



## Interoperable cloud-based solution for cross-vector planning and management of Positive Energy Districts

### Our Vision

To lead the transformation towards sustainable urban energy systems, making Positive Energy Districts a standard for cities across Europe, contributing significantly to the EU's climate goals.

### Our Mission

To develop and demonstrate innovative, scalable, and replicable solutions for Positive Energy Districts that effectively integrate renewable energy sources, enhance energy efficiency, and foster community engagement and resilience.

### Our Approach

InterPED adopts a holistic, cross-disciplinary approach, combining state-of-the-art technologies with participatory design and rigorous stakeholder engagement. We focus on tailored solutions that address specific local needs, ensuring that our pilot projects set a benchmark for future urban energy systems.

#### PROJECT NUMBER

101138047

#### PROJECT ACRONYM

InterPED

#### START

01/01/2024

#### DURATION

36 months

#### COSTS

€6,978,353

#### FUNDING

€4.884.847

## InterPED Objectives

InterPED is focused on creating Positive Energy Districts (PEDs) that integrate renewable energy, improve grid stability, and reduce carbon emissions. Our main objectives are:

### Integrating ICT for PEDs

Build a cloud-based platform to manage PEDs, supporting energy systems integration, high renewable energy use (over 50%), and community involvement.

### Large-Scale Validation

Test the InterPED platform in four pilot sites across Europe to show improved grid reliability, optimized energy use, and at least 30% flexibility in demand.

### Replicability Plans

Develop plans to replicate InterPED in four more districts, demonstrating benefits for the energy grid, local economy, and environment.

## Expected Impact

### Scientific Impact

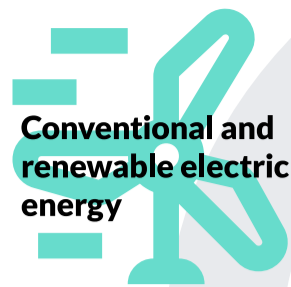
InterPED will advance urban energy management by developing innovative tools and methodologies for Positive Energy Districts (PEDs).

### Societal Impact

By actively involving communities in the energy transition, InterPED fosters inclusivity and empowers citizens to take ownership of energy-efficient practices.

### Techno-Economic Impact

InterPED will optimize urban energy systems, increasing energy efficiency and reducing costs.



Conventional and renewable electric energy

Electricity distribution, transformers, inverters

Electric load and household appliances

## Grid support

- congestion management
- distribution grid state estimation
- improved grid robustness

## Optimized control

- optimal asset scheduling
- cross-vector opt. dispatching
- model predictive control

End users: aggregators, service providers, urban planners...

InterPED planning and operational management tools & services

## Community engagement

- citizen participation
- local energy marketplace
- cooperative DR strategy

Hybrid/electric vehicles and storage

Thermal generation, district heating, etc

## Flexibility services

- cooperative DR strategy
- increased demand flexibility
- optimal load management
- local energy marketplace

## Sector coupling

- cross-vector integration
- RES and waste heat utilization
- non-energy sector coupling

Heating and cooling appliances

Heat pumps and heat exchangers

Waste heat and water management

#### PILOT 1

### Lugaritz-Matía Community (San Sebastián, Basque Country)

Focused on healthcare facilities, including the Birmingham Hospital and two nursing homes, this pilot integrates geothermal, biomass, and gas energy sources. The goal is to improve energy efficiency and transition fully to renewable sources through advanced energy management.

#### PILOT 2

### Ecovillage Findhorn (Scotland)

In the historic Findhorn Ecovillage, InterPED aims to increase renewable energy self-consumption to over 70% through optimized energy dispatching and electrification of heating and transport. Key systems include wind, solar, and enhanced district heating.

#### PILOT 3

### Arena Innovation Community (Capriasca, Switzerland)

This pilot combines residential and public services, including a pool and sports facilities, with a focus on biomass and heat recovery. InterPED will optimize energy self-consumption, introduce e-mobility integration, and manage peak-shaving to enhance sustainability.

#### PILOT 4

### Alba Iulia College District (Romania)

Centered around a technical college, this pilot focuses on solar energy integration and strategic renovations. InterPED will enhance self-consumption, energy flexibility, and create a local energy marketplace to reduce reliance on external sources.



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