

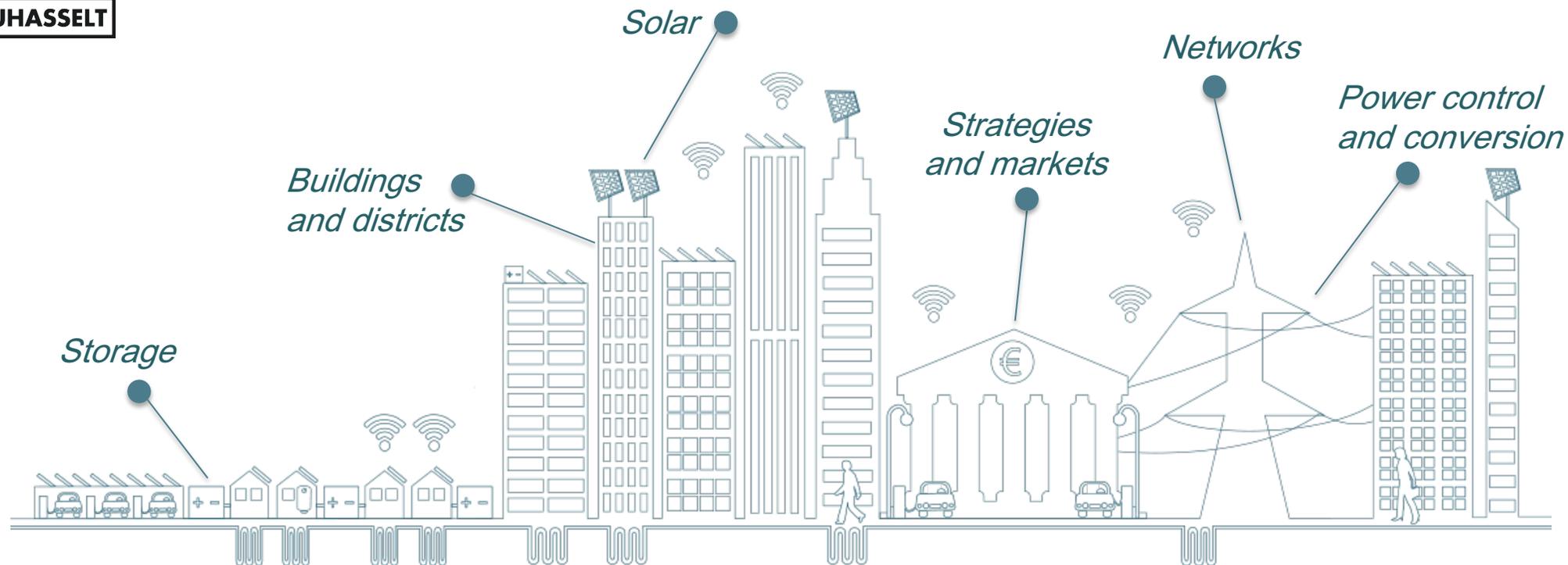
An aerial photograph of Thor Park at sunset. The scene is dominated by a large, white, lattice-structured tower on the left, which is part of the park's historic infrastructure. In the foreground and middle ground, there are several modern, multi-story buildings with flat roofs and large windows. The background shows a vast, green landscape with trees and a distant hill under a bright, low sun that creates a warm, golden glow across the sky and the scene. The overall atmosphere is serene and highlights the integration of historic and modern architecture in a natural setting.

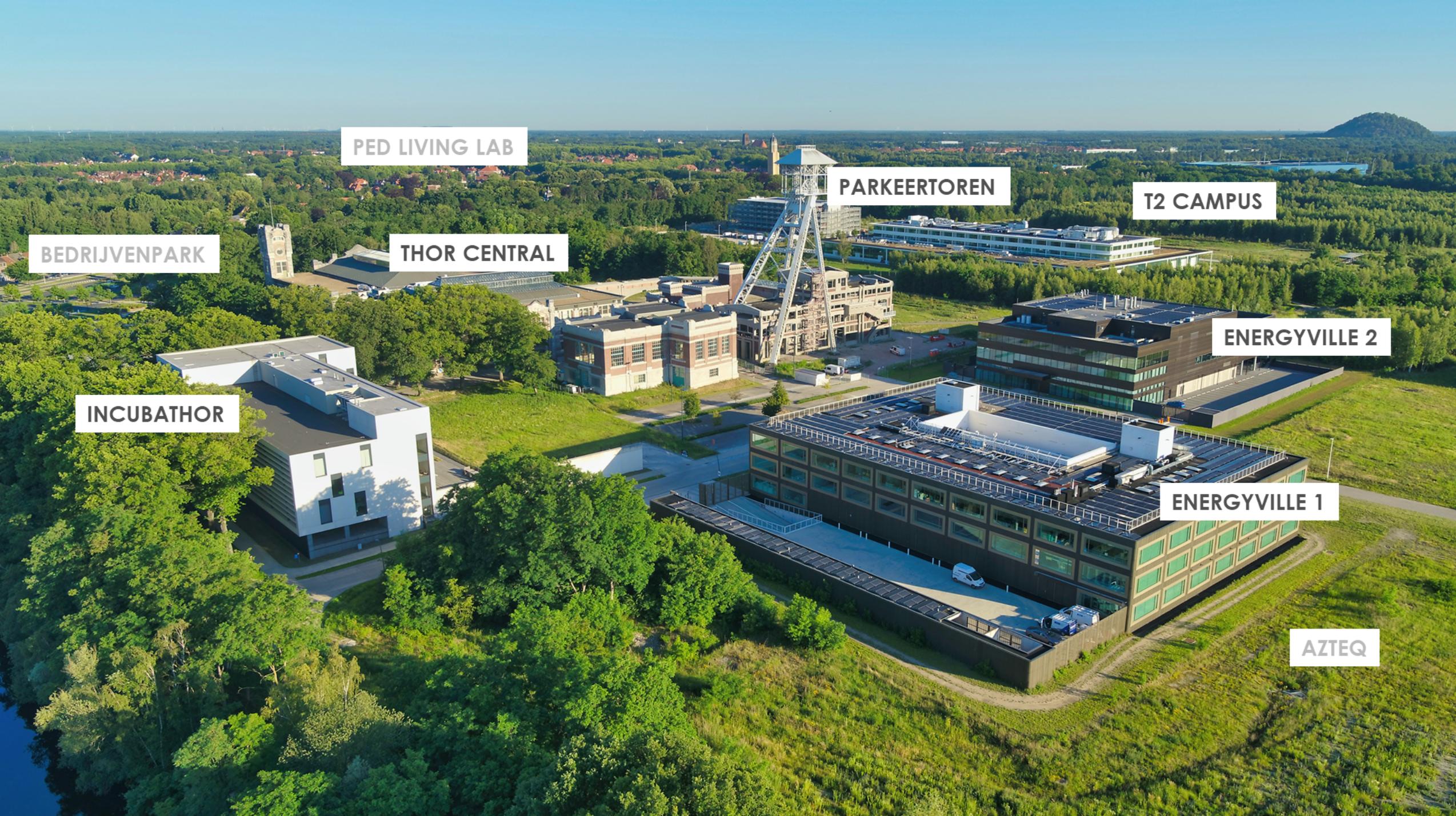
ENERGY COMMUNITIES AND COLLECTIVE ACTIVITIES AIMING FOR A FUTURE PROOF INTEGRATION

