Electrolyzer Market Report by Product (Alkaline Electrolyzer, PEM Electrolyzer, Solid Oxide Electrolyzer), Capacity (Less than 500 kW, 500 kW to 2 MW, Above 2 MW), Application (Power Generation, Transportation, Industry Energy, Industry Feedstock, Building Heat and Power, and Others), and Region 2025-2033

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Report description:

The global electrolyzer market size reached USD 544.8 Million in 2024. Looking forward, IMARC Group expects the market to reach USD 1,067.5 Million by 2033, exhibiting a growth rate (CAGR) of 7.14% during 2025-2033. The market growth is primarily driven by the increasing demand for green hydrogen and favorable government policies promoting renewable energy. Additionally, rapid technological innovations for improving efficiency and costs and rising investments in hydrogen infrastructure are also contributing to the market growth, further supporting global decarbonization goals and energy transition initiatives. At present, Europe holds the largest market share, driven by increasing initiatives in renewable energy adoption.

Electrolyzer Market Trends:
Increasing Demand for Green Hydrogen
The push toward sustainable energy has significantly boosted the demand for green hydrogen, produced using electrolyzers powered by renewable energy sources. This is one of the significant electrolyzer market trends. Green hydrogen is a clean energy carrier that can decarbonize various sectors, including transportation, industry, and power generation. This shift is driven by global efforts to reduce carbon emissions and combat climate change, making green hydrogen a pivotal component in achieving long-term environmental sustainability. For instance, in March 2023, Cummins Inc. launched Accelera by Cummins, a new brand within its New Power business unit, to advance zero-emissions solutions. Accelera aims to help industries transition to sustainable practices with its diverse portfolio, including battery electric and fuel cell electric solutions. The launch supports Cummins' Destination Zero strategy, which focuses on achieving zero emissions across its products. Accelera will also undertake major projects, including a 90MW electrolyzer system in Quebec and a fleet of 1,000 electric school buses in the US.

Significant Technological Advancements

The electrolyzer market revenue is steadily increasing primarily due to innovations in electrolyzer technology, which have enhanced efficiency, reduced operational costs, and improved durability. Advances such as higher electrolytic efficiency, better catalyst materials, and improved system integration have made electrolyzers more viable for large-scale hydrogen production. For instance, in March 2023, Toyota developed an electrolyzer using technology from its Mirai fuel cell vehicle, set to be implemented at DENSO Fukushima plant as a project subsidized by the New Energy and Industrial Technology Development Organization (NEDO). This electrolyzer, producing 8 kg of hydrogen per hour, will support local hydrogen consumption and reduce CO2 emissions. These technological improvements make electrolyzers more attractive for industrial applications and energy storage, supporting the broader adoption of hydrogen as a clean energy source and contributing to the electrolyzer market growth.

Government Incentives and Policies

Governments worldwide are implementing policies and providing financial incentives to promote the adoption of green hydrogen and electrolyzer technology. These include subsidies, tax credits, and research grants aimed at accelerating the development and deployment of hydrogen infrastructure. According to industry reports, India aims to become energy independent by 2047 and achieve Net Zero by 2070. The National Green Hydrogen Mission supports this goal by promoting renewable energy use and green hydrogen. Objectives include making India a leading producer of green hydrogen, reducing fossil fuel dependence, developing local manufacturing, attracting investment, creating jobs, and supporting R&D. By 2030, the mission aims for at least 5 MMT annual green hydrogen production, 125 GW of renewable energy capacity, over ?8 lakh crore in investments, and significant reductions in fossil fuel imports and greenhouse gas emissions. Such support is crucial for overcoming initial cost barriers, fostering innovation, and creating a favorable regulatory environment, thereby driving the growth of the electrolyzer market.

Electrolyzer Market Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the market, along with forecasts at the global, regional, and country levels for 2025-2033. Our report has categorized the market based on product, capacity, and application.

Breakup by Product:

- Alkaline Electrolyzer
- PEM Electrolyzer
- Solid Oxide Electrolyzer

Alkaline electrolyzer accounts for the majority of the market share

The report has provided a detailed breakup and analysis of the market based on the product. This includes alkaline, PEM, and solid oxide electrolyzers. According to the report, alkaline electrolyzer represented the largest segment.

