Connecting solar- and wind electricity to the grid drastically increase interest in aqueous batteries

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Aqueous batteries are low cost because of at least three factors; cheap raw materials, minimal requirements for manufacturing environments, and a limited need for battery management and protection systems. Cheaper material cost because water and the mineral solutes used in traditional aqueous electrolytes, such as H_2SO_4 and KOH, are far cheaper than superdried organic solvents and fluorinated salts, such as LiPF6, used in lithium-ion batteries.
The Edison NiFe battery appeared in beginning of last century, was followed by the NiCd battery when Valdemar Jungner tried to control the parasitic hydrogen evolution reaction in the Edison battery by adding Cd to the Fe-electrode. The Nickel-hydrogen (NiH_2) battery became a preferable choice in space application due to its long cycle life. The NiMH substituted much of the NiCd market with its better capacity. More recently the NiZn is gaining interest with its lower cost of production and high capacity as reflected in a new European battery project LOLABAT, (Long lasting batteries) that aims to bring NiZn back, with funding from the European Union's Horizon 2020 under grant agreement No **963576**. https://www.lolabat.eu/

The NiZn battery was also patented by Edison but never made it into mass production. It has, however, similarities with the NiCd battery but Zn is much more available and environmental beneficial than Cd. The Zn-electrode can also be combined with an air-electrode, further increasing battery capacity and as well as open up for very large sustainable, storage solutions.[1]
This talk will give a background to the chemistries, review recent development and put focus on problems to be solved.

1) Boosting the performance of Zn-air cells by spinel catalysts with bimodal pore structure and gill filament configuration. Hu W.-K., Bai, Y., Yao S., Liu Q., Xu X., Lv T. and Noréus D., *J. Alloy Compd.* **936** (2023) 168185.

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