Story of Amsterdam

From Lighthouse pilots to Legacy: Scaling Positive Energy Districts Across Europe

"What one must learn to do, one learns by doing."

-Aristotle-

AmsTErdam BiLbao cItizen drivEn smaRt cities

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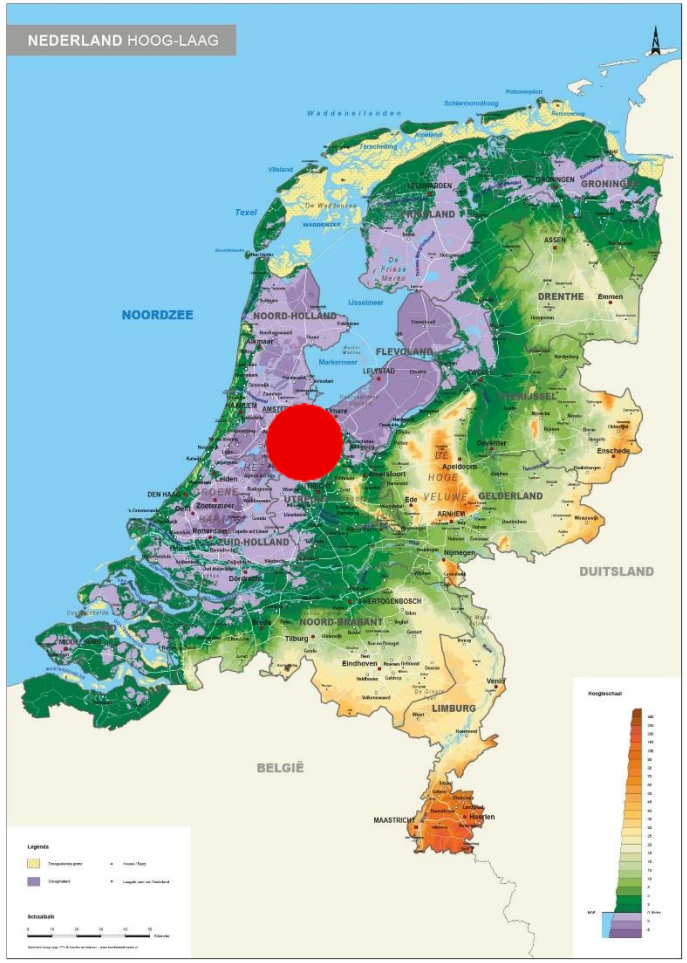
Positive Energy Districts

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 864374.

The Netherlands

A sinking delta



Credits Rijks Geologische Dienst & Koen Stork at Schiermonnikoog

18 million people

Half of our country below sealevel

Living with water

What is needed for our future?

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Amsterdam

A thriving City

Credits iStock / Phaelnogueira

1 million inhabitants

Development of 7.500 dwellings per year

Energy-infrastructure can not handle > **netcongestion**

What is needed for our future?

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ATELIER – Amsterdam

Creating a Positive Energy District

Creating communities

Creating buildings

Creating networks

Combining energy-assets

Sharing the grid connection

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Credits Mikael Samuels

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Energy system Republica

Sources 261 kWp PV (photovoltaic generation)

Infrastructure & Storage

Storage 1 MW/1,1 MWh collective battery

Heating district connection - 10.000 L heat buffer

Heat-cold-storage – ATES (Aquathermal Thermal Energy Storage)

Heat pumps 750 kWth, 250 kWe

EV (electrical vehicle Charging: 32 E-charges (280 kW)

Governance

20.000 m2 commercial real estate, variety in users (cooperation)

Organisation community – who takes decisions?

Temporary limit transport capacity / congestion

Energy Management System (EMS)

Taxes

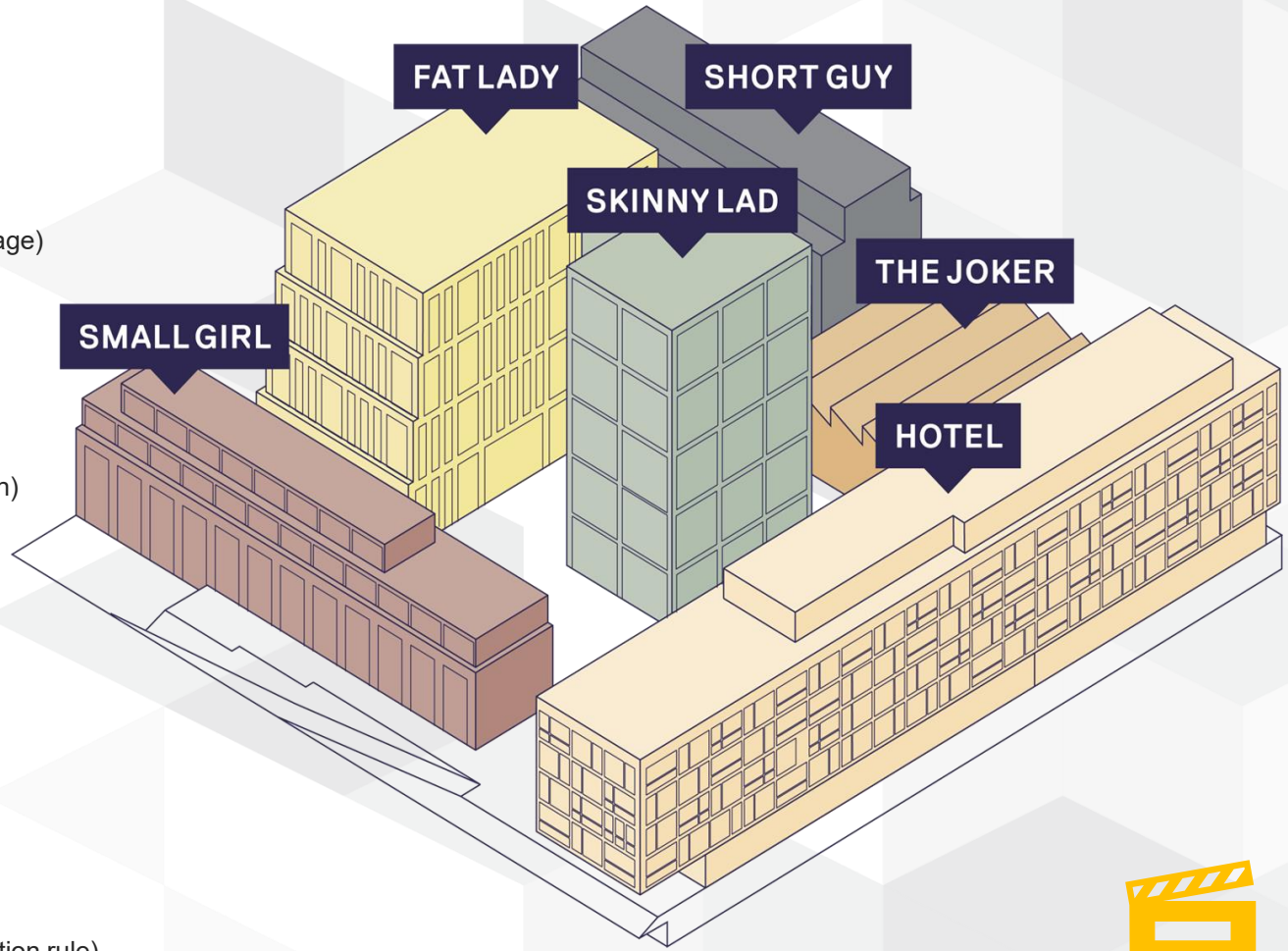
Trade - day-ahead trade and net- balance services

