysis	Nuclear	
	Yellow Hydrogen		Mixed-origin grid energy	Medium
PRODUCTION VIA FOSSIL FUELS	Blue Hydrogen	Natural gas reforming + CCUS Gasification + CCUS	Natural gas coal	Low
	Turquoise Hydrogen	Pyrolysis	Natural gas	Solid carbon (by-product)
	Grey Hydrogen	Natural gas reforming		Medium
	Brown Hydrogen	Gasification	Brown coal (lignite)	High
	Black Hydrogen		Black coal	

*GHG footprint given as a general guide but it is accepted that each category can be higher in some cases.

All about [Green Hydrogen](#).

What is the National Green Hydrogen Mission?

- The National Green Hydrogen Mission was first announced by the Prime Minister in his Independence Day speech in 2021.
- **Objectives** - The mission is aimed at making India a global hub for the production of green hydrogen.
- The mission also aims to:
 1. Creation of export opportunities for green hydrogen.
 2. Decarbonisation of the energy sector.
 3. Development of indigenous manufacturing capacities.

All about [National Green Hydrogen Mission](#).

What are India's commitments?

- **Electricity** - India has committed to 50% electricity capacity from non-fossil sources by 2030.
- Most industrial greenhouse gas emissions in India come from steel, cement, fertilizers and petrochemicals.
- **Green hydrogen** - India is targeting at least 5 million tonnes of production of green hydrogen by 2030, which is larger than that of any single economy.

How can the targets be achieved?

- **Domestic demand** - If we are not a big player domestically, we cannot be a major player in the international market.
- **SIGHT** - The mission introduces a [Strategic Interventions for Green Hydrogen Transition \(SIGHT\)](#) fund for five years, with ₹13,000 crore as direct support to consume green hydrogen.
- This will encourage heavy industries to increase demand, offering economies of scale by which suppliers can reduce prices.
- **Government procurement** - A share of government procurement of steel could be nudged towards green steel, which could help India to later position itself as a green steel exporter.
- **Investments** - India can be an attractive destination for domestic and foreign investment.
- A *mission secretariat* can ensure project clearance is streamlined and reduce financial risks.
- **Electrolyser manufacturing** - The SIGHT fund offers ₹4,500 crore to support electrolyser manufacturing under the performance-linked incentive scheme.
- Not targeting value addition would result in electrolyser technologies and production again getting concentrated.
- China could end up controlling 38% of electrolyser capacity by 2030.
- **Bilateral partnerships** - India must cooperate with like-minded countries on trade, value chains, research and development, and standards.
- **Trade in local currency** - Using yen or euro for trade, could reduce the cost of capital and help us become export competitive.
- **Rules for green hydrogen economy** - India must coordinate with major economies to develop rules for a global green hydrogen economy.
- Attempts for rules and standards are being driven by private corporations rather than structured intergovernmental processes.

What is the way forward?

- **G20** - India's G20 presidency is an opportunity to craft rules for a global green hydrogen economy.
- These rules must address operational threats, industrial competitiveness and strategic threats.
- **Global network** - India should promote a global network on green hydrogen via

which companies could collaborate.

- **India's geography** - With abundant sunshine and significant wind energy resources, India is geographically blessed to become one of the lowest-cost producers of green hydrogen.
- India is well-positioned to show leadership, in our collective interest and that of the planet.

Reference

1. [The Hindu | How to become a green hydrogen superpower](#)

