

# BOLETÍN DE VIGILANCIA TECNOLÓGICA E INTELIGENCIA COMPETITIVA

## ALMACENAMIENTO DE ENERGÍA

MAYO - JUNIO 2023



**BATTERYPLAT**

# ÍNDICE

## NOTICIAS

1. Li-ion BESS costs could fall 47% by 2030, NREL says in long-term forecast u... 2
2. To make electric vehicle batteries, China must be involved 2
3. New battery storage capacity to surpass 400 GWh per year by 2030 – 10 times... 3
4. Is It a Lake, or a Battery? A New Kind of Hydropower Is Spreading Fast. 3
5. Eight hour big battery trumps pumped hydro in NSW long duration storage te... 4

## EMPRESAS Y MERCADOS

6. Revolutionizing shared mobility: bafang's auto-shift shaft drive system 5
7. Thermal storage company Rondo plans 90GWh ramp up of 'Heat Battery' gigafac... 5
8. Chinese company unveils revolutionary new 'sodium-ion' battery that could r... 6
9. USABC Awards \$2.6 Million Lithium Electrode-Based Cell Development Contract... 6
10. Stellantis Inks Development Deal With Lithium-Sulfur Battery Maker 7
11. Fagor Ederlan y MONDRAGON invierten en EEVAM: startup de tecnología para ve... 7
12. Finnish start-up Vensum raises €3.8 million to develop software-controlled ... 8
13. CATL Launches World's First Solar-Plus-Storage Solution with Zero Auxiliary... 8
14. Brenmiller Inaugurates World's First-Ever Gigafactory for Thermal Energy St... 9

## PATENTES

15. Semiconductor based material for battery health and performance assessment ... 10
16. A method for manufacturing an energy storage cell 10
17. Apparatus For Depassivation Of Lithium-Ion Batteries 11
18. Balancing method of a switchable battery device by short-circuiting of its ... 11
19. Cryogenic fluid storage unit 12
20. Electrolyte Solution for Lithium Secondary Battery and Lithium Secondary Ba... 12
21. Energy storage power source using a wound-rotor induction machine (wrim) to... 13
22. Hollow disc rotor for flywheel power storage device and method for manufact... 13
23. Hybrid dc chained energy storage converter and control method thereof 14
24. Induction energy transmission system 14

# ÍNDICE

25. Method and apparatus for quantitative analysis of battery performance, and ...	15
26. Method for exchanging energy, processing unit and vehicle	15
27. Methods For Material Activation With Thermal Energy Storage System	16
28. Methods for production line electricity management based on an industrial i...	16
29. Micro-power wind-light hybrid energy-harvesting power generation apparatus ...	17
30. Phase change polysaccharide-based bio-complexes with tunable thermophysical...	17
31. Printed energy storage device	18
32. Reconfigurable architecture for stationary energy storage system	18
33. Shape stable reprocessable hybrid organic-inorganic compositions for storin...	19
34. Switch control device, current control device, power storage device, power ...	19
35. System for dynamic management and control of lithium battery energy storage...	20
36. Systems and methods for discharging energy storage devices	20
37. Technique Using a Battery Charger and Battery Management System to Detect C...	21
38. Thermal energy storage and power generation system	21
39. Thermoelectrically actuated phase change thermal energy storage (tes) modul...	22
40. Two-phase thermal pump	22
41. Wind turbine thermal energy storage system	23
42. Advanced battery management system (bms) for charge equalization of serial...	23
43. Battery management system, battery pack, energy storage system, and battery...	24
44. High-rate battery system	24
45. Method for preparing a thermal storage system and associated device	25
46. Electrical energy storage device with terminal temperature control and a ga...	25
47. System and method for thermal management of motion sensitive systems	26
48. Transformer for a watercraft, energy distribution system for a watercraft, ...	26

## PUBLICACIONES CIENTÍFICAS

49. Overview Analysis of Recent Developments on Self-Driving Electric Vehicles	27
50. Numerical Simulation of Thermal Energy Storage using Phase Change Material	27
51. Collaborative Optimization of Multi-microgrids System with Shared Energy St...	28
52. Convective meta-thermal concentration for ultrahigh efficient Stirling engi...	28

# ÍNDICE

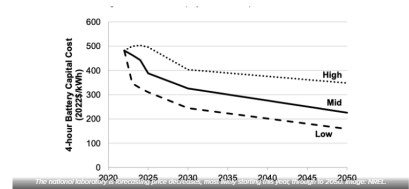
53. Electronic paddle-wheels in a solid-state electrolyte	29
54. Energy storage properties of ferroelectric nanocomposites	29
55. Generic Air-Gen Effect in Nanoporous Materials for Sustainable Energy Harve...	30

# NOTICIAS

## Li-ion BESS costs could fall 47% by 2030, NREL says in long-term forecast update

Publicada en <https://www.energy-storage.news>, 20/06/2023.

The US National Renewable Energy Laboratory (NREL) has updated its long-term lithium-ion battery energy storage system (BESS) costs through to 2050, with costs potentially halving over this decade. The national laboratory provided the analysis in its 'Cost Projections for Utility-Scale Battery Storage: 2023 Update', which forecasts how BESS capex costs are to change from 2022 to 2050. The report is based on collated data and projections from numerous other publications, and uses the example of a four-hour lithium-ion BESS.

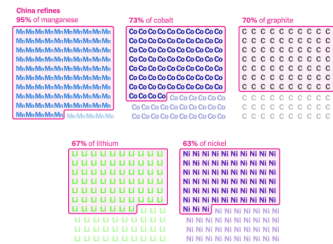


[ver más...](#)

## To make electric vehicle batteries, China must be involved

Publicada en <https://flowingdata.com>, 19/06/2023.

