Consortium

FREDERICK RESEARCH CENTER

Connect:

DIAS, turning rubble into reliable renewable energy.

Funded by the European Union
NextGenerationEU

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Cyprus tomorrow
RECOVERY AND RESILIENCE PLAN

RESEARCH & INNOVATION FOUNDATION

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DIAS

Development of an innovative low-cost and highly efficient Energy Storage system

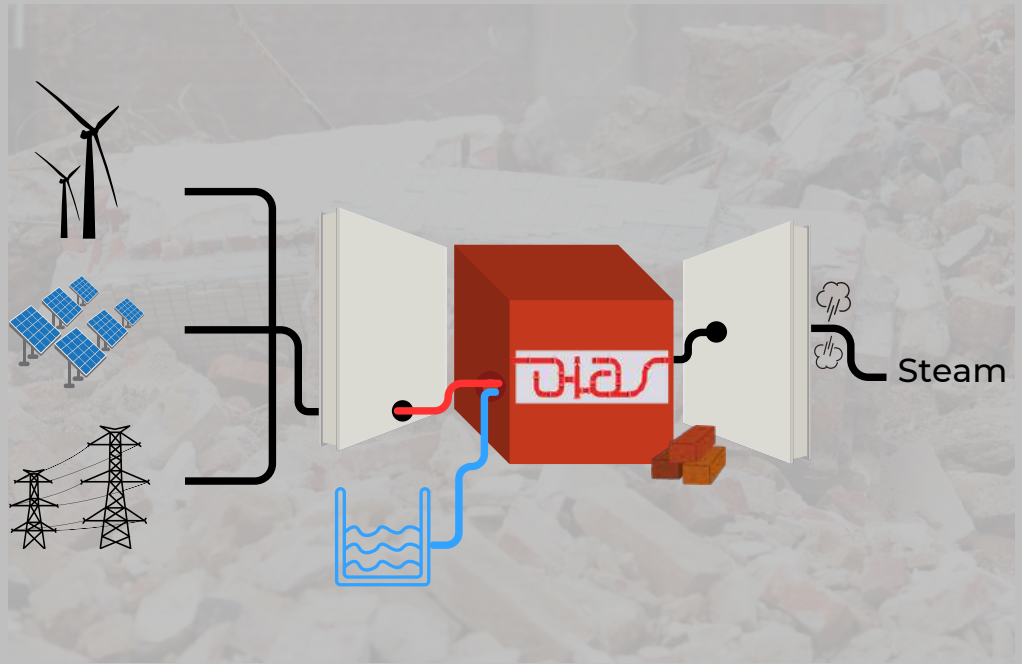
The Technology

The DIAS project introduces **a novel Thermal Energy Storage (TES) system based on geopolymers derived from Construction and Demolition Waste (CDW),** such as recycled clay bricks and ceramic tiles.

Through a sustainable process known as alkali activation (geopolymerization), these waste materials are transformed into high-performance thermal storage media with excellent mechanical strength and thermal stability up to 700 °C.

The TES units are produced using both casting and 3D printing methods, ensuring scalability, modularity, and adaptability.

This innovative system enables efficient storage of surplus renewable energy as heat and its release during periods of high demand, supporting a more stable and resilient energy grid.



Applications

Smart Grids and Energy Networks

By balancing supply and demand in the electricity grid, the TES system enhances the functionality of smart grid infrastructure. It allows for the conversion of peak renewable electricity into thermal energy, which can be stored and used when needed, improving overall grid stability.

Industrial Heat Recovery

In energy-intensive industries such as cement, plastic, and food processing, the DIAS system offers an efficient way to capture and store waste heat. This recovered heat can be reused within industrial processes, reducing energy costs and improving overall sustainability.

Renewable Energy (CSP Plants)

The DIAS TES system can be integrated into Concentrated Solar Power (CSP) plants to store excess thermal energy during sunny periods and release it when sunlight is unavailable. This improves grid flexibility, reduces dependence on fossil fuels, and enables a more consistent supply of renewable energy.

District Heating and Buildings

The modular and scalable design of the DIAS TES units makes them ideal for district heating systems and building-level applications. Hotels, residential buildings, and public facilities can use stored thermal energy for space and water heating, cutting down on energy bills and reducing emissions.