DIGISect

2023 Expert Workshop on

Design and Operation of Digitalized Sector-Coupled Energy Systems

Overview

The aim of the workshop is to bring together experts from Europe to exchange insights and to create a roadmap on possible trends and research directions for operation, control and digitalization in sector-coupled energy systems and sector integration.

Workshop contributions are attributed to the following thematic clusters:

- **Cluster 1 – System architecture and operation strategies**: focus on applications and best practices for sector coupling and sector integration both on system and component levels, including pilot sites, energy communities, innovative technologies, markets & regulation, etc.
- **Cluster 2 – Automation and Digitalization Technologies**: focus on digital technologies enabling sector coupling and sector integration, including artificial intelligence, digital twins, IoT and communication, cyber security, simulation, etc.

Agenda

Thursday, April 20th, 2023 (11:30-18:15)

11:30 – 12:30   Lunch and registration

12:30 – 12:40   **Welcome / Introduction**

12:40 – 13:40   **Keynote 1**
Prof. Astrid Nieße (University of Oldenburg, Germany): *Challenges in cyber-physical energy systems: Of agents and data*

13:40 – 14:00   Break

14:00 – 15:20   **Session 1 – Cluster 1: heating networks and their flexibility** Presentations & Panel Discussion
Session Chair: Ralf-Roman Schmidt (AIT)

Joachim Kelz (AEE Intec): *Combine district heating and wastewater treatment plants*
Alexander Dreher (Fraunhofer IEE): *Unleashing Flexibility: Cornerstones to Harvesting Residential Energy Resources*
Kai Strunz (TU Berlin): *Object-oriented Modeling of Multi-Energy Systems: Methodology and Application to Berlin-Adlershof*
Peter Palensky (TU Delft)

15:20 – 15:45	Break
15:45 – 17:00	**Session 2 – Cluster 2**: Presentations & Panel Discussion Session Chair: Davood Babazadeh (TU Hamburg) Milos Cvetkovic (TU Delft): *Enabling flexibility in integrated energy systems* Qjanwen Xu (KTH): *Control of renewable energy –hydrogen-based energy systems for isolated and grid connected applications* Christian Becker (TU Hamburg): *Modelling and Optimal Operation of Intelligent Integrated Energy Systems* Edmund Widl (AIT): *DigitalEnergyTestbed – An Open Testbed Prototype for Integrated Energy Systems*
17:15 – 18:15	**Discussion & Brainstorming**
19:30:	**Workshop Dinner at Restaurant Gigerl, Rauhensteingasse 3, 1010 Wien**

Friday, April 21st, 2023 (9:00-14:30)

9:00 – 10:20	**Session 3 – Cluster 2**: Presentations & Panel Discussion Session Chair: Qjanwen Xu (KTH) Philipp Linnartz (RWTH Aachen): *Cyber Security Risks in Power System Operation* Stephan Ferenz (University of Oldenburg): *NFDI4Energy – A digital Infrastructure for Interdisciplinary Energy System Research* Pooya Davari (Aalborg University): *Power Electronics for PtX: Challenges and Opportunities* Gernot Steindl (TU Wien): *RES² – IoT Architecture for a Sector-Coupled Smart Local Energy Community*
10:20 – 10:45	Break
10:45 – 11:45	**Keynote 2** Michael Niederkofler (act4.energy, Austria): *Energy Communities as Aggregated Flexibilities – Opportunities and Challenges on the Way to Becoming Participants in Flexibility Markets*
11:45 – 12:45	Lunch
12:45 – 14:00	**Session 4 – Cluster 1**: Presentations & Panel Discussion Session Chair: Thomas Strasser (AIT) Meysam Qadrdan (Cardiff University): *Techno-economic assessment of bi-directional low temperature district heating and cooling networks* Moiz Ahmed (DLR EV): *Distribution Grid Operations Management* Bastian Pfarrherr (Stromnetz Hamburg): *Innovative Ansätze zur Sektorkopplung in den Hamburger Energienetzen* Vedran Peric (TU München): *PHIL Architecture for Integrated Thermal-Electric Grids*
14:00 - 14:30	**Wrap-up and Closing**