For The New York Times, Agnes Chang and Keith Bradsher ask if it's possible for the world to make EV batteries without China. Going over manufacturing and the materials involved, it looks like probably not

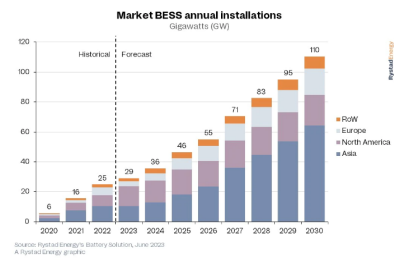


[ver más...](#)

## New battery storage capacity to surpass 400 GWh per year by 2030 – 10 times current additions

Publicada en <https://www.rystadenergy.com>, 14/06/2023.

The era of battery energy storage applications may just be beginning, but annual capacity additions will snowball in the coming years as storage becomes crucial to the world's energy landscape. Rystad Energy modeling projects that annual battery storage installations will surpass 400 gigawatt-hours (GWh) by 2030, representing a ten-fold increase in current yearly additions.

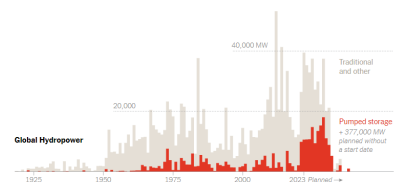


[ver más...](#)

## Is It a Lake, or a Battery? A New Kind of Hydropower Is Spreading Fast.

Publicada en <https://www.nytimes.com>, 02/05/2023.

For a century, hydroelectric power has been synonymous with gigantic dams — feats of engineering that provide renewable energy but displace communities and destroy ecosystems. New research released Tuesday by Global Energy Monitor reveals a transformation underway in hydroelectric projects — using the same gravitational qualities of water, but typically without building large, traditional dams like the Hoover in the American West or Three Gorges in China. Instead, a technology called pumped storage is rapidly expanding.

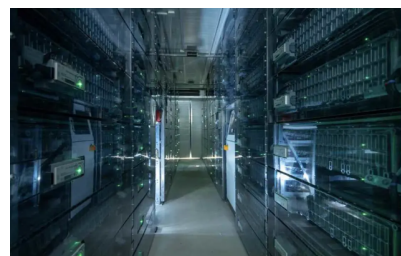


[ver más...](#)

## Eight hour big battery trumps pumped hydro in NSW long duration storage tender

Publicada en <https://reneweconomy.com.au>, 01/05/2023.

A proposed big battery with eight hours storage has emerged as a surprise winner in the NSW state government's first long duration storage tender, beating out pumped hydro projects that had been expected by some to emerge as a dominant force.



[ver más...](#)

## EMPRESAS Y MERCADOS

### Revolutionizing shared mobility: bafang's auto-shift shaft drive system

Publicada en <https://bafang-e.com>, 29/06/2023.

Bafang is innovating for the shared mobility sector, with a system designed to deliver both enhanced rider experience and lower maintenance requirements for fleet operators. In today's developing shared mobility industry, Bafang – as a global supplier of complete drive systems – hopes to bring some driving force to the industry through its own product technology.



[ver más...](#)

### Thermal storage company Rondo plans 90GWh ramp up of 'Heat Battery' gigafactory

Publicada en <https://www.energy-storage.news/>, 27/06/2023.

Rondo Energy, which counts Bill Gates' Breakthrough Energy Ventures among its investors, intends to scale up annual production capacity of its thermal storage tech to 90GWh. The California-headquartered company's Heat Battery is a type of refractory brick that can be heated to as high as 1500°C (2732°F) and retain the heat to be used either in that form, or to generate electricity. The heat can be discharged over durations that span several hours or even days.



[ver más...](#)



## Chinese company unveils revolutionary new ‘sodium-ion’ battery that could rock the ev market — can america compete?

Publicada en <https://www.thecooldown.com>, 23/06/2023.

Chinese automaker JAC Group and tech company HiNa Battery teamed up to create an electric car powered by a sodium-ion battery, Just Auto reports.

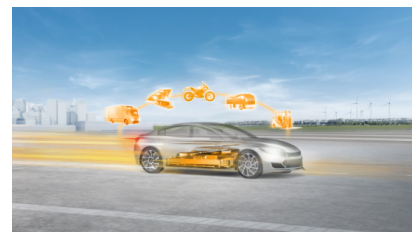


[ver más...](#)

## USABC Awards \$2.6 Million Lithium Electrode-Based Cell Development Contract to Farasis Energy USA

Publicada en <https://www.farasis-energy.com>, 22/06/2023.

Hayward (California), June 22, 2023 – The United States Advanced Battery Consortium LLC (USABC) earlier this year announced a \$2.6 million contract to Farasis Energy USA in Hayward (California) to develop beyond lithium-ion battery technologies. The program goal is to develop a lithium metal-based anode with nickel-rich cathode and liquid electrolyte battery technology for EV application.



[ver más...](#)

## Stellantis Inks Development Deal With Lithium-Sulfur Battery Maker

Publicada en <https://lyten.com>, 30/05/2023.

Stellantis is investing in lithium-sulfur battery maker Lyten in another example of automakers diversifying their EV battery supply networks. The two companies will collaborate to develop mobility applications for Lyten's lithium-sulfur battery, which is meant to be lighter and more energy dense than traditional lithium-ion options.



[ver más...](#)

## Fagor Ederlan y MONDRAGON invierten en EEVAM: startup de tecnología para vehículos eléctricos

Publicada en <https://www.spri.eus>, 27/05/2023.

EEVAM nace con el objetivo de contribuir al desarrollo de nuevas tendencias de movilidad más limpias, seguras y eficientes. Esta operación de inversión en una startup se enmarca en el contexto de la estrategia corporativa de activación de capacidades de emprendimiento y de la promoción de nuevos negocios entre las cooperativas, con una apuesta por empresas jóvenes con capacidad de crecimiento.

[ver más...](#)

## Finnish start-up Vensum raises €3.8 million to develop software-controlled power converters

Publicada en <https://tech.eu>, 26/05/2023.

Vensum Power's technology will enter new pilot projects and product development and the company will expand its research and engineering resources



[ver más...](#)

## CATL Launches World's First Solar-Plus-Storage Solution with Zero Auxiliary Power Supply

Publicada en <https://www.catl.com>, 24/05/2023.

