

# HYDROGEN USAGE CAN BE A GAME CHANGER FOR INDIA

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## What are the different shades of hydrogen?

Green hydrogen gas is produced by splitting water into hydrogen and oxygen using an electrolyzer, that may be powered by electricity generated from [renewable energy sources](#) such as wind and solar, or 'green' hydrogen. While hydrogen produced from natural gas is referred to as 'grey' hydrogen, the emission-free fuel produced from coal or petroleum coke is 'brown' hydrogen. Hydrogen produced from carbon capture and storage is known as 'blue' hydrogen, while the one from biomass and plastics is known as 'white' hydrogen. The clean fuel can be a game changer for India, which imports 85% of its oil and 53% of gas demand.

## Has green hydrogen gained traction here?

There is growing interest in the space, as India is running the largest renewable energy project, with record low solar and wind power tariffs. Apart from state-owned firms, such as NTPC Ltd and Indian Oil Corp. Ltd, private companies Greenko, Adani Group and Acme Solar Holdings Ltd have been tying up with technology providers too. The interest comes amid India's deteriorating air quality, with Solar Energy Corp. of India looking to invite bids to build green hydrogen plants. Given that hydrogen can be used for both fuel cell and internal combustion engines, it is also being leveraged for mobility applications.

## How have other countries reacted to green hydrogen?

Experts say green hydrogen is at the same stage today as solar power a decade ago. In a post-covid world, it will form the thrust of a green recovery plan by Canada, China, Australia, Germany, Japan, South Korea, Spain and US. A case in point is France's €7-billion plan to promote hydrogen use. The fuel has gained acceptance with 17 nations announcing hydrogen pathways.

## What about the super high production cost?

Apart from high capital cost for electrolyzer manufacturing, the availability of rare materials, besides water and land availability are also areas of concern. While electrolyzer prices are over \$800 per kilowatt, they are likely to fall below \$200 per kW. As per Reji Kumar Pillai, president, India Smart Grid Forum, some people are promising electrolyzer at \$550 per kW, which could bring down price of green hydrogen near \$2/kg from \$7-8/kg. A further drop may make green hydrogen competitive vis-à-vis fossil fuels by 2030.

## Is hydrogen a strategic imperative for India?

Hydrogen finds special resonance in India, given the uncertainty in global energy markets. A case in point being the spike in [crude oil prices](#) impacting India, with fuel retailing at record highs. India spent \$101.4 billion on crude imports in FY20 and \$111.9 billion in FY19. Tata Motors, Kerala government, IOC and NTPC have plans for hydrogen fuel cell buses. The Railways plans to run a hydrogen-led suburban train too. With India's attempt to secure climate leadership, it can leverage its growing clean energy capacity for a green hydrogen push.

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