exPEDite

an Introduction

Enabling Positive
Energy Districts
through Digital Twins

Funded by
the European Union

Positive energy districts for sustainable climate change

Cities consume 65% of the world's energy supply and are responsible for 70% of the CO^2 emissions, hence sharing a lot of the responsibility for climate change. We are faced with the challenge of redesigning our existing cities to make them more sustainable, resilient, inclusive and safe. Developing **Positive Energy Districts (PEDs)**, is a breakthrough way to deal with the issue of urban emissions and applying adaptation and mitigation strategies to climate change, while ensuring that these urban areas generate an **annual surplus of renewable energy and net zero greenhouse gas emissions**.

Funded by the European Union

In a nutshell

exPEDite

Enabling Positive Energy Districts through Digital Twins

Start
01/24

BUDGET
7.5M€

End
12/26

LEAD PARTNER
Riga Technical University

PARTNERS
19

ExPEDite aims at creating and deploying a **novel digital twin**, allowing for **real-time monitoring, visualization and management of district-level energy flows**.

Funded by
the European Union


LAUREA
UNIVERSITY OF APPLIED SCIENCES
1862
RĪGAS TEHNISKĀ UNIVERSITĀTE
RIGA ENERGY AGENCY
RIGA DIGITAL AGENCY
SWECO
thelisboncouncil
think tank for the 21st century
OPEN & AGILE SMART CITIES
TECHNOLOGICKÁ PLATFORMA ENERGETICKÁ BEZPEČNOST ČR
VSB TECHNICAL UNIVERSITY OF OSTRAVA
EXUS AI LABS
Pleg.ma labs
Deloitte.
upcom minds
EVIDEN
an atos business
tecnalia
Inspiring Business

ExPEDite's vision: focus on 4 components that contribute to PEDs

1. Building stock energy efficiency
2. Renewable energy sources (RES)
3. Energy flexibility
4. E-mobility & sustainable transport

Combined with **citizen engagement actions**

Funded by the European Union

exPEDite

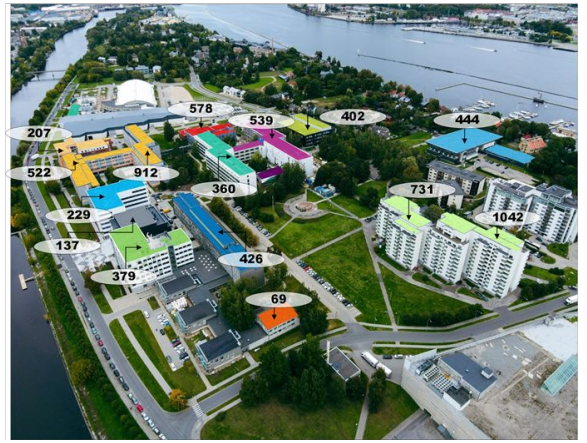
Pilot site: Ķīpsala

RTU smart student city

4700 MWh electrical energy p.a., 2022
6535 MWh heat energy p.a., 2022

- Area 17.5 ha
- 12 faculty & laboratory buildings
- 2 dormitories (850 residents)
- 1 is an olympic-size swimming pool.
- All buildings renovated or new (80 mln EUR)