Use

Hotel (110 rooms), offices, 55 apartments (23 rental)

All users behind one meter (1.5 MVA), one internal net (exemption rule)

Peak management to stay in the limit of the connection



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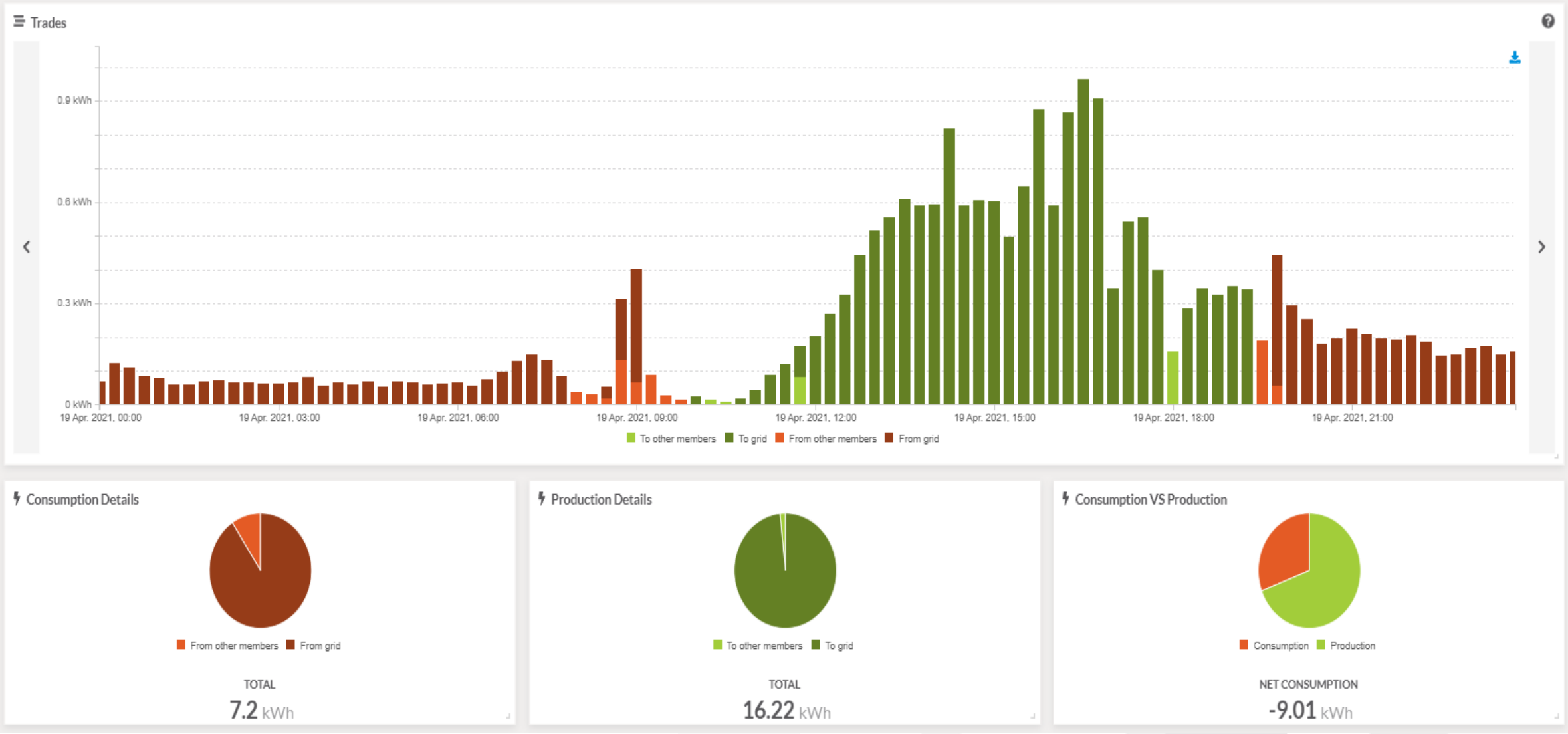
Sharing the energy

Republica



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ATELIER - Poppies

Credits Arts eMotion

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Energy system

Poppies

Sources

87 kWp PV (photovoltaic generation) 1/3 PVt

Infrastructure & Storage

Heat-cold-storage – ATES (Aquathermal Thermal Energy Storage) monosource

Heat pumps

EV (electrical vehicle Charging: 2 E-charges

Governance

6000 m2 commercial real estate, variety in users (middle price rental apartments + commercial units)

Organisation community – who takes decisions?

