

# **Investment and financing issues in the hydrogen energy storage industry**





## Overview

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Capital spending on low-emissions hydrogen projects reached USD 4.3 billion in 2024, an 80% increase from 2023. Based on recent final investment decisions (FIDs), spending could rise by more than 80% in 2025 to nearly USD 8 billion. In 2024, capital spending was almost evenly split between.

The hydrogen industry has garnered substantial attention as a pivotal solution in addressing the intricate challenges of energy transition and achieving decarbonization across diverse sectors. The efficacy of deploying hydrogen technologies hinges upon the availability of robust financing.

In this comprehensive analysis, we explore the multifaceted challenges and limitations facing hydrogen energy, identifying key areas for innovation, investment, and collaboration to overcome these obstacles and unlock the full potential of hydrogen as a sustainable energy source. Technological.

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the.

As a secondary energy that is green and low carbon, with abundant sources and wide-ranging application scenarios, hydrogen is gradually becoming a crucial carrier in the global energy transition. In March 2022, China's National Development and Reform Commission (NDRC) and the National Energy. Why is financing a hydrogen energy project so difficult?



Hydrogen energy projects require significant upfront investment, ranging from research and development to infrastructure deployment and commercialization. Securing funding and financing for hydrogen projects can be challenging due to perceived risks, uncertainty about market demand, and the lack of established revenue streams.

How does financing affect the hydrogen industry?

Securing adequate financing is a crucial driver for the growth and progress of the hydrogen industry (Chien et al. 2021). Presently, investments in hydrogen technologies primarily rely on government or university research and development grants, as well as corporate venture equity (Scott and Powells 2020).

Does hydrogen financing have a forward-looking perspective?

Building upon this analysis, the study offers a forward-looking perspective on hydrogen financing, which considers emerging technologies, evolving policy landscapes, and dynamic market trends.

What challenges does the hydrogen industry face?

The hydrogen industry faces several financial challenges, including high upfront costs, infrastructure investments, and technology development. The high cost of producing hydrogen is one of the prominent tasks confronting the industry.

How can the public and private sector contribute to the hydrogen industry?

Collaboration between the public and private sectors is essential to attract investment and drive innovation in the hydrogen industry. Governments can provide funding and incentives for companies that invest in hydrogen technologies, while companies can work together to develop new technologies and bring them to market.

Why should we invest in hydrogen?

It drives innovation, supports infrastructure development, mitigates risks, and enhances the affordability and competitiveness of hydrogen. Adequate funding enables research and development, facilitates the construction of a robust supply chain, attracts investment, and lowers production costs.



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### Assessment of Hydrogen Energy Industry Chain Based on Hydrogen

To reach climate neutrality by 2050, a goal that the European Union set itself, it is necessary to change and modify the whole EU's energy system through deep decarbonization ...

### Hydrogen Insights

Hydrogen is gathering strong momentum as a key energy transition pillar Underpinned by a global shift of regulators, investors, and consumers toward decarbonization, hydrogen (H<sub>2</sub>) is ...



### [Challenges and Limitations - World Hydrogen Energy ...](#)

In this comprehensive analysis, we explore the multifaceted challenges and limitations facing hydrogen energy, identifying key areas for innovation, ...



### Hydrogen-powered future: Catalyzing energy transition, industry

The study also highlights hydrogen's evolving global market, with investments exceeding USD 680 billion and expanding project portfolios in



Europe, North America, and ...



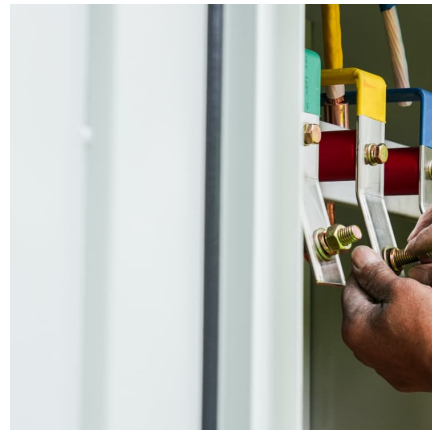
### Green hydrogen contracting financing of green hydrogen ...

Hydrogen is at the intersection of major industrial sectors, mobility, and energy. The financing of the green hydrogen value chain is expected to include the manufacturing of upstream and ...