Most buildings equipped with BMS and HVAC

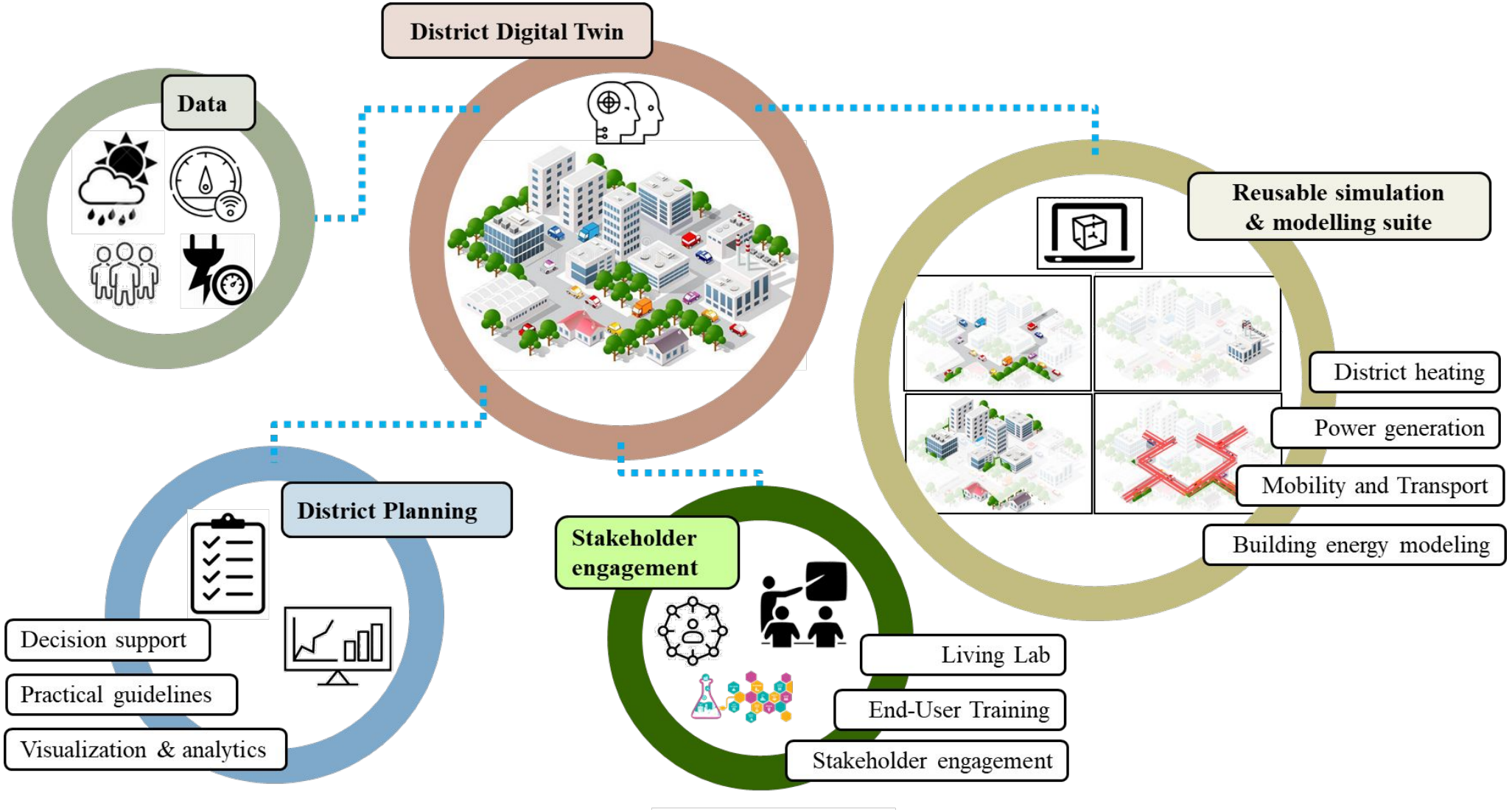


Expected outcomes

- Increased number of **city planning actions** for PEDs.
- **Enhanced data gathering approaches** with identification relevant (standardized) multi-dimensional data sets, high-resolution real-time data streams, and relevant forecasting data, drawing also on the work of common European data spaces.
- **Consolidated city sensor network specifications**.
- Increased **integration of existing smaller scale management systems**.
- Increased number of city planning departments / approaches **using common data and (replicable) elements and processes**.
- **Improved performance of AI based self-learning systems** for optimization of positive clean energy districts and bottom-up complex models.