Use

All users regular energy-contracts

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Energy system SchoonSchip

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Positive Energy Districts

Sources 516 PVpanels 60 PVtpanels 167 kWp PV (photovoltaic generation)

Infrastructure & Storage

Storage 30-46 ? individual batteries

30 heat pumps

EV (electrical vehicle) Charging

Governance

144 inhabitants in 46 households in 30 floating houses

Organisation community – who takes decisions?

Energy Management System (EMS)

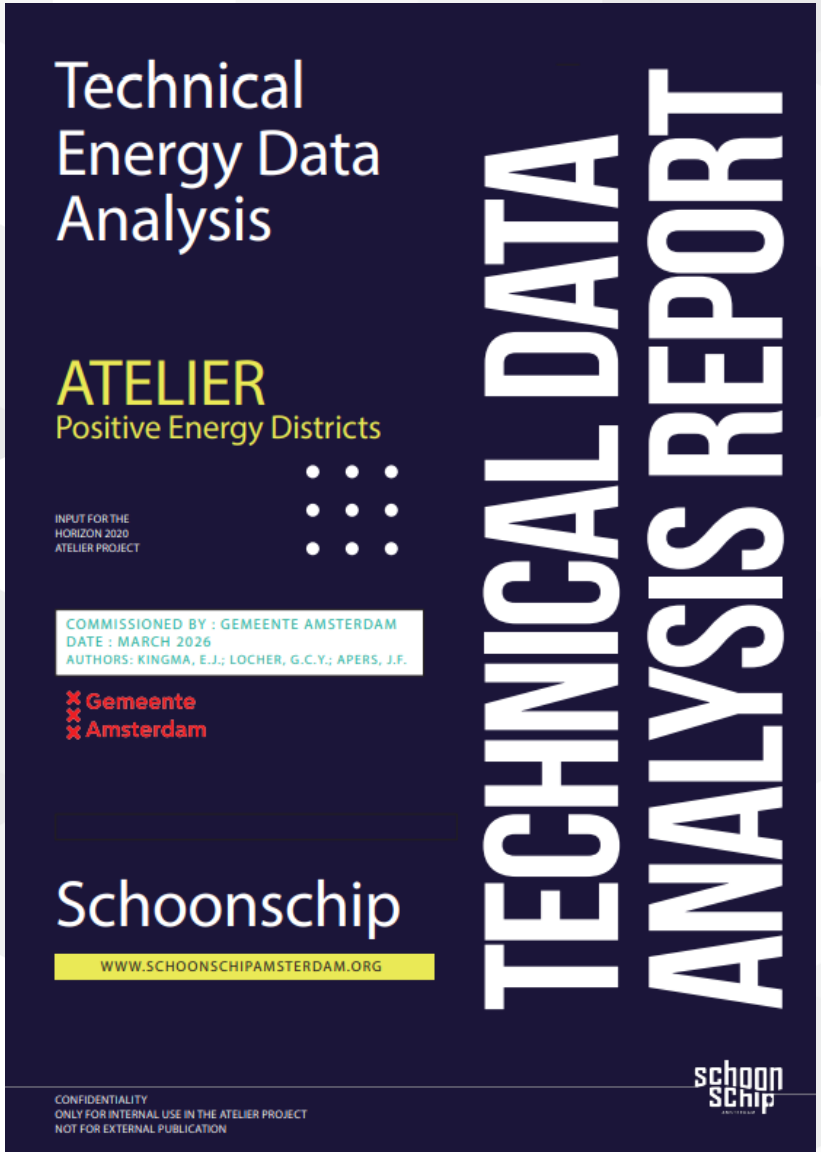
Taxes

Trade - day-ahead trade and net- balance services

Use

All users behind one meter (? MVA), one internal net (exemption rule)