CATL released the world's first solar-plus-storage integrated solution with zero auxiliary power supply at the SNEC International Photovoltaic Power Generation and Smart Energy Conference & Exhibition on May 24.



[ver más...](#)

## Brenmiller Inaugurates World's First-Ever Gigafactory for Thermal Energy Storage

Publicada en <https://www.businesswire.com>, 01/05/2023.

The factory is expected to operate at full capacity by the end of 2023 and produce up to 4GWh of bGen™ systems annually to serve the Company's pipeline of clean energy projects.



[ver más...](#)

## PATENTES

### Semiconductor based material for battery health and performance assessment and monitoring in the sub-cell level

Publicada en Tecnologías asociadas a almacenamiento de energía, 30/06/2023.

Solicitante: SPINORX INC.

The present invention comprises semiconductor materials for use in rechargeable energy storage devices particularly rechargeable secondary lithium batteries or lithium-ion batteries (LIBs) as monitoring sensors at the sub-cell level. The present invention includes semiconductor materials compositions fabricated from silicon-based, gallium-based, germanium-based, or a variety of other semiconductor materials as well as implementation methods related thereto. The aforementioned system can be embedded in the structure of negative and positive electrodes, at the interface of electrodes and electrolyte and/or at the interface of electrodes and current collector. The use of semiconductor materials proposed in this invention results in more accurate performance assessment, improved battery state of health monitoring, enhanced battery safety, and extended battery life.

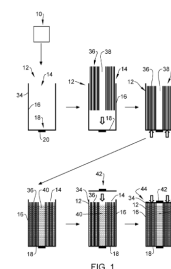
[ver más...](#)

### A method for manufacturing an energy storage cell

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: SKELETON TECHNOLOGIES GMBH [DE]

A method for manufacturing an energy storage cell (44), such as an ultracapacitor, comprises the steps of: a) providing a metal material (10); b) forming the metal material (10) into a cell body (12) that has a bottom portion (18), a wall portion (16), and a top opening (14); c) introducing through the top opening an electrode assembly (36); d) closing the top opening (14) with a lid assembly (42) thereby forming a cell interior that contains the electrode assembly (36); and e) fixing the lid assembly (42) to the cell body (12), wherein the bottom portion (18) is formed with e.g. - at least one exterior channel portion (24) that includes an exterior channel base portion



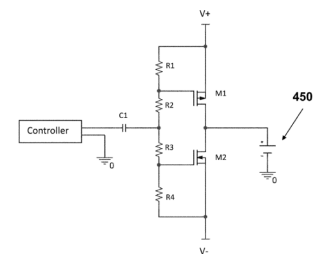
[ver más...](#)

## Apparatus For Depassivation Of Lithium-Ion Batteries

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Omnitek Partners LLC

A device for depassivation of an energy storage device having an anode, a cathode and a core with an electrolyte, the device including: a first switch configured to provide a positive input voltage to the anode; a second switch configured to provide a negative input voltage to the anode; and a controller configured to: detect that a first predetermined event related to a buildup of passivation has occurred with regard to the energy storage device



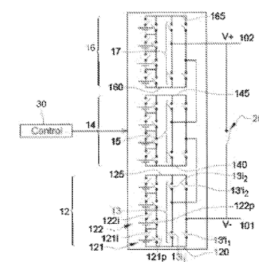
[ver más...](#)

## Balancing method of a switchable battery device by short-circuiting of its output

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

The Invention relates to a battery pack type device including: a) —a plurality of energy storage elements in series, each associated with at least one switch to connect it in series or disconnect it and/or to short-circuit it; b) —at least one switch for establishing a short-circuit between a first terminal and a second terminal of the battery when the latter is disconnected or supplies a zero voltage; c) a control circuit, specifically adapted to: select at least one first energy storage element in a first state-of-charge or at least one second energy storage element



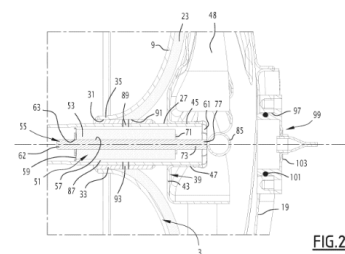
[ver más...](#)

## Cryogenic fluid storage unit

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: FAURECIA SYSTEMES D'ECHAPPEMENT [FR]

The cryogenic fluid storage unit (1) comprises: - an internal reservoir (3) which internally delimits a storage volume (5) for storing the cryogenic fluid; - an external reservoir (13) inside which the internal reservoir (3) is arranged, wherein an intermediate space (15) separates the internal reservoir (3) from the external reservoir (13); - a thermal insulation (23) interposed between the internal reservoir (3) and the external reservoir (13); - a getter (51) received in a volume in fluidic communication with the intermediate space



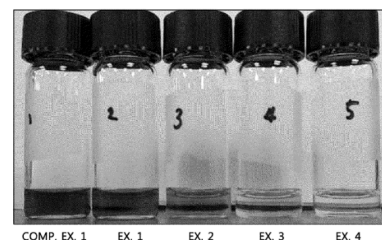
[ver más...](#)

## Electrolyte Solution for Lithium Secondary Battery and Lithium Secondary Battery Comprising the Same

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: LG Energy Solution, Ltd.

An electrolyte solution for a lithium secondary battery and a lithium secondary battery including the same are disclosed herein. In some embodiments, an electrolyte solution includes a lithium salt, a nitrogen compound and an organic solvent, wherein the lithium salt comprises bis(trifluoromethanesulfonyl)imide (LiTFSI) and the organic solvent comprises an ether-based solvent. The electrolyte solution can have improved oxidation stability and storage stability at high temperature.



