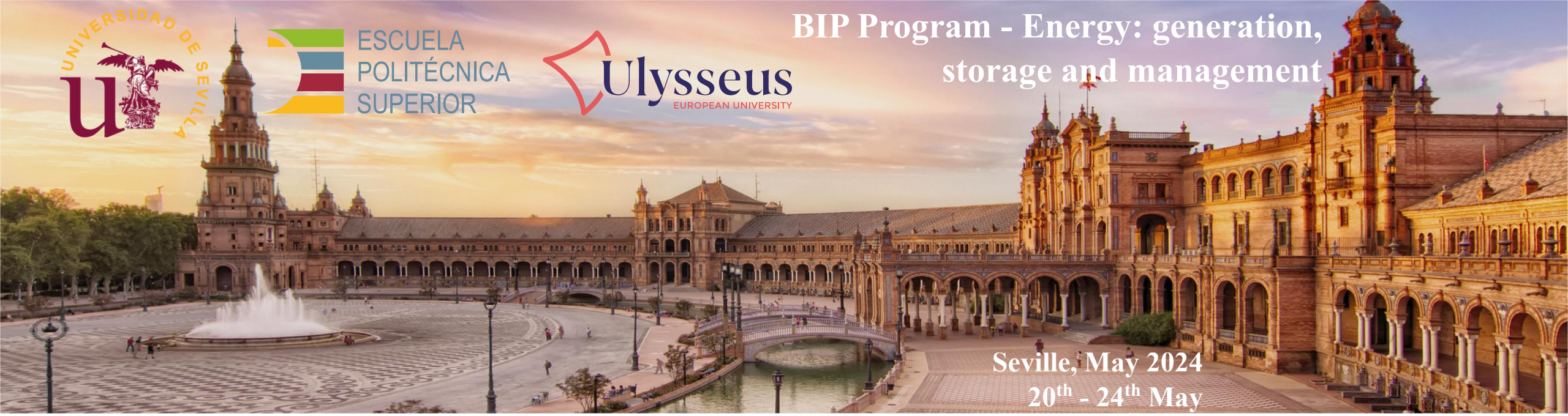


Workshop 2: Visit CATEPS µGrid

Dr. Enrique Personal (University of Seville)

Seville, 21st May 2024

Workshop 2: Visit CATEPS µGrid

- Presentation of the CATEPS µGrid Living-Lab Project.
- Description of the CATEPS µGrid Living-Lab structure and facilities
- Visit CATEPS µGrid itself

Workshop 2: Visit CATEPS µGrid

Presentation of the CATEPS µGrid Living-Lab Project

The "**Microgrid Living-Lab for the use of artificial intelligence in the integration of renewable energies and the management of flexibility**" was funded through the "*Ayudas a infraestructuras y equipamientos de I+D+i, en la modalidad adquisición de material científico y mejora de infraestructuras I+D+i, para entidades de carácter público en el ámbito del Plan Andaluz de Investigación, Desarrollo e Innovación*" program.

- Diesel Generator (800kW)
- Smart building (Manageable loads)
- Electric Vehicle Chargers

Andalucía se mueve con Europa

UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional

Junta de Andalucía

Investment: ~400 k€

Deployed energy resources:

- Photovoltaic generation (74.48 kWp)
- Wind generation (6 kWp)
- Battery Storage System (80.64 kWh)

ICT infrastructure (with a control center)