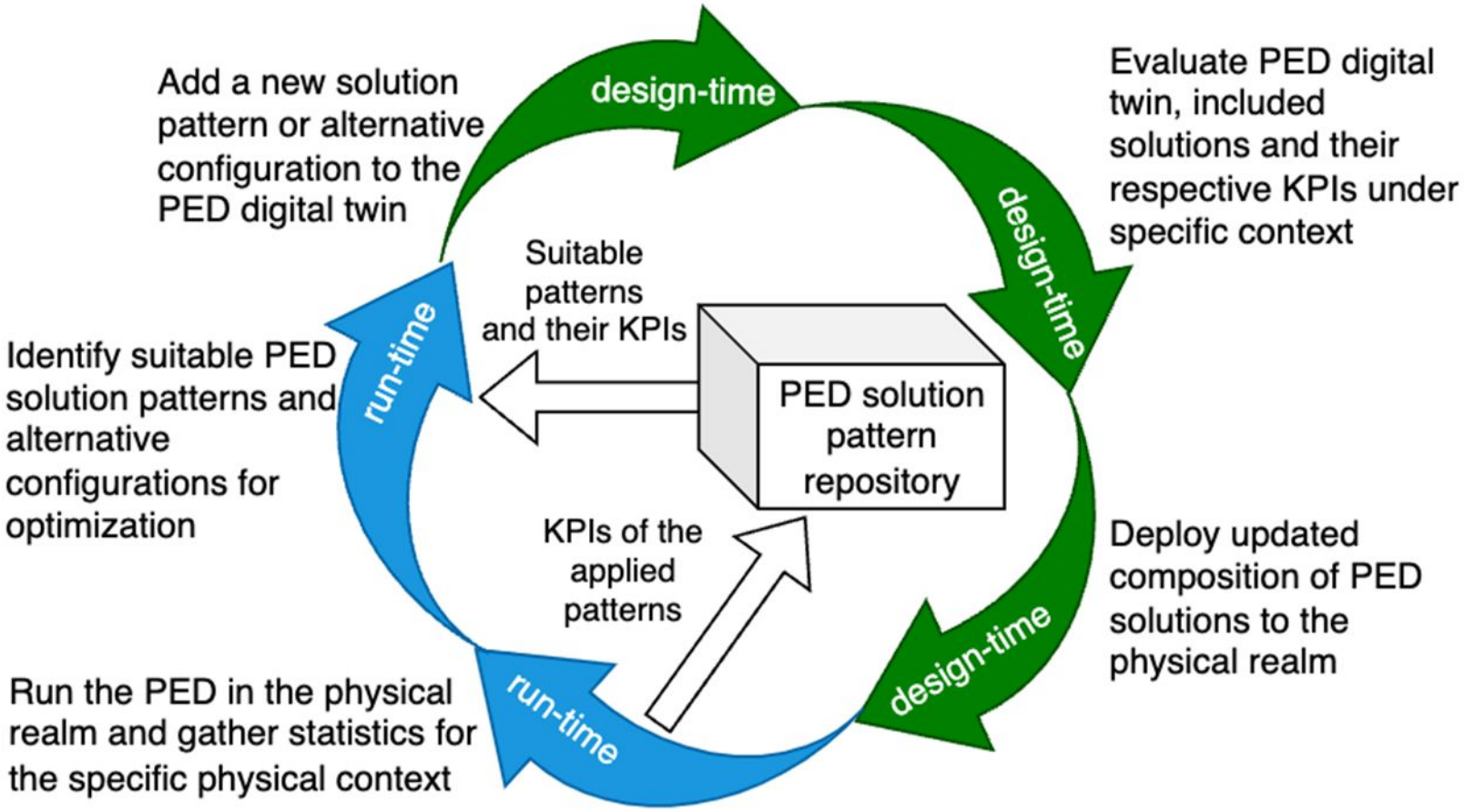
Funded by the European Union

ExPEDite's conceptual approach to the District Digital Twin



Funded by the European Union

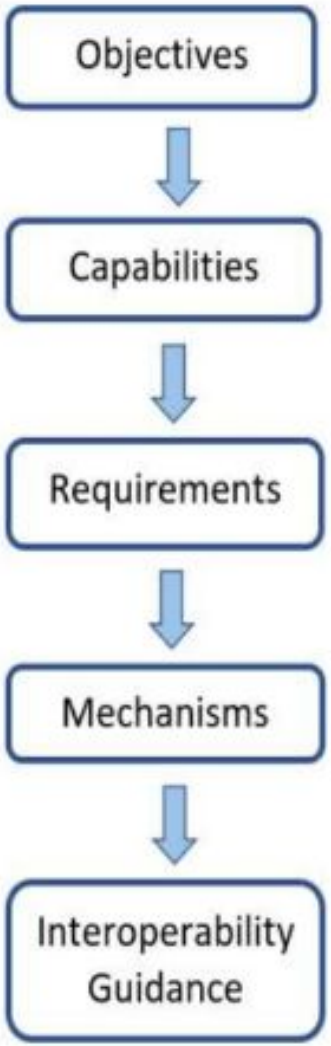
ExPEDite digital to physical



Funded by the European Union

MIMs Compliance level evaluation

Main principles of a MIM.Meter



The MIM.Meter principles:

- A set of closed questions (Y/N) to evaluate in which extend the implemented solutions are covering the requirements of the related MIM.
