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Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle Supply, Demand and Key Producers, 2026-2032

https://marketpublishers.com/r/GD8420B5C52DEN.html
Date: June 2026
Pages: 90
Price: US$ 4,480.00 (Single User License)
ID: GD8420B5C52DEN

Abstracts

The global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market size is expected to reach $ 113 million by 2032, rising at a market growth of 27.8% CAGR during the forecast period (2026-2032).

A solid-state hydrogen storage fuel cell passenger vehicle is a passenger vehicle that uses a fuel cell system as its main power source or range-extending power source and stores onboard hydrogen in a solid-state hydrogen storage system. Such vehicles typically use metal hydrides, magnesium-based hydrides, TiFe-based alloys, AB5/AB2 hydrogen storage alloys, or other solid hydrogen storage materials to reversibly absorb and release hydrogen under relatively low pressure and controlled thermal conditions. The released hydrogen is then supplied to a fuel cell stack to generate electricity for the traction motor and battery system. A complete vehicle system usually includes solid-state hydrogen storage tanks or modules, a fuel cell stack, hydrogen supply components, thermal management, a traction battery, electric drive units, a vehicle control unit, hydrogen safety monitoring, crash protection, and energy management software. Compared with conventional 70MPa compressed-hydrogen FCEVs, solid-state hydrogen storage vehicles emphasize low-pressure safety, high volumetric hydrogen density, long-duration storage stability, and potential integration with fuel-cell waste heat. However, they also face challenges in material weight, hydrogen release rate, heat management, system cost, packaging, and vehicle-level energy efficiency.

In 2025, the global production volume of solid-state hydrogen storage fuel cell passenger vehicles projected to reach 180 units, with an average price of $86,500 per vehicle and an average gross margin of 8.5%.

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Based on our research, solid-state hydrogen storage fuel cell passenger vehicles should not be treated as equivalent to the broader fuel cell passenger vehicle market. The currently available or semi-commercial passenger FCEVs, including Toyota Mirai, Hyundai NEXO, Honda CR-V e:FCEV, and BMW iX5 Hydrogen demonstrators, mainly rely on compressed hydrogen storage rather than solid-state hydrogen storage. Solid-state storage offers potential advantages in low-pressure safety, stable hydrogen storage, high volumetric density, and thermal coupling with fuel cell waste heat, but it also faces major challenges in system weight, heat management, hydrogen release rate, cost, packaging, and vehicle-level efficiency. Therefore, this study adopts a narrow scope and counts only demonstration passenger vehicles, prototypes, and small-batch vehicles equipped with solid-state hydrogen storage systems.

From a supply perspective, the number of companies directly involved in the combination of passenger vehicle, fuel cell system, and solid-state hydrogen storage remains very limited. The low-pressure room-temperature solid-state hydrogen storage fuel cell MPV shown in China in 2025, developed by SAIC Motor, Shanghai Hydrogen Propulsion Technology, and related partners, is one of the clearest public examples of this category. Solid-state hydrogen storage suppliers such as GRIMAT, Hydrexia, HBank Technologies, Tellus Materials, GKN Hydrogen, GRZ Technologies, and H2planet have relevant storage-device or metal-hydride system capabilities, but most are not passenger vehicle OEMs. Traditional FCEV companies such as Toyota, Hyundai, Honda, BMW, Mercedes-Benz, GAC, and Great Wall Motor have fuel cell vehicle platforms, but their public passenger vehicle technologies are still primarily based on compressed hydrogen.

From a demand perspective, early demand is likely to come from government-backed demonstrations, research validation, hydrogen industry zones, regional pilot programs, low-pressure safety demonstrations, and automaker technology development rather than mass-market retail customers. Passenger vehicles impose strict requirements on vehicle weight, cabin space, range, refueling convenience, cost, and reliability. Solid-state storage systems are still disadvantaged in weight and thermal management, which limits their near-term suitability for mass-market sedans and SUVs. The more realistic early applications are likely to be MPVs, SUVs, demonstration fleets, or range-extended fuel cell passenger vehicles where system packaging and operating patterns can be better controlled.

From a technology perspective, two architectures are most plausible. One uses the fuel cell as the main onboard power-generation system, with the solid-state storage unit supplying hydrogen and the battery handling transient power demand. The other uses a

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fuel cell range-extender architecture, where the traction battery provides most driving power and the fuel cell maintains state of charge or extends range. The latter may be more practical in early demonstrations because it can reduce required fuel cell power, improve thermal integration, and lower total system cost. The 2025 Chinese demonstration MPV reportedly uses a 50kW fuel cell system and coordinates cabin heating with hydrogen release thermal demand, illustrating why thermal system integration is central to this vehicle category.

From a risk perspective, this market faces both FCEV passenger vehicle uncertainty and solid-state storage technology uncertainty. Passenger FCEVs remain constrained by hydrogen station density, hydrogen price, vehicle cost, and competition from battery electric vehicles. Solid-state storage adds further challenges in material mass, cost, hydrogen release kinetics, standardization, certification, and long-term durability. Metal hydride systems are technically mature in some stationary and specialty applications, but conventional systems are often too heavy and costly for mainstream light-duty passenger vehicles. Over the long term, solid-state hydrogen storage fuel cell passenger vehicles are more likely to develop as a specialized demonstration and safety-focused niche before any broader commercialization becomes realistic.

This report studies the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle that contribute to its increasing demand across many markets.

Highlights and key features of the study
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle total production and demand, 2021-2032, (Units)
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle total production value, 2021-2032, (USD Million)
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Units), (based on production site)
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle consumption by region & country, CAGR, 2021-2032 & (Units)

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U.S. VS China: Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle domestic production, consumption, key domestic manufacturers and share
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Units)
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Units)
Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Units)

This report profiles key players in the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include SAIC Motor, Shanghai Hydrogen Propulsion Technology, GRIMAT Engineering Institute, Hydrexia, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (Units) and average price (US$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle Market, By Region:

United States

China

Europe

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Japan

South Korea

ASEAN

India

Rest of World

Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle Market, Segmentation by Type:

Metal Hydride Storage

Magnesium-based Hydride Storage

TiFe-based Alloy Storage

AB5/AB2 Alloy Storage

Complex Hydride Storage

Other

Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle Market, Segmentation by Power:

Below 30kW

30–60kW

60–100kW

100–150kW

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Above 150kW

Other

Global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle Market, Segmentation by Application:

Government Demonstration

Hydrogen Industry Park Mobility

Public-sector Fleet

Technology Validation

Low-pressure Safety Demonstration

Regional Pilot Operation

Other

Companies Profiled:

SAIC Motor

Shanghai Hydrogen Propulsion Technology

GRIMAT Engineering Institute

Hydrexia

Key Questions Answered:
1. How big is the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market?
2. What is the demand of the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market?

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3. What is the year over year growth of the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market?
4. What is the production and production value of the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market?
5. Who are the key producers in the global Solid-State Hydrogen Storage Fuel Cell Passenger Vehicle market?
6. What are the growth factors driving the market demand?

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