FEDECOM

Use case of the Bilbao City Hall

FEDECOM (FEDErated - "system of systems" - approach for flexible and interoperable energy COMmunities) is a Horizon Europe project demonstrating sector coupling by federating energy communities. FEDECOM provides a scalable and adaptable cloud-based platform including analytical, modelling and optimisation services for planning, supervision and control of integrated local energy systems.

FEDECOM project partners:

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Before FEDECOM

The **Bilbao City Hall** use case comprises five buildings — Casa Consistorial, San Agustín, Anexo, Aznar, and La Peña Library — each featuring diverse heating and cooling installations. These public service buildings mainly operate during weekday office hours, thus having high energy demand peaks during operational hours.

By integrating FEDECOM's innovative energy management solutions, the project

aims to enhance efficiency through optimised thermal interdependencies among these sites, as well as increasing and optimising the use of electrical systems, such as heat pumps, taking advantage of the peer-to-peer FEDECOM electricity market. Upgrades include data acquisition, sensor replacements, and cloud-based systems integration, optimising energy consumption and generation across a portfolio of buildings.

Existing Technologies

- **Multiple gas boilers** with a combined capacity above 2.5 MW
- **Heat pumps** for thermal management with a combined capacity above 1 MW across various buildings
- **Chillers** providing a total cooling capacity of 560 kW

- **Photovoltaic (PV) panels** generating up to 42 kWp of electricity
- **Energy storage systems**, including a 300 kWh uninterruptible power supply (UPS)
- **Electric vehicle (EV) charging infrastructure**, consisting of two chargers

After FEDECOM

The **upgrades that FEDECOM has brought** to the City Hall buildings focus on optimising the operation of existing systems, through three key aspects:

▶ Taking advantage of the demand and production synergies between the buildings

▶ Optimising the systems' operating with machine learning predictive algorithms that take into account demand profiles, weather forecast and energy prices

▶ Integrating in the FEDECOM peer-to-peer energy market to further optimise operational costs and increase use of RES
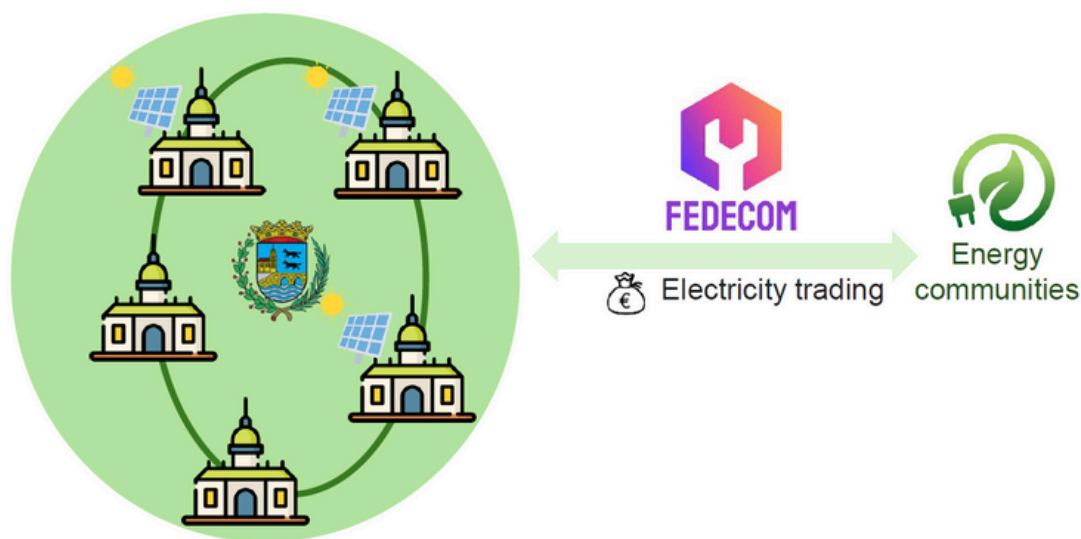
Project's benefits for the pilot

- **Optimized** energy use across five municipal buildings
- **Increased** integration of renewable energy (e.g., PV solar)
- **Preparing** the site to trade excess energy with other communities
- Cloud-based **data management** and enhanced monitoring
- **Improved** building comfort and energy efficiency

Innovations of the FEDECOM Platform

- **Real-time monitoring** of energy production and consumption enables dynamic adjustments for optimal efficiency across municipal buildings.
- **Optimized renewable integration**, focusing on PV solar, enhances renewable energy usage within the city hall system.
- **Peer-to-peer energy trading** allows surplus or deficit energy from municipal buildings balanced through the FEDECOM platform.

Interested in Replicating this Use Case in Your Community?

Do not hesitate to contact us for more details:

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