

White (Natural) Hydrogen Market: Focus on Exploration, Identified Deposits, and Future Scenarios

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Abstracts

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White Hydrogen Market Overview:

The white hydrogen market is emerging as a transformative force in the energy sector, offering a clean alternative to traditional energy sources. White hydrogen is distinct in its production method, as it is generated through advanced processes that set it apart from conventional hydrogen production techniques. This innovative approach to hydrogen generation presents an opportunity to significantly reduce carbon emissions and decrease reliance on fossil fuels, thereby contributing to the global effort to combat climate change. The versatility of white hydrogen allows for its use across various applications, including transportation, power generation, and industrial processes, making it a key component in the transition toward a sustainable and low-carbon economy. As awareness and demand for sustainable energy solutions increase, the white hydrogen market is expected to expand, playing a crucial role in shaping the future of clean energy.

Market Lifecycle Stage

The white hydrogen market is likely to be driven by the demand for sustainable energy alternatives. It is also known as gold hydrogen or natural hydrogen. It is derived not through environmentally harmful methods or renewable electricity but directly from the planet's natural geological resources. This form of hydrogen, which is found in abundance within the Earth's crust, offers an inexhaustible and clean energy source. Despite the existing hurdles related to its extraction and development of necessary infrastructure, the expanding clean energy industry and increasing environmental

concerns highlight a promising outlook for white hydrogen. Its successful exploitation could lead to transformative changes across various sectors, including transportation, electricity production, and manufacturing, steering the world toward an eco-friendly and more sustainable path. The market is still in its nascent stage, but the opportunity it presents is enormous, which marks the beginning of a competitive endeavor in the clean energy powerhouse.

The white hydrogen market signifies a profound industrial impact across various sectors. These naturally occurring alternatives offer a sustainable solution to greenhouse gas emissions, reducing environmental harm and promoting ecosystem health. By reducing carbon emissions, lowering energy use, and supporting clean energy sources, white hydrogen contributes to a more sustainable environmental future. Additionally, its clean production process promotes safer industrial practices and offers the potential for cleaner air and water. This market stimulates advancements in clean energy technology, propelling research and development toward more efficient production and utilization methods for white hydrogen. Regulatory frameworks are essential to ensure product safety and compliance standards. Overall, the rise of white hydrogen marks a transition toward environmental safety, laying the groundwork for a more resilient and sustainable energy.

The key players operating in the white hydrogen market include Helios, Natural Hydrogen Energy LLC, Koloma, Hydroma Inc., H2Au, La Francaise de l'Energie SA, Gold Hydrogen Limited, and HyTerra, among others. These companies are focusing on strategic partnerships, collaborations, exploration, and extraction to enhance their offerings and expand their market presence.

Market Segmentation:

Segmentation 1: by End-User Application

Oil and Gas

Industrial Feedstock

Mobility

Power Generation

Others

Segmentation 2: by Source

Serpentinization of Olivine and Pyroxene Ultramafic Rocks (Containing Peridotite, Dunite, or Kimberlite)

Volcanic Activity and Magma Crystallization

Hydrothermal Vents

Degassing Primordial Hydrogen

Others (Ophiolite Seeps, Graphite Deposits, Conventional Oil and Gas Sources and Generation, Potash Deposits, Earthquakes, Fermentation of Organic Matter, Oxidation, or Corrosion of Iron Compounds)

Segmentation 3: by Country

Mali

U.S.

France

Australia

Spain

Oman

Russia

Kazakhstan

Nordic Region (including Iceland)

Eastern Europe (including Ukraine, Kosovo, Serbia, and Poland)

Korea

Japan

Recent Developments in the White Hydrogen Market

In July 2023, Koloma received a significant investment of \$91 million from notable backers such as Bill Gates and other investors. This funding is earmarked for their initiative to drill for white hydrogen in the U.S. Midwest, a venture poised to significantly contribute to the advancement of the clean energy revolution. The hydrogen startup intends to take advantage of incentives provided by the Inflation Reduction Act and the U.S. Bipartisan Infrastructure Law, specifically the hydrogen production tax credit (PTC).

