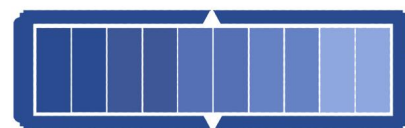


BOLETÍN DE VIGILANCIA TECNOLÓGICA E INTELIGENCIA COMPETITIVA

ALMACENAMIENTO DE ENERGÍA

SEPTIEMBRE - OCTUBRE 2020



BATTERYPLAT

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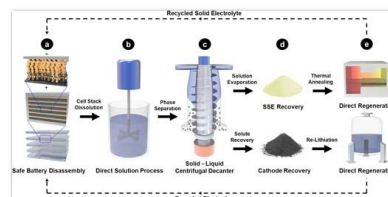
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NOTICIAS

Designing batteries for easier recycling could avert a looming e-waste crisis

Publicada en nanowerk, 27/10/2020.

Despite overwhelming enthusiasm for cheaper, more powerful and energy-dense batteries, manufacturers have paid comparatively little attention to making these essential devices more sustainable.

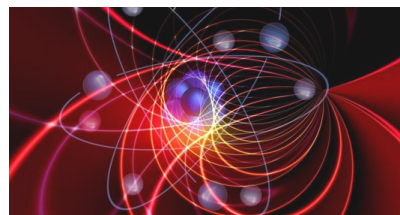


[ver más...](#)

Researchers create blueprint for 'quantum battery' that doesn't lose charge

Publicada en <https://phys.org/>, 25/10/2020.

Scientists from the universities of Alberta and Toronto developed a blueprint for a new quantum battery that doesn't leak charge. "A quantum battery is a tiny, nano-size battery meant to be used for applications on the nano scale," explained U of A chemist Gabriel Hanna, who was principal investigator on the study.

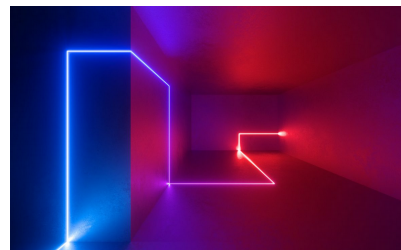


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Preparing for the age of energy storage

Publicada en <https://www.eba250.com>, 21/10/2020.

In this interview driven by Energy Storage News, Bo Normark, Industrial Strategy Executive at EIT InnoEnergy and one of the leaders of the EBA250 initiative, comments on the past, present and future of energy storage. He shares his view on the main areas in focus in energy storage – lithium-ion batteries, flow batteries, ultracapacitors and hydrogen, and illustrates the need for Europe to invest in the entire energy value chain.



[ver más...](#)

European Green Deal Call: €1 billion investment to boost the green and digital transition

Publicada en <https://trimis.ec.europa.eu/>, 23/09/2020.

The European Commission has decided to launch a €1 billion call for research and innovation projects that respond to the climate crisis and help protect Europe's unique ecosystems and biodiversity. The Horizon 2020-funded European Green Deal Call will spur Europe's recovery from the coronavirus crisis by turning green challenges into innovation opportunities.

[ver más...](#)

Innovative Batteries for eVehicles

Publicada en <https://ec.europa.eu/>, 15/09/2020.

The challenge is to develop a safe and sustainable battery for electric-vehicles through the development of new materials and chemistries making use of abundant, sustainable low cost materials, which are easily available in Europe.

[ver más...](#)

Stanford technology predicts the slow death of a lithium-ion battery

Publicada en <https://news.stanford.edu>, 14/09/2020.

A new model offers a way to predict the condition of a battery's internal systems in real-time with far more accuracy than existing tools. In electric cars, the technology could improve driving range estimates and prolong battery life. Batteries fade as they age, slowly losing power and storage capacity. Having more certainty around how much energy a battery can hold throughout its entire lifecycle makes it possible to use more of that capacity without damage. As in people, aging plays out differently from one battery to another, and it's next to impossible to measure or model all of the interacting mechanisms that contribute to decline.



[ver más...](#)

Recycling, end-of-life and safe transport of batteries under spotlight in US, EU initiatives

Publicada en Energy Storage news, 03/09/2020.

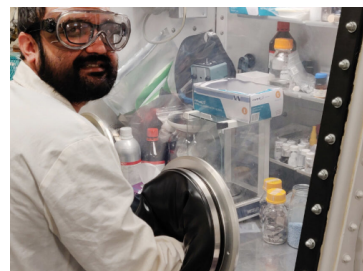
Guidelines for lithium-ion battery storage system decommissioning and recycling have been launched in the US by the national Energy Storage Association, while associations in European Union territories as well as the US have come together to launch an online information portal on the safe transportation.

[ver más...](#)

Crean baterías más ligeras y rápidas de cargar con un ánodo de partículas de silicio nanométricas

Publicada en <https://elperiodicodelaenergia.com>, 03/09/2020.

Durante mucho tiempo, los científicos han estado investigando el potencial del silicio en las baterías de ion-litio. El uso de este material como componente del ánodo, en lugar del grafito que se usa hoy en día, podría multiplicar por diez la capacidad de almacenamiento de estos dispositivos. Pero, para ello, es necesario resolver algunos problemas inherentes al silicio, ya que este no tiene la misma durabilidad que el grafito en un escenario tan exigente como es la batería de un vehículo eléctrico. Tiende a expandirse, contraerse y romperse en pedazos más pequeños a medida que se realizan los ciclos de carga y descarga.



