



**UNIVERSITÉ
DE GENÈVE**

INSTITUT DES SCIENCES
DE L'ENVIRONNEMENT

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CYCLE DE FORMATION ÉNERGIE – ENVIRONNEMENT
SÉMINAIRE 2020-2021

Optimization-based Energy Management System for Hybrid Energy Networks

Daniel Muschick

BEST – Bioenergy and Sustainable Technologies GmbH

Jeudi 15 octobre 2020 à 17h15

Cette conférence aura lieu uniquement via Zoom – pas de suivi en présentiel !

Lien pour la diffusion en direct avec Zoom :

<https://unige.zoom.us/j/96030529079>

ID de réunion : 960 3052 9079

Code secret : 780864

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L'orateur

Daniel Muschick is a Senior Researcher at BEST – Bioenergy and Sustainable Technologies, a non-profit research organization located in Graz, Austria.

He has obtained his master's degree in computer engineering and his PhD in control system theory, both at Graz University of Technology. He currently leads a small group investigating the optimization-based supervisory control of multi-energy systems with a strong focus on the thermal network and bringing theory to practice.

La conférence

The need to integrate renewable energy sources in a decentralized way and the future possibilities of local energy business models due to Energy Communities as envisaged by the European Union will lead to increasingly complicated energy systems encompassing various energy types such as electrical power, heat and cooling, and gas.

The main goal is to produce and consume as much energy as possible locally, thus reducing the strain on the networks and the dependencies on large, centralized energy production sites. This requires a supervisory control method which can interact with all energy systems and is able to efficiently operate and coordinate the various (volatile) energy sources and storages. The relevant tasks are demand and yield prediction, unit commitment and economic dispatch as well as state estimation.

While there has been a lot of progress in the field of intelligently operating electricity networks (Smart Grids), the combined operation with thermal networks is still a rather young field of research.

The talk will demonstrate the results obtained with a modular, optimization-based energy management system which was installed at a demonstration site located in Innsbruck, Austria. There a business campus was equipped with a local heating grid and various coupling techniques between heat and power (CHP, P2H, waste water heat pumps) as well as photovoltaics for electricity generation. Based on the experiences made, the status quo is assessed critically and necessary future fields for research are identified.