Lessons learned from the regulatory sandbox Thor Park

Energyville

Research – Development – Training – Industrial Innovation





PED LIVING LAB

PARKEERTOREN

T2 CAMPUS

BEDRIJVENPARK

THOR CENTRAL

ENERGYVILLE 2

INCUBATHOR

ENERGYVILLE 1

AZTEQ



EnergyVille

What happens when KU Leuven, VITO, imec and UHasselt join forces in their research into renewable energy and intelligent energy systems? You get a unique cooperation that entails the entire value chain of energy systems and where over 400 researchers from 42 different nationalities work in 22 labs. Welcome to EnergyVille! Here we develop technologies that support private and public stakeholders in their transition to an energy efficient, decarbonised and sustainable urban environment. We work on solutions for solar energy, electric and thermal storage, power control and conversion, but we also investigate buildings, districts, strategies and markets. It's a lot, we know! Come on in and discover how we do it!

[Start the EnergyVille tour](#)

KU LEUVEN



<https://360.energyville.be>

Thor Park



Parking Tower (2020)

- EV charging 10 connections (5 x dual 22kW)
- PV 54 kWp (extension?)

T2 Campus

- PV 158 kWp

EnergyVille 2

- EV charging 10 connections (5 x dual 22kW)
- PV 67kWp

Smart Manufacturing Campus (planned)

- PV investigated

Parking 8

- EV charging 2 x 11kW

EnergyVille 1

- EV charging 520 kW over 27 sockets (5 x 3,7kW, 2 x 7,4kW, 18 x 22kW, 1 x 43kW, 1 x 50kW DC)
- Electric pool vehicles (V2G ready)
- PV 369 kWp (South-Nord, East-West)