[ver más...](#)

MUBIL, el centro de electromovilidad de Gipuzkoa, se presentó ayer en Tolosa

Publicada en <https://www.cidetec.es>, 03/09/2020.

CIDETEC ENERGY STORAGE gestionará el laboratorio avanzado de almacenamiento de energía, financiando parte del proyecto. Se trata de uno de los proyectos estratégicos del Gipuzkoa, que busca convertir a este centro en un polo de innovación y conocimiento ligado a la electromovilidad y colocar al territorio a la vanguardia industrial en movilidad eléctrica y almacenamiento de energía a nivel internacional.



[ver más...](#)

ALMAGRID

Publicada en <https://www.cidetec.es>, 01/09/2020.

La iniciativa ALMAGRID, reconocida por el CDTI como Red de Excelencia Cervera, se articula en torno a cuatro centros de investigación tecnológica con un alto grado de especialización y excelencia en el sector de la Energía. Estos centros son CIDETEC Energy Storage, que actúa como coordinador, Tekniker, ITE y Circ

ALMAGRID

Financiador

Número de expediente: CER-20191006 Convocatoria: Acreditación y concesión de ayudas destinadas a Centros Tecnológicos de Excelencia "Cervera"



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Free battery transport information now available on cross-industry platform BatteriesTransport.org

Publicada en <https://www.batteriestransport.org/>, 01/09/2020.

Brussels/Washington D.C., 1 September 2020 - The industry associations for batteries and battery-powered products RECHARGE, EPBA, EUROBAT, PRBA, EBRA, ACEA, LEVA-EU and MDBTC announced today the launch of a new information platform for the safe transportation, testing and packaging of battery cells, batteries, and vehicles and equipment containing batteries. With the aim of facilitating access to battery-specific transport information and raising awareness, the eight associations make available free and easy-to-understand content on the requirements as set out by the United Nations, the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and other transport regulations.

[ver más...](#)

Innovation in batteries and electricity storage – A global analysis based on patent data

Publicada en <https://www.epo.org>, 01/09/2020.

EPO's first joint study with the International Energy Agency underlines the key role that battery innovation is playing in the clean energy transition.



[ver más...](#)

EMPRESAS Y MERCADOS

Accelerated demand for today's key battery technologies will drive market growth needed for Green Deal achievements by 2030

Publicada en <https://www.eurobat.org>, 07/10/2020.

The European battery industry is currently undergoing a transformational process driven by the ambition to decarbonise our transport and energy systems. Motivated by the new strategic growth outlined in the European Green Deal, demand for batteries will grow rapidly in the coming years, making this market an increasingly strategic one at a global level.



[ver más...](#)

Anatomy of the New Supercapacitor Industry

Publicada en <https://www.idtechex.com>, 21/09/2020.

Surprises abound in the new IDTechEx Research report, "Supercapacitor Markets, Technology Roadmap, Opportunities 2021-2041". In 2010, there were no Chinese manufacturers in the top ten supercapacitor manufacturers. In 2020, 40% of them are Chinese. This has been achieved by world-class R&D, being in one of the largest markets globally, strong investment and government support including protective trading. However, China is not leading in capacitor-supercapacitor hybrids where the USA saw a \$7 million follow on order recently.



[ver más...](#)

Are Batteries the Trade War China's Already Won?

Publicada en <https://financialpost.com>, 16/09/2020.

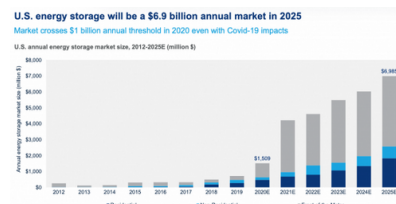
(Bloomberg) — Come next summer, at a lithium-ion battery factory in Endicott, N.Y., thousands of rechargeable cells should start rolling off a production line. Run by Imperium3 New York LLC, a consortium of small companies, it will be the only new production facility of its type to open in 2021 in the U.S., delivering batteries to clients in defense, transportation, and other industries.

[ver más...](#)

US just hit second highest quarterly energy storage deployments despite COVID effect

Publicada en Energy Storage news, 04/09/2020.

The US industry deployed 168MW / 288MWh of energy storage in the second quarter of this year, the second highest quarterly figures on record, according to Wood Mackenzie Power & Renewables. The market research and analysis firm has just issued its latest quarterly US Energy Storage Monitor, produced in cooperation with the national Energy Storage Association industry group.



[ver más...](#)

Huawei: Residential solar-plus-storage is starting point for new era of mainstream renewable energy

Publicada en Energy Storage news, 03/09/2020.

The head of the Smart PV division of Chinese technology giant Huawei has said that the high end residential energy storage market will be the company's entry point into a technology that helps integrate solar to the grid.



[ver más...](#)

UK energy storage investor Gresham House 'optimistic' despite COVID-19 impact on share price

Publicada en Energy Storage news, 03/09/2020.

One of two dedicated energy storage investment funds listed on the London Stock Exchange has seen its Net Asset Value (NAV) per share fall slightly as a result of COVID-19 but remains optimistic for its performance over the year.

[ver más...](#)

Portugal's 'record-low bid' solar auction will result in at least 100MWh of energy storage

Publicada en Energy Storage news, 02/09/2020.

