+357 96 030922
info@marketpublishers.com

North America Low-carbon Hydrogen Market Assessment, By Electricity Source [Renewable Energy, Non-renewable Energy], By Type [Green Hydrogen, Blue Hydrogen, Aqua Hydrogen], By Production Process [Electrolysis, Gasification], By End-use Industry [Transportation, Power Generation, Oil Refineries, Steel, Fertilizers, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

North America low-carbon hydrogen market size was estimated at 121.14 kilo tons in 2022, which is expected to grow to 527.9 kilo tons in 2030, with a CAGR of 20.2% during the forecast period between 2023 and 2030. The increasing developments of low-carbon hydrogen for the transportation industry and the rising environmental restrictions for the oil refineries sectors in North America are expected to reduce the carbon footprint, spurring the demand for low-carbon hydrogen to ensure efficient substitution of traditional fossil fuels, thereby boosting the market growth.

Furthermore, the government authorities in North America are implementing stringent regulatory measures to minimize carbon emissions. North America's rigorous carbon emission norms induce high carbon footprint-generating industries, including fertilizers, steel, transportation, and others, to utilize low-carbon hydrogen. The above-listed industries produced about 25% or more of global CO2 emissions. Thus, the demand for low-carbon hydrogen is increasing in North America. It, in turn, is resulting in manufacturers of hydrogen establishing new low-carbon hydrogen-generating plants in North America, creating a prominent market growth potential in the upcoming years.

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Rising Adoption of Low-carbon Hydrogen in the Oil Refineries

Low-carbon hydrogen provides aid in desulfurizing crude oil, biodiesel, and other products to eradicate carbon footprint generation into the atmosphere. The employment of low-carbon hydrogen manufactured from renewable energy sources is increasing in oil refinery applications such as reactors, heavy oil hydrotreating units, and others. The growth of the oil refinery industry is attributed to factors such as the increasing adoption of green hydrogen to maximize production output and the launch of new oil refineries.

For instance, in January 2023, Imperial Oil Limited invested USD 720 million to develop a new renewable diesel manufacturing facility in Canada. The plant will have a production capacity of 20,000 barrels per day. The new renewable diesel manufacturing facility will utilize low-carbon hydrogen supplied by Air Products. Thus, the recent developments of oil refineries are accelerating the demand for low-carbon hydrogen to achieve low-carbon targets, which, in turn, is benefiting the market growth.

Ongoing Pilot Projects for Utilization in the Power Generation Sector Boosts the Market

The prime benefit of employing low-carbon hydrogen in the power generation industry is to generate electricity by eliminating the production of greenhouse gases responsible for climate change. The low-carbon hydrogen is utilized in various power generation applications, including gas turbines, heating, etc. Thus, due to the above benefits, power generation companies in the United States are collaborating with low-carbon manufacturers to deploy green hydrogen in gas turbine systems.

For instance, in September 2022, the New York Power Authority (NYPA) showcased the outcome of a green hydrogen demonstration project as part of a comprehensive decarbonization strategy. The project showcased a diminished carbon footprint using green hydrogen blended with natural gas for power generation at the Power Authority’s Brentwood Small Clean Power Plant in the United States. Hence, the increasing deployment of low-carbon hydrogen in the power generation plants to produce small amounts of heat is augmenting the market growth in North America.

Recent Partnerships in the Transportation Sector are Accelerating the Market Growth

The low-carbon hydrogen fuel enables vehicles to travel longer distances with lesser refueling than traditional fossil fuels. Hence, low-carbon hydrogen is employed in fueling public transits such as buses, aircraft, marine vessels, mining vehicles, heavy-duty tractor-trailers, and others. The increasing investments in the new green hydrogen-

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powered marine vessel development and rising production of heavy-duty trucks are prominent aspects boosting the transportation industry growth in North America.

For instance, in December 2022, Amazon, an e-commerce company in the United States, formed a strategic partnership with Plug Power to supply 10,950 tons of green hydrogen for transportation and building applications. Hence, the increasing deployment of low-carbon hydrogen, including green hydrogen in the North America transportation industry, as a fuel in the internal combustible engine is supplementing the market growth.

Future Market Scenario

The transition of hydrogen manufacturers of grey hydrogen to energy-efficient low-carbon hydrogen is accelerating the development of new green and blue hydrogen plants. For instance, in January 2023, Exxon Mobil Corporation provided a front-end engineering and design (FEED) contract to develop a new low-carbon hydrogen manufacturing facility in the United States. The project construction will commence in 2024, and the production will start between 2026-2027. Thus, the new infrastructure development will boost the low-carbon hydrogen supply, propelling market growth in North America in the coming years.

Government authorities in North America are collaborating with hydrogen manufacturers to grant them financial aid for new low-carbon hydrogen facilities development in the region. For instance, in November 2022, the Canadian government allocated USD 365.2 million (CAD 775 million) to Air Products for a blue hydrogen plant development in Alberta, Canada. Hence, the government's aid for the low-carbon hydrogen plant construction in North America to develop a carbon negative eco-system, which is expected to augment the market growth in the forecast period.

The recent regulatory framework in North America for reducing the prices of low-carbon hydrogen will boost the demand for green and blue hydrogen in the coming years, thereby creating a lucrative opportunity for market growth. For instance, the United States aims to lead the cost-effective low-carbon hydrogen industry. As a result, the United States has implemented the Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act (IRA) to allot USD 8 billion for new low-carbon hydrogen hub development and provide tax rebates to green and blue hydrogen manufacturers.

Key Players Landscape and Outlook

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The key players offering low-carbon hydrogen in North America are leveraging their technological potential to develop low-carbon hydrogen plants. Furthermore, the primary focus of the market players such as Plug Power Inc., Exxon Mobil Corporation., Ballard Power Systems., Bloom Energy, and others are on the utilization of a diverse range of strategies, including infrastructure development for new plants, reducing the overall production cost, increasing efficiency, and others.

For instance, in October 2021, Air Products announced the construction of a USD 4.5 billion low-carbon hydrogen complex in Louisiana, the United States. The new manufacturing facility will have a production capacity of more than 750 million cubic feet per day. Therefore, developing a new low-carbon hydrogen facility will boost the market's revenue growth in the coming years.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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