

SMART BUILDING MANAGEMENT CONCEPT AS A PRECONDITION FOR A SMART CITY UPSCALING

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Introduction

ACRONYM: 3SMART

TITLE: „Smart Buildings – Smart Grid – Smart City”

DURATION: 01 January 2017 – 30 June 2019; 30 Months

OVERALL OBJECTIVE: Provide a technological and legislative setup for cross-spanning energy management of buildings, energy grids and major city infrastructures in the Danube region

OVERALL BUDGET: 3.791.343,41 EUR

CO-FINANCING: 85%

PARTNERS: UNIZGFER (Lead); HEP (CRO); E3, IDRIJA, ElektroP (SLO); EEE,STREM, EnergyG (AUT); UNIDEBTTK, EON (HU); UNIBGFMG (SRB); EPHZHB,SVEMOFSR (BIH)

HEP PARTNERS: HEP DSO, HEP ESCO, HEP d.d.



Danube region

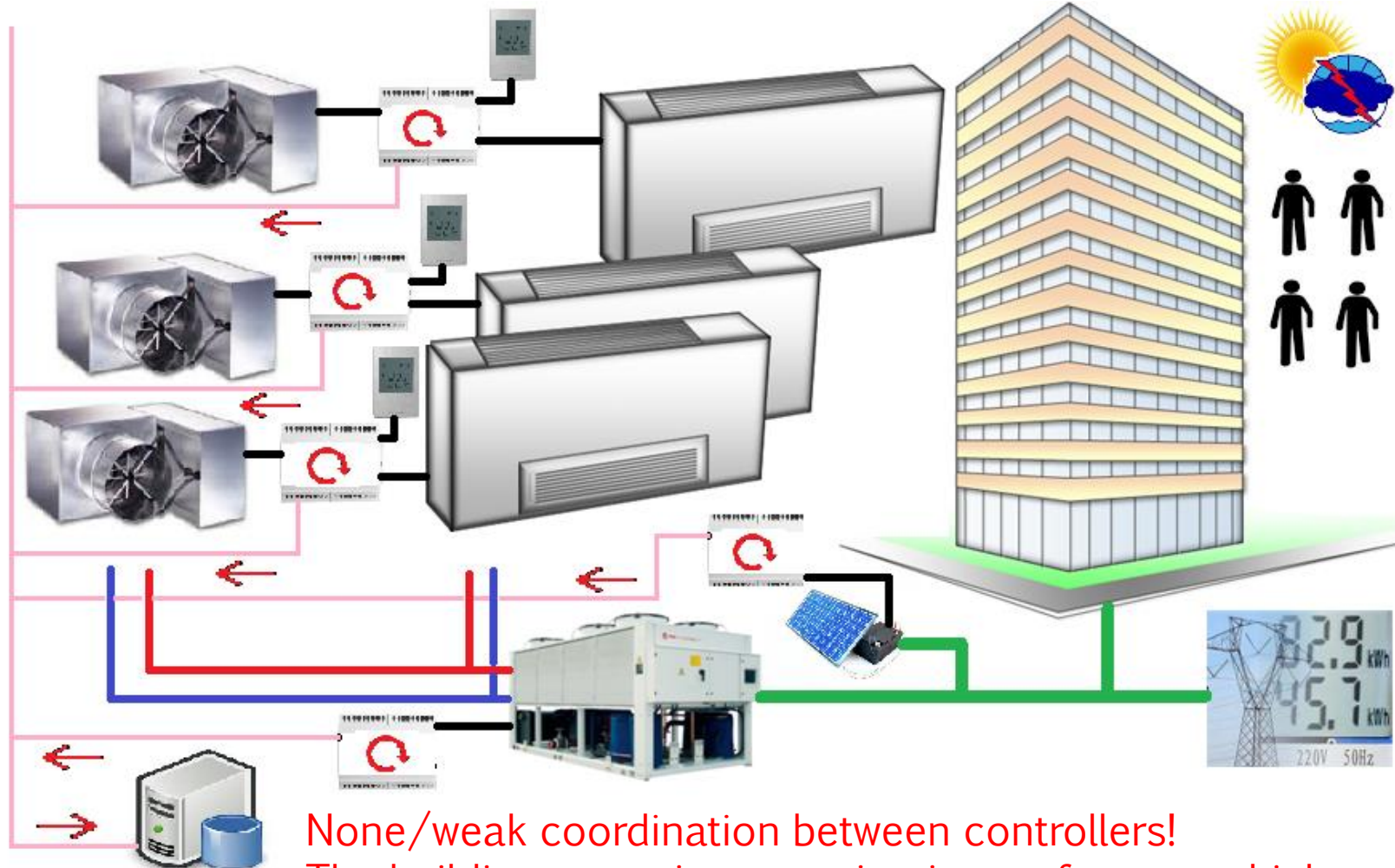


Introduction

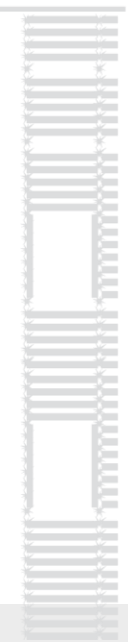
- Expected results from the project:
 - Energy Regulatory Framework Impact Strategy, Energy Management Strategy in Cities
 - Cost Benefit Analysis of the EMS (Energy Management System) model
 - Open modular energy management software in building and grid side
 - Installation of additional equipment (Building Management System, Batteries, Temperature Sensors, Computers, Software, etc.)



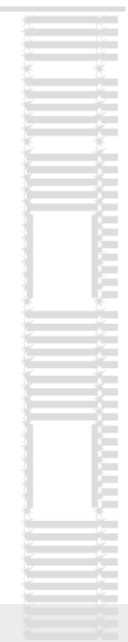
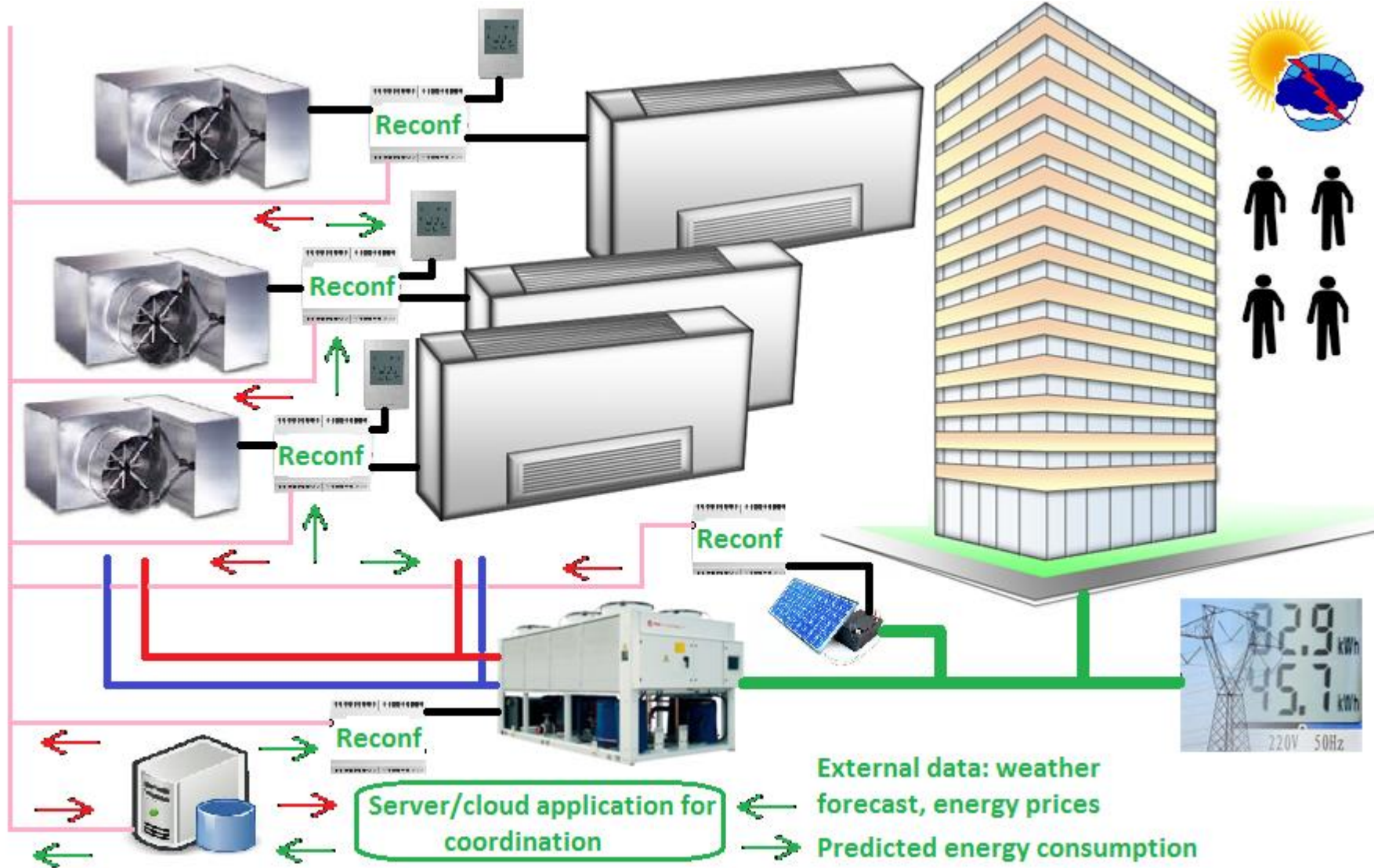
Classical Commercial Buildings