Alkaline electrolyzers account for the majority of the electrolyzer market share due to their long-established technology, cost-effectiveness, and reliability. They have been used for decades, providing a proven track record of performance. Alkaline electrolyzers operate efficiently at lower temperatures and pressures, which reduces operational costs. Additionally, they use widely available and inexpensive materials, further enhancing their economic viability. Their durability and scalability make them suitable for large-scale hydrogen production, meeting the growing demand for green hydrogen. For instance, in July 2023, Nel Hydrogen Electrolyser AS, a subsidiary of Nel ASA, signed a EUR9 million contract to supply 20 MW of alkaline electrolyser equipment to Hyd'Occ for its project in Port-La-Nouvelle, France. The electrolyser will produce renewable hydrogen for local industry and transportation, positioning Port-La-Nouvelle as a key Mediterranean hydrogen hub. This, in turn, is driving the alkaline electrolyzer segment, thereby enhancing the electrolyzer market value.

Breakup by Capacity:

- Less than 500 kW
- 500 kW to 2 MW
- Above 2 MW

500 kW to 2 MW holds the largest share of the industry

The report has provided a detailed breakup and analysis of the market based on the capacity. This includes less than 500 kW, 500 kW to 2 MW, and above 2 MW. According to the report, 500 kW to 2 MW represented the largest segment.

The 500 kW to 2 MW segment dominates the electrolyzer market share due to its suitability for a wide range of applications,

balancing scale and flexibility. This capacity range is ideal for industrial applications, renewable energy integration, and transportation fuel production, providing an efficient solution for medium-scale hydrogen generation. It offers an optimal blend of cost-effectiveness and operational efficiency, making it attractive for various end-users. Additionally, the electrolyzer market report highlights significant technological advancements that have improved the efficiency and durability of electrolyzers within this range, further driving their adoption. The scalability and adaptability of 500 kW to 2 MW electrolyzers position them as a preferred choice in the evolving hydrogen economy.

Breakup by Application:

-Power Generation
-Transportation
-Industry Energy
-Industry Feedstock
-Building Heat and Power
-Others

Power generation represents the leading market segment

The electrolyzer research report has provided a detailed breakup and analysis of the market based on the application. This includes power generation, transportation, industry energy, industry feedstock, building heat and power, and others. According to the electrolyzer market research report, power generation represented the largest segment.

Power generation represents the leading market segment due to the growing emphasis on renewable energy sources and the need for efficient energy storage solutions. Electrolyzers enable the conversion of excess renewable energy, such as solar and wind, into green hydrogen, which can be stored and later used to generate electricity during periods of high demand or low renewable output. This capability enhances grid stability and reliability. Additionally, green hydrogen produced by electrolyzers can be used in fuel cells to generate clean electricity, supporting the transition to a low-carbon energy system. The integration of electrolyzers into power generation aligns with global decarbonization goals and energy sustainability initiatives, further creating a positive electrolyzer market outlook.

For instance, in February 2024, Cochin International Airport Ltd (CIAL) and Bharat Petroleum Corporation Ltd (BPCL) announced that they have signed an MoU to establish the world's first airport-based green hydrogen plant and fueling station at Cochin Airport, Kerala. The plant will produce hydrogen from water using renewable energy to support airport vehicle operations. BPCL will oversee technology and operations, while CIAL will provide land, water, and green energy resources.

Breakup by Region:

-North America
o United States
o Canada
-Asia-Pacific
o China
o Japan
o India
o South Korea
o Australia
o Indonesia
o Others
-Europe
o Germany
o France
o United Kingdom
o Italy
o Spain
o Russia

o Others
- Latin America
o Brazil
o Mexico
o Others
- Middle East and Africa

Europe leads the market, accounting for the largest electrolyzer market share

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and others); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa. According to the report, Europe represents the largest regional market for electrolyzer.

Europe dominates the electrolyzer market due to its strong commitment to decarbonization and renewable energy adoption. The region's robust policy framework, including the European Green Deal and various national hydrogen strategies, supports the development and deployment of hydrogen technologies. For instance, according to the official website of the European Commission, the government approved up to EUR1.4 billion in State aid from seven Member States for the fourth Important Project of Common European Interest (IPCEI) in the hydrogen value chain. Named IPCEI Hy2Move, the project will support research, innovation, and the first industrial deployment of hydrogen technologies to reduce emissions in the mobility and transport sectors, contributing to the EU's climate-neutral goals by 2050. The initiative is expected to unlock EUR3.3 billion in private investments and create around 3,600 direct jobs.