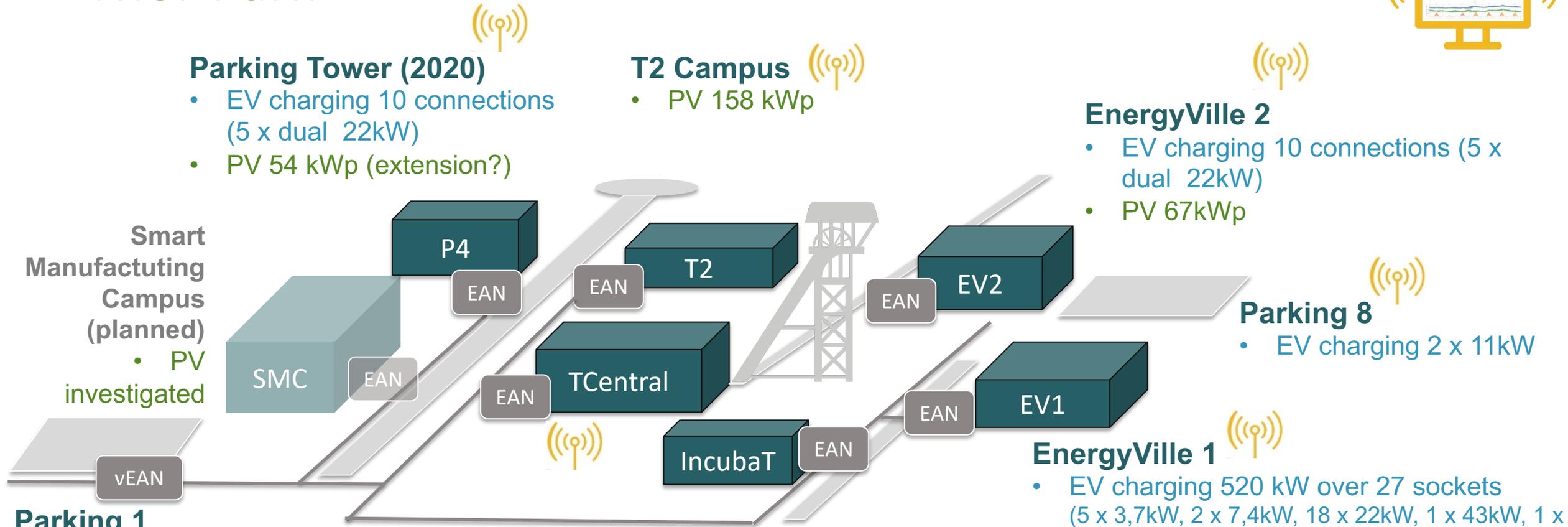
Parking 1

- EV charging 6 x 11kW

Thor Central

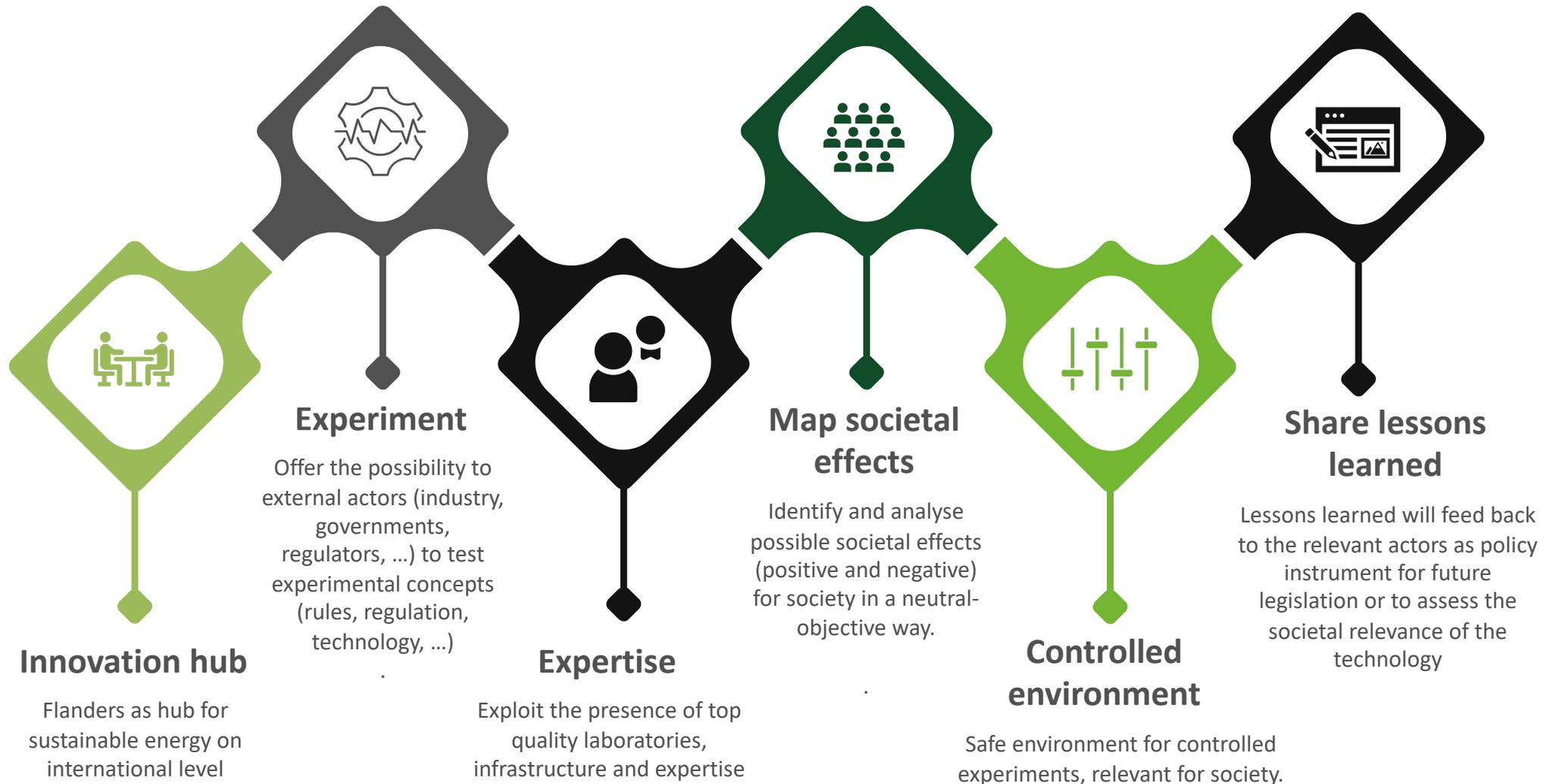
IncubaThor

- EV charging is being investigated
- PV is being investigated

