Hindustan Zinc advances research in zinc-based battery technologies

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Hindustan Zinc is also working with US-based battery manufacturer AEsir Technologies on nickel-zinc battery technology.

Hindustan Zinc Limited is progressing in the development of zinc-based battery technologies through partnerships with leading Indian research institutions. Early-stage research indicates the possibility of future commercial viability for these alternatives to lithium-based systems.

Zinc batteries are being explored as a solution to challenges related to lithium supply, including cost and geopolitical dependence. These systems operate across a wide temperature range, have a longer cycle life, are non-flammable, and use recyclable

materials. They are being studied for applications in sectors such as aerospace, renewable energy, data centres, and critical infrastructure, and can provide backup power for durations ranging from 3 to 72 hours.

Focus on zinc-ion and zinc-air battery development

Hindustan Zinc signed a memorandum of understanding with the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, in August 2024 to develop Zinc-Ion batteries. Professor Prem Senguttuvan, associated with the project, said, “The team is focusing on novel zinc anode formulations, coupled with advanced electrolytes. We have made noteworthy progress in electrode/electrolyte interface engineering, which is very encouraging.”

A second collaboration, formalised in October 2024 with the Indian Institute of Technology (IIT) Madras, is focused on designing a 1 kWh rechargeable Zinc-Air battery using a 6/12-cell stack. Professor Aravind Kumar Chandiran, who is leading the project, stated, “These batteries are an emerging solution for electric vehicles, grid-scale energy storage and consumer electronics.”

Hindustan Zinc is also working with US-based battery manufacturer AEsir Technologies on nickel-zinc battery technology, providing technical inputs, specialised alloys, and commercial support.

Arun Misra, Chief Executive Officer, Hindustan Zinc commented, “The battery segment is primed for innovation as the world shifts towards long-lasting and environmentally friendly energy sources. We at Hindustan Zinc are poised to play a key role in supporting this transition through the production of critical metals like zinc. Our collaborations with two of India’s premier research institutes reflect our commitment to advancing cutting-edge innovations that can redefine the future of energy storage. Batteries have the potential to accelerate this shift through energy storage and we aim to drive responsible innovation and long-term impact across the value chain.”

Hindustan Zinc is leveraging its metallurgical and electrowinning capabilities, along with its expertise in electrodes and performance materials, to support the development and scale-up of zinc-based batteries for industrial use.

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