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India Hydrogen Market Assessment, By Type [Green Hydrogen, Blue Hydrogen, Brown Hydrogen, Pink Hydrogen, Others], By Technology [Steam Methane Reforming, Partial Oxidation of Oil, Coal Gasification, Electrolysis Of Water, Methanol Reforming, Ammonia Cracking], By Delivery Mode [Pipeline and Tanks and Cylinders], By Application [Chemical, Energy, Petroleum Refining, Metal Processing, Glass Industry, Edible Fats and Oil, Others], By Region, Opportunities and Forecast, FY2018-FY2032F

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Abstracts

Hydrogen plays a crucial role in national energy strategy, with increasing potential for usage in a wide range of applications across almost all sectors including transportation, industrial, commercial, residential and portable. The India Hydrogen Market is projected to reach 12.46 million tons by FY2032 from 6.94 million tons in FY2024, growing at a CAGR of 7.58% during the forecast period FY2025-FY2032.

The India hydrogen market is expected to be driven by rising awareness about greenhouse gas emissions, strengthening of government regulations for desulfurization and encouraging the production and consumption of hydrogen. Since hydrogen is a powerful energy transporter, its further expansion into energy and automotive is expected to benefit greatly.

Hydrogen is an essential industrial gas that is employed in many different applications. The market growth is also driven by the rising demand for fuel-cell electric cars (FECV)

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and rockets in the aerospace sector. Additionally, the use of hydrogen fuel cells in bicycles, buses, trains, boats, ships, commercial aircraft, marine vessels and specialty vehicles like forklifts, is promoting market growth in the automotive industry.

India anticipates fast growth of the hydrogen economy by assuring the cost-effective adoption of low-carbon hydrogen technologies throughout many industries, especially in the power sector. The central government approved “National Green Hydrogen Mission” on 4th Jan 2023, in which government aims to invest around US$ 2 Billion (Rs. 19,744 Crore) in developing additional capacity of 5 million tons of Hydrogen by the end of 2030. It will help in achieving 500 GW capacity from renewable energy till 2030 target which central government has set. On the other hand, it is anticipated that the market would be constrained by the high capital costs of hydrogen energy storage.

Increasing Adoption in Various Sectors Acting as a Driver for India Hydrogen Market

The increasing adoption of hydrogen across various sectors significantly drives the growth of India's hydrogen market. Hydrogen's versatility makes it a compelling option for industries such as transportation, manufacturing, and chemicals due to its clean and efficient energy properties. Hydrogen-powered buses and trucks are starting to roll out, while industrial applications utilize hydrogen for processes like steel production and ammonia synthesis. Companies like Indian Oil Corporation and NTPC are investing in hydrogen fuel cells and production facilities to meet the escalating demand. This cross-sector integration of hydrogen as a clean energy solution supports India's transition to a sustainable energy future and underscores its pivotal role in the country's energy landscape.

For instance, in December 2024, Greenzo Energy India Ltd. partnered with France’s EODev to introduce Toyota hydrogen fuel cell-powered generators to India and Nepal. This collaboration aligns with India’s ‘Make in India’ initiative, supporting local assembly and generating green technology jobs. Greenzo Energy will distribute EODev’s emission-free generators and provide maintenance services, targeting sectors like agriculture, telecom, and transportation. By replacing conventional diesel generators with these scalable, zero-emission alternatives, the partnership underscores India's commitment to reducing fossil fuel dependency and supports the National Green Hydrogen Mission. This move highlights the increasing adoption of hydrogen in various sectors, driving the growth of the Indian hydrogen market.

Green Hydrogen from Sea Water is the Future of Energy and Mobility

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India's energy transformation is projected to be greatly aided by green hydrogen and this path is taken by the National Green Hydrogen Mission. In addition, it is anticipated that the mission will accelerate the deployment of the green hydrogen ecosystem and open new avenues for innovation and financial investment throughout its value chain, resulting in financial gains, job creation and economic expansion. Furthermore, to decarbonize heavy sectors including steel mills, fertilizer factories and oil refineries, green hydrogen is anticipated to play a significant role.

Pollution-free production favors its development

The India hydrogen market has grown due to the usage of hydrogen in power generation and stringent environmental restrictions in favor of greener forms of energy. Using hydrogen as an energy carrier is beneficial for the environment since water and heat are the sole by-products of hydrogen's reaction with oxygen. Therefore, usage of hydrogen fuel cells results in no emissions of greenhouse gases or other pollutants.

Green Hydrogen to substantiate demand from industrial to transportation and power

Green Hydrogen is a relatively new product which is being pushed in India due to its pollution-efficient production process which almost eradicate pollution while manufacturing making it green and safe. It is expected to generate significant demand from transportation especially passenger cars and buses since hydrogen is more cost effective compared to petrol & diesel and refilling time is way lesser than any other fuel.

Power generation is the next big thing through hydrogen and key companies including NTPC, Reliance Industries, Adani Group, Acme Solar, ReNew Power and JSW Energy already confirmed their plans to establish green hydrogen plants in coming years to support government plans of expansion in the sector.

Impact of COVID-19 on India Hydrogen Market

Factors including supply chain interruptions, delays in the execution of renewable energy projects and reduced benefits from government subsidies have reduced investments and developments of renewable technology during Covid period. However, the Indian government has initiated various programmes to improve international collaborations, supplier diversity and circular economy strategies which supported the deteriorating conditions for the hydrogen market in India post Covid. Moving forward, limitations on mobility have been lifted and the market is now expanding once again.

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Impact of Russia-Ukraine War on India Hydrogen Market

Impact of the Russia-Ukraine conflict on the India hydrogen market is likely to be indirect, as India is not heavily dependent on imports for its hydrogen needs at present. Moreover, India is actively exploring domestic sources of hydrogen, such as green hydrogen produced from renewable sources, which could help mitigate any potential supply chain disruptions in the future.

Additionally, it could potentially affect India's access to key inputs for hydrogen production. Russia is one of the world's largest producers of natural gas, which is a key feedstock for hydrogen production, hence anticipation of higher natural gas prices which could potentially affect the cost of hydrogen production in India. However, as per the Niti Aayog, over 80% of additional capacity will be green hydrogen, which is not dependent on oil or gas, hence the war will have a minor effect on hydrogen prices.

Key Players Landscape and Outlook

The India hydrogen market is consolidated and there are just a few major players in the industry. Most of the manufacturers have structured production and demand structures and every company wants to expand as soon as new demand arises.

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Contents

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6. MARKET MAPPING, FY2024

7. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE

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