Peak management to stay in the limit of the connection



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Energy community

SchoonSchip

Credits https://schoonschipamsterdam.org/

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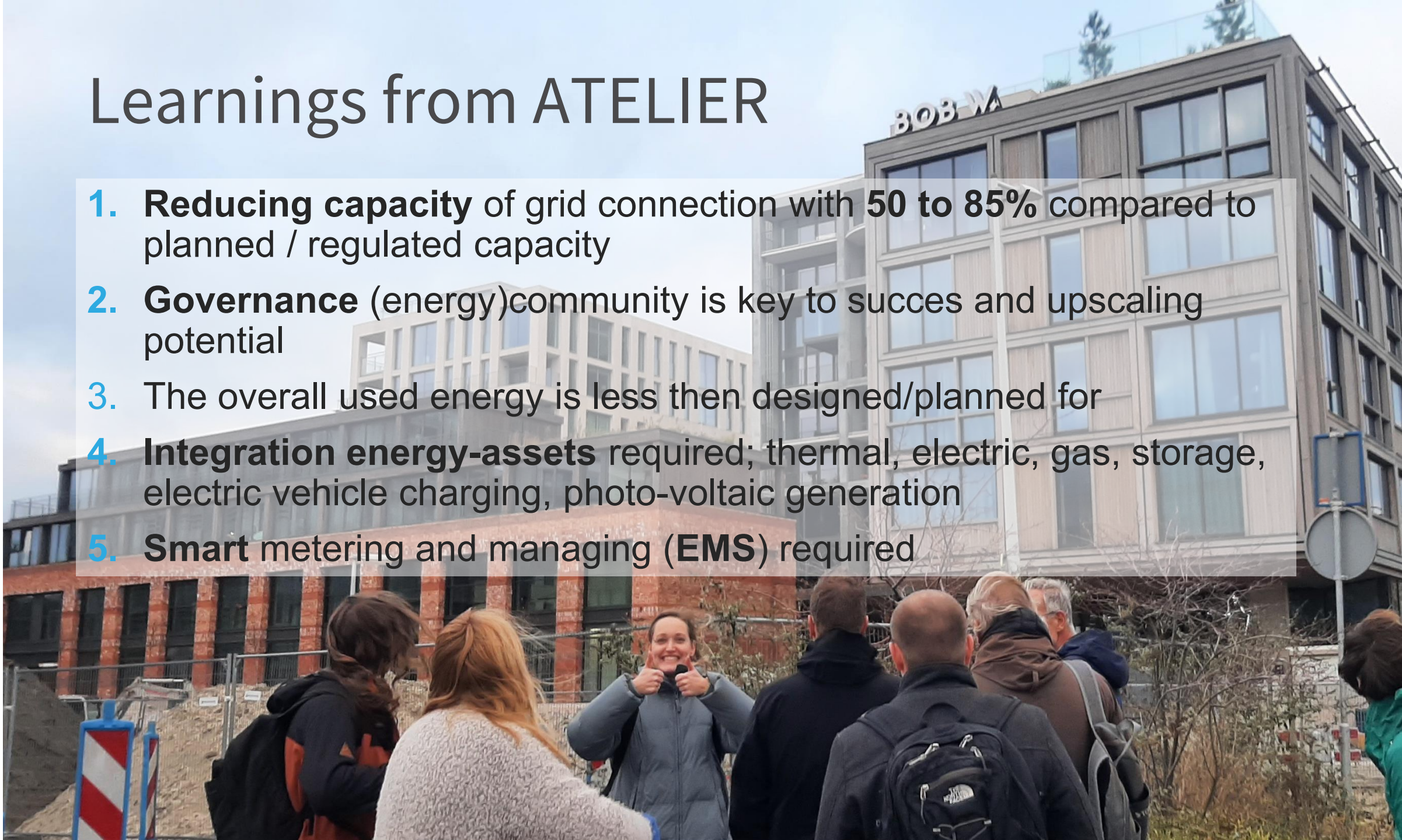
Learnings from ATELIER

1. **Reducing capacity** of grid connection with **50 to 85%** compared to planned / regulated capacity
2. **Governance** (energy)community is key to succes and upscaling potential
3. The overall used energy is less then designed/planned for
4. **Integration energy-assets** required; thermal, electric, gas, storage, electric vehicle charging, photo-voltaic generation
5. **Smart** metering and managing (**EMS**) required



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Scaling

[Walk the talk – making visible]

[Exploring pilot potential]

What if we apply the capacity reduction to all new developments in the City?

Organisational willingness is key

Providing/prescribing governance & contracting standards to developers

Credits Ines van der Klip & inkijkjes.nl

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The promise of Amsterdam

Relieving netcongestion

Creating communities

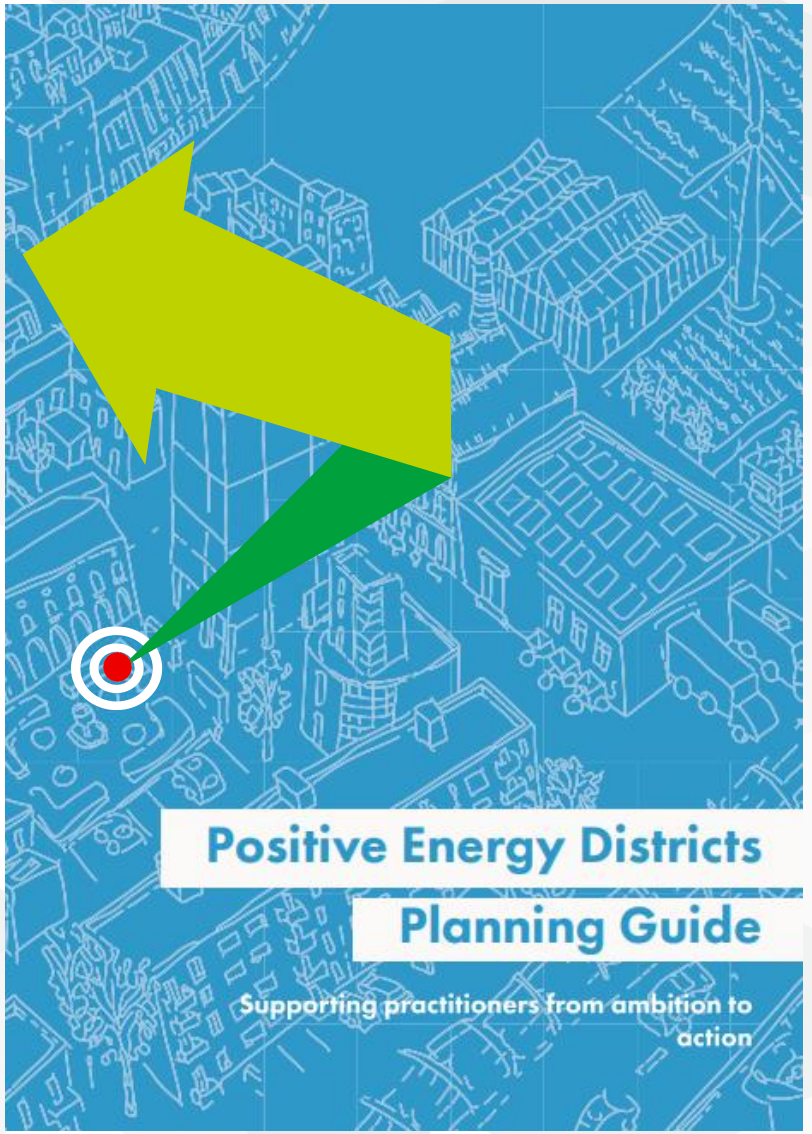
Supporting resilience

Tool PED-Planning guide

>>> Research & Innovation

>>> Scaling from 1 – 100 – 1000

>>> Living Lab Energy Communities



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Resilient Europe

Where the energy supply is safe & stable

Where we own and actively engage in our energy supply

Where we can live in a fossil-free society

Where there is equality in carrying the costs of the transition towards fossil-free solutions

Credits StGrafix / Shutterstock

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Energy communities: What can be achieved?

