

Latest gravity energy storage patent list query

What is gravity energy storage technology?

Classification of energy storage technologies. Gravity energy storage technology (GES) depends on the vertical movement of a heavy object in a gravitational field to store or release electricity.

How many technical routes does solid gravity energy storage technology have?

Solid gravity energy storage technology has as many as eight technical routes. Although the technical routes are different, some essential features are the same. They can be summarized into two aspects: principle and equipment.

Why is solid gravity energy storage called SGES?

This is the reason why they are all called solid gravity energy storage. As for equipment, each technology route needs different equipment to achieve heavy lifting. However, it can be found that they all need motor-generation units and weight, which means that motor-generation units and weight are the critical equipment of SGES.

Can virtual devices improve solid gravity energy storage performance?

Therefore, improving these two virtual devices can improve solid gravity energy storage performance. The motor-generation unit is the energy conversion hub of solid gravity energy storage, which directly determines the cycle efficiency of solid gravity energy storage technology.

What is solid gravity energy storage?

They can be summarized into two aspects: principle and equipment. As for the principle, although each technological route lifts heavy objects in different ways (e.g., using ropes, carriers, or water currents), they all do so by lifting heavy objects to store electrical energy. This is the reason why they are all called solid gravity energy storage.

What is the cycle efficiency of solid gravity energy storage (SGES)?

The motor-generation unit is the energy conversion hub of solid gravity energy storage, which directly determines the cycle efficiency of solid gravity energy storage technology. The current efficiency of motor-generation units is about 90 %, so SGES's cycle efficiency is around 80 %.

where m_i is the mass of the i th object in kg, h_i is its height in m, and $g = 9.81 \text{ m/s}^2$ is the acceleration due to gravity. As of 2022, 90.3% of the world energy storage capacity is pumped hydro energy storage (PHES). [1] Although effective, a primary concern of PHES is the geographical constraint of water and longer term scalability.

An energy storage system and method that enables gravity-based energy storage to have a significantly larger

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capacity in a single shaft for given capital cost and thus an improved cost per unit energy for large scale energy storage as well as enabling continuity of power input and output at an external connection point across the extent of the system"s energy capacity comprises a ...

Gravity energy storage systems, using weights lifted and lowered by electric winches to store energy, have great potential to deliver valuable energy storage services to enable this transformation. The technology has inherently long life with no cyclic degradation of performance making it suitable to support grids into the future and has be ...

Invention defines a method and apparatus for storing energy where a power source is used to reposition a mass in a gravitational field to a position of higher potential energy where the stored potential energy may be recovered with extremely low loss regardless of the state of charge of the system, where the force of gravity may be allowed to accelerates the mass, where the ...

Discover how Green Gravity"s gravitational energy storage technology is changing the game in renewable energy storage. Mark Swinnerton, a former BHP executive, leads the way with innovative solutions. ... ENB"s latest Cost Report findings provide optimism as investments in oil and gas, as well as new energy rise. ENB Future of Energy Report 2023.

Gravity energy storage technology (GES) depends on the vertical movement of a heavy object in a gravitational field to store or release electricity. ... The number of SCI literature and public patents (search by the US, European, and Chinese patent databases) has increased in the past ten years, as shown in Fig. 3 (a). The result shows that the ...

The Gravity Field Energy Storage & Recovery System invention is a mechanical, electrical and electronic system that has the ability to harness any electrical or mechanical power source and allow it to do work to configure a mechanical system into a state of high potential energy, using either a high-mass object in a gravitational field or a ...

This patent application describes a "Device" entitled "Gravity Engine" that extracts energy from gravity and buoyancy and converts this into energy of another form, for example, Electrical energy. Devices using similar principles of operation described have potential to be scaled from very small to large scale electrical or other energy production to suit individual applications.

It is predicted that the penetration rate of gravity energy storage is expected to reach 5.5% in 2025, and the penetration rate of gravity energy storage is expected to reach 15% in 2030, and the market size of new gravity energy storage is expected to exceed 30 billion in the long run, and the market share is expected to increase significantly .

Gravitricity is an innovative gravity-based mechanical energy storage technology being developed by

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Gravitricity, an energy storage company based in Edinburgh, Scotland, UK. The novel energy storage system is based on the principle of raising and lowering a heavyweight to store and release electrical power.

The present invention provides novel designs and improved methods for the construction and operation of a gravity powered energy storage facility. This facility might also be called a gravity battery or a gravitational potential energy storage device. The device converts electricity into gravitational potential energy, and vice versa, by raising and lowering massive ...

It also revealed that the concrete foundations have been completed for the firm's first gravity storage project in the US, in Georgia with Enel Green Power. Energy Vault now provides a range of energy storage solutions including battery storage and green hydrogen and is forecasting for US\$325-425 million in revenues this year.

Our GraviStore underground gravity energy storage technology uses the force of gravity to offer some of the best characteristics of lithium batteries and pumped hydro storage. Hydrogen Storage Our H₂ FlexiStore underground hydrogen storage technology uses the geology of the earth to contain pressurised fuel gas, allowing safe, large-scale ...

Gravity energy storage systems have inherent advantages in that they typically have a long operating life with a minimal maintenance burden. They are also relatively simple and do not require hazardous or scarce materials. However, looking at the patent filing activity, it is clear that there are still technical problems to solve. In a previous Guest Blog for Energy ...

By repurposing disused mine shafts for energy storage, they can be used productively for up to 50 years beyond their original lifetime, thus mitigating decommissioning costs. Gravitricity says it has an expanding portfolio of intellectual property in underground energy storage including eight granted patents and a further two pending.

The energy a gravity-based storage system can store and discharge is a function of mass, gravity (which is constant) and the distance of the drop: this formula, Energy = mass x gravity x height, or $E = mgh$, will be familiar to ...

Major Energy Storage Breakthrough: Energy Vault has developed a gravity energy storage platform that is designed to be cost-efficient, reliable, safe to operate and environmentally sustainable in order to ... elements were incorporated into its latest design of a modular, flexible, higher power and compact product architecture, the new EVx ...

The concept is similar to other gravity energy storage technologies, but Swinnerton believes the use of old mine shafts, rather than purpose-built tall towers, will be his competitive advantage. "Green Gravity's energy storage technology represents a breakthrough in the search for economic long-duration storage of renewable energy," he said.

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2016-03-17 Publication of WO2016040746A1 publication Critical patent/WO2016040746A1/en Links. Espacenet; ... compared to other sources and methods of obtaining the hundreds of millions of pounds needed for cost-effective gravity-based energy storage. In still other embodiments, the mass is obtained within economically viable towing distances of ...

Country: USA | Funding: \$31.3M Quidnet Energy is developing an alternative approach to energy storage by storing water to deliver energy. This new form of sub-surface pumped hydro storage enables large-scale deployment of renewable energy and allows for predictable, dispatchable delivery of power from intermittent renewable energy resources such ...

Gravity energy storage (GES) is an innovative technology to store electricity as the potential energy of solid weights lifted against the Earth's gravity force. When surplus electricity is available, it is used to lift weights. ... (2020) Industrial System for Energy Storage, Energozapas LLC, Patent No. US10833533B2; 12/27/2018; 02/06/2020 ...

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