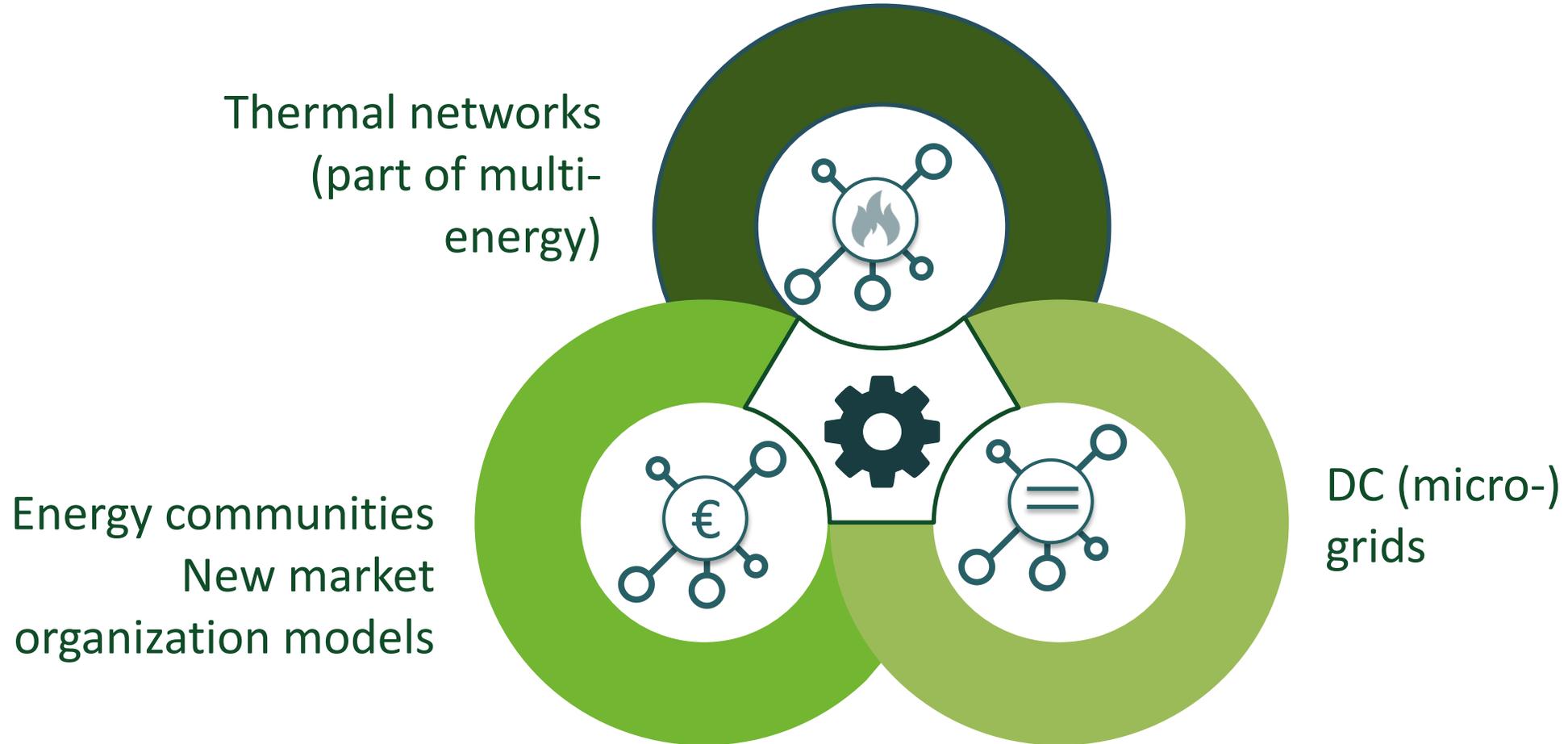


Thor Park – Regulatory sandbox

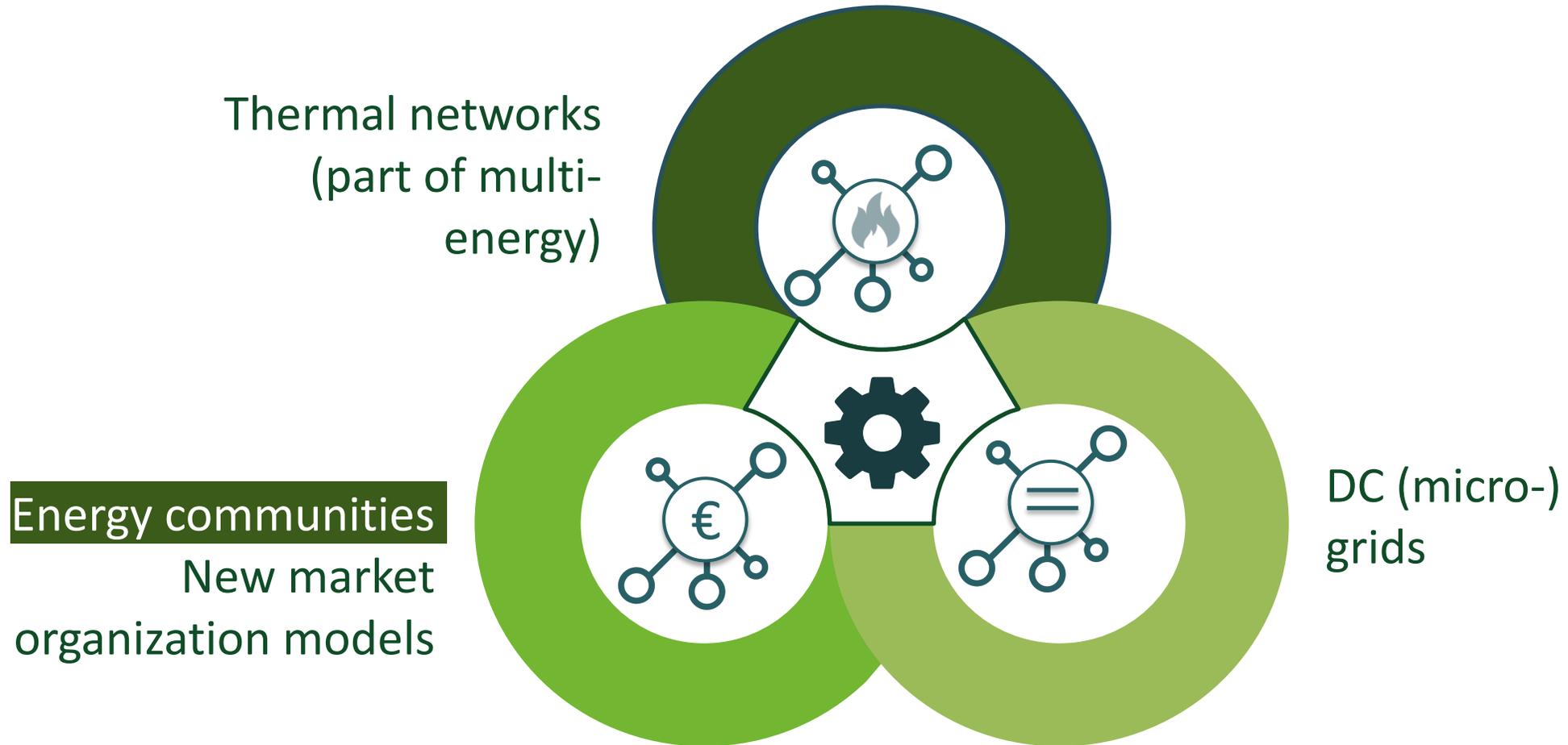
Thor Park as the area to experiment with innovative energy technologies in a regulatory sandbox