Portugal's record-breaking solar auction "exceeded expectations", a top government official has told our sister site PV Tech, confirming that Spanish company Enerland was the company with the lowest bid. Secretary of state for energy João Galamba said it was "quite remarkable" that the lowest price was down on a previous record Portugal held for its first solar auction. The auction was the first of its kind in Portugal that invited companies to lodge bids with a storage component included, with eight of the 12 batches awarded to solar-plus-storage projects.

[ver más...](#)

Flywheel-lithium battery hybrid energy storage system joining Dutch grid services markets

Publicada en Energy Storage news, 02/09/2020.

A hybrid energy storage system combining lithium-ion batteries with mechanical energy storage in the form of flywheels has gone into operation in the Netherlands, from technology providers Leclanché and S4 Energy. Switzerland-headquartered battery and storage system provider Leclanché emailed Energy-Storage.news this week to announce that what began as a small-scale pilot of the twinned technologies has now gone to grid-scale and into commercial operation.



[ver más...](#)

First DC-coupled grid-scale battery storage system in UK begins construction from GE

Publicada en Energy Storage news, 01/09/2020.

The UK's first DC-coupled battery energy storage system is under development in a collaboration between GE Renewable Energy and engineering company Wykes. GE Renewable Energy was chosen by Wykes to deliver the 25MW multiple hour duration energy storage systems, which will be integrated with Wykes' 60MW solar PV plant at the Chelveston Renewable Energy Park.



[ver más...](#)

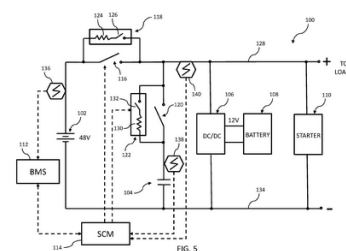
PATENTES

A battery-ultracapacitor hybrid energy storage system architecture for mild-hybrid power systems

Publicada en Tecnologías asociadas a baterías, supercondensadores, supercondensadores, acumuladores, 21/10/2020.

Solicitante: CUMMINS INC. [US]

A mild-hybrid energy storage system architecture is provided, comprising: a battery; an ultracapacitor connected in parallel with the battery; a passive battery pre-charge circuit connected between a terminal of the battery and a DC bus; a battery main contactor connected in parallel with the battery pre-charge circuit between the terminal of the battery and the DC bus.



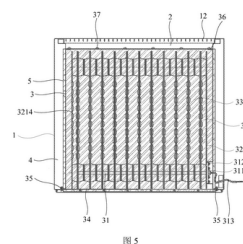
[ver más...](#)

Composite phase change energy storage material and phase change heat storage heating device

Publicada en Tecnologías asociadas a almacenamiento de energía, 21/10/2020.

Solicitante: ZHANG, Li [CN]

Provided are a composite phase change energy storage material and a phase change heat storage heating device. The phase change heat storage heating device comprises a housing (1), a heat dissipation assembly (2) and a heat storage unit located in the housing; the heat storage unit comprises a heat storage container (3), an electric heating element (31), a heat conduction assembly (32) and a phase change heat storage medium (33), wherein the electric heating element (31) and the heat conduction assembly (32) are both located at an inner part of the heat storage container (3), the heat conduction assembly (32) is immersed in the phase change heat storage medium (33), and the heat conduction assembly (32) and the electric heating element (31) have heat conduction.



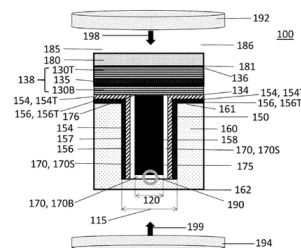
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Lithium energy storage

Publicada en Tecnologías asociadas a baterías, supercapacitores, supercondensadores, acumuladores, 21/10/2020.

Solicitante: IBM [US]

Making a rechargeable Lithium energy storage device begins by forming one or more trenches in a solid silicon substrate. One or more region interface precursors are deposited in the trench followed by one or more anode materials, one or more solid polymer electrolytes (SPE), and one or more cathode materials. Electrically cycling transforms the battery structures prior to full operation of the battery. Some, or all, of the process steps can be performed while the materials are within the trench, i.e. in-situ.



[ver más...](#)

Method for accurately measuring reopening pressure of hydraulic fracturing induced fracture in deep borehole

Publicada en Tecnologías asociadas a almacenamiento de energía, 21/10/2020.

Solicitante: Institute of Geomechanics, Chinese Academy of Geological Sciences [CN]

The present disclosure relates to the technical field of rock mechanics, and in particular to a method for accurately measuring a reopening pressure of hydraulic fracturing induced fracture in a deep borehole. The method includes: pumping a fluid into a sealed inner space of a drilling pipe for energy storage; and opening a valve at a lower end of the drilling pipe such that energy is released from the fluid in the inner space of the drilling pipe under the action of pressure to inject the fluid into a test interval.

[ver más...](#)

Two phase exothermic quenching

Publicada en Tecnologías asociadas a baterías, supercondensadores, supercondensadores, acumuladores, 21/10/2020.

Solicitante: THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY OF THE NAVY [US]

A method of cooling a battery cell includes: atomizing a cooling fluid by driving it through a micro-nozzle at a pressure sufficient to create a jet of aerosolized liquid droplets while retaining sufficient momentum in flow of the fluid to travel from the nozzle to an outer surface of the battery cell; impinging the spray of the jet of aerosolized liquid droplets on an outer surface of the battery cell; partially evaporating the liquid droplets on the outer surface to conduct heat from the outer surface; and convecting heat from the outer surface of the battery via the cooling fluid.

