

## Hydrogen energy storage japanese patent



## Overview

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Europe and Japan are leading the world in hydrogen patent filings, says a new report from the International Energy Agency and European Patents Office.

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Europe and Japan are leading the world in terms of patent filings related to hydrogen, according to a new report. Technologies related to producing hydrogen accounted for the largest number of hydrogen patents in 2011-2020. The automotive sector was the area of transport with the biggest jump in.

The European Patent Office (EPO) and the International Energy Agency (IEA) have released the latest data on patent focusing on the hydrogen technology development. Leader in global patenting in hydrogen is Japan has 24 percent share of all international patent families (IPFs) filed from 2011 to.

A renewable energy storage system which uses hydrogen as a storage medium. The system comprises a hydrogen generation module for producing hydrogen through electrolysis of water wherein the hydrogen generation module is powered by one or more renewable energy sources and a hydrogen storage module.

A liquid hydrogen storage system (10) includes: a hydrogen tank (12) that stores liquid hydrogen; a first channel (24) that communicates between the hydrogen tank (12) and outside of a vehicle; a reaction section (25) that causes hydrogen gas flowing through the first channel (24) to react with.

A liquid hydrogen storage system includes: a hydrogen tank that stores liquid hydrogen; a first channel that communicates between the hydrogen tank and outside of a vehicle; a reaction section that causes hydrogen gas flowing through the first channel to react with oxygen for conversion into water.

Innovation in hydrogen is shifting towards low-emission solutions, with Europe and Japan in the lead and the United States losing ground, according to a new

joint study of hydrogen technology patents by the European Patent Office (EPO) and the International Energy Agency (IEA). The report uses. How many patents are there in Green Hydrogen Energy?

Comprehensive analysis of 5,471 patents in the areas of green hydrogen energy from year 2002 to 2022. Classification of water electrolysis (ALK, PEM, AEM, SO, ALL) and system operation (BOP, CON). Natural Language Process (NLP) method for automatic parsing of the patent database.

What is the global patent trend of green hydrogen?

The global patent trend of green hydrogen by technology areas (or technology subtypes) during the recent 20 years has been presented. The technology type of the system operation showed a ratio of 53% as shown in Fig. 2 (a), while that of the water electrolysis has less than 50%.

Which technologies generate the most hydrogen patents?

Hydrogen production technologies accounted for the largest number of hydrogen patents overall in the 2011-2020 period, and the report finds that across all segments of the hydrogen value chain, low-emission innovations generated more than twice the number of international patents than established technologies.

How important are technology trend studies on patent analysis of hydrogen technology?

Technology trend studies on patent analyses of hydrogen technology are critical in understanding the status of present and future technology, as well as, its market opportunity. However, the studies were mostly limited to specific countries and lacked the details of green hydrogen production technology.

What is a hydrogen Innovation Report?

The report uses global patent data to provide a comprehensive, up-to-date analysis of innovation in hydrogen technologies. It is the first study of its kind and covers the full range of technologies, from hydrogen supply to storage, distribution and transformation, as well as end-use applications.

Are patents a technical barrier in green hydrogen technologies?

The network analysis was utilized to understand high-impact patents as a

technical barrier in green hydrogen technologies. A Python script was developed to identify forward and backward relations of a specific patent to others, which was cited by patents in the following years.

## Hydrogen energy storage japanese patent



### HYDROGEN RELEASE AND STORAGE SYSTEM, HYDROGEN

...

[0001] The present invention relates to a hydrogen release and storage system, a hydrogen release and storage method, an ammonia production apparatus, a gas turbine, a

...

### Japan's Hydrogen Revolution Attracts Global Players

Japan is transforming its energy landscape, positioning hydrogen technology as a key component in its strategy to meet its commitment to net-zero emissions by ...



### Hydrogen Based Renewable Energy Storage System

The system includes a hydrogen generation module for producing hydrogen through electrolysis of water, with the hydrogen generation module powered by one or more renewable energy ...



### Understanding innovation of new energy industry: Observing ...

Understanding innovation of new energy

industry: Observing development trend and evolution of hydrogen fuel cell based on patent mining

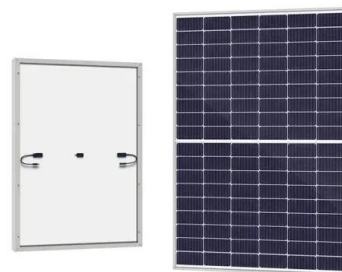


## Hydrogen patents shift towards clean technologies ...

The report uses global patent data to provide a comprehensive, up-to-date analysis of innovation in hydrogen technologies. It is the first study of its kind ...

## Hydrogen patents for a clean energy future: A global trend ...

This study by the EPO and IEA is the most comprehensive, global and up-to-date investigation of hydrogen-related patenting so far. It covers technologies for the full range ...



## Investigating diffusion and convergence trajectory of hydrogen ...

Japanese enterprises hold the majority of HST patent families, especially in hydrogen fuel cells, frequently involving high-pressure or liquid hydrogen tanks and hydrogen ...



## The Analysis of Innovation Network in China s Hydrogen

...

