

# Hydrogen Carriers Market Forecasts to 2034 – Global Analysis By Carrier Type (Ammonia, Liquid Organic Hydrogen Carriers (LOHC), Liquid Hydrogen and Metal Hydrides), Form, Production Source, Technology, Application, Distribution, End User, and By Geography

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## Abstracts

According to Statistics MRC, the Global Hydrogen Carriers Market is accounted for \$3.2 billion in 2026 and is expected to reach \$7.8 billion by 2034 growing at a CAGR of 11.7% during the forecast period. Hydrogen carriers refer to chemical compounds and physical states through which hydrogen is stored, transported, and distributed at higher volumetric and gravimetric energy densities than compressed gaseous hydrogen, enabling economically viable long-distance hydrogen trade and end-use delivery across applications that direct hydrogen pipelines or on-site electrolysis cannot efficiently serve. They encompass ammonia synthesized from green hydrogen for large-scale intercontinental maritime shipping, liquid organic hydrogen carrier compounds including dibenzyltoluene that release hydrogen through catalytic dehydrogenation, liquid hydrogen achieved through cryogenic liquefaction, and solid-state metal hydride storage systems that absorb and release hydrogen through reversible chemical reactions for stationary and mobile applications.

Market Dynamics:

Driver:

Green Hydrogen Export Economy Development

Green hydrogen export economy development is the primary market driver as countries with abundant renewable energy resources including Australia, Chile, Saudi Arabia, Namibia, and Morocco are investing in green ammonia and liquid hydrogen production infrastructure for export to energy-importing nations including Japan, South Korea, and Germany that have insufficient domestic renewable energy resources for full hydrogen economy self-sufficiency. Bilateral government hydrogen trade agreements are creating committed import volumes that de-risk carrier infrastructure investment and generate long-term offtake certainty for hydrogen carrier shipping, terminal, and reconversion facility projects. Japan's and South Korea's hydrogen import programs with committed government procurement are creating the most defined commercial demand signals for maritime hydrogen carrier infrastructure investment globally.

Restraint:

#### Energy Penalty and Conversion Efficiency Losses

Energy conversion efficiency losses across the hydrogen carrier cycle — encompassing synthesis or liquefaction, shipping, reconversion or release, and purification — represent a fundamental thermodynamic cost that substantially reduces the effective delivered energy value of green hydrogen compared to direct pipeline transport or on-site electrolysis generation. Ammonia reconversion to pure hydrogen for fuel cell applications imposes additional efficiency penalties and equipment costs that challenge the lifecycle economics of ammonia as a hydrogen carrier in applications requiring high-purity hydrogen rather than direct ammonia combustion. LOHC dehydrogenation energy requirements at the point of hydrogen release necessitate heat supply infrastructure that adds capital and operational complexity to receiving terminal designs.

Opportunity:

#### Maritime Shipping Decarbonization Demand

Maritime shipping sector decarbonization mandates represent a transformational demand opportunity for hydrogen carriers as the International Maritime Organization's greenhouse gas reduction targets are compelling shipping companies to evaluate green ammonia, methanol, and liquid hydrogen as zero-carbon ship propulsion fuels that require the same maritime carrier infrastructure as hydrogen export logistics. Ship propulsion fuel demand from decarbonizing maritime fleets could represent a larger near-term commercial demand pool for hydrogen carriers than the stationary and mobility hydrogen end-use markets that most hydrogen carrier supply chain analyses

focus on. Port infrastructure investment in green ammonia bunkering facilities creates dual-purpose assets serving both hydrogen import and maritime refueling functions that improve infrastructure utilization economics.

Threat:

#### Direct Renewable Energy Import Competition

Direct renewable electricity import through long-distance high-voltage DC transmission cables represents a competing energy trade approach that eliminates the conversion efficiency losses inherent in hydrogen carrier logistics, creating a potentially superior economics argument for renewable energy trade in geographies where interconnection is physically feasible. Planned HVDC interconnector projects between North Africa and Europe, and Australia and Southeast Asia, could reduce the total addressable market for hydrogen carrier-based renewable energy trade in routes where cable alternatives become technically and financially viable within the forecast period. Carbon capture and utilization advances creating alternative synthetic fuel production pathways could reduce the strategic premium on hydrogen carrier infrastructure investment in energy importing nations.

Covid-19 Impact:

COVID-19 minimally disrupted hydrogen carrier development programs as long-term infrastructure investment timelines proved resilient to pandemic-era economic uncertainty. Post-pandemic fossil fuel price volatility following geopolitical disruptions dramatically accelerated energy-importing government commitment to green hydrogen and carrier infrastructure investment as energy security diversification strategies. EU REPowerEU program and Japan's revised hydrogen strategy both incorporated accelerated green hydrogen import timeline targets that are generating immediate hydrogen carrier technology procurement and infrastructure investment programs exceeding pre-pandemic planning ambitions.