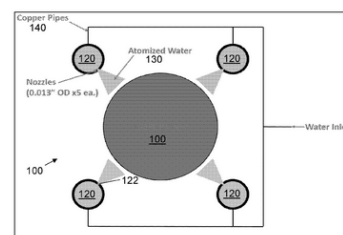


FIG. 1

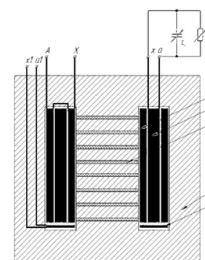
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Arc-quenching earthing reactor with non-magnetic gaps rdmk, rdsd with capacitor control

Publicada en Tecnologías asociadas a consumo y reciclaje de energía, 14/10/2020.

Oficina: Federación de Rusia

Invention relates to electrical engineering, to power equipment for compensation of capacitance currents of earth fault in medium voltage electrical grids. Arc-quenching earthing reactor with capacitor control of working current includes windings located on rods of rod or armored rod magnetic conductor with non-magnetic gaps. It is equipped with controlled load elements C_n and R_n , connected in parallel and connected to secondary winding of reactor. Its primary winding is connected to neutral of electrical grid, and secondary winding is installed between parts of primary winding.



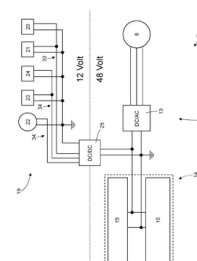
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Electric system of a road vehicle provided with a dc-dc electronic power converter

Publicada en Tecnologías asociadas a almacenamiento de energía, 14/10/2020.

Solicitante: FERRARI S.p.A

An electric system of a road vehicle; the electric system has: a high-voltage electric circuit provided with a first storage system; a low-voltage electric circuit provided with a plurality of electrical loads; and a DC-DC electronic power converter, which connects the low-voltage electric circuit and the high-voltage electric circuit to one another. The DC-DC electronic power converter has: a high-voltage input; a low-voltage output; a conversion device; a control unit, which controls the conversion device; and a second storage system connected to the low-voltage output.



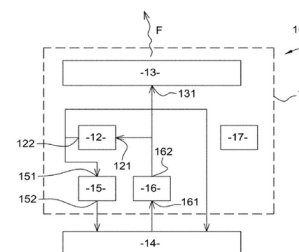
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Heating apparatus comprising a battery and a power inverter for introducing energy from the battery to the electric supply device

Publicada en Tecnologías asociadas a almacenamiento de energía, 14/10/2020.

Solicitante: LANCEY ENERGY STORAGE

A heating apparatus including a storage device and at least one heater member. The heater member can be connected to the storage device and an electric power supply source. An inverter is connected to the output of the storage device and the electrical supply source. First switching elements are used to vary the first connection elements between an open circuit configuration and a closed circuit configuration in which electrical energy stored in the storage device is injected into the electrical supply source via the inverter.



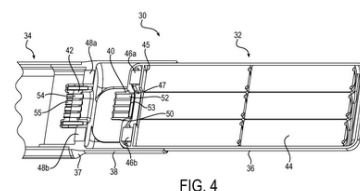
[ver más...](#)

Magnetically coupled power system for a powered mobility assistance device including fast swap battery

Publicada en Tecnologías asociadas a baterías para transporte, 14/10/2020.

Solicitante: PARKER-HANNIFIN CORPORATION [US]

A power system includes a battery assembly that has at least one battery cell for providing power; a battery receiver that removably receives the battery assembly; and a plurality of first connecting elements that are located in the battery assembly and a corresponding plurality of second connecting elements that are located in the battery receiver, wherein an attractive magnetic force between the plurality of first and second connecting elements aids in maintaining a physical connection between the battery assembly within the battery receiver. In addition, a connection between a pair of a first connecting element and a corresponding second connecting element further constitutes an electrical connection between the battery assembly and the battery receiver.



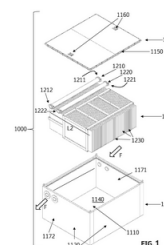
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Thermal energy storage systems

Publicada en Tecnologías asociadas a almacenamiento de energía, 14/10/2020.

Solicitante: PHASE CHANGE ENERGY SOLUTIONS, INC. [US]

In one aspect, thermal energy storage systems are described herein. In some embodiments, such a system comprises a container, a heat exchanger disposed within the container, and a phase change material (PCM) disposed within the container. The heat exchanger comprises an inlet pipe, an outlet pipe; and a number n of plates in fluid communication with the inlet pipe and the outlet pipe, wherein n is at least 2.

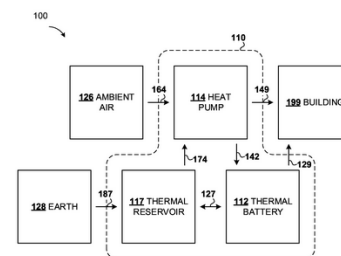


Thermal storage system with coupled tanks

Publicada en Tecnologías asociadas a almacenamiento de energía, 14/10/2020.