Exploring the role of energy communities in sustainable local energy systems

Machiel Brautigam (Republica)

Eelke Kingma & Chai Locher (SchoonSchip)

Eva Winters (TNO)

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Energy communities; What can be achieved?

Workshop agenda:

1. Presentation: The role of energy communities in local energy systems (20 min)
2. Presentation: Meet energy community Schoonschip (20 min)
3. Presentation: Meet energy community Republica (20 min)
4. Fishbowl discussion on upscaling energy communities with speakers and participants (30 min)

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Icebreaker; who are you?

What interests you most about energy communities?

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What role can energy communities play in local energy systems?

Today's focus:

1. What is an energy community and how do they differ from energy companies?
2. What energy activities can they engage in, and what value can communities create through energy activities?
3. What impact will they have on future energy systems?

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Energy community vs energy company

What do you think are the most important characteristics of an energy community?

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Join at menti.com | use code 8110 0720

Mentimeter

What do you think are the most important characteristics of an energy community?

menti.com

8110 0720

Waiting for participants

What are ECs in EU legislation?

Art. 2 (11) (Directive 2019/944)

*'citizen energy community' means a **legal entity** that:*

*(a)is based on **voluntary and open** participation and is **effectively controlled by members** or shareholders that are natural persons, local authorities, including municipalities, or small enterprises;*

- ***Governance***

*(b)has for its primary purpose to **provide environmental, economic or social community benefits** to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and*

- ***Purpose***

*(c)may engage in **generation**, including from renewable sources, **distribution, supply, consumption, aggregation, energy storage, energy efficiency services** or charging services for electric vehicles or provide other energy services to its members or shareholders;*

- ***Activities***

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What makes them different?

Energy communities are not different because of *what* they do;

What makes them different is:

Who does it, how they do it, and the value they create through it.

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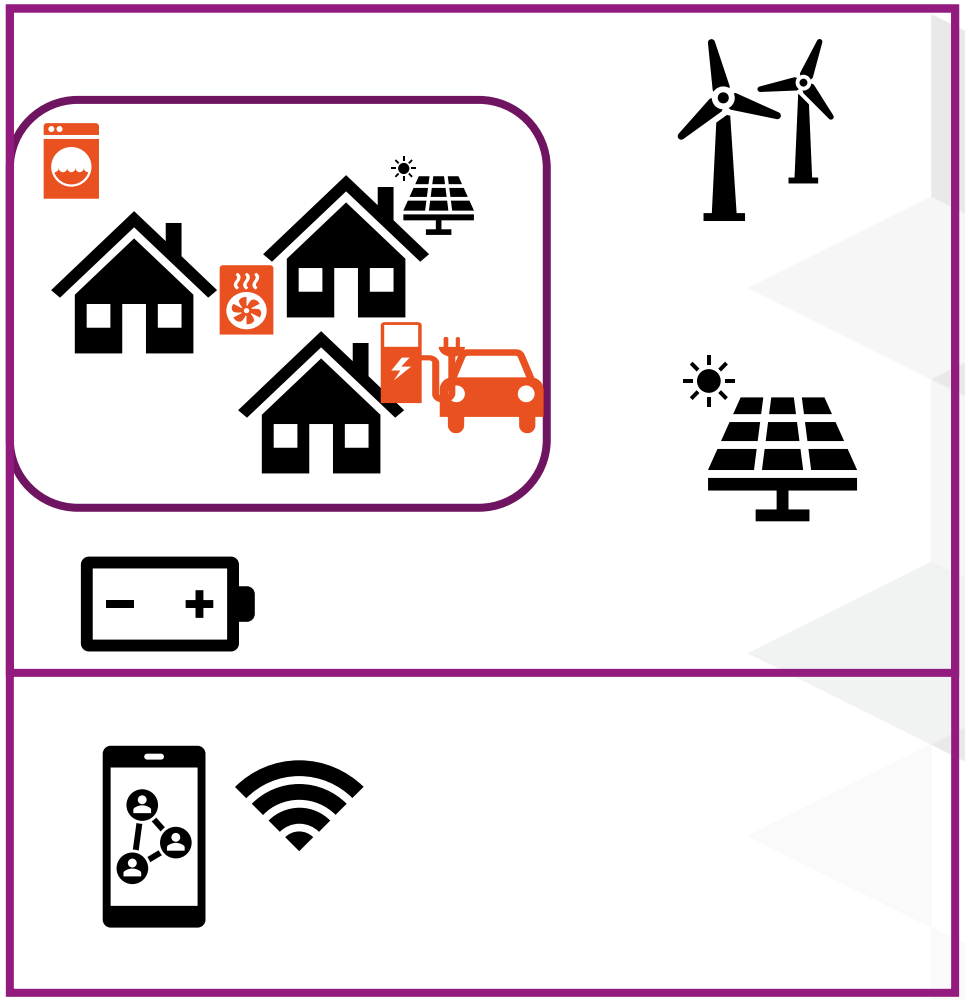
Dutek

Wide range of energy communities



Energy community as

1. Developer of assets & owner of assets
2. Providing knowledge on the use of assets/ energy monitoring
3. Producer that sells to a market participant
4. Smart: energy community supports passive (behind the meter) steering (implicit flex)