Thor Park – Regulatory sandbox

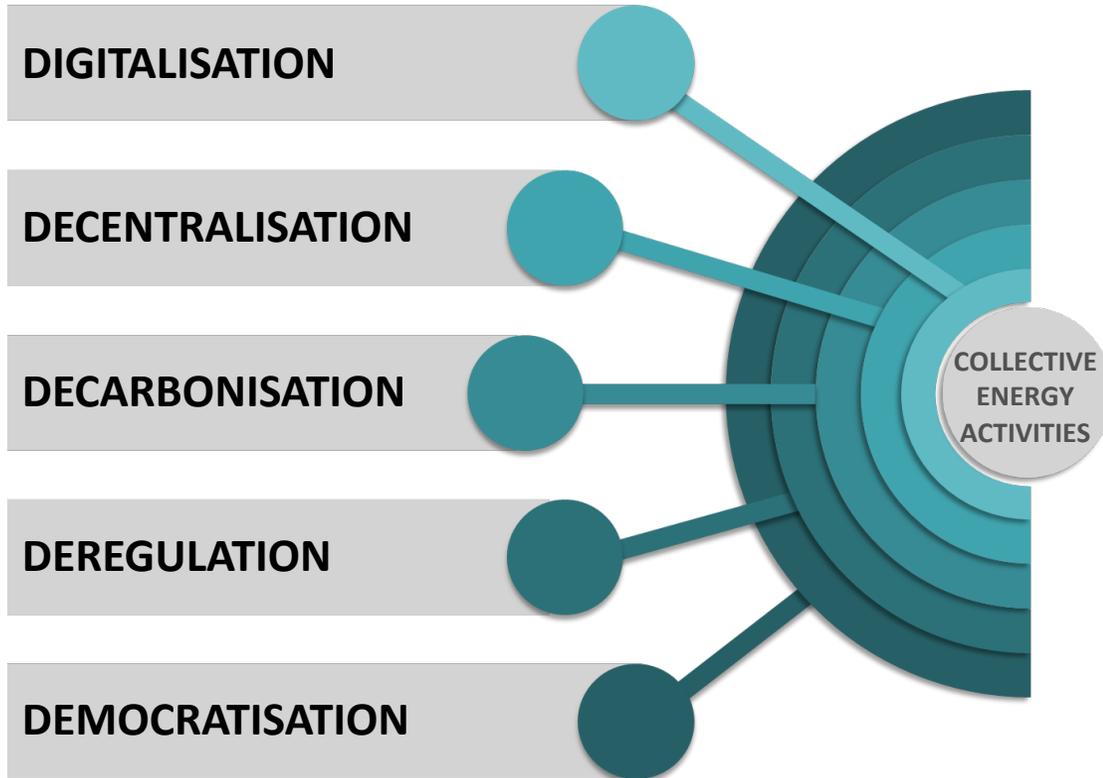


Thor Park – Regulatory sandbox

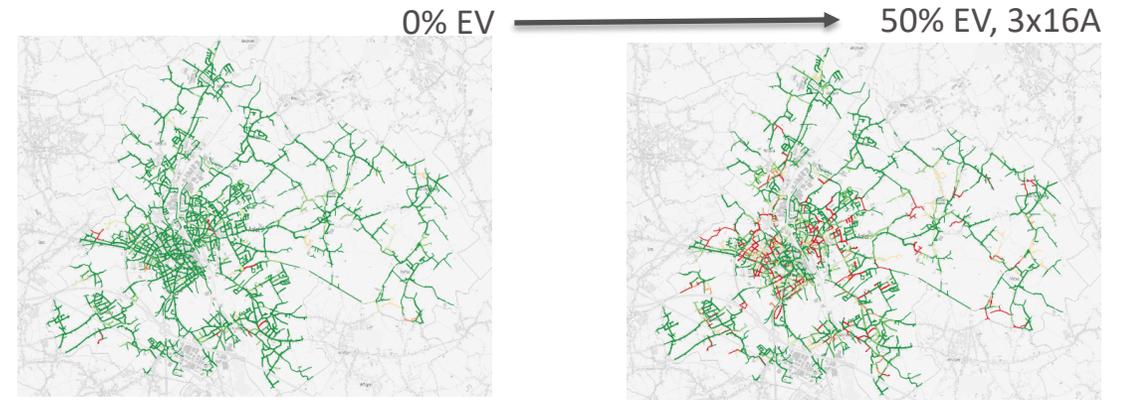


From an energy landscape in transition ... to energy communities

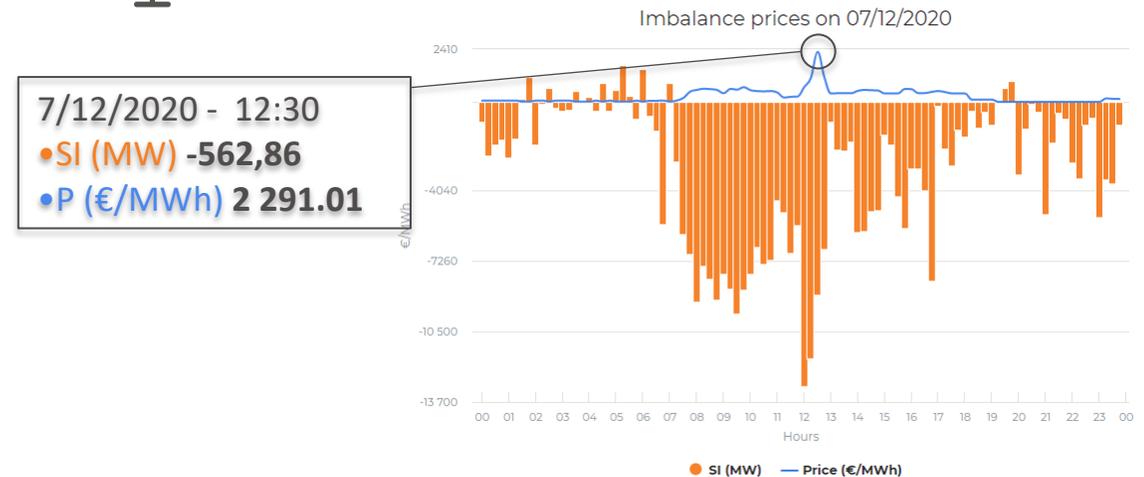
Challenge or opportunity?



GRID CONSTRAINTS



ENERGY BALANCING



Defining collective activities

WHY?

- Insight in benefits provided
- Benefits for the end consumer
 - Benefits for the System Operators
 - Benefits for commercial actors
 - Benefits for society
 - System level benefits

WHO?

- Consumer preferences
- Target specific consumer groups (energy poverty)
- Assets



HOW?

Economic

- Proper signals (tariffs, commodity, flexibility request)
- Incentive to keep them engaged

Technological

- Automation and data
- Disruptive technologies (P2P)
- Interoperability and standardization

Organisational

- Distribution of benefits

Social-political

- Policies and measures

Quantitative assessment to identify challenges and opportunities

MODEL INPUT

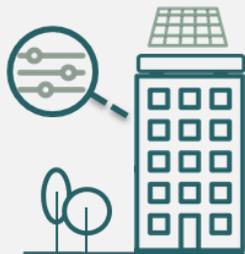
COMPOSITION ENERGY SCENARIO

Energy generation mix

Integration energy technologies

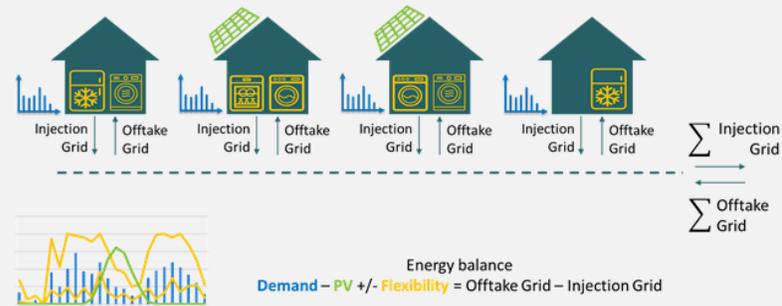
Definition end-consumers

DEFINITION OF USE CASE

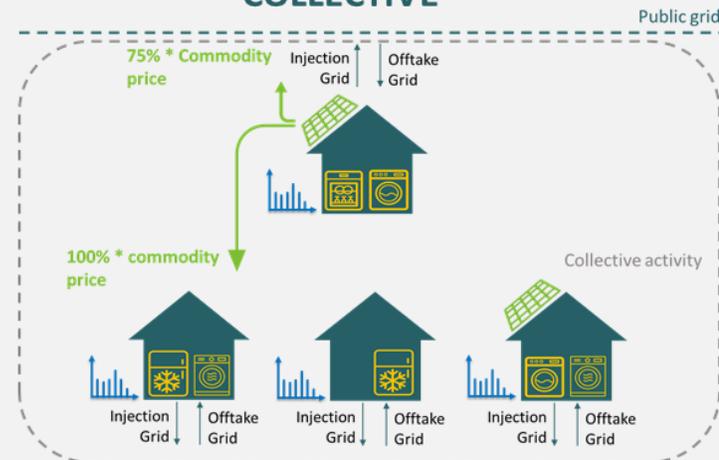


MODEL

INDIVIDUAL



COLLECTIVE



ASSESSMENT

Impact grid user

KPI1

KPI2

...