[ver más...](#)

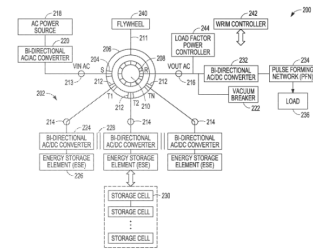
## Energy storage power source using a wound-rotor induction machine (wrim) to charge and discharge energy storage elements (eses)

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: RAYTHEON COMPANY

A stored energy power source uses a wound-rotor induction machine (WRIM) to receive energy from an external source, store the energy in N energy storage elements (ESEs) via tertiary windings, and discharge the ESEs to deliver energy via a secondary winding to a load producing output. Each discharging ESE contributes to a total flux at the secondary winding to sum the individual ESEs voltages. These voltages can be stepped up or down by a transformation ratio between the secondary winding and each of the tertiary windings. A flywheel may be coupled to the secondary to store and delivery energy.

[ver más...](#)



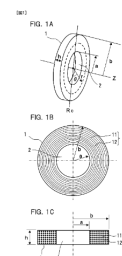
## Hollow disc rotor for flywheel power storage device and method for manufacturing same

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: NEXFI TECHNOLOGY INC. [JP]

Provided are a hollow disc rotor for a flywheel power storage device in which limit peripheral speed and limit accumulated energy have been dramatically improved and a method for manufacturing the same. The present invention is formed from a plurality of circumferentially wound reinforcing fibers, a matrix material that fills gaps between the reinforcing fibers, and carbon nanotubes that, from surfaces of the reinforcing fibers as reference points, expand upward toward the matrix materials.

[ver más...](#)



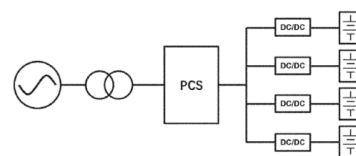


## Hybrid dc chained energy storage converter and control method thereof

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Delta Electronics (Shanghai) CO., LTD

Provided is a hybrid DC chained energy storage converter, including: a positive DC bus; a negative DC bus; a main circuit inductor; at least one high frequency sub module, including a first switch circuit and a first capacitor connected in parallel; a plurality of low frequency sub modules each including a second switch circuit and an energy storage element connected in parallel, the main circuit inductor.



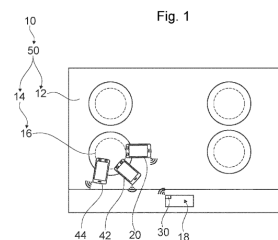
[ver más...](#)

## Induction energy transmission system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: BSH HAUSGERÄTE GMBH

The invention relates to an induction energy transmission system (10), in particular an induction cooking system, comprising a support panel (12), a supply unit (14) which is arranged below the support panel (12) and has at least one induction supply element (16) for inductively providing energy, a control unit (18) for controlling the supply unit (14), and at least one mobile terminal (20) which has at least one induction receiving element (22) for receiving the inductively provided energy and at least one energy storage device (24) for storing the inductively received energy.



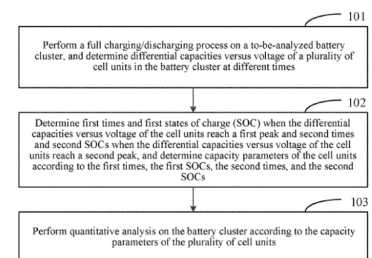
[ver más...](#)

## Method and apparatus for quantitative analysis of battery performance, and electronic device therewith

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: SHANGHAI MAKESENS ENERGY STORAGE

The invention discloses method and apparatus for quantitative analysis of battery performance and an electronic device. The method includes performing a full charging/discharging process on a to-be-analyzed battery cluster, and determining differential capacities versus voltage of a plurality of cells in the battery cluster at different times; determining first times and first states of charge (SOC) when the differential capacities versus voltage of the cell units reach a first peak and second times and second SOC's when the differential capacities versus voltage of the cell units reach a second peak, and determining capacity parameters of the cell units according to the first times, the first SOC's, the second times, and the second SOC's



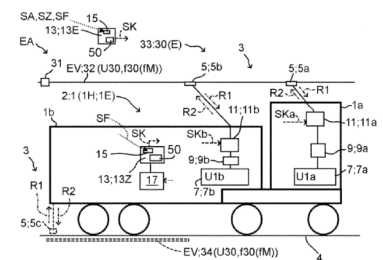
[ver más...](#)

## Method for exchanging energy, processing unit and vehicle

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: ZF CV Systems Global GmbH

The disclosure relates to a method for exchanging electrical energy between an energy-storage unit in a vehicle, operated by a vehicle operator, and an energy-user. The energy-storage unit has been configured to store electrical energy long-term. An electrical connection between the energy-storage unit and the energy-user can be configured to exchange energy. In accordance with the disclosure, there is provision that an exchange of energy from the energy-user into the energy-storage unit of the vehicle in a first energy-transmission direction



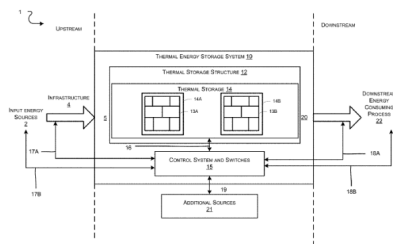
[ver más...](#)

## Methods For Material Activation With Thermal Energy Storage System

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Rondo Energy, Inc.

An energy storage system converts variable renewable electricity (VRE) to continuous heat at over 1000° C. Intermittent electrical energy heats a solid medium. Heat from the solid medium is delivered continuously on demand. An array of bricks incorporating internal radiation cavities is directly heated by thermal radiation. The cavities facilitate rapid, uniform heating via reradiation. Heat delivery via flowing gas establishes a thermocline which maintains high outlet temperature throughout discharge.



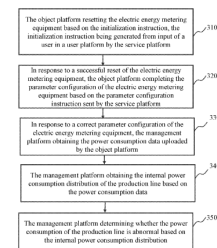
[ver más...](#)

## Methods for production line electricity management based on an industrial internet of things, systems and storage mediums thereof

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: CHENGDU QINCHUAN IOT TECHNOLOGY CO., LTD.