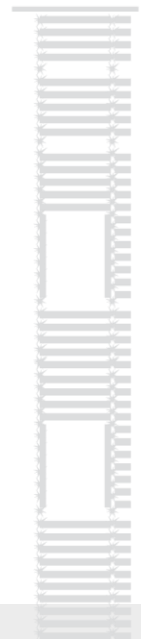
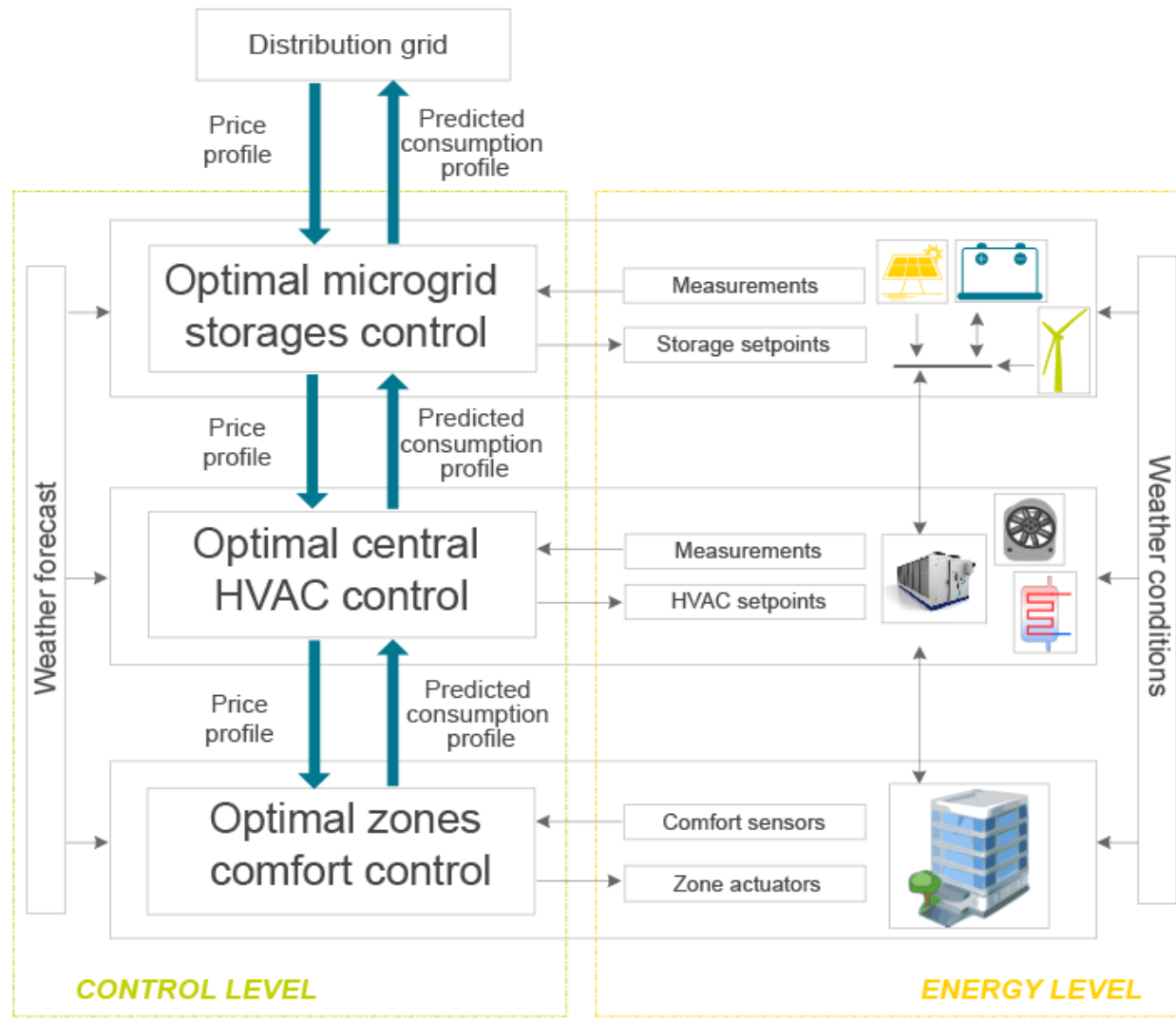
None/weak coordination between controllers!
The building operation to maintain comfort costs higher than it should!



