



European Energy Network

The voluntary network of European Energy Agencies - at the heart of the clean energy transition

Name and Country of EⁿR Member

CRES - Greece



**ΚΑΠΕ
CRES**



Name of Project/Programme & Link to website

MetroHESS – Hybrid Energy Storage System for the Utilization of Regenerative Braking Energy in Metro Stations

<https://metrohess-project.eu/>

Description of Project

Purpose of MetroHESS research project is to develop a Hybrid Energy Storage System (HESS) in order to exploit the energy from regenerative braking of Athens metro rail systems. The recovered energy being stored in the HESS will be used to cover base loads such as Lighting Systems and Passenger Transport Systems, which are main energy consumers for the metro operator.

For the architecture of the HESS, measurements of the regenerative braking energy potential in traction rectifier substations and in the traction systems on board of trains along with the energy auditing of selected metro stations will be conducted.

The results of the measurements will serve as input for the dimensioning process.

The combination of energy storage components with different electrical characteristics will be tested and appropriate energy management strategies will be also exploited. The developed system will be evaluated for its functionality and financial viability.

The project will be an excellent opportunity to discuss and improve the resulting methods and concepts directly with companies active in the Transport sector and results being transferred afterwards to industry.

The scientific results regarding the conceptual design methodology and the energy management strategies will be shared with the scientific community.

Aim/Expected Impact of Project

The project's main objective is the reduction of energy consumption of the selected metro stations, since part of their base load consumption will be covered by the energy previously stored in the HESS. Subsequently, the electricity cost for the Metro Operator will be reduced.

Ultimate goal of MetroHESS project is the largest scale application of the HESS in the transport sector.

Involvement of the Agency and Link to the EU Green Deal

- **Smart mobility,**
- **Research & Innovation**

CRES is the coordinator and scientific advisor of the project, ensuring high quality and on-time completion of all scientific deliverables. Authorities to the energy system integration.