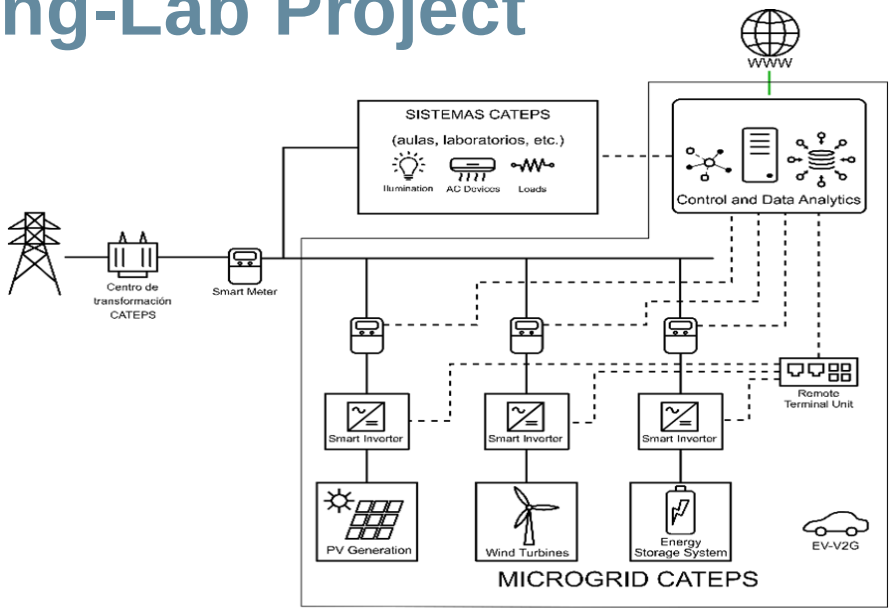



Workshop 2: Visit CATEPS µGrid

Presentation of the CATEPS µGrid Living-Lab Project

The "**CATEPS µGrid Living-Lab**" main objectives are having a research infrastructure with a medium-scale generation, storage systems and smart loads, structured in a modular way throughout the building and with management capacities (emulating a set of Distributed Energy Resources).

This architecture allows us to research and develop of technologies and strategies based on AI, for integration (management and optimization) of DERs on a real testbed.



Research Activities:

- Definition and test of Flexibility Resource Market structures.
- Design of tools based on digital twins for modelling of DER.
- Intelligent systems for the management of distributed energy resources (DERMS).
- Control interfaces and key performance indicators for the management and evaluation of DER operation.
- Analysis of cybersecurity aspects of electrical systems.

Workshop 2: Visit CATEPS µGrid

Description of the CATEPS µGrid Living-Lab structure and facilities

- **Photovoltaic generation system**
- **Wind generation system**
- **Battery Energy Storage system**
- **Control Center & ICT Infrastructure**

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Description of the CATEPS µGrid Living-Lab structure and facilities

Photovoltaic generation system:

4x 28x 665 Wp → Total 74.48 kWp

112 Monocrystalline photovoltaic modules (with 132 cells each one) of Passive Emitter Rear Cell (PERC) technology.

Canadian Solar HiKu7 solar panels.

4x 15kW → Total 60kW

Four Three-Phase Inverters (one in each roof), with 2 strings each one.

Fronius SYMO 15.0-3-M Inverters.

CATEPS Roofs

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Description of the CATEPS µGrid Living-Lab structure and facilities

Wind generation system:

2x 3 Wp → Total 6 kWp

Two Vertical axis wind generator with H-Type Darrieus rotor.

Tumurly Vortex3.0 generators

One 5kW Inverter, with 2 strings.

Deye SUN-5K-SG03LP1-EU.

CATEPS Roofs

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Description of the CATEPS µGrid Living-Lab structure and facilities

Battery Energy Storage system:

6x 10kW converters → Total 60 kW

Six 10kW single-phase converters (two in parallel per each phase.

Victron MultiPlus-II 48/10000/140-100

6x 280Ah, 48V → Total 80.64 kWh

Six packs of Lithium Iron Phosphate (LFP), each one of 13.44kWh.

CEGASA eBick Pro 280 solution.

