EPC4SES Newsletter

January 2023

Dear reader,

The **ERANet-RegSys project EPC4SES - EPC based Digital Building Twins for Smart Energy Systems** launches its fifth and final newsletter. The project started in February 2019 and celebrated its final conference in December 2022.

In this newsletter you will find a short summary of the main outcomes, potential impacts and highlights of the project and the pilot sites, all of them widely discussed during the closing conference.


Main outcomes of the pilot areas

AUSTRIAN PILOT (STOCKERAU)
Model predictive control for operational scheduling

- Goal: maximise the use of solar energy and low CO2 energy from grid to fulfill household energy demand.

- A simulation for 5-day period was conducted. With the application of MPC, household heating demand was reduced.

- Reduction in CO2 intensity of energy use.

- Share of solar energy in energy use was increased by 5 times leading to higher energy self-sufficiency.
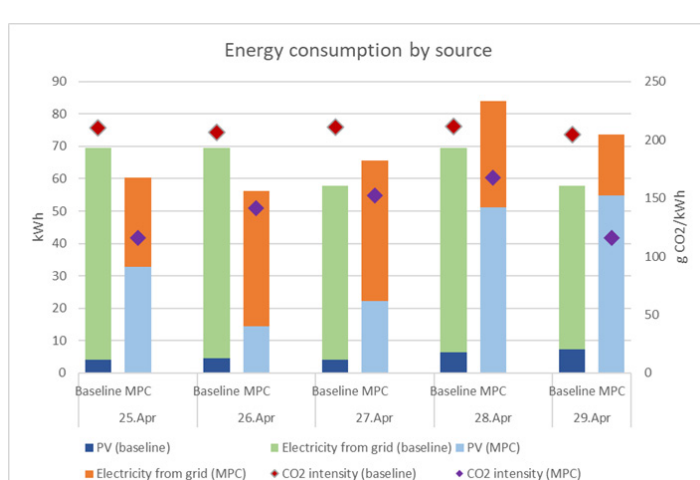
AUSTRIAN PILOT (KUCHL)

- Goal: apply MPC to use low CO2 energy and reduce the carbon footprint of building heating system.

- A simulation for a 5-day period was conducted. With MPC intervention the heating demand was reduced.

- Varying set point temperature accounts for the reduced energy use.
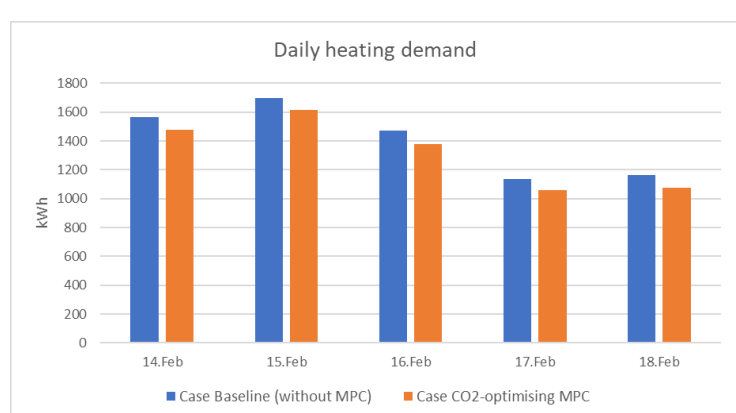
SPANISH PILOT

- Reduce the CO2 emissions from heating/cooling systems thanks to the development of MPC dedicated to estimating the energy demand at district level.

- Decarbonization and optimization of local energy supply systems through better planning and management of energy demand together with better exploitation of renewable energy sources deployed in buildings.

- Improved incentive planning for building renovation and refurbishment.

- Optimization of the use of renewable technologies at the air conditioning level.

- Improvement of energy transmission in smart grid systems, thanks to a better coordination of the energy demand and forecast of the sizing of the available storage.

GERMAN PILOT (BERLIN)

The Berlin pilot covered a district heating sub-network and was investigating Model Predictive Control at several levels of the system. The simulation included a digital building twin which had been based on the XML from the energy performance contracting process, the sub-network and solar thermal and buffer tank. Also, an off-line and an on-line solution for MPC was created.

- XML containing the building information should and might be slightly extended allowing accurate simulation. During winter, artificial horizon should be considered.

- The more the system is decarbonised the lower the CO2 savings originating from MPC, starting with 15% on the building level and ending with 3% applying MPC for the central solar thermal buffer.

- Sacrificing those CO2 savings the solar thermal installation could be slightly downsized using MPC. Since the buildings were well insulated 15% savings could be achieved with MPC for the DHW tank.
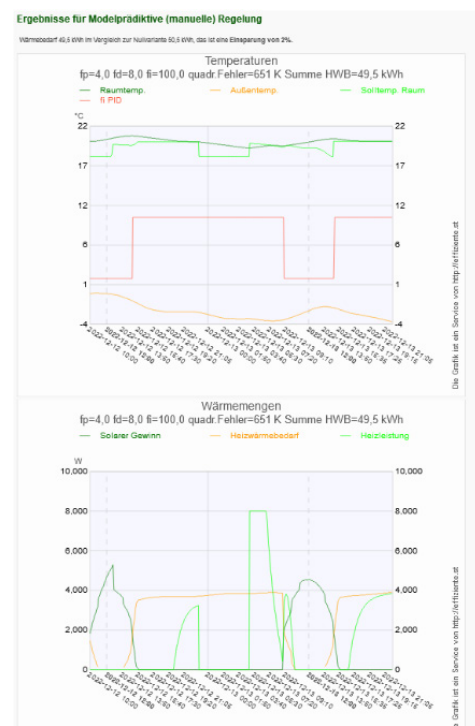
Knowledge Community

EPC4SES's expert members joined the Knowledge Community and have actively participated to the Expera Working Groups discussions on various topics. Working Groups build up the mutual knowledge and collaboration between projects, enable a thorough discussion of the main lessons learnt by the different projects and feed the community with state-of-the art information.

Working Groups

- Consumer and Citizen Involvement
- Regional Matters
- Storage and Cross Energy Carrier Synergies
- Regulatory and Market Development
- System Architecture
- Implementation Modelling
- Standardisation & Interoperability

Highlights

1. Common strategies to overcome barriers together
2. Two major challenges: **data privacy** and **compliance** with EU legislation
3. Need to close the gap between **real word** and **research driven projects** via technology transfer processes with a multilevel approach.

Standardisation & Norming

Standards and norming related to the project topic:

DIN SPEC 91410-1: Provision of flexibility for the congestion management of electrical power grids - Requirements for the voluntary participation of suppliers in a flexibility platform

DIN SPEC 91410-2: Identification & assessment of flexibility in buildings and urban neighborhoods

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