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India Green Hydrogen Market Assessment, By Technology [Alkaline Electrolyzer, Polymer Electrolyte Membrane (PEM) Electrolyzer, Proton Exchange Membrane Electrolyzer, Solid Oxide Electrolyzer], By Production Source [Solar, Wind], By Transportation Channel [Pipeline, Waterways, Roadways], By End-User Type [Domestic; Industrial-Energy and Power, Steel, Refineries, Chemicals, Transportation, Manufacturing, Others], By Region, Opportunities, and Forecast, FY2018-FY2032F

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Abstracts

Hydrogen is an important industrial fuel with a wide range of uses, including the manufacture of ammonia (majorly used for fertiliser production), steel, refineries, and power. The term ‘Green Hydrogen’ refers to hydrogen gas produced using renewable energy sources such as wind or solar power. The process does not emit any greenhouse gases and has the potential to replace fossil fuels. According to an Indian government source, the Hydrogen demand in India is expected to increase from six million tonnes in 2020 to 30 million tonnes by 2050, growing at a CAGR of 5.51% in volume terms. The share for Green Hydrogen in India will be in double digits in volume terms of the total hydrogen production in FY2030. The India Green Hydrogen Market will be valued at USD 8 billion in FY2030 and is projected to increase to USD 340 billion by 2050, growing at a CAGR of 20.61%.

Rise in awareness about global warming and carbon emissions have propelled the growth of India green hydrogen market. After China and the United States, India is the

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third largest carbon dioxide producer, due to which the need for the adoption of green hydrogen has increased over time. Additionally, the market provides huge potential for development and investment due to the increase in chemical demand, technological advancements, and government support. However, factors such as high cost of production, conversion, storage and transportation of green hydrogen restrains the market expansion.

Alkaline Electrolyser Dominates

According to the Ministry of New and Renewable Energy, alkaline electrolyser is produced by several manufacturers in India and dominates in term of market share by technology in 2022. More advanced electrolyser technologies including solid oxide and anion exchange membranes are also on the verge of commercialization. In 2021, Bhabha Atomic Research Center (BARC) and Bharat Petroleum Corporation Limited (BPCL) had worked together to scale up the alkaline electrolyser technology to boost up the production of green hydrogen.

Government Initiatives Provides Lucrative Business Opportunity

The growth of the green hydrogen market is influenced by the initiatives taken by the Government of India with an aim to adopt green hydrogen, particularly to decarbonize industries including ammonia, refineries, iron and steel, methanol and heavy-duty transportation. For instance, in 2021, the Indian government approved an initial investment of Rs. 197.4 billion for the National Green Hydrogen Mission. By 2030, India will create a capacity for producing green hydrogen of five million tonnes annually, along with an additional 125 GW of renewable energy capacity. Over the years, India has strengthened its expertise in producing renewable energy at lower costs. As a result, India is one of the world's most competitive producer of green hydrogen.

Mega-Scale Projects Transforming the Market Landscape

The Indian green hydrogen sector is witnessing a surge in large-scale infrastructure projects. These projects aim to integrate advanced technology and renewable energy resources, making green hydrogen more accessible and cost competitive. Companies are partnering with state governments to develop green hydrogen hubs, tapping into India’s solar and wind energy potential. This synergy is accelerating the commercialization of green hydrogen and driving down production costs.

For instance, in January 2025, Prime Minister Modi inaugurated NTPC Green Energy

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Limited’s USD 21 billion green hydrogen hub in Andhra Pradesh. This hub is expected to support industries such as steel, fertilizers, and chemicals, showcasing India’s commitment to sustainable industrial transformation.

Impact of COVID-19 on Green Hydrogen Market

Due to the sudden outbreak of the COVID-19 pandemic, the renewable energy industry witnessed production losses including the green hydrogen market too. Halt or disruption in transportation, shortage of raw materials, slowdown of on-site work and decreased demand for chemicals have negatively impacted the India green hydrogen market. The lockdown and strict social distancing norms in 2020 led to the disruption in the chemical and renewable energy industry impacting manufacturing and supply chain operations. However, post COVID-19 recovery in 2021, the Indian government had chosen several initiatives to enhance global partnerships, supplier diversity, innovative inventions to minimize the need for certain resources that strengthened the declining conditions for the India green hydrogen market. With the removal of mobility restrictions in India, the market is witnessing growth again.

Impact of Russia Ukraine War on Green Hydrogen Market

The price of the global crude oil had risen to as high as USD 140 per barrel, the highest level seen after fourteen years because of the continued tensions between Russia and Ukraine. India's susceptibility to geopolitical sanctions is shown by the increase in the cost of oil, natural gas and fertilisers. The Union Transport Minister of India reaffirmed that green hydrogen is a new alternative that would lessen India's vulnerability to such price fluctuations.

Key Players Landscape and Outlook

The market for green hydrogen is consolidated and there are limited number of players operating in this business. Reliance Industries Limited (RIL) is a leading manufacturer and holds the dominant share. The market consists of other major players such as Oil & Natural Gas Corporation (ONGC), Adani New Industries Limited (ANIL), GAIL India Limited etc. Companies are making significant investments in R&D projects to introduce new products and increase production capabilities. For instance, Reliance Industries Limited (RIL) has announced its goals to achieve net zero carbon emissions by the year 2035. In order to construct a 5000-acre green energy complex in Jamnagar, Gujarat, RIL aims to invest INR 600 billion. Similarly, Oil India Limited (OIL) has taken the first important step toward a Green Hydrogen Economy in India with the recent

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commissioning of India's first 99.999% pure Green Hydrogen pilot plant. The plant was set up at the Jorhat Pump Station in Assam in April 2022.

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