

FAQs

Green Hydrogen

Q What is the context ?

A The ongoing tensions between Russia and Ukraine have led to the prices of crude oil shooting to \$130/barrel. Green hydrogen is an emerging option that will help reduce India's vulnerability to such price shocks.

Q What are the deficiencies in Renewable Energy Technologies ?

A **Intermittent nature of Renewable Energy:** Renewable Energy can only be generated intermittently.

- Battery technology cannot store electricity at a grid scale.

Financial viability: There are question marks on the financial viability of green power.

- In India, renewable electricity is a replacement for coal-based power, **the cheapest form of energy**.
- That's a big constraint on its viability.
- Moreover, the customers of this power – the state distribution companies – are collectively insolvent.
- A business cannot prosper if its primary customers are not financially viable.

Batteries are not suitable for heavy trucks: While electric cars and two-wheelers get a lot of visibility, much of India's oil is burnt in heavy trucks.

- Lithium batteries are not viable for trucks.

Critical minerals: Electric vehicles require large quantities of lithium and cobalt that India lacks.

- These minerals also have very concentrated supply chains that are vulnerable to disruptions.
- Large-scale investments in electric vehicles may create unsustainable dependencies for the country.

Q Is green hydrogen a solution?

A

- Intermittent hydrogen in the energy mix can help circumvent some of these problems.
- Hydrogen is an important industrial gas and is used on a large scale in petroleum refining, steel, and fertiliser production.

FAQs

- As of now, the hydrogen used in these industries is **grey hydrogen**, produced from natural gas.
- Green hydrogen produced using renewable energy can be blended with grey hydrogen.
- This will allow the creation of a substantial **green hydrogen production capacity**, without the risk that it may become a stranded asset.
- Creating this hydrogen capacity will provide experience in handling the gas at a large scale and the challenges involved.
- **Blending with CNG:** To widen the use of green hydrogen, it can be blended with compressed natural gas (CNG), widely used as a fuel for vehicles in Delhi, Mumbai and some other cities.
- This will partly offset the need for imported natural gas and also help flag off the challenges of creating and distributing hydrogen at a national level.
- By bringing down the price of green hydrogen sufficiently, India can help unlock some stranded assets.
- The country has close to 25,000 megawatts of gas-fired power generation capacity that operates at a very low-capacity utilisation level. The high price of natural gas reduces the viability of such electricity.
- These plants could use hydrogen blended with natural gas. Hydrogen should, however, be used to generate electricity after it has served its utility in other avenue.

Q What can be the Way forward ?

A

- To catalyse a hydrogen economy, India needs some specialist players to execute projects as well as finance them.
- **Participation of private players:** Apart from government-backed players, the hydrogen economy will need private sector participation.
- India's start-up sector, with over 75 unicorns, is perhaps the most vibrant part of the country's economy currently.
- This ecosystem has been enabled by a mix of factors, including the presence of entrepreneurs with ideas and investors who are willing to back up these ideas
- **Creation of refueling network:** One challenge of using new transport fuels, whether CNG or electric vehicles, is the creation of large-scale refuelling networks.
- Bringing hydrogen vehicles on the road too soon will require the creation of yet another set of infrastructure.
- Building fleets of hydrogen-fueled vehicles for gated infrastructure can be a good starting point.

FAQs

- Airports, ports and warehouses, for instance, use a large number of vehicles such as forklifts, cranes, trucks, tractors and passenger vehicles.
- The government's Green Hydrogen Policy sends the right signals about its intent. It now needs to ensure that investment can freely come into this space.

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