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*Dear Reader,*

One step before the end of **ACTIVATE** “*Ancillary services in active distribution networks, based on monitoring and control techniques*” it is our pleasure to welcome you to the seventh and last edition of the **project Newsletter!**

**ACTIVATE** is an ambitious research project funded by the Hellenic Foundation for Research & Innovation, and is being implemented by a consortium of 4 highly capable and well established Universities.

*If you would like to keep up with all the latest developments of our project follow us on Facebook, LinkedIn & Researchgate.*

*Kind Regards,  
The ACTIVATE Research Team*

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## About ACTIVATE

**ACTIVATE** proposes the design of *hybrid control strategies*, combining features of centralized and decentralized concepts to improve the performance of the network operation. In order to extend the applicability of the proposed hybrid strategy also a *virtual inertia* scheme is incorporated to modify the control strategies of distributed renewable energy sources (DRES) converters. To enhance further the adaptability of the provided virtual inertia and to modify the overall dynamic response of the power system, *energy storage systems* are used with novel congestion management techniques.

Additionally, an innovative *network monitoring architecture* is proposed to determine the converter virtual-inertia parameters and coordinate the hybrid control strategy operation.

Finally, to facilitate the implementation and application of the proposed scheme in existing distribution grids, a *prototype three-phase, four-leg converter* has been developed.

# Communication & Dissemination activities

## Workshop Participation

An overview and results of ACTIVATE were presented in the international workshop “Implementing digitalization to improve energy efficiency and renewable energy deployment in distribution networks”, organized in Kadir Has University in Istanbul, 14/02/2023 - 16/02/2023.

Researchers for academia and industry from Turkey UK, Greece and Kazakhstan were met and shared their experiences on issues related to active distribution networks, services and modelling.



## Ancillary Services in Active Distribution Networks, based on Monitoring and Control Techniques (ACTIVATE)

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Implementing digitalization to improve energy efficiency and renewable energy deployment in distribution networks – Istanbul, 15-16 Feb. 2023

## DUTH Idea Accelerator Info Day

ACTIVATE participated in the DUTH Idea Accelerator Info Day presenting results of the project and most importantly the ACTIVATE prototype converter to the Democritus University of Thrace community

The workshop was organized in Xanthi during 28/02/2023 - 03/03/2023.



## Communication & Dissemination activities



# IPST2023

International Conference on Power Systems Transients  
THESSALONIKI | 11-15.06.2023

## International Conference on Power Systems Transients, IPST 2023

Our papers “Application of a performance assessment method to identify the applicability range of distribution network equivalent models” and “Transient performance of a unified control system for the provision of ancillary services in low-voltage distribution networks” were presented in IPST 2023 on 11 – 15 June 2023. Both papers have been also selected as journal papers in the Special Issue of the conference in Electric Power Systems Research (EPSR).

Scope of the **first paper** is to evaluate the applicability range of conventional equivalent models for the dynamic analysis of modern DNs by using a recently proposed performance assessment method.

In the **second paper**, the ACTIVATE unified control system for the provision of ancillary services by distributed RES-BES systems is validated via tie-domain simulations.

## Journal Publication

The results of WP5 have been published in the paper entitled “Validation of a Holistic System for Operational Analysis and Provision of Ancillary Services in Active Distribution Networks” in *Energies*, MDPI.

Scope of the paper and this WP was to present a validation of the overall ACTIVATE system, which is performed by using simulation and power-hardware-in-the-loop results in combined transmission and distribution network models.



*energies*

URL: <https://doi.org/10.3390/en16062787>

## Communication & Dissemination activities

### ACTIVATE International Workshop

As a closing event of ACTIVATE, an international workshop was organized on 19/05/2023 in the Department of Electrical & Computer Engineering in Democritus University of Thrace.

In the workshop, members of the research group from Democritus University of Thrace and Aristotle University of Thessaloniki presented the results of the project. Moreover, an invited speaker, Prof. Emrulah Fatih Yetkin from Kardir Has University, Istanbul Turkey gave a talk on topics relevant to ACTIVATE.

Students from DUTH and guest academics from Klaipėdos valstybinė kolegija / Higher Education Institution (KVK) also attended in the workshop.



## Project Consortium



### Democritus University of Thrace (DUTH)

Power Systems and Electrical Machines laboratories are involved in ACTIVATE. DUTH is proud to be one of the largest Universities in Greece. In this context, it has attracted a significant number of research programs funded by the EU as well as national and private resources. The research team of ACTIVATE consists from two DUTH academics, three PhD candidates and two MSc students.

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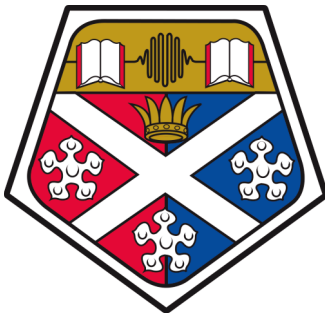


POWER SYSTEMS LABORATORY  
ARISTOTLE UNIVERSITY OF  
THESSALONIKI

### Aristotle University of Thessaloniki (AUTH)

The Power Systems Laboratory (PSL) of AUTH is running since 1980 and has been involved in 140+ European, bi-lateral and national projects (<http://power.ee.auth.gr/>). The PSL and the team members involved in this project have significant experience in all topics related to power systems analysis, operation and control, modelling, distributed generation and smart grids and renewable energy sources.

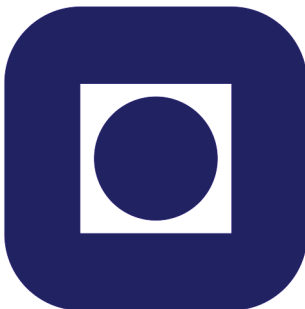
Grigoris Papagiannis [gpapagia@ece.auth.gr](mailto:gpapagia@ece.auth.gr)



### University of Strathclyde (UoS)

The D-NAP laboratory of the Institute for Energy and Environment provides an environment for research, development and testing of smart grid functions incorporating PHIL functionalities with real-time simulators. Also, experts in the topics related to power systems modeling and near real-time dynamic security assessment from UoS, will participate in the development of ACTIVATE network monitoring techniques.

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### Norwegian University of Science and Technology (NTNU)

Experts from Department of Electric Power Engineering of NTNU will contribute on the development and testing of the three-phase converter. NTNU experts are specialized in the area of wide band gap power converters design, gate and base driver designs for WBG devices, as well as dc-breaker concepts for MV and HVDC systems.

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