Programme co-funded by European Union funds (ERDF, IPA, ENI)

Interreg
Danube Transnational Programme
3Smart

Newsletter No.4

PILOT IN BOSNIA AND HERZEGOVINA: JP EPHZHB d.d. Mostar, Vuciji Brig b.b., 80240 Tomislavgrad

Basic facts and initial state:

- 26 controllable heating/cooling zones over 2 floors, covering area of about 1.000 m^2
- Heating and cooling system with 29 fan coils; digital room climate control
- Heating energy supplied from the heat pump with 75 kW nominal heat power (27 kW nominal electric power) and electrical boiler with 88 kW nominal heat and electrical power; cooling energy supplied from the heat pump with 73 kW nominal cooling power (27 kW nominal electric power)

Total cost of the investment:
226.500 EUR, of which 192.500 EUR funded from the Interreg Danube Transnational Programme

3Smart investment:

- PV plant 49.8 kWp, battery storage system 32 kWh/10 kW lithium-ion with controllable charging/discharging power
- Heat meters for measuring heating/cooling energy, temperatures, flow for several key points, electrical energy meters for measuring parameters of electrical energy for several key points
- Compact room automation stations for fan coil control, room operator units for fan coils, compact room automation stations for air handling units control, room operator units for air handling units control
- Pyranometers for extraction of direct and diffuse component of solar irradiance from 2 measurements of global solar irradiance, weather forecast service for prediction of direct and diffuse component of solar irradiance
- DDC equipment
- Building management system – SCADA
- 3Smart database as a data source/sink for the 3Smart Energy Management System (EMS) with integrated all relevant data including data exchange with the grid to implement demand response
- Simple, robust and modular changeover (soft switch) between the mode in which climate control is performed on a classical decentralized way as up to now, and the mode in which the newly introduced 3Smart EMS can through its open two-way database issue commands towards the key actuating variables in the building

Application of the 3Smart tool on-site:

- Coordinated
  I. (**building zone level**) predictive control of energies used for cooling/heating individual rooms
  II. (**central HVAC system level**) predictive control of starting temperatures for the heating and cooling medium for the building and shaping optimal energy-exchange profile with the district heating grid
  III. (**microgrid level**) predictive control of the battery system charging / discharging energy that implements control of energy exchange profile with the electricity grid including demand response

  which maintain comfort as required by the end-users and minimize the building energy costs
- Auxiliary prediction and estimation procedures which as a side-effect facilitate and enhance building maintenance
- Interfacing procedures to implement computed commands on existing actuating equipment

Expected effect:
Decrease of electrical power peak of the building; decrease of electrical energy consumption of the building; decrease of electrical energy usage from the grid by using electrical energy from PV plant and battery storage system when technically and economically justified

Public presentation will be held on:
18 July 2019

SAVE THE DATE

Please follow further news regarding the event on 3Smart web page

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Newsletter No.4

PILOT IN BOSNIA AND HERZEGOVINA: Electricity distribution grid of JP EPHZHB d.d. Mostar, around pilot building

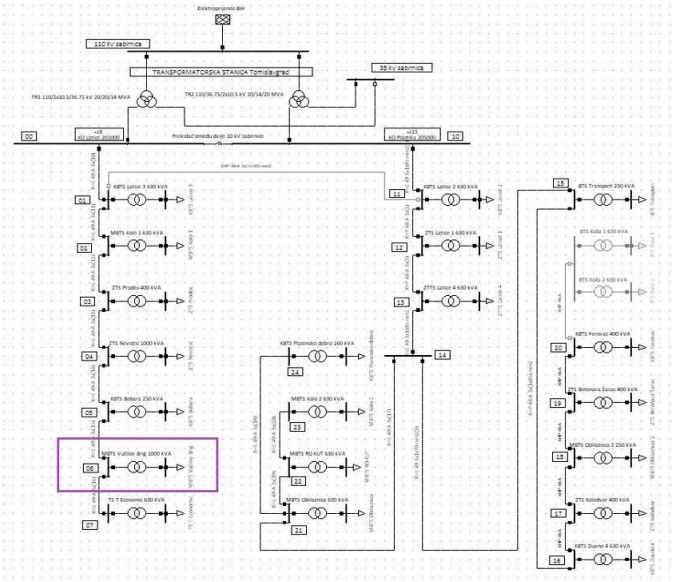
Basic facts and initial state:

- Pilot location is connected to low voltage network which is supplied from substation 10(20)/0,4 kV. Substation is part of 10 kV MV feeder
- EPHZHB building has its own metering point towards the distribution system operator (DSO)
- The power exchange market in Bosnia and Herzegovina is not yet established
- EPHZHB has professional tool for grid modelling which is used for grid-side modules
- The DSO does not have the tools (and does not do it in real-life) for optimizing grid planning by taking end-users flexibility into account. There is no methodology for encouraging end-users to exhibit flexibility to help the grid (and the DSO)

Total cost of the investment: 3.000 EUR, of which 2.550 EUR funded from the Interreg Danube Transnational Programme

3Smart investment:

- Creation of grid model for implementing long-term and short-term 3Smart grid management modules



Application of the 3Smart tool on-site:

- Short-term modules:
  I. Day-ahead module for optimal management of building flexibility, driven by long-term contract with the DSO
- Long-term modules:
  I. Annual: Contracting flexibility provided by end-users, defining reservation and utilization costs and “negotiating” these with the end-users
  II. Multiannual: Defining the need for flexibility in the distribution network based on investment triggers

Expected effect: More efficient planning and operation of the distribution network, concept for the methodology to encourage the end-users to assist the system, reduction of end-users' electricity bills due to flexibility services for the DSO
Public pilot presentation date: **18 July 2019**