Hydrogen Innovation Webinar: Showcasing Diverse and Promising Applications.

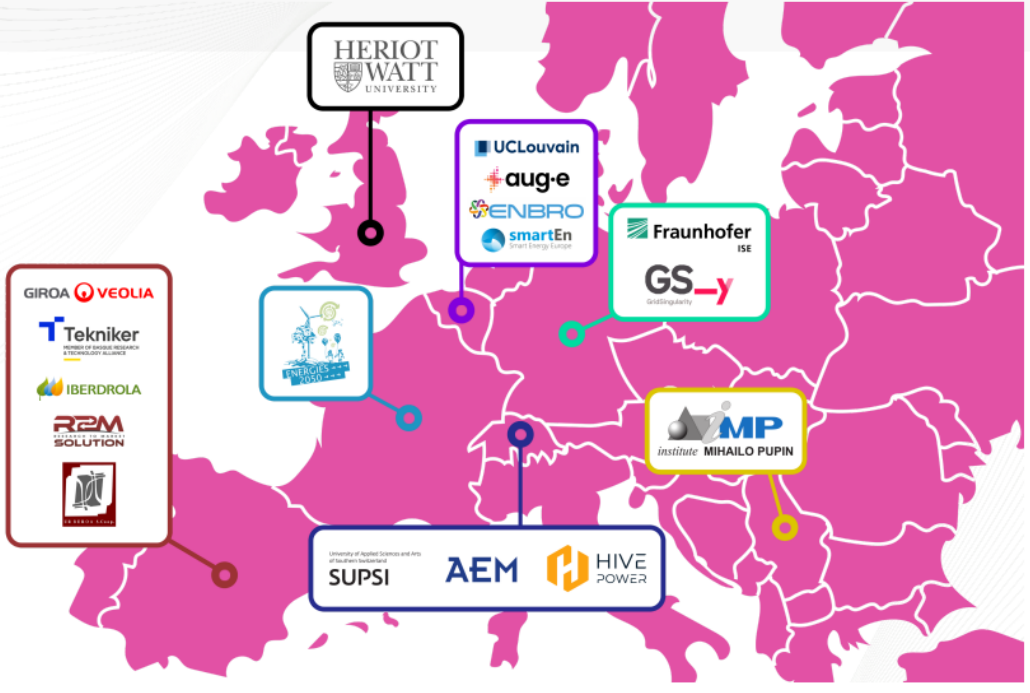
FEDECOM – Integrating Hydrogen into Federated Energy Systems

FEDECOM CONTEXT.

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.

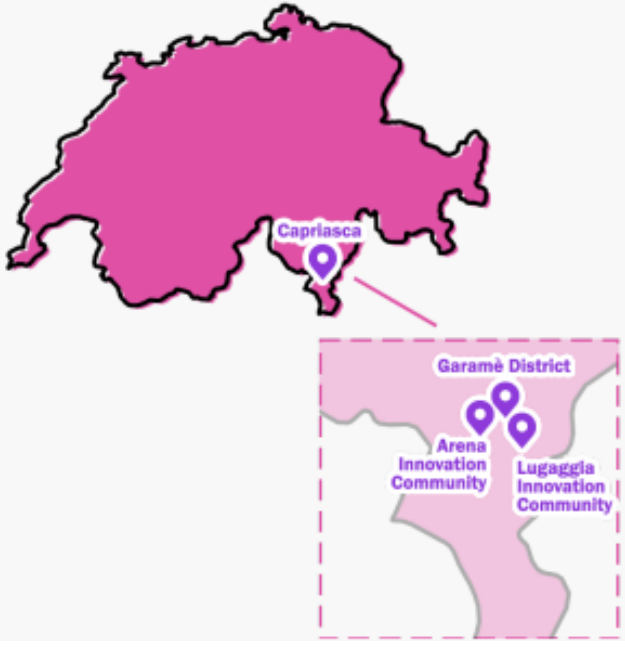


Pilots Overview

PILOTS

Virtual Green H2 Federation
Spain

Residential Hydropower Federation
Swiss



Cross-country e-Mobility Federation
Benelux / Netherlands

Hydrogen Pilots. Puertollano.

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**

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Hydrogen Pilots. Puertollano.

GREEN HYDROGEN AT IBERDROLA

Puertollano - Green H2 for Fertilizers

a) Electrical building

b) Control Room

c) Water Storage Tank

d) Fire water tank

e) Rectifiers

f) Electrolyzer Building

g) H_2 Storage

h) Air cooling system

Compression system located behind the electrolyzer building

Hydrogen Pilots. Puertollano.

GREEN HYDROGEN AT IBERDROLA

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

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Hydrogen Pilots. Puertollano.

GREEN HYDROGEN AT IBERDROLA

Puertollano - Green H2 for Fertilizers

GREEN HYDROGEN AT IBERDROLA

Barcelona - Green H2 for Heavy Mobility

1st 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
- **1st Phase:** 2.5 MW PEM electrolyzer from Cummins
  - ✓ 1st recharge completed in January 2022
  - ✓ 46 buses charged every day + 14 be incorporated in 2025
- **Potential 2nd Phase:** 5 MW to supply up tp 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

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Hydrogen Pilots. Barcelona.

GREEN HYDROGEN AT IBERDROLA

Barcelona - Green H2 for Heavy Mobility

a) Electrical and control building

b) Electrolyzer (Cummins, 2.5 MW)

c) H_2 compressor (up to 450 bars)

d) H_2 Storage

e) Fire water tank

f) Loading zone

g) Dispensing zone

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Thank you

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