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Hydrogen Generation Market – Global Industry Size, Share, Trends, Opportunity, and Forecast Segmented by Source (Blue hydrogen, Green hydrogen, and Grey Hydrogen), Technology (Steam Methane Reforming (SMR), Coal Gasification, and Other), Application (Oil Refining, Chemical Processing, Iron & Steel Production, and Other), By Region & Competition, 2020-2030F

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Abstracts

The Global Hydrogen Generation Market, valued at USD 173.65 Billion in 2024, is projected to grow at a CAGR of 5.26% to reach USD 236.19 Billion by 2030. Hydrogen generation involves producing hydrogen gas from feedstocks such as natural gas, coal, biomass, and water using technologies including steam methane reforming, partial oxidation, and electrolysis. Market growth is strongly driven by global decarbonization initiatives, rising demand for low-emission industrial feedstocks, and extensive government support through incentives and national hydrogen strategies. According to the Hydrogen Council, clean hydrogen projects reaching final investment decisions increased from 102 in 2020 to 434 in 2024, with committed investment rising from USD 10 billion to USD 75 billion during this period. However, the sector faces a major challenge in the form of high capital expenditure for production facilities, storage systems, and distribution networks, as well as uncertainties in evolving regulatory frameworks, both of which can slow deployment and broader adoption.

Key Market Drivers

The global hydrogen generation market is primarily propelled by escalating

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decarbonization efforts and supportive government policies. Countries and industries are accelerating the shift toward low-carbon energy sources to meet climate targets, driving demand for clean hydrogen across refining, chemicals, steelmaking, and heavy-industry applications. The IEA's Global Hydrogen Review 2024 reported global hydrogen demand reached 97 million tonnes in 2023, up 2.5% from 2022, reflecting strong momentum toward cleaner industrial operations. Complementing this, government-driven incentives and structured hydrogen strategies are reducing investment risks and supporting early-stage market development. One example is the European Commission's April 30, 2024 announcement of the European Hydrogen Bank pilot auction, which awarded €720 million to seven projects expected to produce 1.58 million tonnes of renewable hydrogen over a decade. Such initiatives strengthen investor confidence and accelerate infrastructure build-out, supported by rising electrolyzer deployment, which reached 1.4 GW of installed capacity in 2023 and is projected to grow to 5 GW by the end of 2024.

Key Market Challenges

A major challenge hindering the expansion of the Global Hydrogen Generation Market is the substantial capital expenditure required for hydrogen production, storage, and distribution infrastructure. Large-scale facilities and pipeline networks involve high upfront costs, making financial closure difficult and slowing project execution. These challenges limit the pace at which planned hydrogen projects become operational. According to the International Energy Agency, in 2024 only USD 39 billion of the USD 570 billion in announced hydrogen-related investments had secured financing beyond the initial proposal stage. This gap illustrates the difficulty developers face in accessing the vast funding required to build a comprehensive hydrogen economy. As a result, supply growth remains constrained despite rising demand, delaying large-scale commercialization and the broader adoption of hydrogen as a clean fuel and industrial feedstock.

Key Market Trends

Technological advancements in electrolyzer systems are a defining trend in the hydrogen generation market, with ongoing improvements aimed at enhancing efficiency, lowering costs, and increasing operational durability. Rapid innovation is making green hydrogen more competitive, supporting its scalability. Intesa Sanpaolo Innovation Center's 2023 Industry Trends Report projects annual electrolyzer capacity additions to surge from 4.9 gigawatts in 2023 to over 300 gigawatts by 2030, highlighting the central role of technology in expanding clean hydrogen production. Another key trend is the

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diversification of hydrogen's industrial applications. Beyond refining and ammonia production, hydrogen is increasingly being explored for steelmaking, heavy transportation, and aviation. A 2024 study published in the International Journal of Hydrogen Energy projected that green hydrogen-based steel could account for 2% of current total steel production by 2030. This widening application base reinforces hydrogen's long-term potential as a critical enabler of global decarbonization.

Key Market Players

Air Liquide S.A.

Messer SE & Co. KGaA

ITM Power plc

Engie SA

Cummins Inc.

Air Products and Chemicals, Inc.

FuelCell Energy, Inc.

Nippon Sanso Holdings Corporation

McPhy Energy SA

Linde Plc

Report Scope:

In this report, the Global Hydrogen Generation Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Hydrogen Generation Market, By Source:

Blue hydrogen

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- Green hydrogen
- Grey Hydrogen

Hydrogen Generation Market, By Technology:

- Steam Methane Reforming (SMR)
- Coal Gasification
- Other

Hydrogen Generation Market, By Application:

- Oil Refining
- Chemical Processing
- Iron & Steel Production
- Other

Hydrogen Generation Market, By Region:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - France
  - United Kingdom

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Italy

Germany

Spain

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Asia Pacific

China

India

Japan

Australia

South Korea

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Hydrogen Generation Market.

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Available Customizations:

Global Hydrogen Generation Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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