- Each question has a relative weight depending on its relative contribution to reach the targeted requirement
- The relative weight of a question is an integer value from 0 (question with no influence, for information only) to 10 (non-negotiable “MUST have”)
- The compliance rate of a MIM is a percentage aggregating the weighted scores

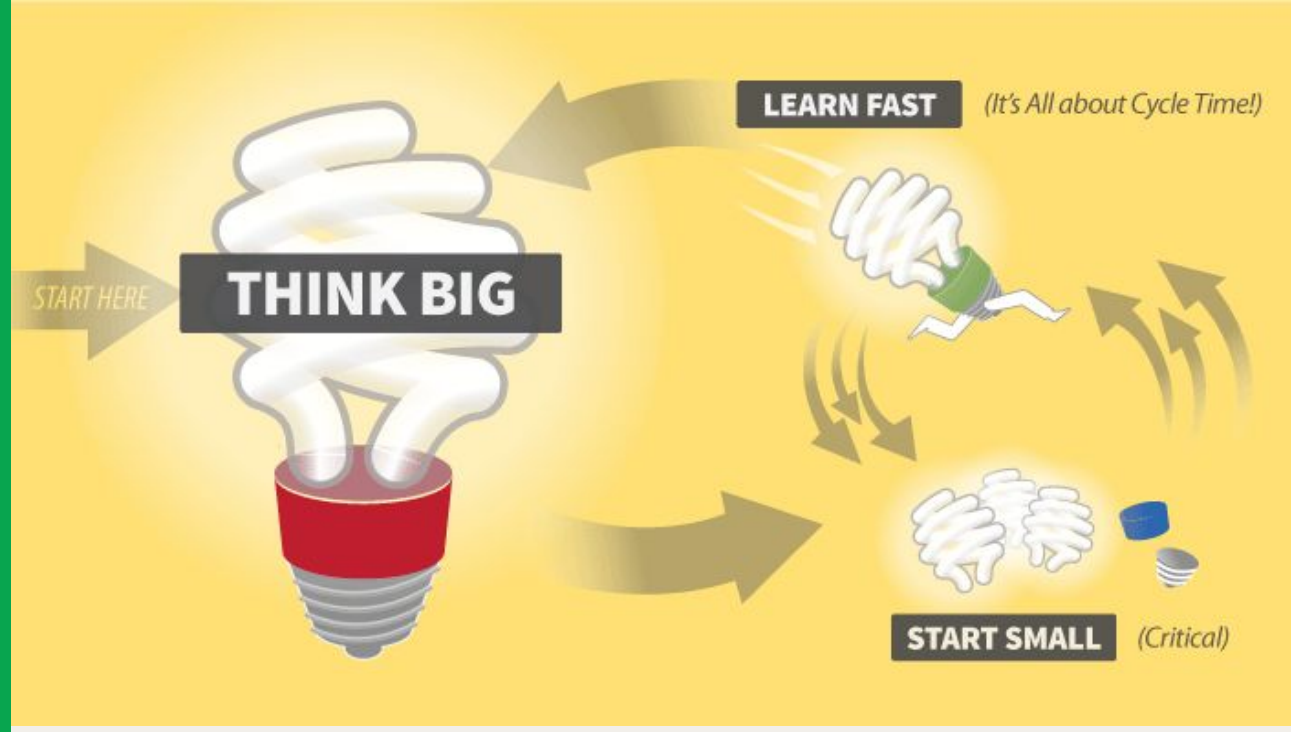
Interaction	MIM1	Context Information	MIM2	Data Models
	MIM3	Contracts		
	MIM7	Places		
Integrity	MIM4	Trust		
	MIM5	Transparency		
	MIM6	Security		
Impact	MIM8	Indicators		
	MIM9	Analytics		
	MIM10	Resources		

