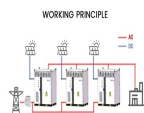


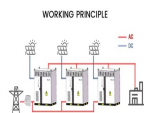
# FINNISH ENERGY STORAGE BATTERY POSITIVE ELECTRODE MATERIAL



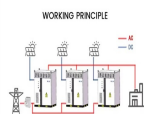
What is a battery from Finland project? Batteries from Finland -project is enhancing the growth of knowledge basis and global competitiveness along the entire battery value chain ??? from raw material production to battery cell production, battery applications and recycling. The study was commissioned by Business Finland and jointly executed by Gaia Consulting and Spinverse. WHY FINLAND?



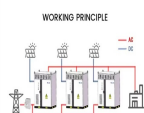
Which energy storage technologies are being commissioned in Finland? Currently, utility-scale energy storage technologies that have been commissioned in Finland are limited to BESS (lithium-ion batteries) and TES, mainly TTES and Cavern Thermal Energy Storages (CTES) connected to DH systems.



Why should you choose a battery company in Finland? Industrial companies integrate continuously batteries in applications. Re-use and recycling is a core focus of many companies. Finland has strong know-how regarding exploration, mining, raw materials production, processing and refining due to the long history of mining.

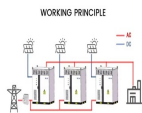


What is the future of energy storage in Finland? Reserve markets are currently driving the demand for energy storage systems. Legislative changes have improved prospects for some energy storages. Mainly battery storage and thermal energy storages have been deployed so far. The share of renewable energy sources is growing rapidly in Finland.

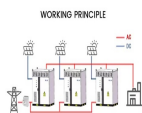


Is Finland a good operational environment for Li-ion batteries? The attractiveness of Finland as operational environment for COMPANIES currently active within the Li-ion battery value chain in Finland was mainly considered as somewhat attractive or attractive covering together 81% of the company representative answers.

# FINNISH ENERGY STORAGE BATTERY POSITIVE ELECTRODE MATERIAL



Is energy storage legal in Finland? Like the energy storage market, legislation related to energy storage is still developing in Finland. The two are intertwined as who is allowed to own and operate energy storages will define the business models of the storages. A major barrier to the implementation of ESS was removed when the issue of double taxation was solved.



Among various batteries, lithium-ion batteries (LIBs) and lead-acid batteries (LABs) hold supreme status in the forest of electric vehicles. LIBs account for 20% of the global ???



Lithium (Li)-ion batteries are by far the most popular energy storage option today and control more than 90 percent of the global energy storage. Li-ion batteries are composed of cells in which lithium ions move from the positive electrode ???



The reversible redox chemistry of organic compounds in AlCl<sub>3</sub>-based ionic liquid electrolytes was first characterized in 1984, demonstrating the feasibility of organic materials ???



The demand for large-scale energy storage is increasing due to the decreasing non-renewable resources and deteriorating environmental pollution. binder, separator etc. play ???

# FINNISH ENERGY STORAGE BATTERY POSITIVE ELECTRODE MATERIAL



In this review, we discuss the research progress regarding carbon fibers and their hybrid materials applied to various energy storage devices (Scheme 1). Aiming to uncover the ???



The main fundamental challenge is therefore the successful development of compounds suitable to be used as active materials for the positive and negative electrodes within the ESW of the selected electrolyte, or ???



(1) It is highly desirable to develop new electrode materials and advanced storage devices to meet the urgent demands of high energy and power densities for large-scale ???



Organics based on the carbonyl group (C=O) have been widely studied as promising electrode materials for actual energy storage applications because of their many desirable characteristics, such as high theoretical capacity and fast ???



Although these processes are reversed during cell charge in secondary batteries, the positive electrode in these systems is still commonly, if somewhat inaccurately, referred to as the cathode, and the negative as the anode. ???