In May 2023, an inadvertent discovery was made in the Lorraine region of France, i.e., a substantial deposit of white hydrogen. The revelation came during soil methane level tests conducted by a collaborative team comprising researchers from the University of Lorraine's GeoRessources Lab, France's National Centre for Scientific Research (CNRS), and energy producer La Française de l'Energie. Presently, efforts are underway to drill deeper to ascertain the precise quantity of hydrogen present. Initial estimates suggest the potential presence of approximately 46 million tonnes, which surpasses more than half of the world's current annual production of gray hydrogen.

In January 2023, Hydroma Inc., an energy provider specializing in natural and green hydrogen projects, entered a memorandum of understanding with Senegal's Permanent Secretariat for Energy (PSE) to foster the growth of both green and natural hydrogen industries. Moreover, in December 2022, the company entered a partnership agreement with Pegasus Capital Advisors (PCA) aimed at advancing green and natural hydrogen projects in Africa and Canada, indicating progress in global sustainability efforts.

Demand - Drivers and Limitations

The following are the demand drivers for the white hydrogen market:

Increase in R&D and awareness regarding white hydrogen

Rise in inclination toward sustainable resources over conventional

White hydrogen having potential for cost competitiveness

The following are the limitations of the white hydrogen market:

Underdeveloped white hydrogen infrastructure

Potentially sizable white hydrogen reserves in Earth's crust largely untapped

How can this report add value to an organization?

Product/Innovation Strategy: The application segment helps the reader understand the different end-user applications of white hydrogen (oil and gas, industrial feedstock, mobility, power generation, and others). The product segment helps the reader understand different sources (serpentinization of olivine and pyroxene ultramafic rocks (containing peridotite, dunite, or kimberlite), volcanic activity and magma crystallization, hydrothermal vents, degassing primordial hydrogen, others (ophiolite seeps, graphite deposits, conventional oil and gas sources and generation, potash deposits, earthquakes, fermentation of organic matter, oxidation, or corrosion of iron compounds). The countries considered in the report are Mali, the U.S., France, Australia, Spain, Oman, Russia, Kazakhstan, the Nordic Region (including Iceland), Eastern Europe (including Ukraine, Kosovo, Serbia, and Poland), Korea, and Japan. The market is poised for significant expansion with ongoing technological advancements, increased investments, and growing awareness of white hydrogen. Therefore, this business is a high-investment and high-revenue generating model.

Growth/Marketing Strategy: The white hydrogen market has been growing at a rapid pace. The market offers enormous opportunities for existing and emerging market players. Some of the strategies covered in this segment are mergers and acquisitions, product launches, partnerships and collaborations, business expansions, and investments. The strategies preferred by companies to maintain and strengthen their market position primarily include partnerships and collaborations.

Competitive Strategy: The key players in the white hydrogen market analyzed and

profiled in the study include white hydrogen exploration and extraction companies and upstream service providers. Additionally, a comprehensive competitive landscape such as partnerships, agreements, and collaborations are expected to aid the reader in understanding the untapped revenue pockets in the market.

Key Market Players and Competition Synopsis

The companies that are profiled have been selected based on inputs gathered from primary experts and analyzing company coverage, product portfolio, and regional presence.

Some of the prominent names in this market are:

Research Institutes

National Centre for Scientific Research (CNRS)

U.S. Geological Survey (USGS)

National Renewable Energy Laboratory (NREL)

International Renewable Energy Agency (IRENA)

Exploration and Extraction Companies

Helios

Natural Hydrogen Energy LLC

Koloma

Hydroma Inc.

H2Au

La Francaise de l'Energie SA

Gold Hydrogen Limited

HyTerra

Upstream Service Providers

Schlumberger

CGG

Halliburton

Baker Hughes

Weatherford

TechnipFMC plc

Service and Equipment Companies

SOLEXPERTS AG

Chapman Hydrogen and Petroleum Engineering Ltd.

Gas Players

BP p.l.c.

Shell

Eni

Equinor ASA

Transmission System Operators

Gasunie

50Hertz

GRTgaz

Enag?s S.A.

Potential Companies

Repsol

ENGIE

TotalEnergies

Companies that are not a part of the aforementioned pool have been well represented across different sections of the report (wherever applicable).

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