Grid – Building Coordination



Functional diagram of 3Smart



Pilot Building



Existing system

- 2 Water Chillers – 1.063 kW_{cooling}
- Heating station (District Heating) with 3 substations:
 - Kompakt 1000 (1000 kW)
 - Kompakt 1000DHW (1000 kW)
 - Kompakt 120 (120 kW)
- Air Handling Unit – 5.000 m³/h
- PV Plant – 29,64 kW_e

- Radiators – 288
- Fan Coils - 313



Investment

- Interventions on existing system was performed on 3 levels:
 - Zone Level
 - HVAC Level
 - Microgrid Level



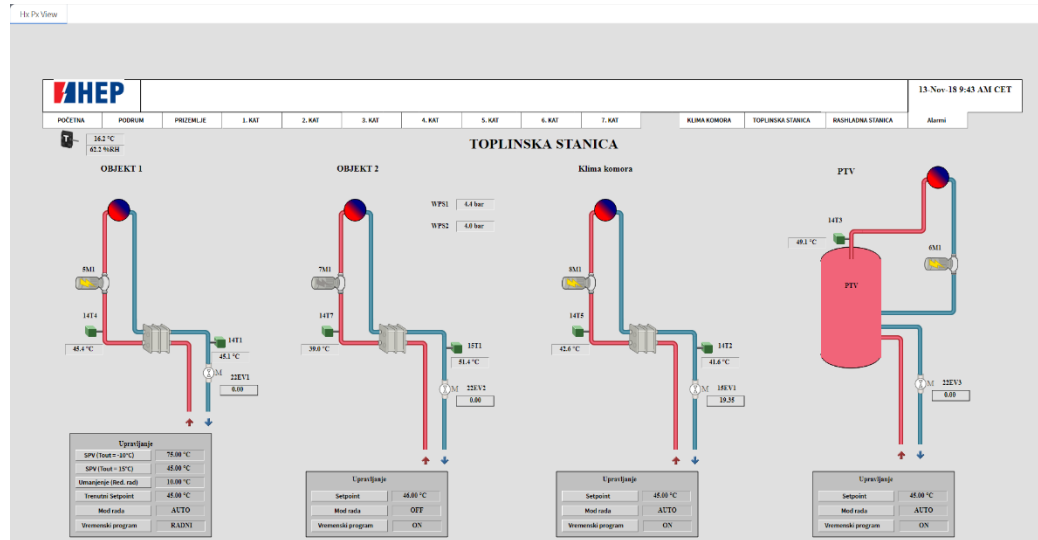
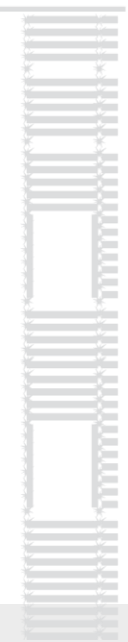
Zone Level

- All offices equipped with:
 - Siemens RDG controller for controlling heating and cooling equipment in the room
 - Thermal actuators for radiators
 - 2 temperature sensors – on heating and cooling medium return
- Equipment installed:
 - Siemens RDG Controllers – 243
 - Siemens RXB Controllers (Hallways) – 30
 - Thermal actuators – 288
 - Temperature sensors – 486
 - Wiring – 14,5 km (14.714 m)
 - 36 heat meters installed (4 per floor)



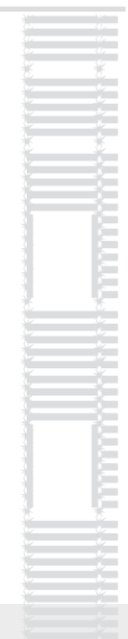
HVAC Level

- 2 new control cabinets installed
- Following systems integrated to BMS:
 - Heating station with 3 substations
 - Water Chillers
 - Circulation pumps
 - Air Handling Unit



Microgrid Level

- Battery pack with following characteristics installed:
 - Li-ion batteries
 - Capacity – 32,4 kWh
 - AC/DC Converter – 10 kW
- Integration of PV plant to BMS
 - PV plant is in feed in tariff – it will not be controlled, only production will be monitored



Future work

- Finish BMS of the Building
- Integration of all Heat meters to BMS
- Creation of 3Smart databases
- Installation of all 3Smart modules
- Testing the modules on lower scale – office or floor level
- Full implementation of 3Smart modules

START OF SAVING



Acknowledgement

The presented research results are obtained within the project Smart Building – Smart Grid – Smart City (3Smart)

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PROJECT WEB PAGE

www.interreg-danube.eu/3smart

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Thank you for your attention!

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