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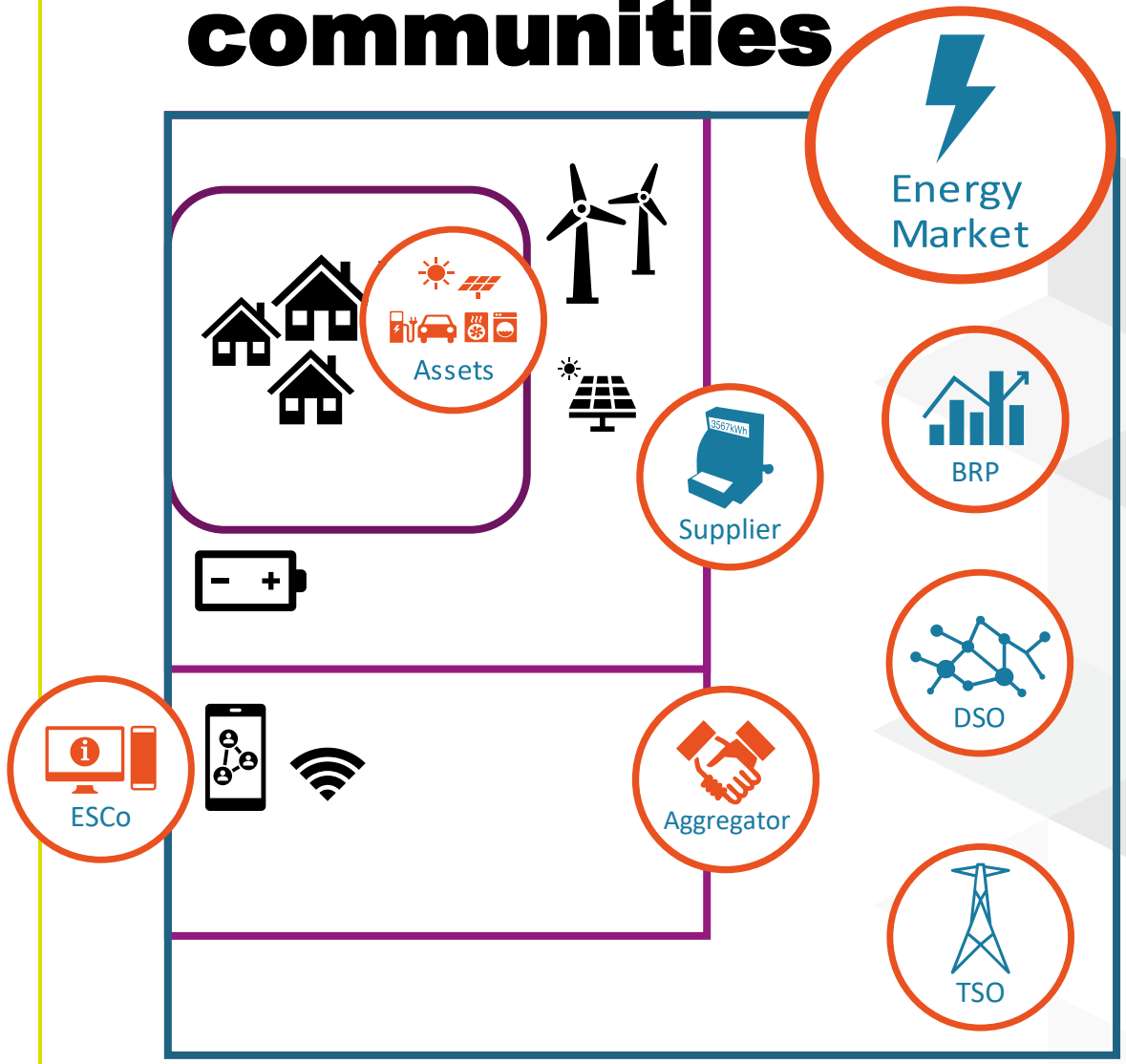
Wide range of energy communities



Energy community

1. Supports peer 2 peer trading
2. Supports energy sharing
3. Sells energy to their members
4. Is a demand response aggregator or sells flex to demand response aggregator

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Activities

non-energy market activities

Collective ownership

Services within the EC

Domain transcending value

Implicit flexibility

Managing and operating infrastructure

Energy market activities

Exchange of energy

Explicit flexibility

Loosely based on the ENTSOE harmonised role model and the USEF (universal smart energy framework)
Winters & Van der Veen TNO 2023