Some embodiments of the present disclosure provide a method for production line electricity management based on an Industrial Internet of Things, system, and storage medium. The system includes a registration module and a judgment module. The registration module is configured to: reset electric energy metering equipment based on an initialization instruction; in response to a successful reset of the electric energy metering equipment, complete a parameter configuration of the electric energy metering equipment based on a parameter configuration instruction sent by the service platform.



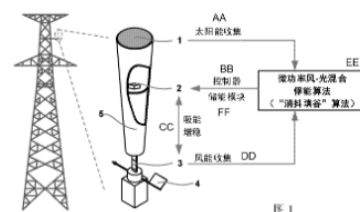
[ver más...](#)

## Micro-power wind-light hybrid energy-harvesting power generation apparatus and energy harvesting method

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: GRID JIANGSU ELECTRIC POWER CO., LTD.

Disclosed in the present invention are a micro-power wind-light hybrid energy-harvesting power generation apparatus and an energy harvesting method. The apparatus comprises: a solar power generation module, a wind power generation module, a control module, an energy storage module and an accessory structure, wherein the solar power generation module is mainly composed of a solar thin-film battery and a corresponding interface control circuit; the wind power generation module includes a wind-induced vibration structure, a cantilever beam structure, a piezoelectric element and a corresponding interface control circuit;



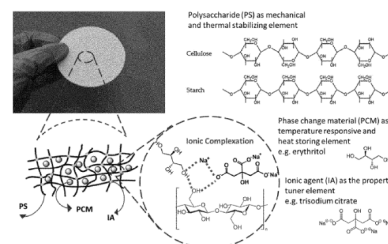
[ver más...](#)

## Phase change polysaccharide-based bio-complexes with tunable thermophysical properties and preparation method thereof

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Aalto University Foundation sr

Temperature responsive phase change bio-complexes (PCBC) with tunable physicochemical properties and preparation method thereof. The phase change bio-complexes consist of a phase change material (PCM) (or mixture of PCMs) and a polysaccharide (or combination of polysaccharides). The polysaccharide provides mechanical and thermal stabilization and the PCM provides temperature responsive properties to the complexation.



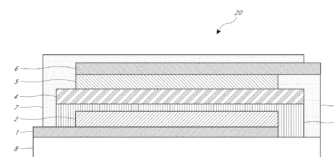
[ver más...](#)

## Printed energy storage device

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Printed Energy Pty Ltd

A printed energy storage device includes a first electrode including zinc, a second electrode including manganese dioxide, and a separator between the first electrode and the second electrode, the first electrode, second, electrode, and separator printed onto a substrate. The device may include a first current collector and/or a second current collector printed onto the substrate.



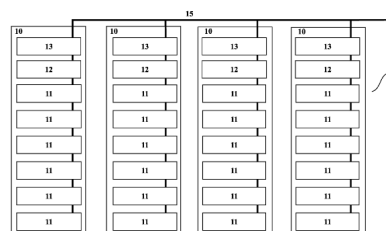
[ver más...](#)

## Reconfigurable architecture for stationary energy storage system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Atieva, Inc.

A modular energy storage cabinet, and a system including same, may include an AC connection port capable of connecting to an AC bus, and a plurality of battery modules, an inverter, and a plurality of busses, wherein the plurality of busses electrically connect the plurality of batteries to each other and to the positive DC input and negative DC input of the inverter to effectuate a voltage.



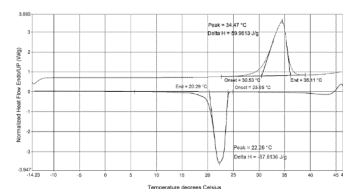
[ver más...](#)

## Shape stable reprocessable hybrid organic-inorganic compositions for storing thermal energy

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: CARMEL OLEFINS LTD. [IL]/[IL]

A composition including: (a) one or more salt hydrate inorganic constituents capable of thermal energy storage (ITES); and (b) an organic matrix containing polymer. A related method is also disclosed.



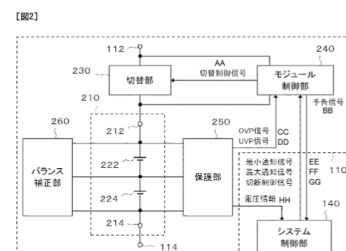
[ver más...](#)

## Switch control device, current control device, power storage device, power transfer system, and power system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: RYUKA & PARTNERS

This switch control device is for controlling the operation of a switch device for switching states of electrical connection between a power storage unit of a power storage device and a power terminal of the power storage device. The switch control device comprises: a first determination unit that determines whether the voltage of the power storage unit has reached a preset first threshold; a first signal output unit that outputs a first signal for providing an advance notice that the power storage unit and the power terminal will be electrically disconnected, when the voltage of the power storage unit is determined to have reached the first threshold.



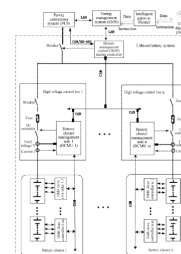
[ver más...](#)

## System for dynamic management and control of lithium battery energy storage system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: SHANGHAI MAKESENS ENERGY STORAGE TECHNOLOGY CO., LTD.

The invention discloses a system for dynamic management and control of a lithium battery energy storage system and an electronic device. A battery management system (BMS) is configured to read a present operation data stream of each cell.



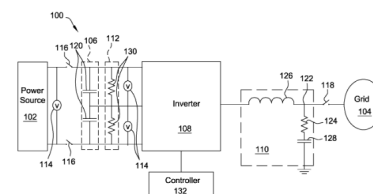
[ver más...](#)

## Systems and methods for discharging energy storage devices

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: GE GRID GMBH [DE]/[DE]

A power converter system is provided. The power converter system includes an energy storage device electrically coupled to a direct current (DC) power source and configured to store electrical energy received from the DC power source, an inverter electrically coupled to the energy storage device, and a pulse width modulation (PWM) filter electrically coupled to the inverter and including a resistor inductor capacitor (RLC) circuit.