Solicitante: UT-BATTELLE, LLC [US]

Methods and apparatus are disclosed for high-efficiency thermal storage with a fluid-filled "battery" tank positioned within a fluid-filled "reservoir" tank. Fluid loops couple the tanks to a heat pump and a building. The heat pump can charge the battery tank or deliver thermal energy (cold or heat) to a building, using the reservoir tank or ambient air as a thermal energy source. The battery tank can discharge energy to the building jointly with the heat pump or, at periods of peak electricity usage, with the heat pump switched off. Operating modes allow significant savings in electricity usage and mitigate the "duck curve." Low duty cycle usage of the reservoir enables efficient underground thermal storage with less digging than conventional geothermal technologies. Additional efficiency is achieved with phase change materials installed inside a tank or in a tank wall, providing temperature regulation. Control methods are disclosed.



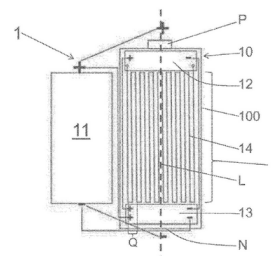
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Wirelessly rechargeable energy store

Publicada en Tecnologías asociadas a almacenamiento de energía, 14/10/2020.

Solicitante: Tecflower AG

A wirelessly rechargeable energy store includes a housing, having a casing wall, in which a converter, a storage core, charging electronics and an antenna structure are arranged along a longitudinal axis. The energy store, independently of the relative alignment of antenna structures used with respect to the acting field direction, achieves an increased recharging efficiency and, because of its housing configuration, is diversely usable as a replacement for batteries and battery packs in small electrical devices. The antenna structure comprises at least two induction loops—shaped from an electrically conductive wire—formed as flat coils, which are arranged in a partly overlapping manner on a flexible printed circuit board.



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Novel phase change material and methods of use

Publicada en Tecnologías asociadas a almacenamiento de energía, 07/10/2020.

Solicitante: MONASH UNIVERSITY

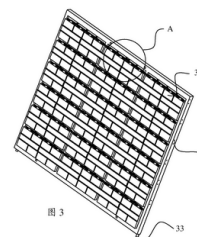
The invention relates to a phase change material including one or more salts of low vapour pressure and low flammability and an energy storage system, method and device comprising the phase change material.

[ver más...](#)

Power storage module and electric water heater

Publicada en Tecnologías asociadas a almacenamiento de energía, 07/10/2020.

Solicitante: QINGDAO ECONOMIC AND TECHNOLOGICAL DEVELOPMENT ZONE HAIER WATER HEATER CO., LTD. [CN]
A power storage module (3) and an electric water heater, the power storage module (3) comprising: several storage batteries (31), the storage batteries (31) being used for storing electrical energy; and a heat dissipation rack (32), the heat dissipation rack (32) being used for installing the storage batteries (31) and being used for dissipating heat released by the storage batteries (31); the storage batteries (31) are in thermal conduction connection with the heat dissipation rack (32).

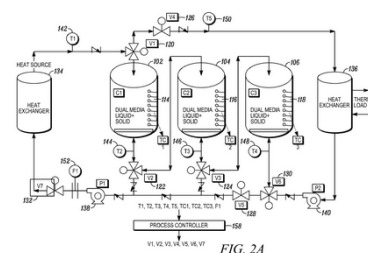


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Thermocline thermal energy storage in multiple tanks

Publicada en Tecnologías asociadas a almacenamiento de energía, 07/10/2020.

Solicitante: TERRAFORE TECHNOLOGIES, LLC [US]
A method of optimizing thermocline zone within a thermal storage system including a plurality of storage tanks fluidly coupled to one another in series, to effectively form a single tank having an equivalent height of the combined height of the plurality of storage tanks.



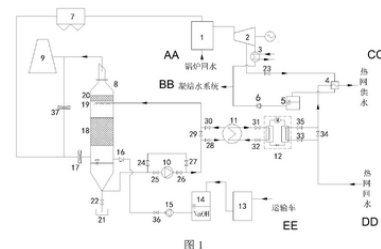
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Energy-saving system for adopting electric heat pump to deeply recycle smoke waste heat of thermal power plant for centralized heating

Publicada en Tecnologías asociadas a consumo y reciclaje de energía, 30/09/2020.

Solicitante: DALIAN UNIVERSITY OF TECHNOLOGY [CN]

An energy-saving system for adopting an electric heat pump to deeply recycle smoke waste heat of a thermal power plant for centralized heating, comprising a coal-fired boiler (1), a steam turbine (2), a condenser (3), a heating network heater (4), a condensate tank (5), a condensate delivery pump (6), a dust collector (7), a flue gas waste heat recovery tower (8), a chimney (9), a waste heat recovery circulating water pump (10), an anti-corrosion and efficient water-water plate heat exchanger (11), an electric heat pump (12), a NaOH storage tank (13), a NaOH preparation device (14), a NaOH solution pump (15), a check valve (16), a flue gas inlet valve (17), a condensate collection tank (21), a flue gas bypass pipeline valve (37) and multiple valves and connecting pipelines.



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Electrokinetic power harvesting from wet textile

Publicada en Tecnologías asociadas a consumo y reciclaje de energía, 03/09/2020.

Solicitante: INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR [IN]

The subject invention particularly lies in a device for harvesting electrokinetic power using wet fabric-based channel (FC) to transport electrolyte solution through the micro and nanopores of the fibres utilising the surface energy, an intrinsic property of the device. A device for harvesting electrokinetic power using Fabric based channel prepared from a piece of commercial grade fibre cloth has been disclosed. The said device comprises of Fabric based channel preferably made of cotton fibre, copper electrodes (4) suitably positioned on the piece of cotton having three segments of root (1), stem (2) and leaf (3) and inserted in the 1 mM NaCl solution electrolyte. An arrangement of said devices connected in series, parallel or series-parallel combination mode is also disclosed.