The hydrogen energy industry serve as the key develop-ment target for strategic emerging industries in China, its development is significant in adjusting the energy structure, promoting ...



## Japan leads in patent focusing on hydrogen ...

Among hydrogen's many potential end-use applications, the automotive sector has long been the focus for innovation, and patenting in this ...



## ESS



## Liquid hydrogen storage system

This application claims priority to Japanese Patent Application No. 2022-107581 filed on Jul. 4, 2022, which is incorporated herein by reference in its entirety including the specification,

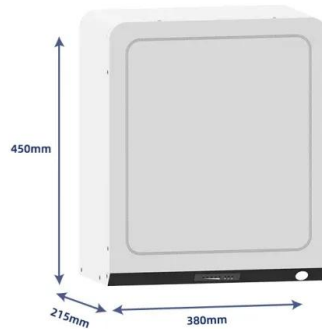


## Hydrogen station technology development review through patent ...

The development of technology was relatively slow in the following five years. However, since 2002, the number of patent applications for hydrogen station technologies has ...

## First Assembly of a Uranium-Based Rechargeable ...

This research was conducted by Assistant Principal Researcher Dr. Kazuki Ouchi, Researcher Dr. Katsuhiko Ueno, and Senior Principal ...



## Patent analysis on green hydrogen technology for future ...

The patent number KR 10-2012-7019134 shows a system for interconverting hydrogen and electrical energy, which includes a reversible conversion stage, a hydrogen ...

## Hydrogen patents for a clean energy future

On 10 January 2023, the European Patent Office (EPO) and the International Energy Agency (IEA) have published a joint study analysing the innovation along hydrogen ...



## Hydrogen energy utilization system

The hydrogen energy utilization system according to the present invention is a hydrogen generator in which a cartridge-type reaction vessel into which an alkaline aqueous solution is ...



## Hydrogen patents shift towards clean technologies ...

Innovation in hydrogen is shifting towards low-emission solutions, with Europe and Japan in the lead and the United States losing ground, according to a new ...



## Comparative patent analysis for the identification of global ...

Patent documents provide knowledge about which countries are investing in certain technologies and make it possible to identify potential innovation trends. The aim of this ...

## Patent analysis on green hydrogen technology for future ...

Abstract Technology trend studies on patent analyses of hydrogen technology are critical in understanding the status of present and future technology, as well as, its market ...



## Hazer Group Secures Key Patent in Japan for Hydrogen ...

Source:Hydrogen Fuel News Expanding Intellectual Property in a Strategic Market Hazer Group Ltd., an Australian-based clean-tech innovator, has achieved significant progress with the ...

## Hydrogen patents for a clean energy future

Combining the energy expertise of the IEA with the EPO's patent knowledge, it provides the most comprehensive and up-to-date global review of patenting trends in a broad range of ...



## Hydrogen based renewable energy storage system

[0059] The grid scale renewal energy storage and release system 10 can provide efficient and grid scale storage of energy for solar and wind energy using hydrogen and for the transport of

## Investigating diffusion and convergence trajectory of hydrogen storage

Safe and flexible hydrogen storage technology (HST) emerges as a crucial element in driving the industrialization of hydrogen energy. Consequently, HSTs are being ...



## Advancements in hydrogen storage technologies: Enhancing ...

The research aims to assess and progress hydrogen storage systems from 2010 to 2020 with an emphasis on obtaining high efficiency, safety, and capacity. To strengthen ...

## JP7062867B2

Using current technology, hydrogen storage has a lower volumetric energy storage density than hydrocarbon fuels. Therefore, hydrogen storage requires a much larger and heavier storage



## Research of Patents for Automotive Hydrogen Energy in China

Hydrogen fuel cell vehicle (FCV) technology is of great significance to energy security and environmental protection. With the rapid development of automotive hydrogen ...

## Japan's Hydrogen Revolution Attracts Global Players

Japan is transforming its energy landscape, positioning hydrogen technology as a key component in its strategy to meet its commitment to net-zero emissions by 2050. To achieve its ambitious ...



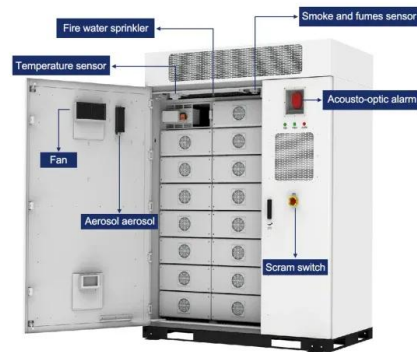
## Recent advances in hydrogen production, storage, and fuel cell

Abstract The future is bright for hydrogen as a clean, mobile energy source to replace petroleum products. This paper examines new and emerging technologies for ...

## Patent landscape review of hydrogen production methods:

...

Using the Derwent World Patents Index (DWPI), the study includes bibliometric analysis, technology evaluation, and technology updates in the field of hydrogen production. ...



## Hydrogen based renewable energy storage system

The system comprises a hydrogen generation module for producing hydrogen through electrolysis of water wherein the hydrogen generation module is powered by one or more renewable ...

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