Press Release

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Significant contribution of the KIOS CoE to the development of intelligent management and control methods of a real-life microgrid

The KIOS Research and Innovation Center of Excellence research team has contributed significantly to the development of intelligent methods and techniques for the management and control of a pilot microgrid, in the framework of the European research project entitled "3DMicroGrid".

A microgrid is a small and localized electricity network with distributed resources and loads that is usually interconnected with the main grid, but it can disconnect and autonomously operate due to technical restrictions or economic benefits.

The "3DMicroGrid" project aims to facilitate the design, development and demonstration of a future-proof active smart micro-grid system, as well as to optimize the operation of multiple small to medium sized renewable energy sources and loads within the microgrid. The KIOS participates actively in this project as a partner, along with other research institutions, universities and companies from 8 different countries.

The KIOS research team led the way for developing accurate simulation models for the microgrid considering real measurements. These models emulate in real-time the operation of the microgrid as a digital twin which in turn allows the investigation of its performance under extreme scenarios. Towards this end, researchers used a dedicated real-time simulator and unique experimental setups available in the KIOS laboratory premises.

In this context, the KIOS researchers have developed and tested intelligent control methods with the ultimate goal to improve the operation of the micro-grid by supporting the stability, efficiency and power quality of the main grid. Furthermore, they have designed a novel management method to reduce the operational cost of the micro-grid by maximizing the participation of available renewable energy resources. Finally they have developed a novel mechanism to enable the secure transition of the micro-grid to autonomous operation mode.

All the above methods have been integrated in a software platform that is able to automate the microgrid operation and support the operator to evaluate the performance of the micro-grid.

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End of announcement