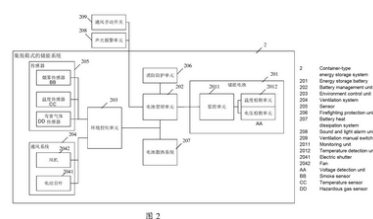
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Container-type energy storage system and environment control method therefor

Publicada en Tecnologías asociadas a baterías, supercapacitadores, supercondensadores, acumuladores, 02/09/2020.

Solicitante: CONTEMPORARY AMPEREX TECHNOLOGY CO., LIMITED [CN]

Disclosed in the present application are a container-type energy storage system and an environment control method therefor. The energy storage system comprises an energy storage battery 201, a battery management unit 202, an environment control unit 203, a ventilation system 204, and several sensors 205; the battery management unit 202 is connected to the energy storage battery 201 and the environment control unit 203 respectively, and the ventilation system 204 is connected to the environment control unit 203



[ver más...](#)

Energy storage and alternating current power combiners

Publicada en Tecnologías asociadas a almacenamiento de energía, 02/09/2020.

Solicitante: HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P. [US]

A first alternating current (AC) power may be changed into a direct current (DC) power and stored in an energy storage as stored power. The stored power may be converted into a second AC power and combined with the first AC power.

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Energy storage system and insulation detection method therefor

Publicada en Tecnologías asociadas a baterías, supercapacitadores, supercondensadores, acumuladores, 02/09/2020.

Solicitante: CONTEMPORARY AMPEREX TECHNOLOGY CO., LIMITED [CN]

An energy storage system and an insulation detection method therefor. The insulation detection method comprises: closing a main positive relay and a main negative relay in a high-voltage safety box (222) of each electric cabinet (22) in an energy storage system (2); controlling an insulation detection board (212) to perform insulation detection on the energy storage system (2) at a total power management system (211) side, and reporting the result of insulation detection to a power conversion system (23); if the result of insulation detection at the total power management system (211) side indicates that there is no fault, and an insulation detection start instruction of the power conversion system (23) has not been received, controlling the insulation detection board (212) to continue performing performing insulation detection on the energy storage system (2) at the total power management system (211) side

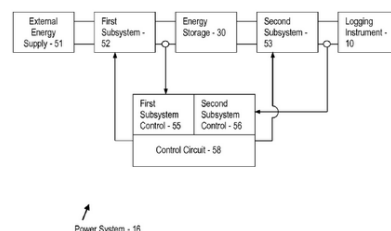
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Power system for high temperature applications with rechargeable energy storage

Publicada en Tecnologías asociadas a almacenamiento de energía, 02/09/2020.

Solicitante: FASTCAP SYSTEMS CORPORATION

A power system adapted for supplying power in a high temperature environment is disclosed. The power system includes a rechargeable energy storage that is operable in a temperature range of between about seventy degrees Celsius and about two hundred and fifty degrees Celsius coupled to a circuit for at least one of supplying power from the energy storage and charging the energy storage



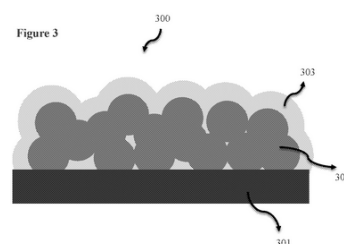
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Solution-phase deposition of thin films on conversion anodes in lithium-ion batteries

Publicada en Tecnologías asociadas a baterías, supercapacitadores, supercondensadores, acumuladores, 02/09/2020.

Solicitante: CORESHELL TECHNOLOGIES, INC. [US]

Methods, systems, and compositions for the solution-phase deposition of thin films that form artificial SEIs on conversion anodes in lithium-ion batteries. In certain aspects, the solution-phase deposition methods comprise sequentially processing a lithium-ion conversion anode with multiple liquid reagents to form a monolayer or stacks of monolayers forming the thin film coating. The conversion anodes produced by the methods and systems described herein have a surface coating that is electrically insulating, consumes little to no lithium, is permeable to lithium transport, is impermeable to electrolyte and is mechanically robust against volumetric expansion.



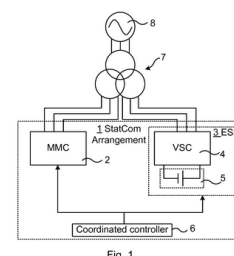
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Statcom arrangement comprising energy storage

Publicada en Tecnologías asociadas a almacenamiento de energía, 02/09/2020.

Solicitante: ABB POWER GRIDS SWITZERLAND AG [CH]

The present disclosure relates to a StatCom arrangement (1). The StatCom arrangement comprises a Modular Multilevel Chain-Link Converter (MMC) (2) arranged to be connected to a high-voltage AC power grid (8) and act as a Static Synchronous Compensator (StatCom). The StatCom arrangement also comprises an Energy Storage System (ESS) (3) comprising a Voltage-Source Converter (VSC) (4) and an energy storage (ES) (5), and arranged to connect the ES to the power grid via the VSC. The StatCom arrangement also comprises a coordinated controller (6) configured to control both the MMC and the ESS based on the same reference.