Funded by the European Union

Incremental and continuous improvement of the exPEDite MIM.Meter

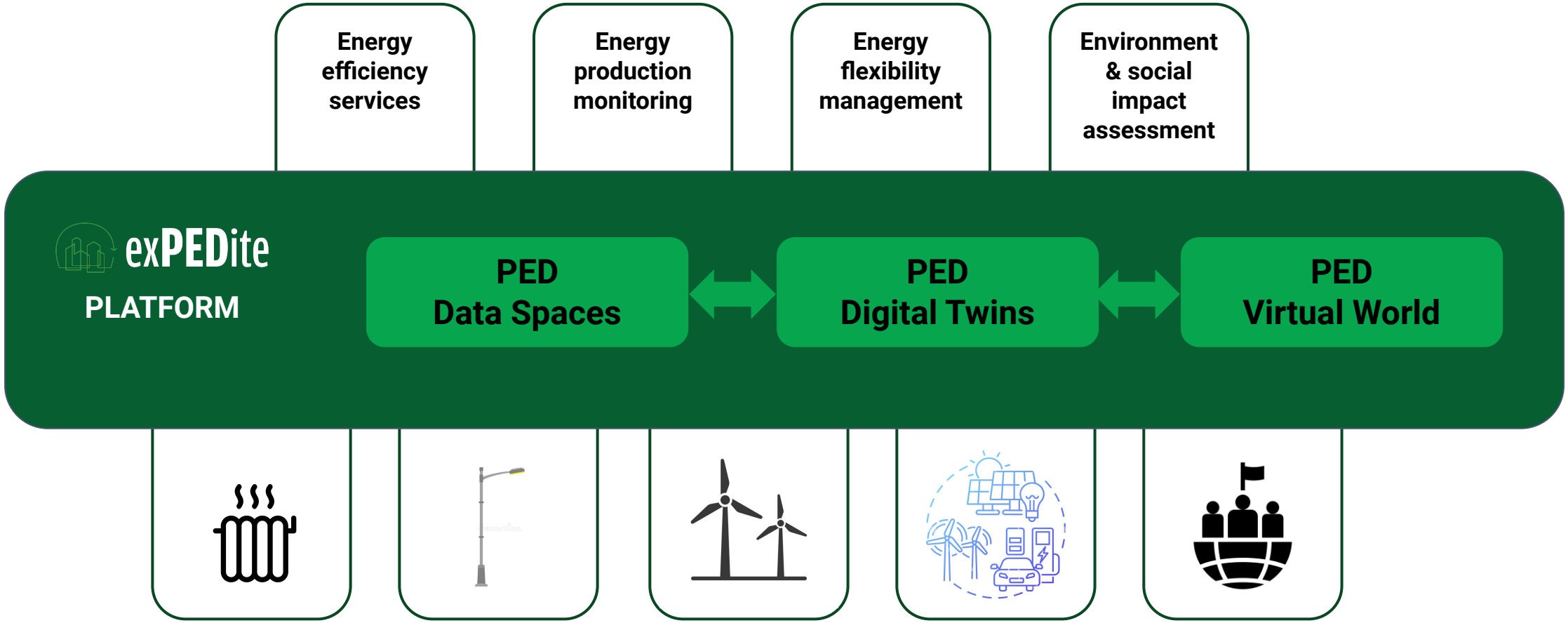
Based on available (and evolutive) operational implementations of **Digital Twins** and **Data Spaces** related to PED.

