Hydrogen Generation Market by Technology (SMR, ATR, POX, Coal Gasification, Electrolysis), Application (Refinery, Ammonia, Methanol, Transportation, Power Generation), Source (Blue, Green, Gray), Generation & Delivery Mode, Region - Global Forecast to 2030

Market Report | 2025-08-04 | 339 pages | MarketsandMarkets

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Report description:

The hydrogen generation market is estimated to reach USD 226.37 billion by 2030 from an estimated value of USD 157.81 billion in 2025, at a CAGR of 7.5% during the forecast period. The hydrogen generation market is driven by increasing global efforts to decarbonize energy systems, the rising demand for clean fuel alternatives, and the expanding adoption of hydrogen across industrial, transportation, and power generation sectors. Supportive government policies, substantial investments in renewable energy, and advancements in electrolysis technology accelerate the market expansion. Additionally, the development of hydrogen infrastructure and growing focus on energy security and emission reduction further strengthen the market growth trajectory across major global regions.

https://www.marketsandmarkets.com/Images/hydrogen-generation-market-new.webp

"Green hydrogen segment is projected to record the highest CAGR between 2025 and 2030."
The green hydrogen segment is expected to record the highest CAGR in the hydrogen generation market during the forecast period, driven by the global transition toward carbon neutrality and the urgent need to decarbonize hard-to-abate sectors. Supportive policy frameworks accelerate project development and commercialization, including tax incentives, subsidies, and national hydrogen strategies worldwide. Additionally, the growing demand for zero-emission fuels in applications such as fuel cell vehicles, power generation, and industrial feedstock positions green hydrogen as a key enabler of the global clean energy transition. Strategic partnerships, large-scale pilot projects, and ambitious decarbonization roadmaps continue to drive the green

hydrogen segment worldwide.
"Coal gasification segment accounted for the second-largest market share in 2024."
The coal gasification segment held the second-largest position in the hydrogen generation market in 2024, driven by its ability to produce hydrogen at scale using abundant domestic coal resources. In this process, coal is partially oxidized with air, oxygen, steam, or carbon dioxide to create a fuel gas. The resulting syngas, primarily composed of hydrogen, carbon monoxide, methane, carbon dioxide, and water vapor, is then utilized as an alternative to methane, piped natural gas, and other fuels for power generation and chemical feedstock production. Hydrogen derived from coal gasification serves critical roles in ammonia synthesis, chemical manufacturing, and supporting hydrogen economy initiatives. Key drivers for this segment include extensive coal reserves, established industrial infrastructure, and the strategic objective of reducing dependence on imported natural gas. Furthermore, technological advancements in gasification processes, including improved efficiency and integration with carbon capture and storage (CCS) systems, enhance the environmental performance of this technology.
"Asia Pacific is likely to be the largest region in the hydrogen generation market during the forecast period."
Asia Pacific is poised to be the largest region in the hydrogen generation market during the forecast period, driven by strong government commitments to decarbonization, energy security, and industrial transformation. National hydrogen strategies in countries such as China, Japan, South Korea, and India accelerate investments in large-scale hydrogen production, particularly in green and blue hydrogen projects. Expanding renewable energy capacity, supportive policy frameworks, and strategic public-private partnerships fuel infrastructure development across the region. Additionally, the rapid growth of hydrogen applications in refining, chemicals, and mobility underscores its leadership.
Breakdown of Primaries:
In-depth interviews have been conducted with various key industry participants, subject-matter experts, C-level executives of key market players, and industry consultants, among other experts, to obtain and verify critical qualitative and quantitative information and assess future market prospects. The distribution of primary interviews is as follows:
By Company Type: Tier 1 - 65%, Tier 2 - 24%, and Tier 3 - 11%
By Designation: C-Level Executives - 30%, Managers - 25%, and Others - 45%
By Region: North America - 27%, Europe - 20%, Asia Pacific - 33%, South America - 12%, Middle East - 4% Africa - 4%
Note: Others include product engineers, product specialists, and engineering leads.
The tiers of the companies are defined based on their total revenues as of 2023. Tier 1: > USD 1 billion, Tier 2: From USD 500 million to USD 1 billion, and Tier 3: < USD 500 million

