Press Release

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Emerald Horizon Chief Scientist Müller: Molten Salt Storage delivers up to six percent more energy

Study in the journal "Energies" – heat of solidification used in a targeted way for the first time – basis for the DUALstorePLUS industrial storage system

Graz, 30 October 2026 – Researchers from Graz University of Technology (TU Graz) and Graz-based, publicly listed Emerald Horizon AG have shown for the first time that molten salt storage systems can also make targeted use of the heat released when the salt solidifies. This yields around six percent more energy from the same storage volume. For CALstore, the thermal storage unit of the DUALstorePLUS system, that equals 300 kWh, or a mass saving of almost 2,000 kg. Across ten 20-foot CALstore containers, it saves one entire container. The results were published on 13 October in the international journal "Energies".

"Molten salt storage is a mature technology, but until now it has been leaving energy on the table," said Dr Mario J. Müller, Vice President R&D at Emerald Horizon AG. Together with TU Graz, the team has shown that the heat of solidification can be used in a controlled way. There is also a clear operating point at which additional energy and high power output go hand in hand.

Until now, salt storage systems, such as those used in solar power plants, have only used the heat stored when the liquid salt is heated and cooled. For the study, so-called solar salt, a mixture of sodium and potassium nitrate, was heated to around 550 degrees Celsius in more than 40 experiments and then discharged using compressed air. Below 222 degrees, the salt begins to crystallise and releases additional heat.

Complete solidification can provide up to ten percent more energy. The findings define the power range of the CALstore storage unit up to a degree of solidification of around 60 percent. Beyond that point, the stored heat can serve as standby output, for example for low-temperature trace heating. The laboratory system completed more than 200 charge

and discharge cycles with around 2,400 operating hours, without any corrosion of the vessel or degradation of the salt.

The findings will feed into the thermal module of the DUALstorePLUS storage system, which combines a lithium iron phosphate battery, a molten salt thermal storage unit and AI-based control. The system is regarded as a key building block for decarbonising industry. It stores electricity from renewable sources and supplies it on demand as electricity or as high-temperature heat, for example for steam generation.

“A large share of industry’s energy demand is process heat, which today mostly comes from fossil fuels. Those who can supply this heat from stored green electricity make production both climate-friendly and secure,” said Müller. The battery part of DUALstorePLUS is already available, and the thermal module for temperatures of up to 550 degrees is scheduled for 2028. The system is offered as Energy-as-a-Service, with no capital expenditure for customers.

The study was carried out at the Institute of Thermal Engineering at TU Graz and funded by the Austrian Research Promotion Agency (FFG) as part of the “CALstore” project.

Service: J. Hochenauer, M. J. Müller, C. Hochenauer: Experimental and Numerical Study of a Laboratory-Scale Salt-Based Thermal Energy Storage (TES) System Focusing on Latent Heat.

Link to the study: https://www.mdpi.com/1996-1073/19/20/4840

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About Emerald Horizon AG

Emerald Horizon AG, headquartered in Graz, was founded in 2019 and develops safe, scalable energy technology for decarbonising industry and energy supply. Its core products are DUALstorePLUS, a hybrid energy storage system combining a battery, molten salt thermal storage and AI control, and SMRX, a thorium-based, accelerator-driven, subcritical energy system. The shares have been listed on the Vienna Stock Exchange (Standard Market) since 26 June 2026, ticker SMRX, ISIN AT0000A3UZE1.

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