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India's push for low-cost energy storage: JNCASR and Hindustan Zir partner on Zn-ion batteries

The partnership between JNCASR, an autonomous institute under the Department of Science and Technology (DST), and Hindustan Zinc, a leader in the zinc sector, is expected to address key challenges in stabilizing the performance of Zn-ion batteries, which is crucial for their commercialization.



 **Saurav Anand** · ETEnergyWorld
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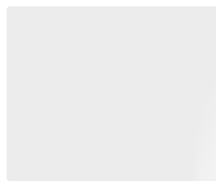


New Delhi: In a significant step towards developing low-cost and efficient energy storage solutions, the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) has

signed a Memorandum of Understanding (MoU) with Hindustan Zinc Limited (HZL) to propel the commercialization of indigenous zinc-ion (Zn-ion) battery technologies. The MoU, signed on August 21, 2024, aims to develop new variants of zinc materials to support grid-scale energy storage and other related applications.

Zn-ion batteries are emerging as a promising alternative to expensive and imported lithium-ion batteries, offering a low-cost and safer option due to the abundance of raw materials like zinc. The partnership between JNCASR, an autonomous institute under the Department of Science and Technology (DST), and Hindustan Zinc, a leader in the zinc sector, is expected to address key challenges in stabilizing the performance of Zn-ion batteries, which is crucial for their commercialization.

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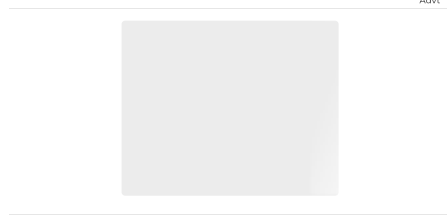
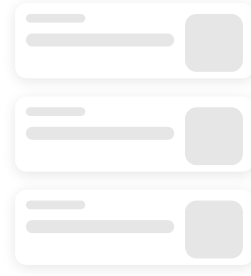
India's energy storage sector has been seeking alternatives to lithium-ion batteries due to their high cost and dependency on imported materials. Zinc-ion batteries, with their mature technology and safer chemistry, present a viable solution. However, the commercialization of these batteries hinges on overcoming the instability of zinc in water-based solutions, which requires modifications at the electrode, electrolyte, and interface levels.

"Zn-ion batteries hold enormous potential for large-scale energy storage due to low-cost and Earth abundant raw materials," said Prof. Premkumar Senguttuvan, JNCASR, whose group has been at the forefront of research in zinc-based batteries. The state-of-the-art battery characterization facility at JNCASR, funded by DST, has made significant advancements in this field, leading to the interest of industry players like Hindustan Zinc.

The MoU will leverage JNCASR's research expertise and Hindustan Zinc's product innovation capabilities to develop new zinc alloys for use as anodes in Zn-ion batteries and electrolytes for rechargeable battery applications. The research will focus on modulating the structure and

chemical compositions of these materials from the atomic/molecular level to the device level to improve the performance and safety of Zn-ion batteries.

As part of the collaboration, the JNCASR team plans to demonstrate Zn-ion pouch batteries that are scalable for large-scale commercial applications. These efforts align with the Sustainable Development Goals (SDG7) for affordable and clean energy and (SDG13) for climate action, marking a pivotal moment in the evolution of battery technologies.




Hindustan Zinc aims to be at the forefront of the battery revolution by providing innovative solutions to support the ongoing global energy transition. "By providing innovative new product solutions, we aim to support the ongoing global energy transition," stated a representative from Hindustan Zinc, underscoring the importance of this partnership.

The collaboration between JNCASR and Hindustan Zinc is expected to accelerate the development of indigenous Zn-ion battery technologies, potentially revolutionizing the energy storage sector in India and supporting the country's broader goals of energy security and sustainability. The success of this partnership could position India as a leader in the global battery market, particularly in the context of the growing demand for affordable and clean energy solutions.

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COMMENTS

 **Gopala Krishna Murthy**
6 days ago

This is sensible. We have zinc available with us. If a zinc based battery is successfully developed, it can immediately displace the lead acid batteries which use heavy lead which is also poisonous. The question is why this has been not developed so far after Leclanche cells were reported centuries ago.

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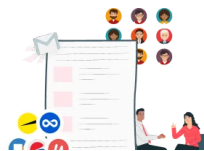
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