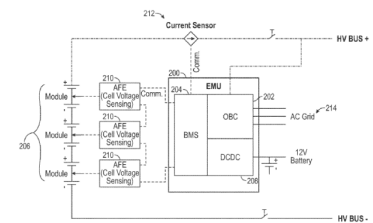
[ver más...](#)

## Technique Using a Battery Charger and Battery Management System to Detect Cell Degradation and Pack Imminent Failures

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Auto Motive Power Inc.

An Energy Management Unit (EMU) integrates the on-board charger (OBC) and battery management system (BMS) and optional DC-DC to behave like a lab based Electrochemical Impedance Spectroscopy (EIS) device. New high-bandwidth charge control schemes, together with new high-voltage system architecture, are disclosed. During vehicle AC charging, the OBC outputs current that sweeps across various frequencies (typically 0.1 Hz to 10 kHz), while the BMS samples the voltage and current to create the Nyquist Plot (Real Vs Imaginary Impedance) of battery cell parameters, without high frequency cell voltage samples



[ver más...](#)

## Thermal energy storage and power generation system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: GYFT LABS [US]

A thermal energy storage and power generation system includes a thermal energy storage device including a container, a heating element in the container, a pair of fins in the container and arranged on opposite sides of the heating element, a thermal storage material in the container, and a tube in the container and extending around the thermal storage material. The system also includes a generator in communication with the thermal energy storage device for converting thermal energy into electrical energy as well as subsystems for regulating and controlling the system.

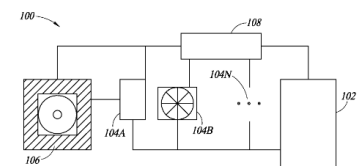


FIG. 1

[ver más...](#)

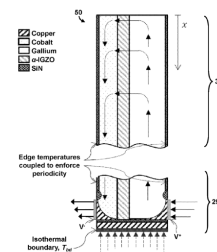


## Thermoelectrically actuated phase change thermal energy storage (tes) module

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: U.S. Army DEVCOM, Army Research Laboratory

A thermal energy storage (TES) device includes a thermoelectric cooler; and a metallic phase change material (PCM) within the thermoelectric cooler. The PCM may include any of gallium or its alloys, low temperature fusible alloys, and solid metal shape memory alloys. A thermoelectric effect within the PCM is to transport heat in the thermoelectric cooler.



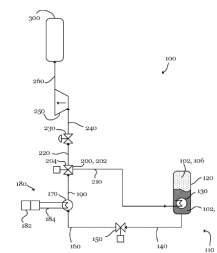
[ver más...](#)

## Two-phase thermal pump

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitante: Rolls-Royce North American Technologies Inc.

A fluid storage tank can be configured to store a cooling fluid in a liquid state and a gas state. A first heat exchanger can be configured to release heat into the fluid storage tank. A second heat exchanger can be disposed fluidly downstream of the fluid storage tank and configured to exchange heat between the cooling fluid and a heat load. A pressure control device can be disposed fluidly downstream of the second heat exchanger. One of the first cooling fluid that has been heated by the second heat exchanger or a second cooling fluid different than the first cooling fluid



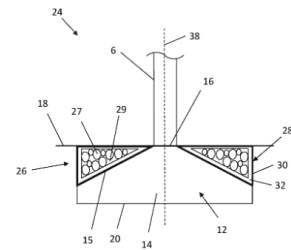
[ver más...](#)

## Wind turbine thermal energy storage system

Publicada en Tecnologías asociadas a almacenamiento de energía, 29/06/2023.

Solicitantes: VESTAS WIND SYSTEMS A/S [DK]/[DK]

A base installation (24) for a wind turbine (2) is provided. The base installation (24) comprises a foundation (12) for supporting the wind turbine (2) and a heat storage mass (26) arranged with the foundation (12). The heat storage mass (26) is at least partially encased in a thermally insulating material (28, 40) and comprises a flow path through which heat transfer medium may flow to exchange thermal energy with the heat storage mass (26).



[ver más...](#)

## Advanced battery management system (bms) for charge equalization of serially connected electrical storage cells

Publicada en Tecnologías asociadas a almacenamiento de energía, 28/06/2023.

Solicitante: IRP NEXUS GROUP LTD

Apparatus for controlling the charging level of a bank of serially connected electrical cells and performing equalization of the charges in the battery array, comprising circuitry for alternately connecting a capacitor to pairs of adjacent battery cells by controlling switches at a predetermined switching frequency; circuitry adjusting the switching frequency to control the impedance of the equivalent resistance of transfer, such that the charging/discharging current is maintained within a range of desired values.

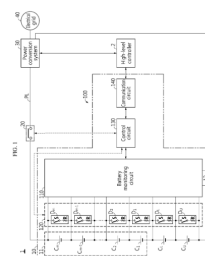
[ver más...](#)

## Battery management system, battery pack, energy storage system, and battery management method

Publicada en Tecnologías asociadas a almacenamiento de energía, 28/06/2023.

Solicitante: LG ENERGY SOLUTION LTD

A battery management system according to the present disclosure includes a battery monitoring device to detect a voltage of each of a reference battery cell and a plurality of battery cells having a common flat region, and detect a current of the battery pack, and a control circuit to stop charging the battery pack, initialize a cumulative current value, and determine a state of charge (SOC) of the cell group to be equal to a sum of an SOC of the reference battery cell and the predetermined value, when the voltage of the reference battery cell reaches a reference voltage during the discharge of the battery pack.



[ver más...](#)

## High-rate battery system

Publicada en Tecnologías asociadas a almacenamiento de energía, 28/06/2023.

Solicitante: NYOBOLT LTD

A battery system 100 comprises a power conditioning circuit 110 operable to condition power discharged from a plurality of connected cells 104 to provide an output voltage range  $V_{out}$  narrower than the input voltage from the plurality of connected cells. A method of discharging a high-rate energy storage system further comprises discharging, using a power conditioning circuit, a plurality of connected cells in a first voltage range, conditioning power discharged from the plurality of connected cells to provide an output voltage in a second range, wherein the second range is smaller than the first range on a per cell basis. The power conditioning circuit may comprise a dual-stage boost converter coupled to a plurality of connected cells. The battery system can be used to discharge cells over a wide cell voltage range and provide a narrower and more usable voltage range to a load, to facilitate fast cell cycling.