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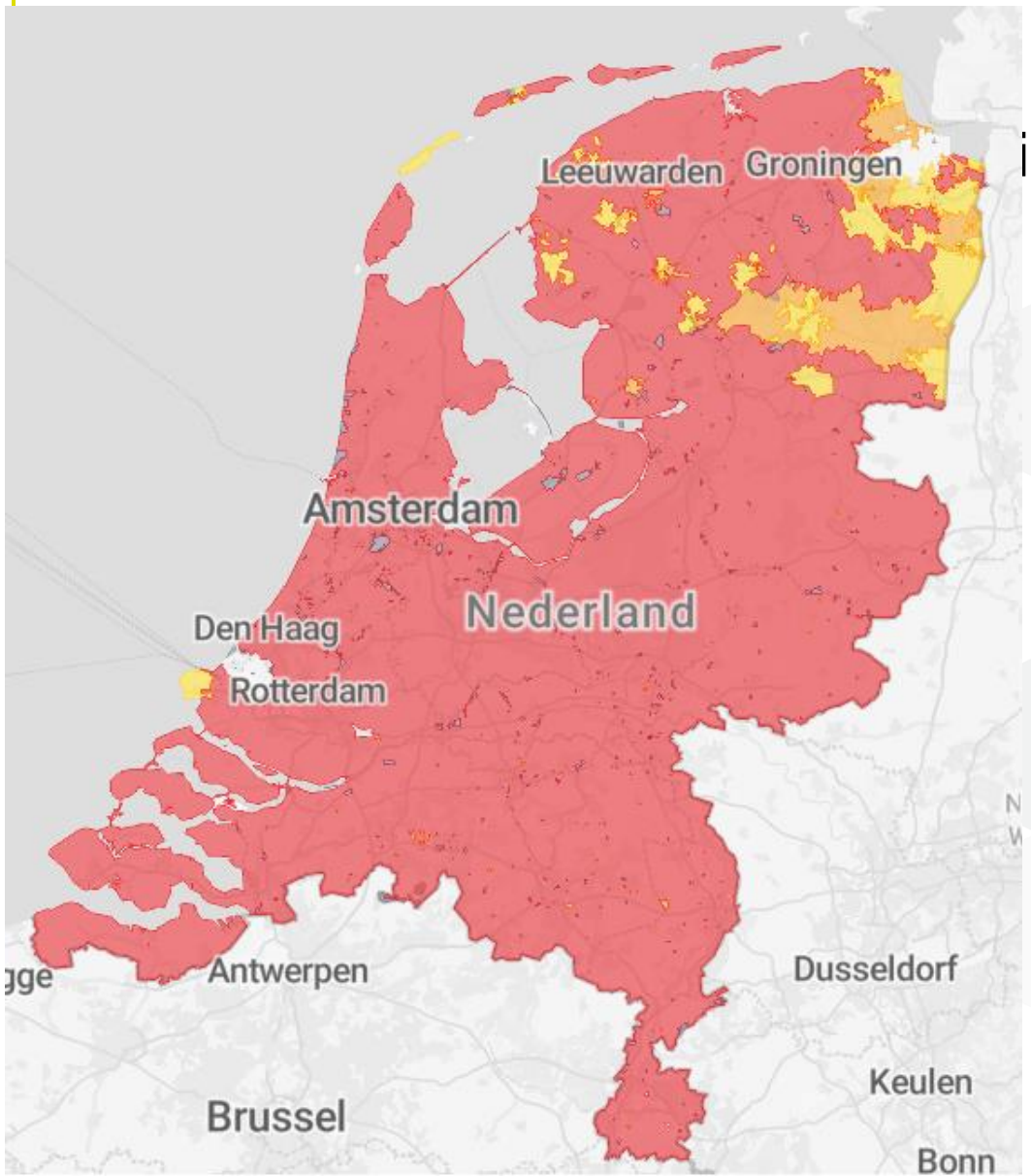
Creating value



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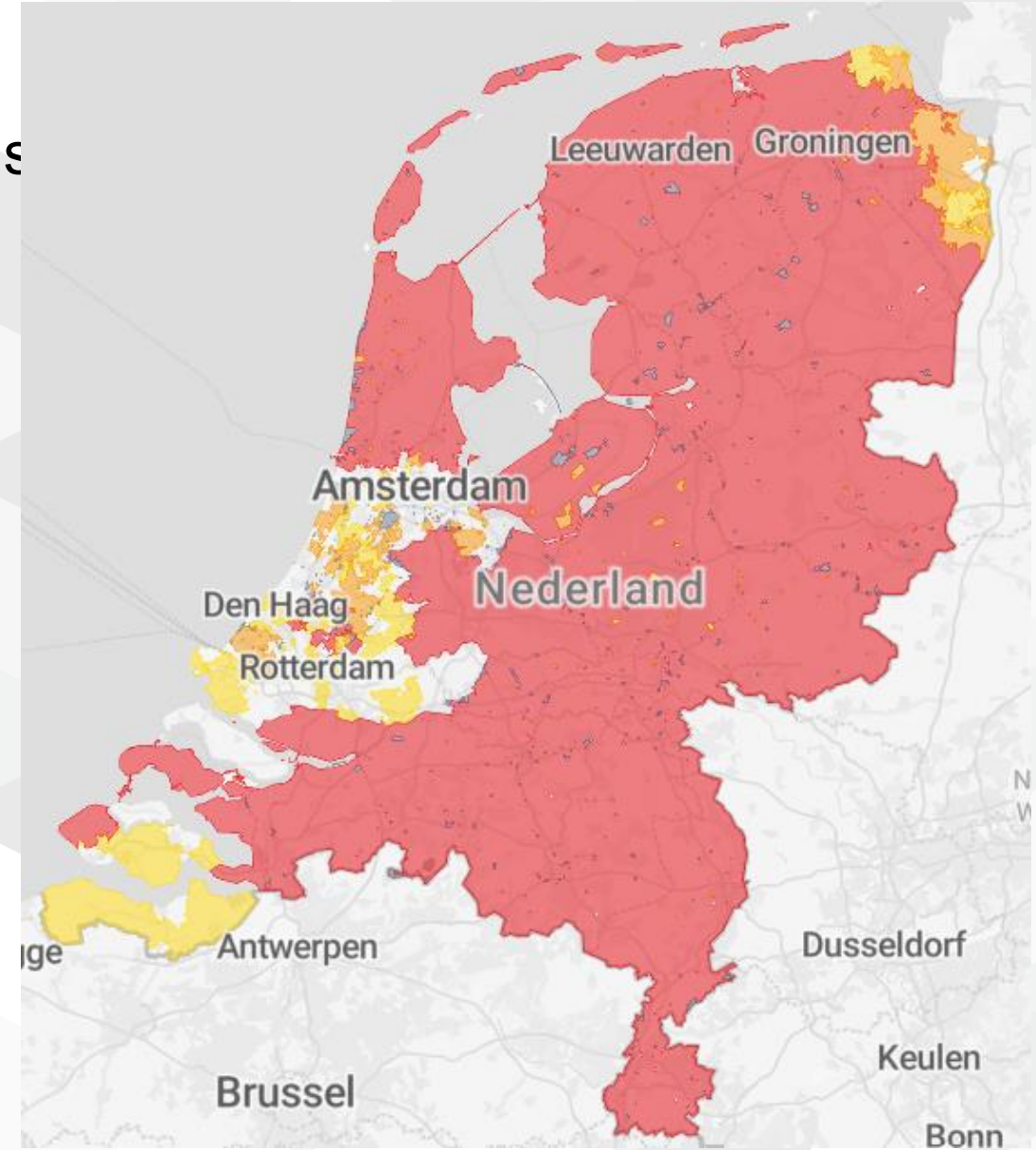

