MAKING PEDs

DECISION-MAKING DIGITAL TWINS FOR CLIMATE NEUTRAL POSITIVE ENERGY DISTRICTS

BRING YOUR CITY'S DIGITAL TWIN TO THE NEXT LEVEL

Make it a decision-support system for your path to climate neutrality



Making PEDs virtual platform — what is it?

The Making PEDs platform integrates **3D city models** into a dynamic, interactive environment that supports **urban analysis and decision-making.**

The platform also supports the planning of **Positive Energy Districts (PEDs)** — neighbourhoods designed to produce more clean energy than they consume, reducing emissions and creating a greener, more sustainable place to live.

At its core, the platform connects **CityGML-based 3D models** with energy and environmental data to form a digital representation of urban districts, **enabling simulations, scenario testing, and cross-domain analysis.**

Within the broader **digital twin concept,** the platform acts as a **decision-support layer,** transforming static city data into an **actionable and understandable system.**

Why is it important?

Cities are complex systems where **buildings, infrastructure, and human activity are interconnected.** Planning interventions towards **Positive Energy Districts (PEDs)** requires understanding of these relationships.

3D city models enable:

- **Assessment**. Evaluate building stock, energy performance, and district characteristics
- **Simulation.** Test scenarios such as retrofitting or renewable energy integration
- **Visualization**. Communicate complex data in an intuitive, spatial way
- **Interoperability.** Provide a standardised data structure (via CityGML) to connect different tools and datasets

By linking data with spatial context, the platform supports **evidence-based decisions at the neighbourhood level.**

Link to MakingPEDs virtual platforms:

Driving Urban Transitions DUT
EUROPEAN PARTNERSHIP
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How can it be used?

The platform is applied throughout planning and decision-making processes for:

- **Analysis.** Understand current neighbourhood conditions and identify opportunities
- **Scenario evaluation.** Compare the impact of different interventions
- **Design support.** Inform early-stage planning and design decisions
- **Communication.** Facilitate discussions between stakeholders through visual outputs
- **Policy and strategy development.** Support long-term planning toward climate neutrality

Overview of the platform workflow

1. Data collection
Gather spatial, energy, and infrastructure data

2. 3D model creation (CityGML)
Structure and enrich data into semantic 3D models

3. Platform integration
Upload models into the Making PEDs platform

4. Scenario setup
Define variables (e.g., retrofits, PV, energy systems, materiality)

5. Simulation & analysis
Run and compare different scenarios

6. Visualisation & communication
Present results to support decision-making

Who can use it?

The platform is designed in a way to serve different stakeholders:

- **Municipalities:** urban planners, energy and sustainability departments
- **Developers** for feasibility studies and investment planning
- **Architects & engineers** for design support and analysis
- **Researchers & sustainability experts** for modelling and evaluation
- **External stakeholders:** including citizens, through simplified visualisations

FROM **DATA** TO **DECISIONS**

4 Urban Living Labs within the Making PEDs project demonstrate how digital twins and 3D city models can support **real-world urban transformation.**

By combining **urban data, standardised models, and simulation tools, Making PEDs helps stakeholders:**

- Better understand future energy demand
- Test strategies before implementation
- Make confident, transparent decisions

This approach supports not only these cities' ambition to develope a **zero-emission district,** but also provides a replicable model for other **cities transitioning toward climate neutrality.**

URBAN LIVING LABS

Civitavecchia, San Liborio



Sant Esteve de Palautordera



Linz, Franckviertel



Bærum, Fornebu