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Storage battery monitoring device and storage battery monitoring method

Publicada en Tecnologías asociadas a baterías, supercapacitadores, supercondensadores, acumuladores, 02/09/2020.

Solicitante: GS YUASA INTERNATIONAL LTD. [JP]

Provided is a storage battery monitoring technology using wireless communication. A storage battery monitoring device according to an aspect of the present invention comprises: a plurality of monitoring units attached to a plurality of storage batteries connected in series and/or in parallel; and a management unit capable of wireless communication connection with the plurality of monitoring units, wherein communication between the management unit and a specific monitoring unit is established by using identification information of the specific monitoring unit, which is included in a message broadcast from the management unit to the plurality of monitoring units.

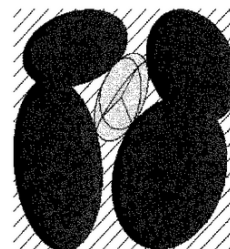
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Systems and reactors for storage of electrical energy

Publicada en Tecnologías asociadas a almacenamiento de energía, 02/09/2020.

Solicitante: ETH ZURICH [CH]

The present invention relates to energy storage systems and reactors useful in such systems. Inventive reactors comprise a reaction vessel defining an inner volume and a compensation element, whereby said inner volume is filled with a fixed bed that is free of cavities and that comprises particles of formula (I), FeO_x (I), where $0 < x < 1.5$; said compensation element is adapted to adjust said inner volume. The reactors are inherently explosion proof and thus suited for domestic use. The systems are useful for compensating long-term fluctuations observed in production of renewable energy.



[ver más...](#)

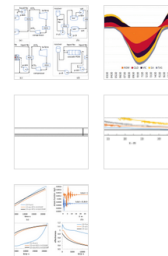
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Assessment of exergy delivery of thermal energy storage systems for CSP plants: Cascade PCMs, graphite-PCMs and two-tank sensible heat storage systems

Publicada en Sustainable Energy Technologies and Assessments, 27/10/2020.

Publication date: December 2020 Source: Sustainable Energy Technologies and Assessments, Volume 42 Author(s): Soheila Riahi, Ming Liu, Rhys Jacob, Martin Belusko, Frank Bruno.

Alternative cascade systems comprising of three, four, and five PCMs, PCM-graphite-PCM and a graphite system were compared with two-tank sensible heat storage systems. Numerical methods including an in-house code and Fluent were used to predict the transient heat transfer during the charging and discharging processes up to 6 h and 10 h, respectively.



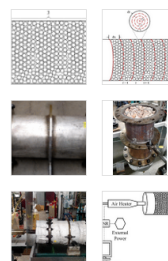
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A novel dynamic simulation methodology for high temperature packed-bed thermal energy storage with experimental validation

Publicada en Sustainable Energy Technologies and Assessments, 27/10/2020.

Publication date: December 2020 Source: Sustainable Energy Technologies and Assessments, Volume 42 Author(s): Jacob F. Tuttle, Nate White, Kasra Mohammadi, Kody Powell

Packed-bed thermal energy storage (TES) is a cost-effective storage option for high temperature applications. This study aims to accurately model the behavior of a packed-bed TES system during transient operation while maintaining low computation time.



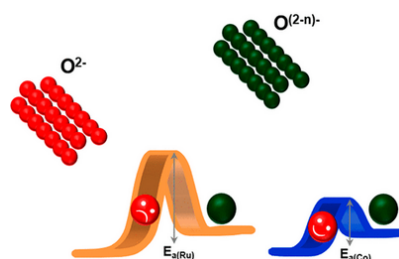
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Enabling Facile Anionic Kinetics through Cationic Redox Mediator in Li-Rich Layered Cathodes

Publicada en ACS Energy Letters, 22/10/2020.

ACS Energy Letters DOI: 10.1021/acsenenergylett.0c01880

Anionic oxygen redox has aroused great interest in developing high-capacity Li-ion battery cathode materials. The fundamental understanding of this concept, compared to cationic redox, has promoted extensive studies on lithium transition metal oxides including those of 4d and 5d transition metals. Lithium ruthenium oxide has been found to exhibit a reversible anionic redox upon cycling.



[ver más...](#)

Crystallization properties of melt-quenched Ge-rich GeSbTe thin films for phase change memory applications

Publicada en AIP Scitation, 15/10/2020.

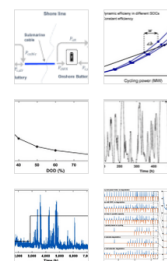
Journal of Applied Physics, Volume 128, Issue 15, October 2020. The crystallization process of melt quenched Ge-rich GeSbTe films, with composition optimized for memory applications, has been studied by optical reflectance measurements. The optical properties have been related to the structure and composition by means of the effective medium approximation. The compositional variations have been investigated by transmission electron microscopy and electron energy loss spectroscopy. Amorphous materials prepared by melt-quenching with different laser energy densities have been studied. For the energy density of 1.5J cm², a uniform amorphous layer, with embedded Ge crystalline grains, is obtained. The film exhibits a crystallization temperature of 275°C and no relevant phase separation during crystallization. For a lower energy density of 1J cm², only half of the film thickness is quenched to the amorphous phase, with Ge depletion. The crystallization temperature of the Ge depleted film is 245°C, and a partial phase separation occurs.

[ver más...](#)

Estimating revenues from offshore wind-storage systems: The importance of advanced battery models

Publicada en <https://www.sciencedirect.com>, 15/10/2020.

