

Tutorial – PSET 2024

Title

Virtual Power Plants: Modelling, Control and Operation

Summary

The tutorial discusses the dynamic analysis and operation of virtual power plants (VPPs), that is, clusters of generators located at different locations of the grid and providing coordinated services. The tutorial is organized into three parts. The first part provides an overview of the structure, components and services that can be provided by VPPs. The second part focuses on the dynamic operation and control of the VPPs and introduces the novel concept of dynamic VPP. The third part discusses the operation of VPPs and their role in ancillary service electricity markets. The tutorial presents the contributions of two European projects, namely edgeFLEX (<https://www.edgeflex-h2020.eu/>) and POSYTYF (<https://posytyf-h2020.eu/>) both based on large consortia that blend industry experience and recent trends in academic research. All parts of the tutorial are enriched with several illustrative examples based on both benchmark and real-world systems.

Duration: 1.5 hours

Agenda

Tutorial part 1

A Taxonomy of Virtual Power Plants

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Tutorial part 2

Dynamic VPP Realization for Multi-time Scales Integration

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Tutorial part 3

Optimal Bidding of Renewable-based VPPs in Energy and Ancillary Service Markets

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