Moreover, significant investments in research and development (R&D), coupled with substantial government funding and subsidies, have accelerated technological advancements. Additionally, Europe's well-established renewable energy infrastructure provides a reliable source for green hydrogen production. Collaborative efforts between governments, industry, and research institutions further drive the electrolyzer market growth, positioning Europe as a leader in the global market. For instance, in January 2023, the Clean Hydrogen Partnership launched its 2023 call for proposals, allocating EUR195 million to develop clean hydrogen technologies, support projects for renewable hydrogen production, and stimulate the use of low-emission hydrogen in hard-to-abate sectors.

Competitive Landscape:

The market research report has also provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the major market players in the electrolyzer industry include:

- Air Liquide S.A.
- Air Products and Chemicals Inc.
- Asahi Kasei Corporation
- Cummins Inc.
- ITM Power plc
- Linde plc
- McPhy Energy S.A.
- Nel ASA
- Plug Power Inc.
- Siemens AG
- Titanium Tantalum Products Limited
- Toshiba Corporation

The competitive landscape of the electrolyzer market is characterized by a mix of established companies and emerging startups, all vying for market share in a rapidly growing industry. Key players are focusing on technological advancements, improving efficiency, and reducing costs to gain a competitive edge. Strategic partnerships, mergers, and acquisitions are common as companies seek to expand their capabilities and market presence. Innovations in product offerings, such as scalable and modular electrolyzer systems, is a significant trend. Additionally, electrolyzer companies are increasingly collaborating with renewable

energy providers to ensure a steady supply of green electricity for hydrogen production, further enhancing their competitive positions.
In March 2023, thyssenkrupp nucera and Unigel signed a Memorandum of Understanding to expand Unigel's green hydrogen plant in Bahia, Brazil, from 60 MW to 240 MW. This facility, the first industrial-scale green hydrogen plant in Brazil, will produce 10,000 tons/year of green hydrogen and 60,000 tons/year of green ammonia.

Key Questions Answered in This Report
1.How big is the electrolyzer market?
2.What is the future outlook of electrolyzer market?
3.What are the key factors driving the electrolyzer market?
4.Which region accounts for the largest electrolyzer market share?
5.Which are the leading companies in the global electrolyzer market?

Table of Contents:

1 Preface
2 Scope and Methodology
 2.1 Objectives of the Study
 2.2 Stakeholders
 2.3 Data Sources
 2.3.1 Primary Sources
 2.3.2 Secondary Sources
 2.4 Market Estimation
 2.4.1 Bottom-Up Approach
 2.4.2 Top-Down Approach
 2.5 Forecasting Methodology
3 Executive Summary
4 Introduction
 4.1 Overview
 4.2 Key Industry Trends
5 Global Electrolyzer Market
 5.1 Market Overview
 5.2 Market Performance
 5.3 Impact of COVID-19
 5.4 Market Forecast
6 Market Breakup by Product
 6.1 Alkaline Electrolyzer
 6.1.1 Market Trends
 6.1.2 Market Forecast
 6.2 PEM Electrolyzer
 6.2.1 Market Trends
 6.2.2 Market Forecast
 6.3 Solid Oxide Electrolyzer
 6.3.1 Market Trends
 6.3.2 Market Forecast
7 Market Breakup by Capacity
 7.1 Less than 500 kW

7.1.1 Market Trends
7.1.2 Market Forecast
7.2 500 kW to 2 MW
7.2.1 Market Trends
7.2.2 Market Forecast
7.3 Above 2 MW
7.3.1 Market Trends
7.3.2 Market Forecast
8 Market Breakup by Application
8.1 Power Generation
8.1.1 Market Trends
8.1.2 Market Forecast
8.2 Transportation
8.2.1 Market Trends
8.2.2 Market Forecast
8.3 Industry Energy
8.3.1 Market Trends
8.3.2 Market Forecast
8.4 Industry Feedstock
8.4.1 Market Trends
8.4.2 Market Forecast
8.5 Building Heat and Power
8.5.1 Market Trends
8.5.2 Market Forecast
8.6 Others
8.6.1 Market Trends
8.6.2 Market Forecast
9 Market Breakup by Region
9.1 North America
9.1.1 United States
9.1.1.1 Market Trends
9.1.1.2 Market Forecast
9.1.2 Canada
9.1.2.1 Market Trends
9.1.2.2 Market Forecast
9.2 Asia-Pacific
9.2.1 China
9.2.1.1 Market Trends
9.2.1.2 Market Forecast
9.2.2 Japan
9.2.2.1 Market Trends
9.2.2.2 Market Forecast
9.2.3 India
9.2.3.1 Market Trends
9.2.3.2 Market Forecast
9.2.4 South Korea
9.2.4.1 Market Trends