We investigate six different lithium-ion battery modeling approaches to highlight the importance of accurately representing batteries in decision tools. Advanced mixed-integer-linear battery models account for efficiencies as a function of the discharge power, power-limits as a function of the state-of-charge, along with degradation, which are usually not accounted for in power systems models.



[ver más...](#)

Review on recent progress in patterning phase change materials

Publicada en AIP Scitation, 23/09/2020.

Journal of Vacuum Science & Technology A, Volume 38, Issue 6, December 2020. This review discusses critical aspects of patterning phase change materials (PCMs), including dry etching, wet clean, and encapsulation, as they dictate the reliability and functionality of the phase change random access memory devices. Specifically, alloys of germanium–antimony–tellurium are used as a model system, and the importance of PCM composition control, critical dimension control, high fidelity pattern transfer, and a system level of ambient control to avoid oxidation that can alter the materials' functionality are highlighted. The research findings motivate the development of a state-of-the-art integrated system that combines dry etch, wet clean, and encapsulation into one platform to realize consistent and successful patterning of PCMs for future generations of the memory devices.

[ver más...](#)

Reversible triplet energy hopping in photo-excited molecules: A two-site model for the spin polarization

Publicada en AIP Scitation, 04/09/2020.

The Journal of Chemical Physics, Volume 153, Issue 9, September 2020. The effect of reversible energy hopping between different local environments on the properties of spin-polarized excited states is investigated theoretically using a two-site model. The kinetic equations for the populations of the spin sublevels of the excited state are derived and then used to obtain analytical expressions for the evolution of the spin polarization of excited triplet states under specific conditions. The time dependence of the triplet state polarization patterns is also obtained by numerical solution of the kinetic equations. It is shown that the reversible energy hopping can lead to significant changes in the properties of the triplet state, including changes in the shape of the observed spectrum and, in some cases, the inversion of the sign of the polarization, the generation of the net polarization, and anisotropic spin-lattice relaxation. The relations between the parameters that can be observed experimentally by time-resolved electron paramagnetic resonance spectroscopy and the kinetic and dynamic parameters of the system are discussed.

[ver más...](#)

Phase change material (PCM) with shaped stabilized method for thermal energy storage: A review

Publicada en AIP Scitation, 03/09/2020.

AIP Conference Proceedings, Volume 2255, Issue 1, September 2020. Utilization of thermal energy storage (TES) is a solution that can be used to overcome the problem of increasing levels of energy consumption. TES is a technology to improve energy efficiency by using effective heat sources that utilize latent heat and sensible heat. Phase Change Material (PCM) is a TES material that is capable of storing large amounts of heat by using small volumes. But as a TES, PCM still has weaknesses such as low thermal conductivity and leakage during the phase change process. The solution to overcome this problem is with the Shape Stabilized Phase Change Material (SSPCM) consists of PCM and supporting materials. Based on various methods of SSPCM it is known that vacuum impregnation is a method that is capable of producing stable PCM by removing gas and moisture in the pores and then injecting PCM into its supporting material. The results obtained by treating vacuum impregnation for shape stabilized on PCM can increase the value of thermal conductivity and prevent leakage. This shows that the shape stabilized method is a very important process to produce PCM that is ready to be applied with optimal and stable characteristics.

[ver más...](#)

Numerical simulations of latent heat thermal energy storage utilizing double inclined fin

Publicada en AIP Scitation, 03/09/2020.

AIP Conference Proceedings, Volume 2255, Issue 1, September 2020. In this study, melting characteristics of a Latent Heat Thermal Energy Storage (LHTES) system with Phase Change Material (PCM) utilizing double inclined fin was numerically investigated in order to guide the design of such systems for energy storage. This configuration was compared with other fin designs with varying inclination in terms of phase change front movement, flow patterns, time history of liquid fraction, and heat transfer enhancement relative to the finless design. The study was based on Computational Fluid Dynamics (CFD) simulations of conductive and convective heat transfers during the melting (energy storing) stage, with solid-liquid phase change sub-model based on enthalpy-porosity approach. Conjugate heat transfer approach, resolving solid tube and fin thickness, was also employed. The negatively inclined double fin of -20° was found to have the maximum heat transfer rate and minimum melting time, followed very closely by the oppositely inclined double fin of 20° and -20° . These models can therefore be considered favorable from the viewpoint of energy storing.

[ver más...](#)

Review of electrical contacts to phase change materials and an unexpected trend between metal work function and contact resistance to germanium telluride

Publicada en AIP Scitation, 01/09/2020.

Journal of Vacuum Science & Technology A, Volume 38, Issue 5, September 2020. Devices based on the unique phase transitions of phase change materials (PCMs) like GeTe and Ge₂Sb₂Te₅ (GST) require low-resistance and thermally stable Ohmic contacts. This work reviews the literature on electrical contacts to GeTe, GST, GeCu₂Te₃ (GCuT), and Ge₂Cr₂Te₆ (GCrT), especially GeTe due to the greater number of studies. We briefly review how the method used to measure the contact resistance (R_c) and specific contact resistance (c) can influence the values extracted, since measurements of low contact resistances are susceptible to artifacts, and we include a direct comparison of Au-, Pt-, Ni-, Mo-, Cr-, Sn-, and Ti-based contacts using a systematic approach. Premetallization surface treatment of GeTe, using ex situ or in situ approaches, is critical for minimizing contact resistance (R_c).

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