Impact grid operator

KPI1

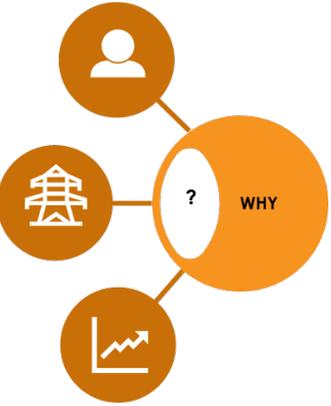
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Societal impact

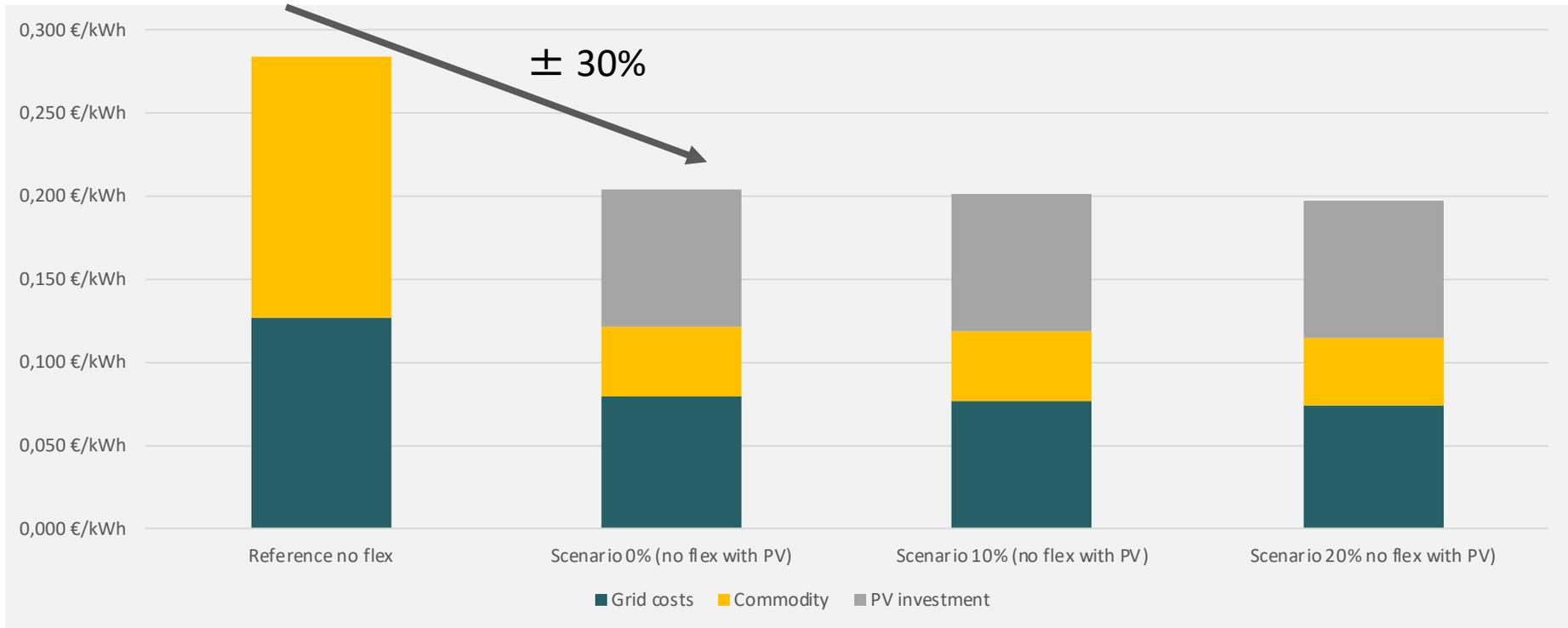
KPI1

...

Assessment of the collective use cases



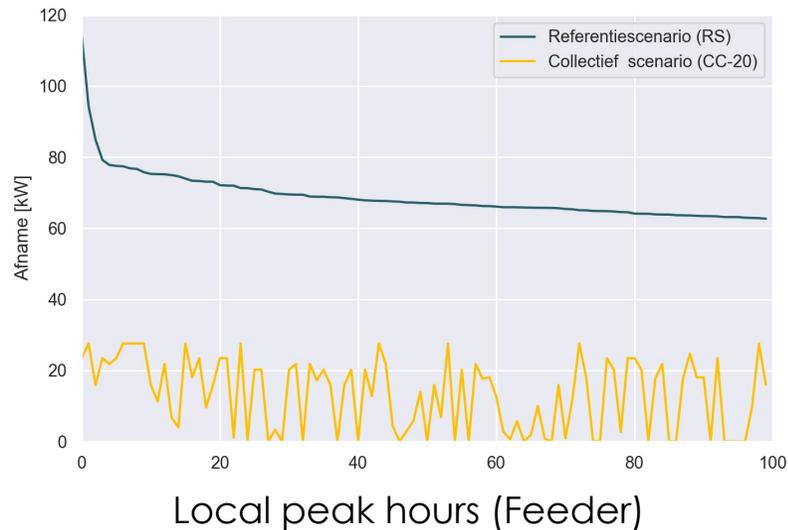
GRID USER IMPACT



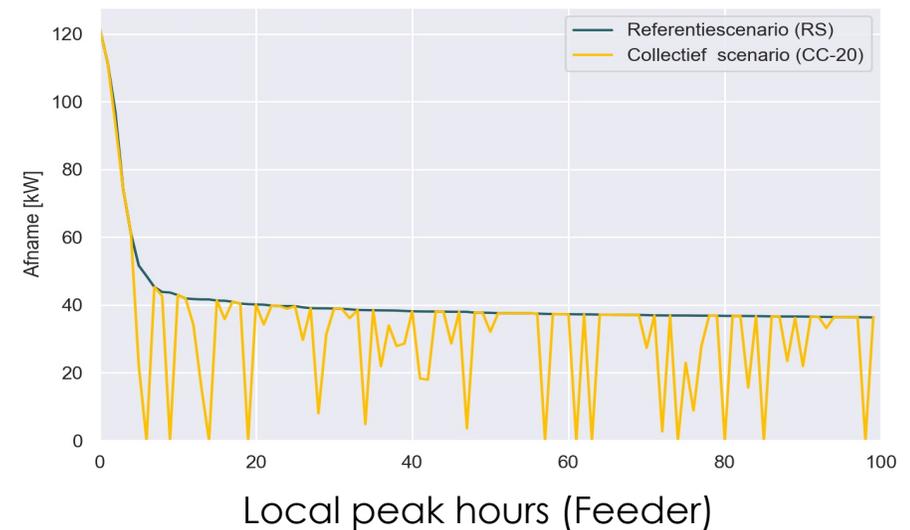
Assessment of the collective use cases

GRID OPERATOR IMPACT – CONSTRAINTS MANAGEMENT

Defined by locality!