### Development Status and Future Prospects of Hydrogen Energy ...

Hydrogen-based energy is essential to the global energy transition to respond to climate issues effectively. This article provides a detailed review of the current status and ...



### [Hydrogen net zero investment roadmap: leading the ...](#)

This rapid progress demonstrates our commitment to hydrogen, and proves that the UK is a world leading destination for investment in low ...





### [Global Hydrogen Review 2024 - Analysis](#)

The Global Hydrogen Review is an annual publication by the International Energy Agency that tracks hydrogen production and demand worldwide, as well as progress in ...



### [Financial instruments for a green hydrogen transition](#)

The recent example of renewable energy deployment offers a good illustration of the trigger role private finance plays in shaping an industry ...

### [SCALING HYDROGEN FINANCING FOR DEVELOPMENT](#)

They can support governments to attract private sector investment by improving enabling conditions, de-risking both clean hydrogen industry and individual projects, reducing costs, and ...



### **Financial Incentives for Hydrogen and Fuel Cell Projects**

The Advanced Energy Project Credit extends the 30% investment tax credit and creates funding for manufacturing projects producing fuel cell electric vehicles, hydrogen infrastructure, ...



[2025 Renewable Energy Industry Outlook, Deloitte ...](#)

Long-duration energy storage (LDES): Regardless of the trajectory of these policy and technology outcomes, green hydrogen would retain its primary use case in ...



**Financing Hydrogen Supply Chains: A Systematic Review ...**

Abstract Energy supply chain participants recognise the benefits of hydrogen energy (H2-e) in accelerating the energy transition. However, concerns remain regarding the financial viability of ...

**5 major challenges in the hydrogen economy in 2024 - and 5 ...**

IMechE returned to the Tottenham Hotspur Stadium in London last month (6-7 March) for Engineering Challenges in the Hydrogen Economy 2024, examining many of the ...





### **Optimizing hydrogen storage: A comparative economic and ...**

This study explores the optimization of hydrogen storage technologies through a comparative economic and financial analysis aimed at supporting the growth of sustainable ...

### **Demystifying Hydrogen**

The industry is focusing on advancing water electrolysis technologies, utilizing industrial waste heat, and integrating hydrogen production with renewable energy systems to ...



### **China Hydrogen Industry Outlook**

Through power-to-hydrogen conversion, renewable electricity can be easily converted into hydrogen at a large scale for long-term storage, transportation, and energy usage, which ...

### **Hydrogen as an alternative fuel: A comprehensive review of ...**

The lack of global standards and investment uncertainties further impede the development of a comprehensive hydrogen economy. This review evaluates hydrogen's ...



### [Funding Opportunities , Hydrogen Program](#)

The U.S. Department of Energy Hydrogen Program, led by the Hydrogen and Fuel Cell Technologies Office (HFTO) within the Office of Energy Efficiency ...

### Hydrogen Infrastructure Report

demand of 20Mton of hydrogen). A delay of investments jeopardises EU's decarbonisation goals, as energy storage in the form of hydrogen will be key not only for managing misaligned supply ...



### [Hydrogen: Investment in the Energy Transition](#)

However, the "green premium", which refers to the higher cost of clean hydrogen compared to conventional fuels, continues to pose challenges, creating ...





### [Energy Storage Market Report 2025 , StartUs Insights](#)

Further, the energy storage industry report explores high-impact subfields such as virtual power plants (VPPs), flow batteries, and hydrogen ...



### **Top 10 Energy Storage Trends & Innovations , StartUs Insights**

Discover the Top 10 Energy Storage Trends plus 20 out of 3400+ startups in the field and learn how they impact your business.

### **Hydrogen's Brutal Month: Billions Lost As Mega-Projects Collapse**

June-July 2025 saw global hydrogen projects worth billions shelved, highlighting severe economic barriers and casting doubt on hydrogen's energy transition role.



### **Hydrogen project investments are accelerating but uncertainty ...**

Final investment decisions for hydrogen projects have doubled over the last 12 months, dominated by China, but installed capacity and demand are low as the industry faces ...



### [The fast-growing hydrogen energy industry \(synopsis\)](#)

High-pressure gaseous hydrogen storage and low-temperature liquid hydrogen storage are already used commercially, while the technologies for organic liquid hydrogen storage and ...



### [Financing Battery Energy Storage Systems - Meeting ...](#)

Conclusion Battery energy storage systems represent a keystone for the transition towards a more sustainable energy generation and ...

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