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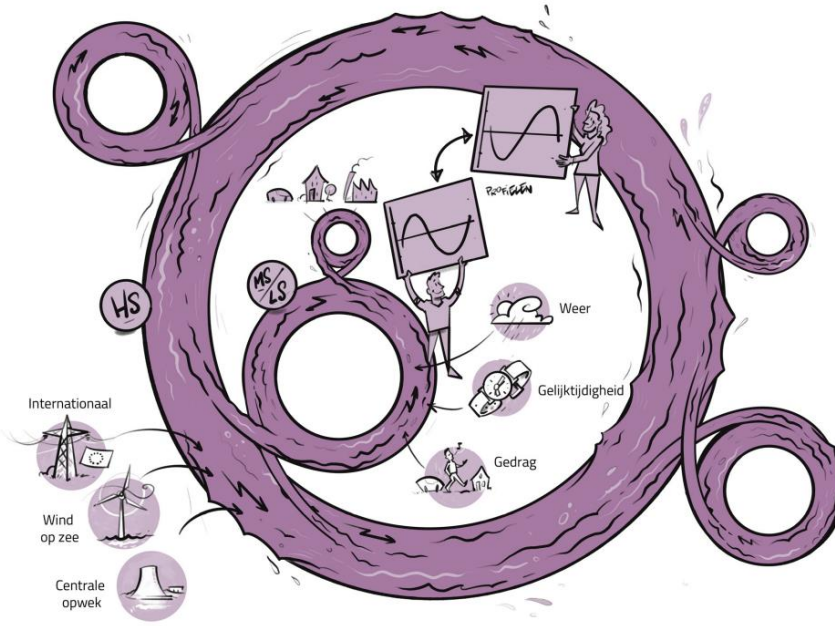

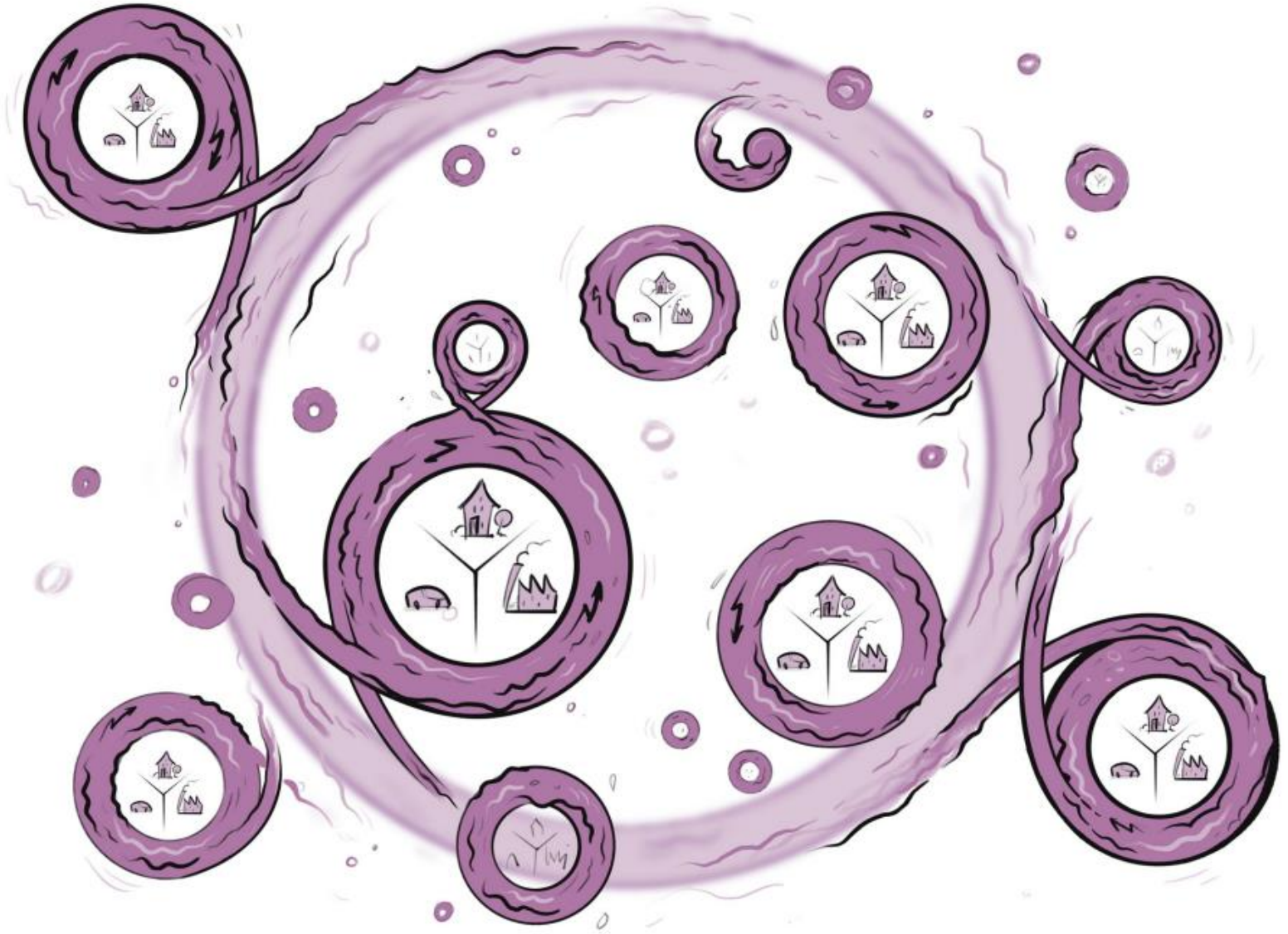

Source illustration: Transform/Robèrt Guérain

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Energy community Republica

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