# How can sector coupling enable flexibility provision? - Technical and market integration challenges

10 October 2019 Rue d'Egmont 11, 1000 Bruxelles

Registration Link

**10h – Welcome coffee**

**10H30 - 11h00 Introduction of the topic and presentation of the MAGNITUDE project - Régine Belhomme, EDF**

The challenge of flexibility provision in the electricity system.
What is sector coupling and how can it enable flexibility provision?
Presentation of the MAGNITUDE H2020 European project and how it contributes to these questions.

**11h00 – 12h00 Session 1 - New technical challenges for Multi-Energy Systems – Chair: Nicole Pini, EIFER**

This session will tackle the role that sector coupling and storage technologies have in providing flexibility. The first presentation will introduce the case studies on which MAGNITUDE relies: their location, purpose, installed technologies and control strategies. It will be highlighted how the current multi-energy systems can evolve, either by installing new sector coupling technologies or operating them differently, in order to maximize flexibility provision. The second presentation will, on the other hand, present how sector coupling is seen from the heating and cooling sector stakeholders. Examples from other ongoing H2020 European projects will be provided.

- Shaping the future multi-energy systems: lessons learnt from the project case studies (20 min, Nicole Pini, EIFER)
- Heating and cooling perspective in energy integration (20 min, Alessandro Provaggi, DHC+)
- Discussion (20 min)

### 12h00 - 13h00 - Poster session and demonstrations – Chair: Angelina Syrri, DTU

Learn more about MAGNITUDE results and the tools under development, through presentations of posters and live demonstrations.

- Flexibility provision by multi-energy systems for services to the electricity system (posters)
  - Integrated pulp and paper mill in Austria, Cardiff University
  - Milan District heating plant, RSE
  - Economic dispatch of heat pumps considering load shifting between electricity and heat, MDH
- Multi-energy market simulation and market price forecasting (live demos)
  - Demonstration of the market simulator for integrated multi-energy carrier systems, VITO/N-SIDE
  - A machine learning algorithm forecasting day-ahead electricity prices in Italy, VITO/N-SIDE

### 13h00 – 14h00 - Lunch

### 14h00 - 15h15 Session 2 – Aggregation and market integration of multi-energy systems– Chair: Kris Kessels, VITO

This session will first look into flexibility provision of multi-energy systems (MES) to the electricity system within the H2020 European projects MAGNITUDE and FHP, specifically focusing on the approach towards aggregation. Afterwards, the potential evolution of energy markets towards a more common vision will be considered. The perspective of the MAGNITUDE project which focuses on (supra)national multi-carrier markets and the FED project which has implemented a local multi-carrier market, will be presented.

- Flexibility provision by MES through aggregation in support of the power system
  - Multi energy aggregation platform for the provision of flexibilities: the MAGNITUDE perspective (15min, Christoph Gutschi, cyberGRID)
  - Energy Communities leveraging flexibility by Active Connected Buildings: experience from the FHP (Flexible Heat and Power) project (15 min, Chris Caerts, VITO)
- Future market design for improved sector coupling
  - Innovative market schemes for integrated multi-energy systems: the MAGNITUDE perspective (15 min, Kris Kessels, VITO)
  - A local marketplace for electricity, district heating and cooling in Gothenburg: the experience of the FED (Fossil-free Energy Districts) project (15 min, Magnus Brolin, RISE)
- Discussion (15 min)

### 15h15 – 15h45 Coffee break

### 15h45 - 16h45 – Session 3 - Modelling and Simulation of Multi-Energy System for flexibility quantification – Chair: Edoardo Corsetti, RSE - Meysam Qadrdan, Cardiff University

The growing development of variable renewable energy sources (vRES) for power generation is leading to ask MESs for a reliable flexible contribution to face the power systems imbalances. In this session we will discuss why MES are relevant for flexibility service provision and how to set (optimal) strategies for market service participation. In the first presentation, a brief sketch of the model-simulation-optimization stages will illustrate how to identify the flexibility from MES to maintain continuous service in the face of rapid and large swings in supply and/or demand, and mismatch between supply and demand. A few exemplifications taken from MAGNITUDE case studies will detail these concepts. Then the second presentation will provide the perspective of another project on the simulation and optimization of MESs.

- Assessment of Multi-Energy System for flexibility maximization (25 min, RSE or Cardiff University)
- Another perspective on the modelling, simulation and optimization of MESs – Invited project (25 min, Speaker to be confirmed)
- Discussion (10 min)

### 16h45-17h00 – Conclusion and next steps - Régine Belhomme, EDF

Wrap-up of the day. Upcoming results and next steps in MAGNITUDE.