

Solar water energy storage patent

Can water storage be combined with solar energy?

Coupling water storage with solar can successfully and cost effectively reduce the intermittency of solar energy for different applications. However the elaborate exploration of water storage mediums (including in the forms of steam or ice) specifically regarding solar storage has been overlooked.

What is a natural solar water based thermal storage system?

Natural solar water-based thermal storage systems While water tanks comprise a large portion of solar storage systems, the heat storage can also take place in non-artificial structures. Most of these natural storage containers are located underground. 4.1.

Are patents filed for energy storage technologies reflected in the data?

Patents filed for energy storage technologies - Our World in Data Figures in recent years are subject to a time lag; submitted patents may not yet be reflected in the data. Figures in recent years are subject to a time lag; submitted patents may not yet be reflected in the data. Our World in Data Articles by topic Latest About Donate All charts

Are water-based solar thermal storages suitable for industrial applications?

In a review conducted by Kocak et al. (2020), regarding sensible solar storages for industrial section, it mentioned that the usage of water-based solar thermal storages for low temperature industrial applications such as pasteurization, cleaning and pre-heating processes, lead to considerable declining in fuel cost and CO₂ emissions.

What is solar thermal storage (STS)?

Solar thermal storage (STS) stores accumulated solar energy, which is received by different types of solar collectors, for later use. They are majorly efficient in regard of providing energy to meet the peak energy demand.

Why should you combine solar applications with water-based storage?

Coupling solar applications with water-based storages is capable of revolutionizing the process of energy supplement due to their several advantages (high reliability, abundance, high efficiency, environmentally friendliness, etc.).

The first patented commercial solar energy water heater [2], was simply a combination of de Saussure's "solar box heater" [1] and a tank inside to hold the water. In their most basic form, the simple ICS water tanks first used in the USA were fully exposed to the elements and as a consequence wind movement across the aperture increased heat loss by ...

As solar energy is absorbed and converted to thermal energy by black body 520, the thermal energy is

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transferred through thermal transfer medium 532 to a thermal storage unit or used to do work, such as drive an engine or turbine, heat water, or for any other suitable use as would be understood by one having ordinary skill in the art.

Energy Technology Patents Data Explorer - Data tools. A data tool by the International Energy Agency. ... Carbon Capture, Utilisation and Storage; Decarbonisation Enablers; Explore all. Topics Energy and Water; Critical Minerals; Fossil Fuel Subsidies; Saving Energy; Global Energy Crisis; All topics. Countries .

On the agenda for COP29 is the Global Energy Storage and Grids Pledge - a pledge which targets a sixfold increase in global energy storage capacity to 1.5 TW by 2030. As reported by the Global Renewables Alliance, the pledge has gained traction, already winning support from multiple countries. This is just the start - the Long Duration Energy Storage Council envisages ...

A solar-powered refrigerator is disclosed. It uses a solar photovoltaic panel to convert solar energy to electricity to power a DC motor. The DC motor drives the compressor of a vapor-compression refrigeration system to freeze an energy-storage vessel, located in the freezer. The energy-storage vessel is filled with a mixture of glycerin, alcohol and water, with a freezing ...

But the Climax had a main issue: it did not resist winter frosts. From the beginning of the XXth century on, several patents were registered as people tried to improve solar water heaters, and the Climax quickly became obsolete, mostly after William J. Baily patented his own water-heater in ...

Annual patents filed for carbon capture and storage technologies; Annual patents filed for electric vehicle technologies; ... Solar energy generation vs. capacity; Solar power generation; The cost of 66 different technologies over time; The ...

Hydrogen energy storage Synthetic natural gas (SNG) Storage Solar fuel: Electrochemical energy storage (EcES) ... Schematic diagram of gravel-water thermal energy storage system. A mixture of gravel and water is placed in an underground storage tank, and heat exchange happens through pipelines built at different layers within the tank. ...

Solar energy is a renewable energy source that can be utilized for different applications in today's world. The effective use of solar energy requires a storage medium that can facilitate the storage of excess energy, and then supply this stored energy when it is needed. An effective method of storing thermal energy from solar is through the use of phase change ...

Solar water heating systems, or solar thermal systems, use energy from the sun to warm water for storage in a hot water cylinder or thermal store. Because the amount of available solar energy varies throughout the year, a solar water heating system won't provide 100% of the hot water required throughout the year.

