Hydrogen Generation Market Report by Technology (Coal Gasification, Steam Methane Reforming, and Others), Application (Methanol Production, Ammonia Production, Petroleum Refinery, Transportation, Power Generation, and Others), Systems Type (Merchant, Captive), and Region 2024-2032

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Report description:

The global hydrogen generation market size reached US$ 163.1 Billion in 2023. Looking forward, IMARC Group expects the market to reach US$ 270.0 Billion by 2032, exhibiting a CAGR of 5.6% during 2024-2032. The rising environmental concerns, increasing need for sustainable energy sources, and escalating demand for renewable energy across the globe represent some of the key factors driving the market.

Hydrogen is a clean, renewable, and abundant energy source that is produced from a variety of sources, including water electrolysis, biomass, and natural gas. It can be used to directly power vehicles, generate electricity, and store energy for later use. The demand for clean energy sources is driven by the need to reduce greenhouse gas emissions and the dependence on fossil fuels. Additionally, the rising cost of traditional fuels, such as oil and natural gas, is accelerating the demand for hydrogen across industry verticals. This is further augmented by the growing cost of electricity, which has rendered hydrogen-based energy sources more attractive. Apart from this, numerous initiatives undertaken by the governments of several countries to encourage the masses to adopt clean energy sources are creating a positive market outlook.

Competitive analysis such as market structure, market share by key players, player positioning, top winning strategies, competitive dashboard, and company evaluation quadrant has been covered in the report. Also, detailed profiles of all major companies have been provided. The market structure is moderately fragmented due to the presence of numerous players at the regional and international levels in the industry due to favorable government initiatives and the extensive application of hydrogen as a coolant in power plant generators. The volume of new entrants is moderate in the hydrogen generation industry due to the

high capital investment, high entry and exit barrier, and low to moderate product differentiation.

What is Hydrogen Generation?
Hydrogen generation is the process of producing hydrogen gas in order to use as a fuel or energy source. It is done in several ways, including electrolysis of water, reforming of natural gas, and biomass gasification. Through electrolysis, an electrical current is applied to water in order to split it into its component elements, hydrogen, and oxygen. The hydrogen gas produced is used as a fuel source or stored in fuel cells. The reforming of natural gas is a process that breaks down the molecules of the gas in order to produce hydrogen and other gases. Lastly, biomass gasification is the process of breaking down organic matter to produce hydrogen and other gases. It is an efficient energy source, as it is clean burning and does not emit any carbon dioxide when burned. It is also lighter than fossil fuels, making it easier to transport.
COVID-19 Impact:
The global COVID-19 pandemic has had a severe impact on the production and demand for hydrogen generation. The chemical industry has suffered greatly, with oil and gas exploration activities taking a major hit during the pandemic. With the growing need for medical supplies during the outbreak, the existing reserves of hydrogen have been utilized to meet these requirements. The power industry has been at the forefront of the demand for hydrogen, accounting for much of the market demand. Government-imposed regulations, such as lockdowns, restricted international travel, and social distancing have had a detrimental effect on the financial state of various countries. However, governments have been keen to use the reduced emissions caused by the shutdown of the industry and transport sector to push the demand for clean fuel alternatives, including hydrogen, in the post-COVID era, which is positively influencing the market.
Hydrogen Generation Market Trends:
At present, governing authorities of numerous nations are taking significant initiatives to reduce carbon emissions in the automotive industry, resulting in increased sales of electric vehicles. Along with this, hydrogen is widely utilized as a coolant in power plant generators, which is acting as another growth-inducing factor. In addition, several projects are aiming to reduce the costs and environmental impacts of hydrogen production technologies. Nuclear energy-based hydrogen generation is considered an economical solution for minimizing the carbon footprint and addressing global climate change, which is further driving demand for hydrogen generation in glass purification, fertilizer production, and semiconductor manufacturing across the globe. Apart from this, the widespread adoption of hydrogen in the production of new materials, such as hydrogenated polymers and hydrogenated metals, offering improved performance and cost savings compared to traditional materials, is providing thrust to the market. Moreover, the development and construction of cost-effective and energy-saving hydrogen stations are creating a positive market outlook. Furthermore, continual technological advancements and cost reductions are making hydrogen generation more affordable and accessible. This is driving investments in the sector, and thus helping to create new markets for hydrogen-based products and services.
Key Market Segmentation:
IMARC Group provides an analysis of the key trends in each sub-segment of the global hydrogen generation market report, along with forecasts at the global, regional and country level from 2024-2032. Our report has categorized the market based on technology, application and systems type.
Technology Insights:

- Coal Gasification
- Steam Methane Reforming
- Others

The report has provided a detailed breakup and analysis of the hydrogen generation market based on the technology. This includes coal gasification, steam methane reforming, and others. According to the report, steam methane reforming represented the largest segment due to the growing global concerns about the environment and climate change. Therefore, the demand for clean energy sources, such as natural gas is increasing. Steam methane reforming is an effective and efficient way to convert natural gas into a clean energy source, influencing the market share.

Application Insights:
-Methanol Production
-Ammonia Production
-Petroleum Refinery
-Transportation
-Power Generation
-Others

A detailed breakup and analysis of the hydrogen generation market based on the application has also been provided in the report. This includes methanol production, ammonia production, petroleum refinery, transportation, power generation, and others. According to the report, ammonia production accounted for the largest market share as ammonia is the primary feedstock for urea and other nitrogen-based fertilizers. Additionally, the rising population and subsequent growth in food production are leading to an increasing demand for ammonia for fertilizer production. Furthermore, the escalating demand for ammonia for industrial purposes, such as for refrigerants, solvents, and production of plastics, and for use in the chemical industry, is driving the demand for ammonia production.
Systems Type Insights:
-Merchant
-Captive

The report has provided a detailed breakup and analysis of the hydrogen generation market based on the systems type. This includes merchant and captive. According to the report, merchant reforming represented the largest segment due to the increasing demand for clean energy sources and the government regulations in place to encourage the production and use of hydrogen as an alternative fuel. Additionally, the growing adoption of hydrogen fuel cell vehicles is also propelling the demand, as well as the potential for new applications in areas such as maritime, industrial, and residential sectors.
Regional Insights:

-North America
oUnited States
oCanada
-Asia-Pacific
oChina
oJapan
oIndia
oSouth Korea
oAustralia
oIndonesia
oOthers
-Europe
oGermany
oFrance
oUnited Kingdom
oItaly
oSpain
oRussia
oOthers
-Latin America
oBrazil

o Mexico
o Others
- Middle East and Africa

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (United States and Canada), Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia and others), Europe (Germany, France, United Kingdom, Italy, Spain, Russia, and others), Latin America (Brazil, Mexico and others) and Middle East and Africa. According to the report, Asia Pacific was the largest market for hydrogen generation. Some of the factors driving the Asia Pacific hydrogen generation market included the growing electricity demand and rapid urbanization and industrialization. Additionally, the rising investments in clean energy-based power plants and the increasing demand for clean and efficient energy are augmenting the demand for the market segment.
Competitive Landscape:
The report has also provided a comprehensive analysis of the competitive landscape in the global hydrogen generation market. Some of the companies covered in the report include:
- Air Liquide International S.A.
- Air Products Inc.
- CLAIND srl
- INOX Air Products Ltd.
- Linde Plc
- Mahler AGS GmbH
- McPhy Energy S.A.
- Messer Group GmbH
- NEL Hydrogen
- Taiyo Nippon Sanso Corporation
- Weldstar Inc.
- Xebec Adsorption Inc.

Key Questions Answered in This Report
1. What was the size of the global hydrogen generation market in 2023?
2. What is the expected growth rate of the global hydrogen generation market during 2024-2032?
3. What are the key factors driving the global hydrogen generation market?
4. What has been the impact of COVID-19 on the global hydrogen generation market?
5. What is the breakup of the global hydrogen generation market based on the technology?
6. What is the breakup of the global hydrogen generation market based on the application?
7. What is the breakup of the global hydrogen generation market based on the system type?
8. What are the key regions in the global hydrogen generation market?
9. Who are the key players/companies in the global hydrogen generation market?

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