



Hydrogen Innovation Webinar: Showcasing Diverse  
and Promising Applications.

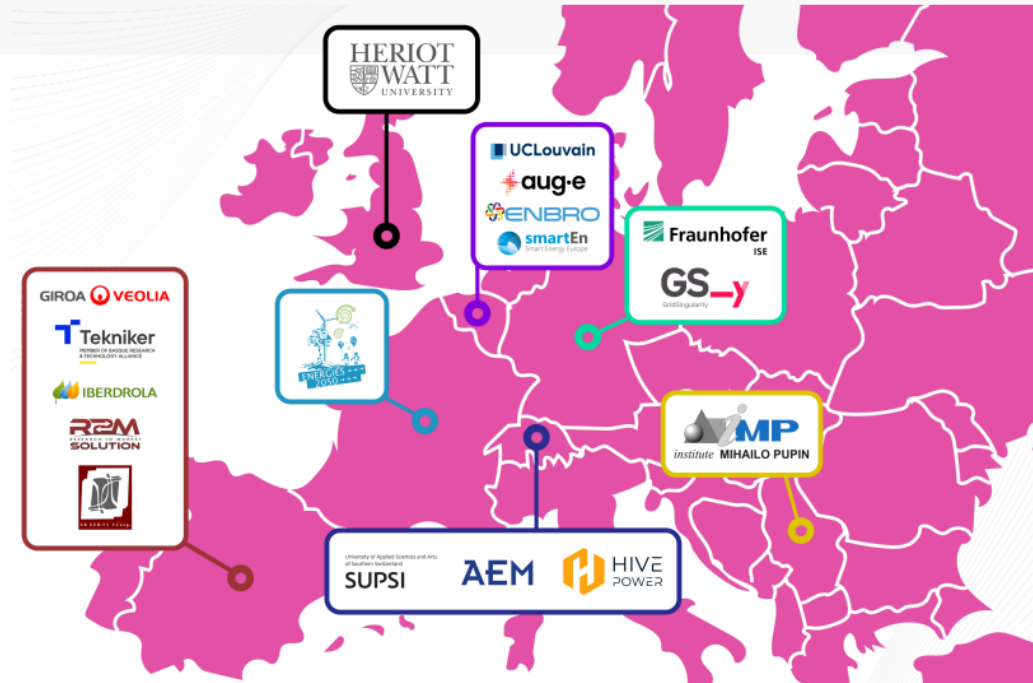
# FEDECOM – Integrating Hydrogen into Federated Energy Systems



FEDECOM is a 48 months EU Horizon Europe funded project started on October 1st, 2022. FEDECOM is developing the technical and business ecosystem to demonstrate the advantages of energy sector coupling across European energy communities. Integrating the local energy systems across the federation of communities will bring economic benefits, improve grid stability and reliability, as well as reduce the overall carbon footprint.

## OBJECTIVES

- Deploying a cloud-based solution for sector coupling, distributed generation and storage, high flexibility management and improvement of RES hosting up to 40%.
- Validating the solution in three pilots across diverse technical, market and climate contexts to demonstrate grid resilience, optimised local operations and unlocking at least 30% of demand side flexibility.
- Developing plans for the large-scale replication of the solution in three follower communities with a focus on impact assessment.
- Evaluating impacts on OPEX, CAPEX and overall value creation.