9.2.4.2 Market Forecast
9.2.5 Australia
9.2.5.1 Market Trends
9.2.5.2 Market Forecast
9.2.6 Indonesia
9.2.6.1 Market Trends
9.2.6.2 Market Forecast
9.2.7 Others
9.2.7.1 Market Trends
9.2.7.2 Market Forecast
9.3 Europe
9.3.1 Germany
9.3.1.1 Market Trends
9.3.1.2 Market Forecast
9.3.2 France
9.3.2.1 Market Trends
9.3.2.2 Market Forecast
9.3.3 United Kingdom
9.3.3.1 Market Trends
9.3.3.2 Market Forecast
9.3.4 Italy
9.3.4.1 Market Trends
9.3.4.2 Market Forecast
9.3.5 Spain
9.3.5.1 Market Trends
9.3.5.2 Market Forecast
9.3.6 Russia
9.3.6.1 Market Trends
9.3.6.2 Market Forecast
9.3.7 Others
9.3.7.1 Market Trends
9.3.7.2 Market Forecast
9.4 Latin America
9.4.1 Brazil
9.4.1.1 Market Trends
9.4.1.2 Market Forecast
9.4.2 Mexico
9.4.2.1 Market Trends
9.4.2.2 Market Forecast
9.4.3 Others
9.4.3.1 Market Trends
9.4.3.2 Market Forecast
9.5 Middle East and Africa
9.5.1 Market Trends
9.5.2 Market Breakup by Country
9.5.3 Market Forecast
10 SWOT Analysis

10.1 Overview
10.2 Strengths
10.3 Weaknesses
10.4 Opportunities
10.5 Threats
11 Value Chain Analysis
12 Porters Five Forces Analysis
12.1 Overview
12.2 Bargaining Power of Buyers
12.3 Bargaining Power of Suppliers
12.4 Degree of Competition
12.5 Threat of New Entrants
12.6 Threat of Substitutes
13 Price Analysis
14 Competitive Landscape
14.1 Market Structure
14.2 Key Players
14.3 Profiles of Key Players
14.3.1 Air Liquide S.A.
14.3.1.1 Company Overview
14.3.1.2 Product Portfolio
14.3.1.3 Financials
14.3.1.4 SWOT Analysis
14.3.2 Air Products and Chemicals Inc.
14.3.2.1 Company Overview
14.3.2.2 Product Portfolio
14.3.2.3 Financials
14.3.2.4 SWOT Analysis
14.3.3 Asahi Kasei Corporation
14.3.3.1 Company Overview
14.3.3.2 Product Portfolio
14.3.3.3 Financials
14.3.3.4 SWOT Analysis
14.3.4 Cummins Inc.
14.3.4.1 Company Overview
14.3.4.2 Product Portfolio
14.3.4.3 Financials
14.3.4.4 SWOT Analysis
14.3.5 ITM Power plc
14.3.5.1 Company Overview
14.3.5.2 Product Portfolio
14.3.5.3 Financials
14.3.5.4 SWOT Analysis
14.3.6 Linde plc
14.3.6.1 Company Overview
14.3.6.2 Product Portfolio
14.3.6.3 Financials

14.3.7 McPhy Energy S.A.
14.3.7.1 Company Overview
14.3.7.2 Product Portfolio
14.3.7.3 Financials
14.3.8 Nel ASA
14.3.8.1 Company Overview
14.3.8.2 Product Portfolio
14.3.8.3 Financials
14.3.9 Plug Power Inc.
14.3.9.1 Company Overview
14.3.9.2 Product Portfolio
14.3.9.3 Financials
14.3.10 Siemens AG
14.3.10.1 Company Overview
14.3.10.2 Product Portfolio
14.3.10.3 Financials
14.3.10.4 SWOT Analysis
14.3.11 Titanium Tantalum Products Limited
14.3.11.1 Company Overview
14.3.11.2 Product Portfolio
14.3.12 Toshiba Corporation
14.3.12.1 Company Overview
14.3.12.2 Product Portfolio
14.3.12.3 Financials
14.3.12.4 SWOT Analysis

Electrolyzer Market Report by Product (Alkaline Electrolyzer, PEM Electrolyzer, Solid Oxide Electrolyzer), Capacity (Less than 500 kW, 500 kW to 2 MW, Above 2 MW), Application (Power Generation, Transportation, Industry Energy, Industry Feedstock, Building Heat and Power, and Others), and Region 2025-2033

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