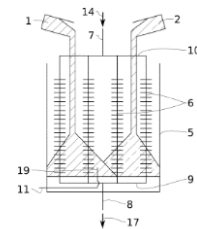
[ver más...](#)

## Method for preparing a thermal storage system and associated device

Publicada en Tecnologías asociadas a almacenamiento de energía, 28/06/2023.

Solicitante: COMMISSARIAT ENERGIE ATOMIQUE

L'invention concerne un procédé de préparation d'un système de stockage thermique par un mélange de matériaux à changement de phase (MCP) liquide/solide comprenant une cuve de stockage du mélange de MCPs, et un système de circulation plongeant dans la cuve, destiné à la circulation d'un fluide caloporteur pour stocker et extraire de la chaleur du mélange de MCPs, et un dispositif d'injection de gaz pour former des bulles de gaz en partie inférieure de la cuve dans le mélange de MCPs, caractérisé en ce qu'il comprend les étapes suivantes.



[ver más...](#)

## Electrical energy storage device with terminal temperature control and a gas duct

Publicada en Tecnologías asociadas a almacenamiento de energía, 22/06/2023.

Solicitantes: MAN TRUCK & BUS SE [DE]/[DE]

The invention relates, inter alia, to an electrical energy storage device (10) for a motor vehicle. The energy storage device (10) has a plurality of battery cells (11) which each comprise a pressure relief valve (12) and contact poles (13). The energy storage device (10) also has a degassing duct (20) which fluidically connects the pressure relief valves (12) of the plurality of battery cells (11) to one another.

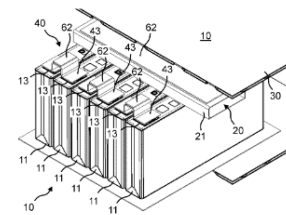


FIG. 5A

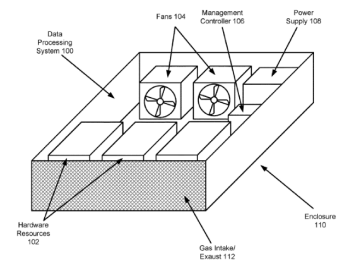
[ver más...](#)

## System and method for thermal management of motion sensitive systems

Publicada en Tecnologías asociadas a almacenamiento de energía, 22/06/2023.

Solicitante: Dell Products L.P.

Methods and systems for thermal management of hardware resources that may be used to provide computer implemented services are disclosed. The disclosed thermal management method and systems may improve the likelihood of data processing systems providing desired computer implemented services by improving the thermal management of the hardware resources without impairment of storage devices. To improve the likelihood of the computer implemented services being provided, the systems may proactively identify whether storage devices subject to impairment due to dynamic motion are present.



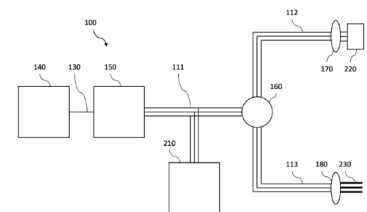
[ver más...](#)

## Transformer for a watercraft, energy distribution system for a watercraft, and watercraft

Publicada en Tecnologías asociadas a almacenamiento de energía, 22/06/2023.

Solicitantes: TORQEEDO GMBH [DE]/[DE]

The present disclosure relates to an energy distribution system for a watercraft, the energy distribution system comprising: a first AC bus; a second AC bus for connecting to at least one second AC load; a third AC bus for connecting to a supply network; a transformer, which is designed to convert an alternating voltage of each of the first to third AC buses into an alternating voltage of each of the other of the first to third AC buses; a DC bus; an energy storage device, which is connected to the DC bus; and a bidirectional AC-DC power converter, which is connected between the first AC bus and the DC bus.



[ver más...](#)

## PUBLICACIONES CIENTÍFICAS

### Overview Analysis of Recent Developments on Self-Driving Electric Vehicles

Publicada en <https://arxiv.org>, 23/06/2023.

This paper provides a comprehensive overview of recent advancements in autonomous electric vehicles (AEVs) within the specified region. It elaborates on the progress and comparative analysis of diverse subsystems, including energy storage, cell balancing for battery systems, vehicle charger layouts, electric vehicle motor mechanisms, and braking systems. Furthermore, this paper showcases several prototype autonomous electric vehicles as conclusive study findings.

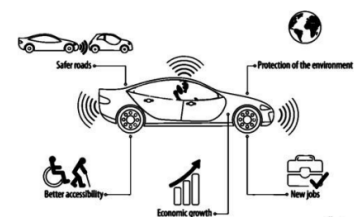


Fig. 1. Benefits of Self-Driving in the United States

[ver más...](#)

### Numerical Simulation of Thermal Energy Storage using Phase Change Material

Publicada en <https://arxiv.org/>, 20/06/2023.

This paper presents a study on the design optimization of Thermal Energy Storage (TES) using a cylindrical cavity and Gallium as a Phase Change Material (PCM). The objective is to improve the time span of charging and discharging, as well as minimize heat loss during storage.

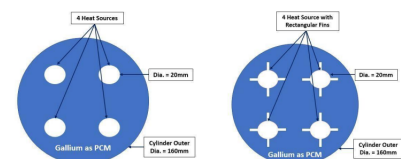


Fig. 1. Computational Domain of Model 1

Fig. 2. Computational Domain of Model 2

[ver más...](#)

## Collaborative Optimization of Multi-microgrids System with Shared Energy Storage Based on Multi-agent Stochastic Game and Reinforcement Learning

Publicada en <https://arxiv.org>, 19/06/2023.