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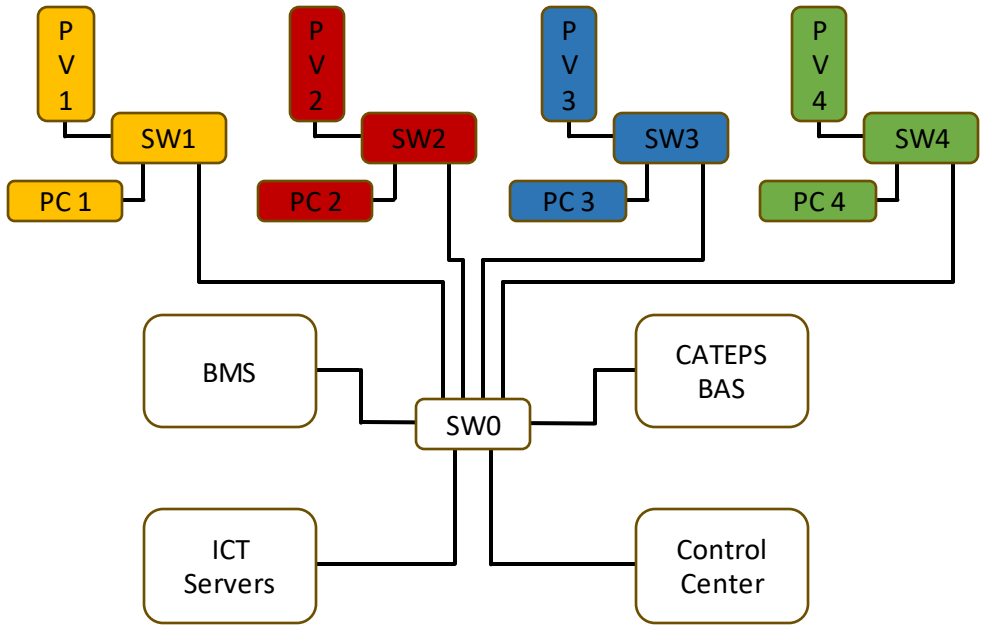
Description of the CATEPS µGrid Living-Lab structure and facilities

Control Center & ICT Infrastructure:



Workshop 2: Visit CATEPS µGrid

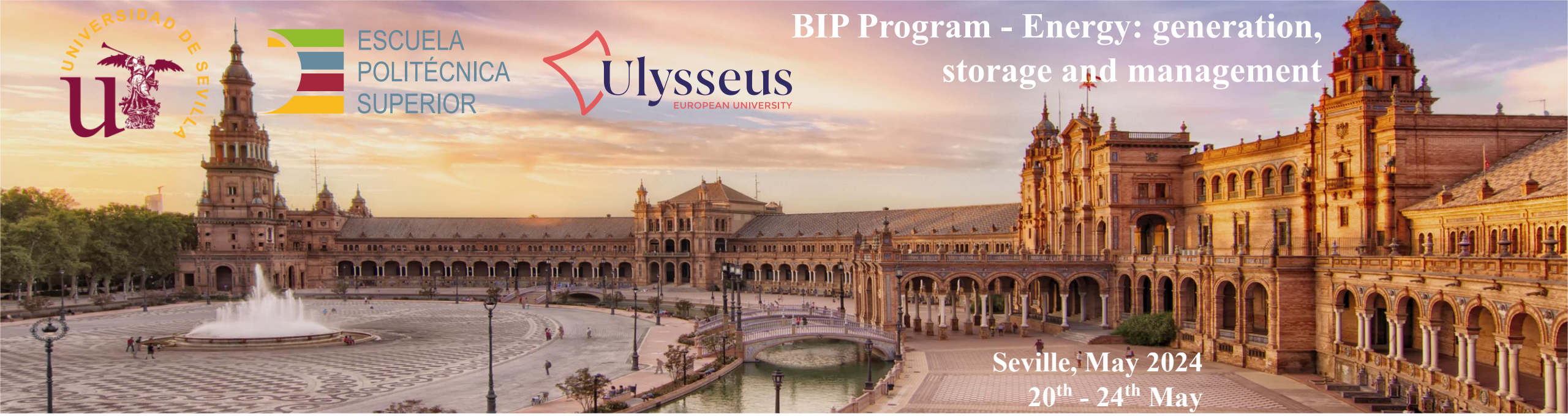
Description of the CATEPS µGrid Living-Lab structure and facilities

Workshop 2: Visit CATEPS µGrid

Visit CATEPS microgrid

- **Photovoltaic and wind generation systems (yellow roof)**
- **Battery Energy Storage system room**
- **Control Center room**

To visit all spaces, We start from the this meet point



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