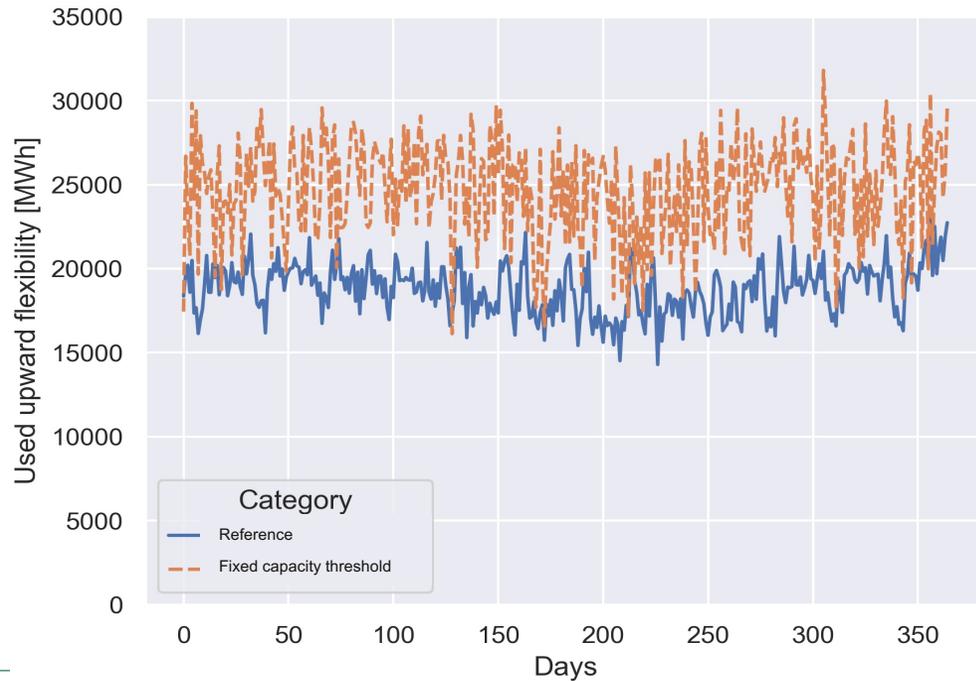
... and flexibility



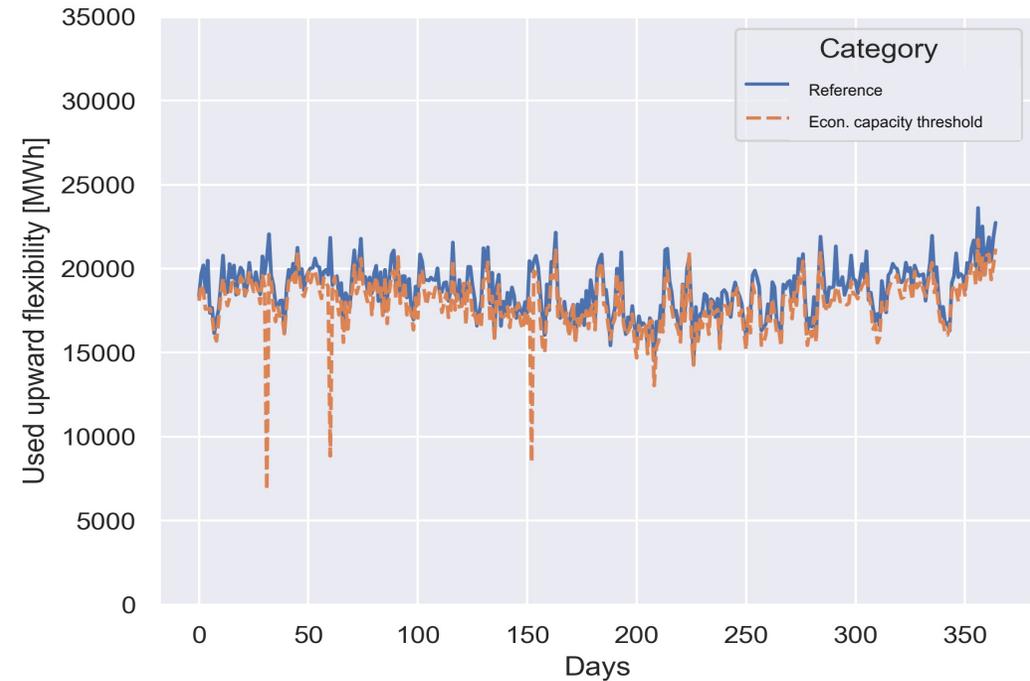
Assessment of the collective use cases

GRID OPERATOR IMPACT – ENERGY BALANCING

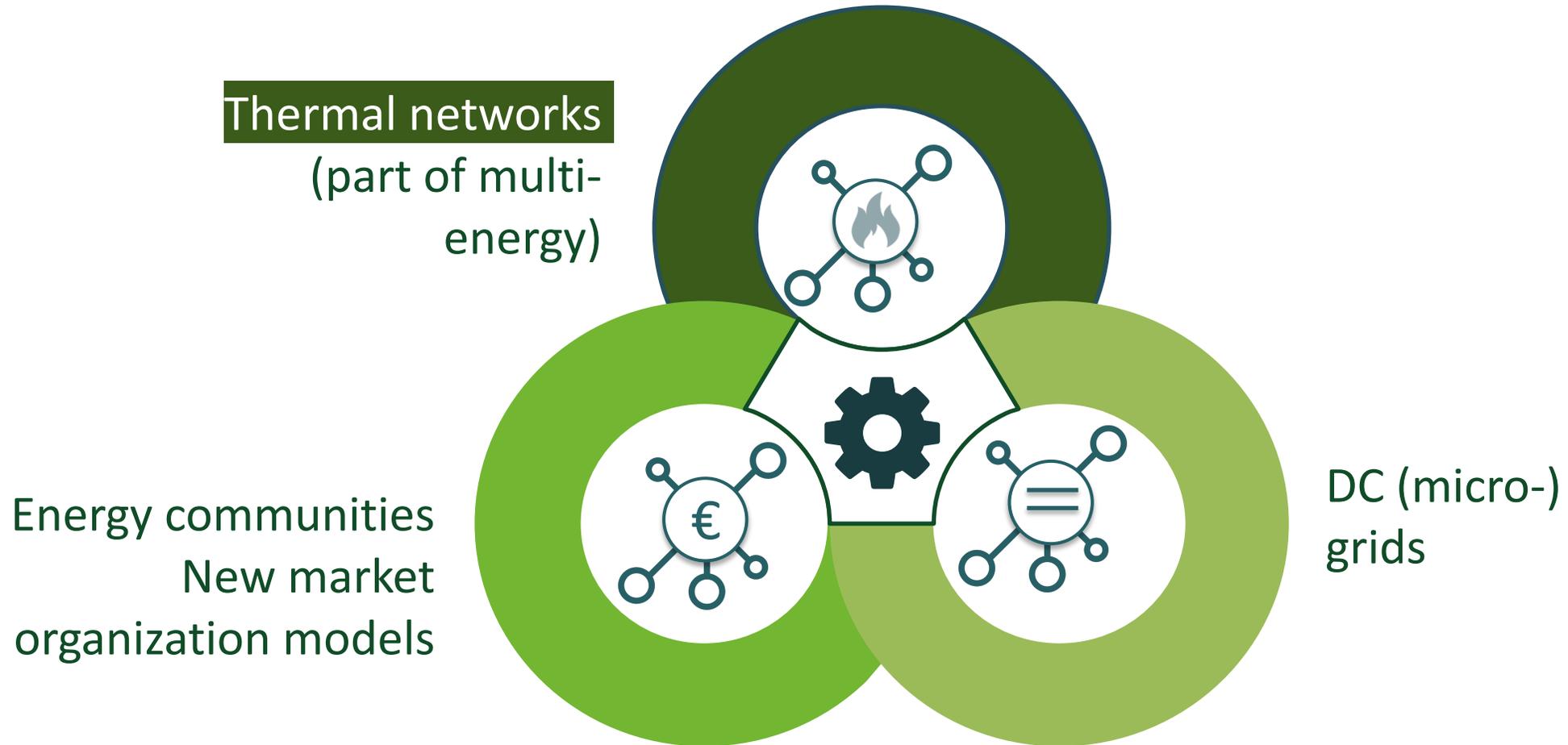
Grid tariff with fixed capacity threshold



Grid tariff with threshold set by economic trade-off



Thor Park – Regulatory sandbox



Thor Park - CollecThor

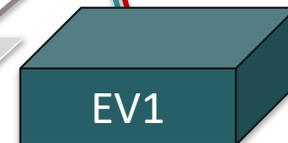
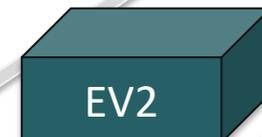
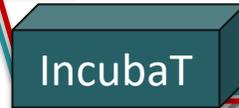
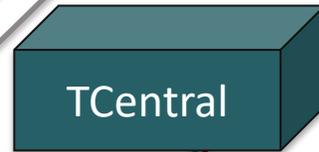
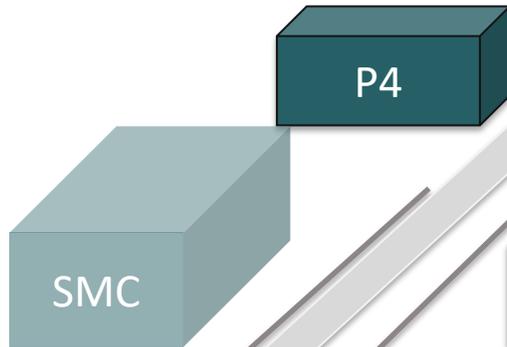
Parking Tower (2020)

T2 Campus

EnergyVille 2

- HP / gas

Smart
Manufacturing
Campus
(planned)



Parking 8

EnergyVille 1

- HP cooling 150kW / heating 180kW
- Gas heating (back-up + high temperature)

Parking 1

Thor Central

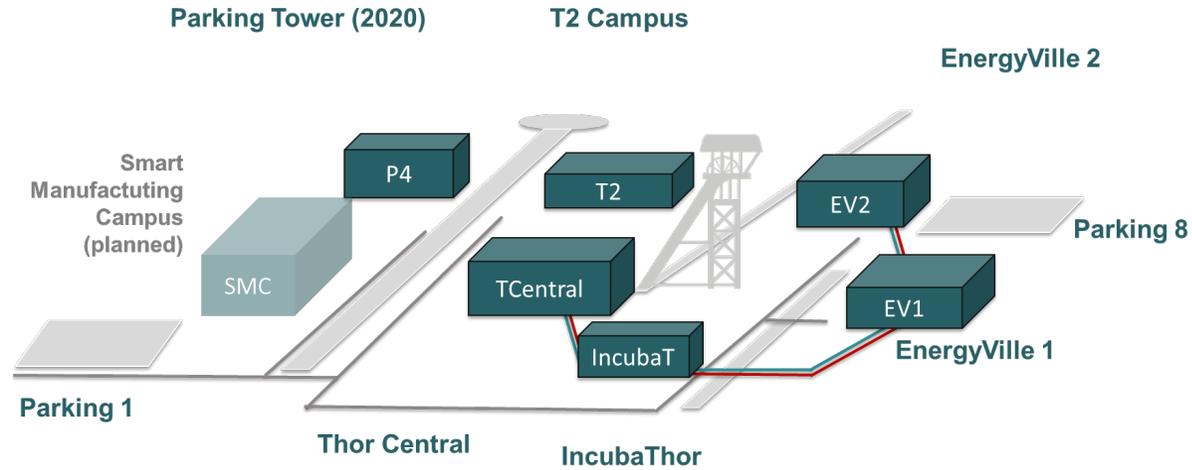
- 1200 kW cooling
- Ventilation

IncubaThor

- 418 kW cooling



Thor Park - CollecThor



INNOVATION

- Decentral sources of energy
- Low temperature
- Cold and heat
- Demand driven

CollecThor®



FEATURES

- Seasonal storage
- Modular approach
- Bi-directional flows
- Smart control



Thor Park – Living lab

By 2023 we want to have a fully-operational living-lab on renewable energy integration in an urban environment, backed by the engagement of an industrial ecosystem

FEATURES

- Ecosystem of **stakeholders** (companies, users, governments, education, entrepreneurship, ...)
- Strategic state-of-the-art **infrastructures**: high ambition
- Close link to **interconnected** research labs
- **Continuity** >10 years
- Open and easy **access** (incl data aspects)
- User interaction – **quadruple helix**
- Stimulating **co-creation**



ACTIVITIES

- Industry-driven **co-development**
- Support in **testing & optimisation**
- **Demonstration and validation** of innovation in a real-life environment



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vito



umec