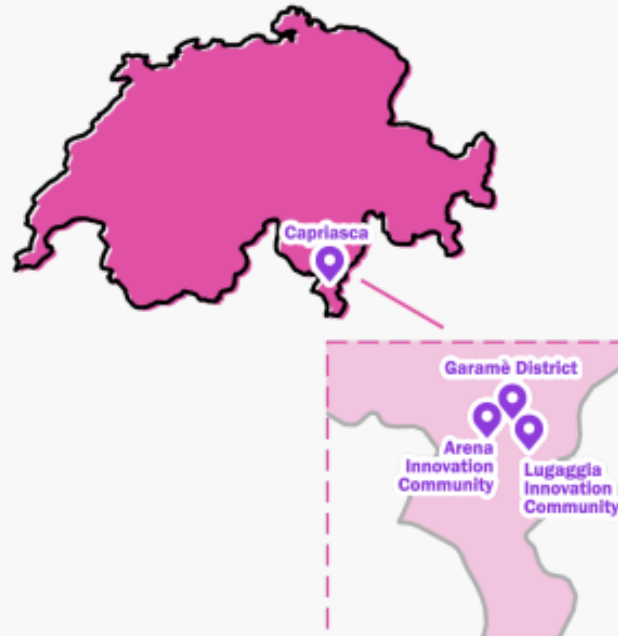


## PILOTS

### Virtual Green H2 Federation *Spain*



### Residential Hydropower Federation *Swiss*



### Cross-country e-Mobility Federation *Benelux / Netherlands*



GREEN HYDROGEN AT IBERDROLA

## Puertollano - Green H2 for Fertilizers



**One of Europe's largest electrolyzer, operating steadily already for 2 years**

- **Green H2** production facility **onsite, fully integrated** in Fertiberia's existing ammonia and fertilizing process
- Experts in **optimizing electricity** supply for RFNBO production since **2023**

Located in **Puertollano** (Ciudad Real, Spain)

In **operation** since Q1 **2023**

**+250 visits** received (institution, media, partners)

**€150M investment** and part of a larger **IPCEI project**

**Pioneer H2 cost optimization system:**

**20 MW  
PEM ELY  
3kt/year**

**BTM Power  
100 MW  
solar plant**

**5 MW BESS  
11 H2 tanks**





## Puertollano - Green H<sub>2</sub> for Fertilizers



- a) Electrical building
- b) Control Room
- c) Water Storage Tank
- d) Fire water tank
- e) Rectifiers
- f) Electrolyzer Building
- g) H<sub>2</sub> Storage
- h) Air cooling system



Compression system located behind the electrolyzer building

## Puertollano - Green H2 for Fertilizers



NEL ASA electrolyzer  
PEM technology  
16 stacks of 1.25 MW each



11 H2 storage tanks  
Supplied by IDESA and VAKO  
60 Bars pressure  
~4 tons usable capacity



Onsite facility integrated in  
Fertiberia's fertilizers production  
process



GREEN HYDROGEN AT IBERDROLA

## Puertollano - Green H<sub>2</sub> for Fertilizers



### Iberdrola's 100 MW Solar PV plant

- 200 Ha. extension
- Bifacial panels enabling greater production (two light-sensitive surfaces)
- Dedicated 30kV underground line (~9km) to deliver 35 MW solar power to Puertollano's 20 MW Green H<sub>2</sub> Facility
- Lithium-ion battery system of 5MW (storage capacity of 20 MWh)

## Barcelona - Green H2 for Heavy Mobility



### 1<sup>st</sup> production and refuelling facility in Spain supplying Green H2

- **Hydrogen Refuelling Station** to supply green H2 to *Transports Metropolitans de Barcelona* (TMB) fleet of hydrogen buses
- **10-years contract**, public tender
- **Location:** free zone of the Port of Barcelona
- **1<sup>st</sup> Phase:** 2.5 MW PEM electrolyzer from Cummins
  - ✓ 1<sup>st</sup> recharge completed in January 2022
  - ✓ 46 buses charged every day + 14 be incorporated in 2025
- **Potential 2<sup>nd</sup> Phase:** 5 MW to supply up to 60 buses and spare capacity for other customers
- **Expected bus consumption:** 18 kg/day – 200 km
- **Load:** 350 bar in 10 minutes
- **Potential production:** 400 tons of green H2 per year





## Barcelona - Green H<sub>2</sub> for Heavy Mobility



- a) Electrical and control building
- b) Electrolyzer (Cummins, 2.5 MW)
- c) H<sub>2</sub> compressor (up to 450 bars)
- d) H<sub>2</sub> Storage
- e) Fire water tank
- f) Loading zone
- g) Dispensing zone



# Thank you

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GIROA  VEOLIA

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