The metal hydrides segment is expected to be the largest during the forecast period

The metal hydrides segment is expected to account for the largest market share during the forecast period, due to growing deployment in stationary hydrogen storage applications for grid balancing, fuel cell backup power, and hydrogen refueling station buffer storage where solid-state storage safety advantages versus compressed or cryogenic alternatives provide compelling installation and regulatory simplicity benefits.

Advanced metal hydride compositions including magnesium-based, complex aluminum hydride, and intermetallic compound systems are achieving commercially relevant gravimetric and volumetric storage densities that are expanding application scope into vehicle and portable power applications. Government funding for solid-state hydrogen storage research is generating technology maturation that is progressively improving metal hydride economics toward commercial competitiveness with established carrier alternatives.

The gaseous segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the gaseous segment is predicted to witness the highest growth rate, driven by rapidly expanding compressed hydrogen gas distribution infrastructure for fuel cell vehicle refueling stations, industrial hydrogen pipeline network expansion, and distributed hydrogen production site interconnection that collectively require large volumes of high-pressure tube trailer and compressed tank storage and transport equipment. Pipeline hydrogen network expansion in Europe and the United States is generating pipeline infrastructure investment demand that encompasses compression, metering, and quality control equipment classified within gaseous hydrogen carrier systems. High-pressure onboard vehicle hydrogen storage system demand from growing fuel cell commercial vehicle fleet deployments is additionally generating sustained gaseous carrier component procurement growth.

Region with largest share:

During the forecast period, the Europe region is expected to hold the largest market share, due to the European Hydrogen Bank supporting large-scale green hydrogen import infrastructure investment, EU hydrogen import target of 10 million tonnes annually by 2030 creating committed demand for maritime carrier infrastructure, and advanced hydrogen economy policy frameworks attracting carrier technology investment across Germany, Netherlands, Belgium, and Spain. European energy companies including Shell plc, TotalEnergies SE, and Equinor ASA are investing substantially in hydrogen carrier supply chain development. Rotterdam and Hamburg port authorities are developing green ammonia import terminal infrastructure that anchors European carrier logistics network development.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, due to Japan's and South Korea's committed hydrogen import programs

representing the world's most advanced government-contracted carrier infrastructure procurement programs, growing renewable hydrogen production investment in Australia and Southeast Asia creating carrier-dependent export supply chains, and large industrial hydrogen demand in China and India providing substantial domestic carrier logistics market development. Japan's Kawasaki Heavy Industries liquid hydrogen carrier ship program and Korea's ammonia import terminal construction are generating tangible carrier infrastructure procurement that validates the Asia Pacific market development trajectory.

### Key players in the market

Some of the key players in Hydrogen Carriers Market include Air Liquide, Linde plc, Air Products and Chemicals Inc., Shell plc, TotalEnergies SE, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Siemens Energy, Nel ASA, Plug Power Inc., ITM Power, Ballard Power Systems, Cummins Inc., ENGIE SA, Equinor ASA, Snam S.p.A., Chart Industries, and Doosan Fuel Cell.

### Key Developments:

In March 2026, Nel ASA secured a contract to supply large-scale electrolyzer systems integrated with ammonia synthesis units for a major Nordic green hydrogen carrier export facility targeting Asian markets.

In February 2026, Air Products and Chemicals Inc. announced a \$1.5 billion green ammonia production and carrier export facility in Saudi Arabia targeting European hydrogen import market supply under long-term offtake agreements.

In November 2025, Chart Industries launched its next-generation vacuum super-insulated liquid hydrogen ISO container with 20% improved boil-off performance for international maritime and multimodal carrier logistics.

### Carrier Types Covered:

Ammonia

Liquid Organic Hydrogen Carriers (LOHC)

Liquid Hydrogen

## Metal Hydrides

### Forms Covered:

Gaseous

Liquid

Solid

### Production Sources Covered:

Green Hydrogen

Blue Hydrogen

Grey Hydrogen

### Technologies Covered:

Chemical Storage

Physical Storage

Cryogenic Storage

### Applications Covered:

Energy Storage

Transportation

Industrial Applications

Power Generation

Distributions Covered:

Pipeline Transport

Shipping Transport

Road Transport

End Users Covered:

Oil & Gas Industry

Chemical Industry

Energy & Utilities

Automotive Sector

Other End Users

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

## Rest of Africa

### What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

### Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

#### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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