Flexibility and Resilience in Integrated Energy System

Summary

Recent developments in renewable energy generation, electric vehicles (EVs), wide use of combined heat and power (CHP) technology, emerging power-to-gas (P2G) devices incited significant changes in energy production and consumption that results in need to investigate future use of Integrated Energy systems.

Research field:	Electrical power engineering and mechatronics
Supervisors:	Prof. Dr. Ivo Palu Fushuan Wen
Availability:	This position is available.
Offered by:	School of Engineering Department of Electrical Power Engineering and Mechatronics
Application deadline:	Applications are accepted between May 03, 2021 00:00 and May 31, 2021 23:59 (Europe/Zurich)

Description

Recent developments in renewable energy generation, electric vehicles (EVs), wide use of combined heat and power (CHP) technology, emerging power-to-gas (P2G) devices incited significant changes in energy production and consumption patterns. As a result, an integrated energy system (IES), formed by integrating and optimizing multiple energy systems in a digitalization framework, provides a new solution to energy and environmental problems. Given this background, it is necessary to systematically present theoretical and methodological frameworks for the modeling and analysis of a closed-loop digitalized IES and to develop coordinated optimal planning and operation strategies for flexibility and resilience enhancement.

Applicants should fulfil the following requirements:

The PhD position is suitable for a student with a master's degree in areas like electrical power engineering, economics, computer science or applied mathematics. Work experience would be strongly useful in one or several application domains, such as electricity and/or emission trading, predictive analytics, optimization methods, systems modeling, smart grids, and end-user energy management applications. The applicant must propose in their application an approach to the topic incl. mix of themes and activities that align with the proposed PhD topic that she/he wishes to pursue incl. analysis methods and evaluation criteria's that best reflect the objectives and challenges of the proposed topic.

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