Achieving the economical and stable operation of Multi-microgrids (MMG) systems is vital. However, there are still some challenging problems to be solved. Firstly, from the perspective of stable operation, it is necessary to minimize the energy fluctuation of the main grid.

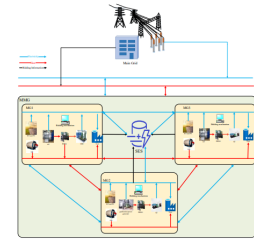


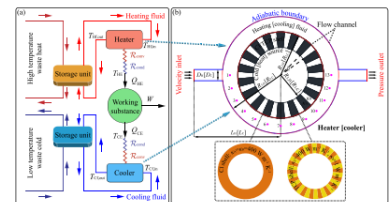
Fig. 1. Framework of the MMG system

[ver más...](#)

## Convective meta-thermal concentration for ultrahigh efficient Stirling engine with waste heat and cold utilization

Publicada en <https://arxiv.org>, 13/06/2023.

The Stirling engine, which possesses external combustion characteristics, a simple structure, and high theoretical thermal efficiency, has excellent potential for utilizing finite waste heat and cold resources. However, practical applications of this technology suffered from thermal inefficiency due to the discontinuity and instability of waste resources.

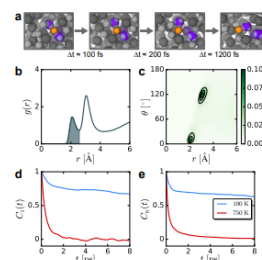


[ver más...](#)

## Electronic paddle-wheels in a solid-state electrolyte

Publicada en <https://arxiv.org>, 31/05/2023.

Solid-state superionic conductors (SSICs) are promising alternatives to liquid electrolytes in batteries and other energy storage technologies. The rational design of SSICs and ultimately their deployment in battery technologies is hindered by the lack of a thorough understanding of their ion conduction mechanisms.

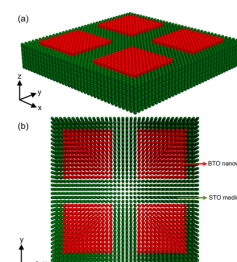


[ver más...](#)

## Energy storage properties of ferroelectric nanocomposites

Publicada en <https://arxiv.org/>, 23/05/2023.

An atomistic effective Hamiltonian technique is used to investigate the finite-temperature energy storage properties of a ferroelectric nanocomposite consisting of an array of BaTiO<sub>3</sub> nanowires embedded in a SrTiO<sub>3</sub> matrix, for electric field applied along the long axis of the nanowires.



[ver más...](#)

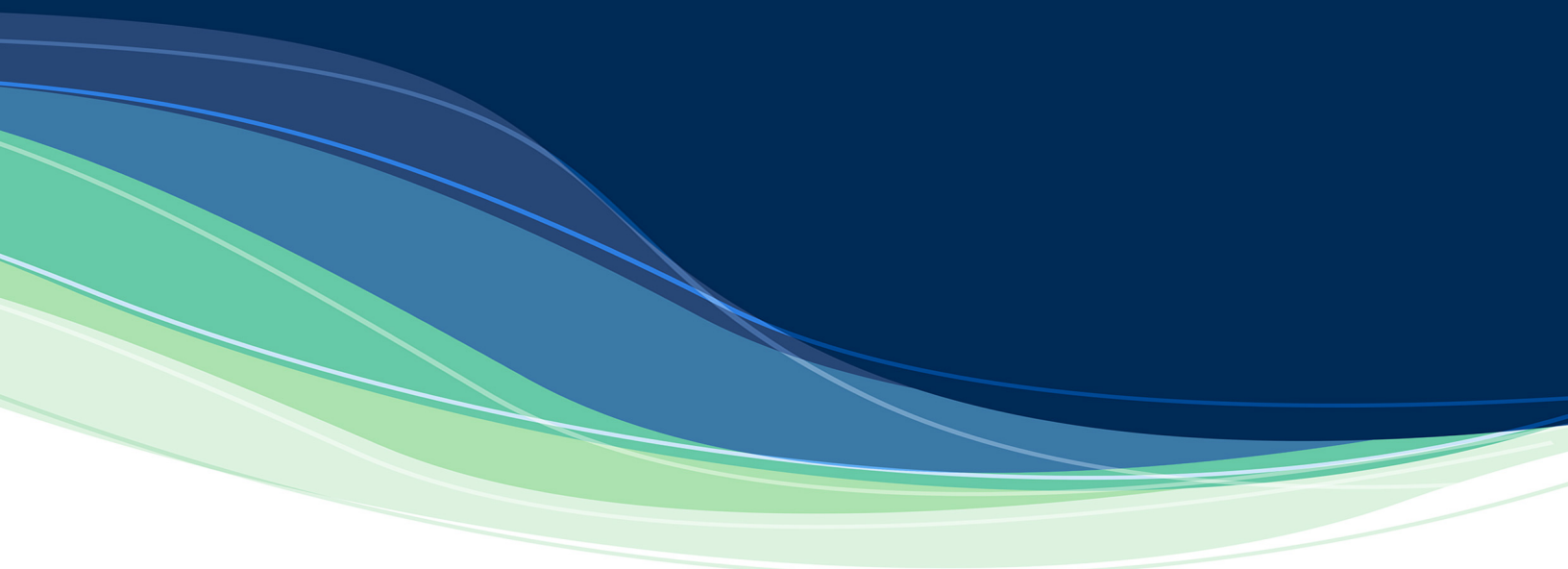


## Generic Air-Gen Effect in Nanoporous Materials for Sustainable Energy Harvesting from Air Humidity

Publicada en <https://onlinelibrary.wiley.com>, 05/05/2023.

Air humidity is a vast, sustainable reservoir of energy that, unlike solar and wind, is continuously available. However, previously described technologies for harvesting energy from air humidity are either not continuous or require unique material synthesis or processing, which has stymied scalability and broad deployment.

[ver más...](#)



Generado con Tecnología VIGIALE©, IALE Tecnología.