

**TechUPGRADE Achieves Groundbreaking Milestone in Sustainable Energy Storage**

The TechUPGRADE project, funded by the Horizon Europe programme of the European Union, proudly announces a significant achievement in the development of sustainable thermochemical technology. The consortium has successfully developed a new material composition that uses minimal expensive, critical, or health-harmful substances. Several Tutton salts, such as K2Zn(SO4)2•6H2O, K2Zn0.5Cu0.5(SO4)2•6H2O, have displayed excellent properties at the gram scale.

This innovative composition has proven capable of long-term cyclic thermal-chemical storage (TCS) operation and effective thermal boosting. This new material represents a major step forward in energy efficiency, demonstrating a remarkable ability to achieve a storage density of at least 400 kWh/m3 for more than ten cycles, while operating efficiently within a temperature range of 90-150°C. This development aligns with the project’s commitment to reducing environmental impact and reliance on critical resources.

**Advancing Sustainable Energy Solutions**

The breakthrough was realized through the collaborative efforts of research teams from the TU Wien, the German Aerospace Center (DLR e.V.), the University of Twente, and the Swedish Research Institute. Utilizing an advanced search algorithm, the teams identified and screened various salt hydrates, focusing on those suitable for operation within the specified temperature range.

**Environmental Sustainability at the Forefront**

Throughout the development process, special attention was given to ensure the environmental sustainability of the new material. Monitoring and evaluation of the material’s sustainability and environmental impacts have confirmed its compatibility with environmental stewardship goals.

**Next Steps for TechUPGRADE**

Building on this milestone, the project will continue with further material characterization and thermodynamic analysis to ensure the material’s practicality and reliability for industrial applications. This upcoming phase is crucial for verifying the material's consistent performance and durability over repeated usage cycles.

**About TechUPGRADE**

TechUPGRADE is an ambitious initiative aimed at creating a groundbreaking advanced thermochemical technology for waste heat recovery. Our solution efficiently recovers waste heat from industrial processes and upgrades it to temperatures ranging from 150­250°C.

TechUPGRADE has received funding from European Union’s Horizon Europe’s Research and Innovation Program under Grant Agreement No. 101103966. The consortium includes leading European partners committed to advancing sustainable energy technologies.

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