Several levels of evaluations, from basic/standard to specific/local.



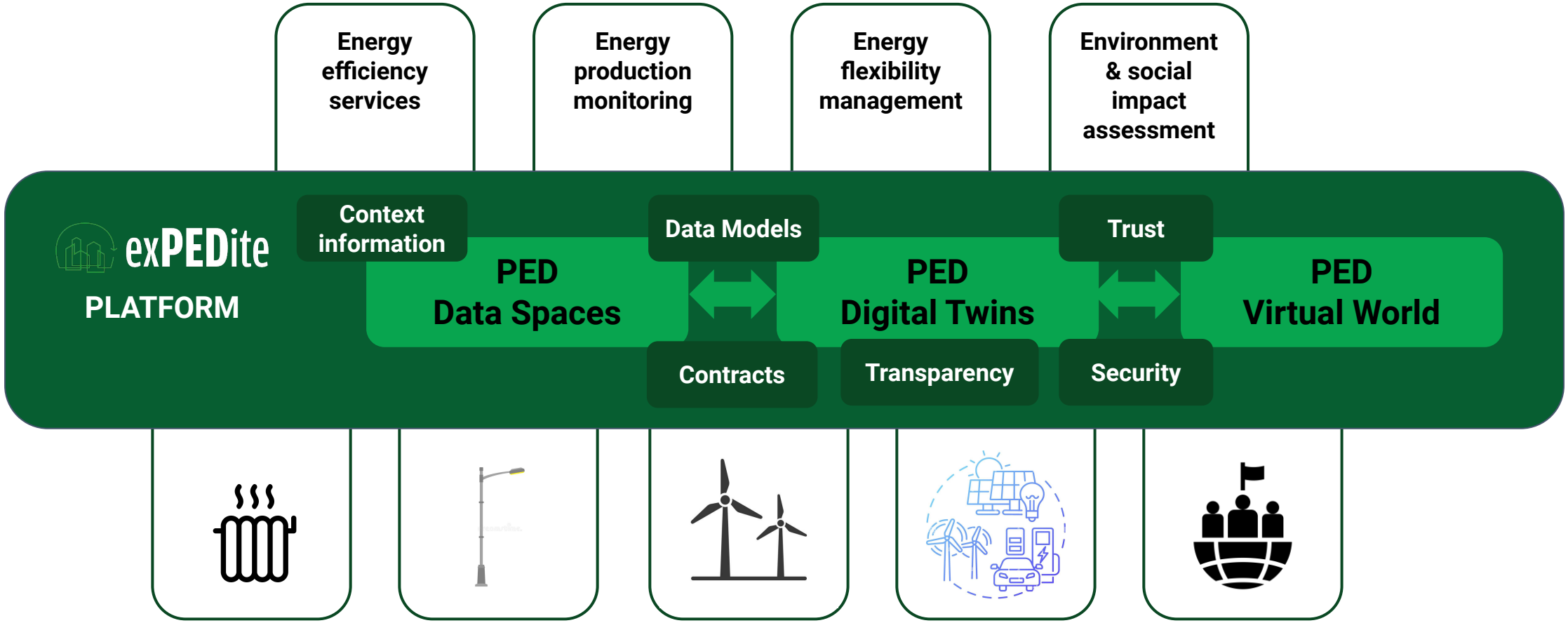
Funded by the European Union

MIMs 1-6 main points of evaluation in the sandbox platform



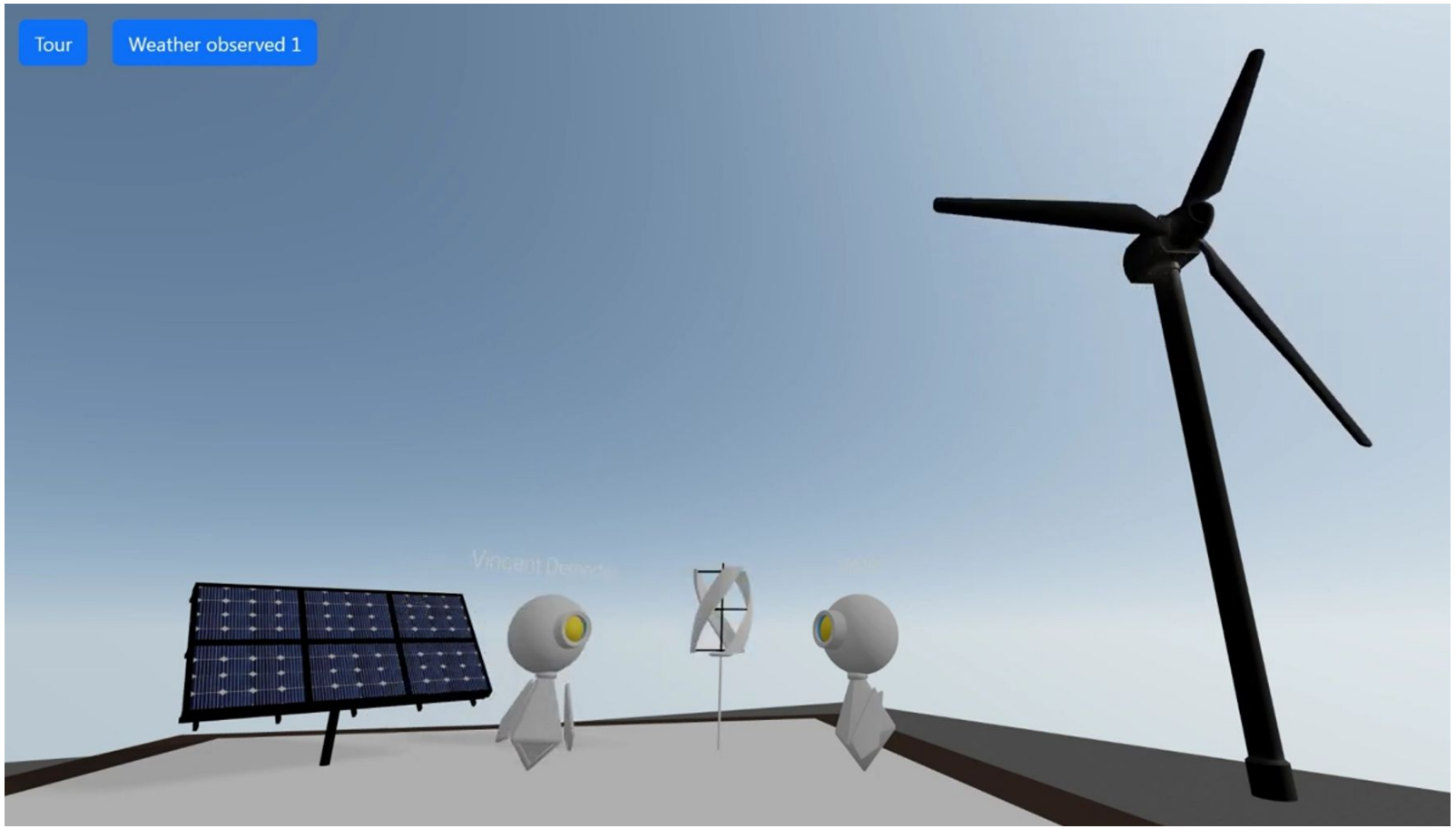
Funded by the European Union

MIMs 1-6 main points of evaluation in the sandbox platform



Funded by the European Union

Possible use of the CitiVerse from OASC France to demonstrate the exPEDite platform



Funded by
the European Union

Thank You

hello@expedite-project.eu

Web—**https://expedite-project.eu/**

Linkedin—**expedite-project**

Twitter—**@ExPEDite_EU**

Funded by
the European Union