The hydrogen generation market is dominated by a few major players with a wide regional presence. Leading players in hydrogen generation market are Linde plc (Ireland), Air Liquide (France), Saudi Arabian Oil Co. (Saudi Arabia), Air Products and Chemicals, Inc. (US), Shell plc (UK), ENGIE (France), Chevron Corporation (US), Orsted A/S (Denmark), Messer SE & Co. KGaA (Germany), Equinor ASA (Norway), Uniper SE (Germany), Exxon Mobil Corporation (US), and BP p.l.c. (UK).
Research Coverage:
The report defines, describes, and forecasts the hydrogen generation market by application, technology, source, and generation & delivery mode. It also offers a detailed qualitative and quantitative analysis of the market. The report provides a comprehensive review of the major market drivers, restraints, opportunities, and challenges. It also covers various key aspects of the market. These include an analysis of the competitive landscape, market dynamics, market estimates in terms of value, and future trends in the hydrogen generation market.
Key Benefits of Buying the Report
-The global push toward decarbonization drives the hydrogen generation market, the growing demand for flexible clean energy solutions, and the need to reduce greenhouse gas emissions across key industrial and transport sectors. While green hydrogen is gaining momentum as a long-term sustainable solution, gray hydrogen currently dominates the market due to its cost-effectiveness, mature production technology, and ability to supply large volumes to meet immediate industrial needs. Supportive government policies, national hydrogen roadmaps, and emission reduction mandates drive investments across the entire hydrogen value chain, including improvements in carbon capture technologies that enable blue hydrogen development. Advancements in production efficiency, integration with existing industrial infrastructure, and the expansion of hydrogen mobility

and energy storage applications further accelerate market growth.
-Product Development/ Innovation: The hydrogen generation market is centered on advancing efficiency, sustainability, and scalability through continuous innovation in production technologies and system designs. Companies invest in developing advanced electrolyzers with higher conversion efficiency and lower operational costs to accelerate green hydrogen adoption. Innovations in steam methane reforming (SMR) and coal gasification processes, including integration with carbon capture, utilization, and storage (CCUS) technologies, enhance the environmental performance of gray and blue hydrogen production. Modular and compact hydrogen generation units allow flexible deployment across industrial, mobility, and energy applications. Integration of digital technologies, such as IoT and advanced data analytics, enables real-time monitoring, predictive maintenance, and optimization of production processes. Material advancements focus on improving corrosion resistance, durability, and safety in hydrogen storage and handling systems. These technological developments are critical to strengthening the hydrogen supply infrastructure and supporting its broader role as a key enabler in the global clean energy transition.
-Market Development: In September 2023, Air Liquide invested USD 433 million to build its Normand'Hy electrolyzer with a capacity of 200 MW to decarbonize the Normandy industrial basin and mobility.
- Market Diversification: In July 2024, Air Products and Chemicals, Inc. entered a 15-year agreement with TotalEnergies to supply 70,000 tons of green hydrogen annually to TotalEnergies' refineries and biorefineries in Northern Europe starting in 2030. This supply will help TotalEnergies replace fossil-based hydrogen, enabling a reduction of approximately 700,000 tonnes of CO? emissions per year. The deal supports TotalEnergies' goal of cutting Scope 1 and 2 emissions by 40% by 2030 (vs. 2015 levels).
-Competitive Assessment: Assessment of rankings of some key players, including Linde plc (Ireland), Air Liquide (France), Saudi Arabian Oil Co. (Saudi Arabia), Air Products and Chemicals, Inc. (US), Shell plc (UK), and ENGIE (France).

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