Flow battery technology italy

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Energy production is today one of the main culprits of greenhouse gas emissions. To meet the decarbonisation targets, it is necessary to reshape the production, storage, and distribution of electricity. To address this urgent need, Sinergy Flow, a deep tech startup headquartered in Milan develops a sustainable, low-cost, high-efficiency flowbatterythat can store electricity for more than 20 hours.

Now, Sinergy Flow from the PoliHub community has closed a €1.8 million investment round led by French Italian venture capital firm 360 Capital, which invested through Poli360 fund, in partnership with Politecnico di Milano, and A+360, a fund dedicated to energy transition in collaboration with A2A. The round was also followed by Tech4Planet, the National Technology Transfer Pole for Sustainability established on the initiative of CDP Venture Capital SGR through the Technology Transfer Fund.

Sinergy Flowwill use the investment to expand its team and pursue R& D activities, validating the technology in a relevant environment, scaling the device, and preparing for mass production in the coming years.

“The energy transition is one of the most important challenges humankind has ever faced, and we strongly believe that our long-duration, low-cost, sustainable energy storage technology will make it possible,” said Alessandra Accogli, CEO and Founder of Sinergy Flow.

Fausto Boni, General Partner and Founder of 360 Capital commented, “We are very happy to step side by side with Sinergy Flow on this path, as the issues of energy transition and LDES are absolute priorities for 360 Capital. We strongly believe that the startup, thanks to its revolutionary battery and the use of abundant waste materials can be a game-changer in decarbonisation, and we hope that it can also represent an international success story, made in Italy.”

Sinergy Flow was founded by Alessandra Accogli, Gabriele Panzeri, and Matteo Salerno in 2022 in Milan. Currently, the board comprises the three founders and two representatives of the VC funds. The company plans to hire new team members in the next six months.

It develops a redox flow battery based on earth-abundant and low-cost material, fully compliant with the Circular Economy principles. Sinergy Flow’s concept aims to deliver sustainable, high-efficiency flow batteries for power grids, at a lower cost than competitors. It is possible for the company as it has worked out how to use inexpensive and abundant materials, such as sulphur or waste residues from petrochemical plants.

Batteries based on vanadium or zinc bromide represent the cutting edge of redox flow storage tech, an international research team has claimed. They have identified challenges and opportunities for about a dozen redox flow storage technologies, while providing estimates of their current and projected levelized costs of storage.

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Researchers from the University of Burgos in Spain, Italy"s University of Padua, Finland"s Aalto University, the University of West Bohemia Pilsen in Czechia, and the Basque Research and Technology Alliance (BRTA) have conducted a comprehensive analysis of all redox flow battery (RFB) and hybrid RFP technologies. They argue that these technologies are promising alternatives to lithium-ion technologies in stationary storage applications.

Redox flow storage has advantages over other storage technologies, such as flexible modular design/operation, scalability, moderate maintenance costs, long-life cycling, high round-trip efficiency (RTE), depth of discharge (DoD), fast responsiveness, and negligible environmental impacts, the researchers said. Most of these positive factors are related to the technology"s unique ability to decouple energy and power.

“Power and energy density limitations in comparison to other technologies such as lithium-ion batteries are generally overcome by the more cost-effective scalability,” the group said.

Vanadium redox flow batteries (VRFBs) and zinc-bromine redox flow batteries (ZBFBs) - the most representative kinds of hybrid flow batteries - are the real state of the art, the researchers claimed. However, the road to bringing them to commercial success and applicability is still a “long way to go,” they added.

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