ISES Solar World Congress 2003 Göteborg, Schweden, 14. - 19.06.2003 1 SEASONAL THERMAL

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Renewable energy technologies produce marketable energy by converting natural phenomena and sources of energy into useful forms of energy. These technologies use the sun's energy and its direct (solar radiation) and indirect effects on the earth (wind, falling water, and various plants, i.e., biomass), gravitational forces (tides), and the heat of the earth's ...

A. Ri watt 53-Gal Evac Tube Solar Water Heater (200 litres) Key Features: Evacuated tube collector technology for optimal heat absorption; Aesthetic design that complements home exteriors; High capacity for larger families or commercial use; Price: This best solar water heater (200 ltr) is around \$1,013.07; B. Ri watt 80 Gal Evac Tube Solar Water ...

A solar water heater is typically comprised of solar collectors which absorb solar energy, and a system to transfer the heat to the water. There are two main types of solar water heaters: passive systems, which rely on ...

Based on the detailed information of radical innovative patents, solar energy is mainly applied to water heating, air conditioning and mobile charging. The research related to heating water is mainly about the water tank material, solar pipeline and control unit, which are the core technologies to heat water.

Within the thermal storage sector, technology relating to heat storage in solar thermal power plants dominates the patent landscape. In these systems, holding tanks for heat transfer fluid ...

The residential sector is one of the most important energy-consuming districts and needs significant attention to reduce its energy utilization and related CO₂ emissions [1]. Water heating is an energy-consuming activity that is responsible for around 20 % of a home's energy utilization [2]. The main types of water heating systems applied in the buildings are conventional ...

The operation of the mixing valve 17 allows the water in the storage tank 10 to be raised substantially higher than a normal residential consumer water system thereby allowing the solar photovoltaic water heating system 1 to store more energy in the storage tank 10. The water storage tank 10 further includes a cover 25 for housing and ...

A system for heating water using solar energy comprises a photovoltaic array, a water heater comprising a variable resistive load, and a controller for varying either the load characteristics of the resistive load or the power generating characteristics of the photovoltaic array, or both, to ensure maximum power transfer efficiency.

AQUABATTERY is a sustainable long duration energy storage for solar, wind and other renewables



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generation. Discover our climate tech for decarbonisation and achieving net-zero power system. ... Increasing storage duration is as simple ...

The invention relates to a long-term heat storage device for long-term storage of solar energy and other types of energy, in the heat storage material of which a rock bulk material, in particular of volcanic origin, such as diabase, basalt, granite and gneiss, is used. ... 2015-06-11 Publication of US20150159959A1 publication Critical patent ...

Solar energy is a kind of low-density energy, especially in the winter time or overcast and rainy, solar water heater often can not provide the hot water of sufficient temp, at this moment need the mode of the auxiliary heating of electricity consumption to regulate, the solar water heater water tank of existing charged auxiliary heating all proposes in order to satisfy this purpose basically ...

These include solar water heating, which comprise thermosyphon, integrated collector storage, direct and indirect systems and air systems, space heating and cooling, which comprise, space heating ...

It is worth bearing these factors in mind as we take a look at trends in patenting in the renewable energy sector. Patents and renewable energy. The WIPO-administrated Patent Cooperation Treaty (PCT) is widely used by inventors seeking patents internationally. By filing a single PCT application, applicants can seek patent protection for an ...

When a solar water heating and hot-water central heating system are used together, solar heat will either be concentrated in a pre-heating tank that feeds into the tank heated by the central heating, or the solar heat exchanger will replace the lower heating element and the upper element will remain to provide for supplemental heat. However, the primary need for central heating is ...

As shown in Table 1, across all EST lists (EPO, 2019; USPTO, 2009; WIPO, 2010), we found that all forms of renewable energy generation either come directly or indirectly from thermal energy generated by the sun or deep inside the earth - this includes solar energy, wind energy, biomass energy, geothermal energy, nuclear energy, water energy, ocean ...

1. solar drinking-water machine, comprise glass heat-collecting vacuum tube (1), header A (2), tube connector (3), storage tank (4), controller (5), indicator lamp A (6), indicator lamp B (7), temperature sensor (8), with penstock (9), header B (10), it is characterized in that being provided with glass heat-collecting vacuum tube (1) between header A (2) and the header B (10), the ...

Solar, wind, water, and geothermal power all play growing roles in our electric infrastructure, just as hydrogen, hybrid, and biofuel technologies will continue to increase the efficiency of our transportation systems. ... Our portfolio shows some representative renewable energy patents that we have prosecuted. Renewable energy technologies ...



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