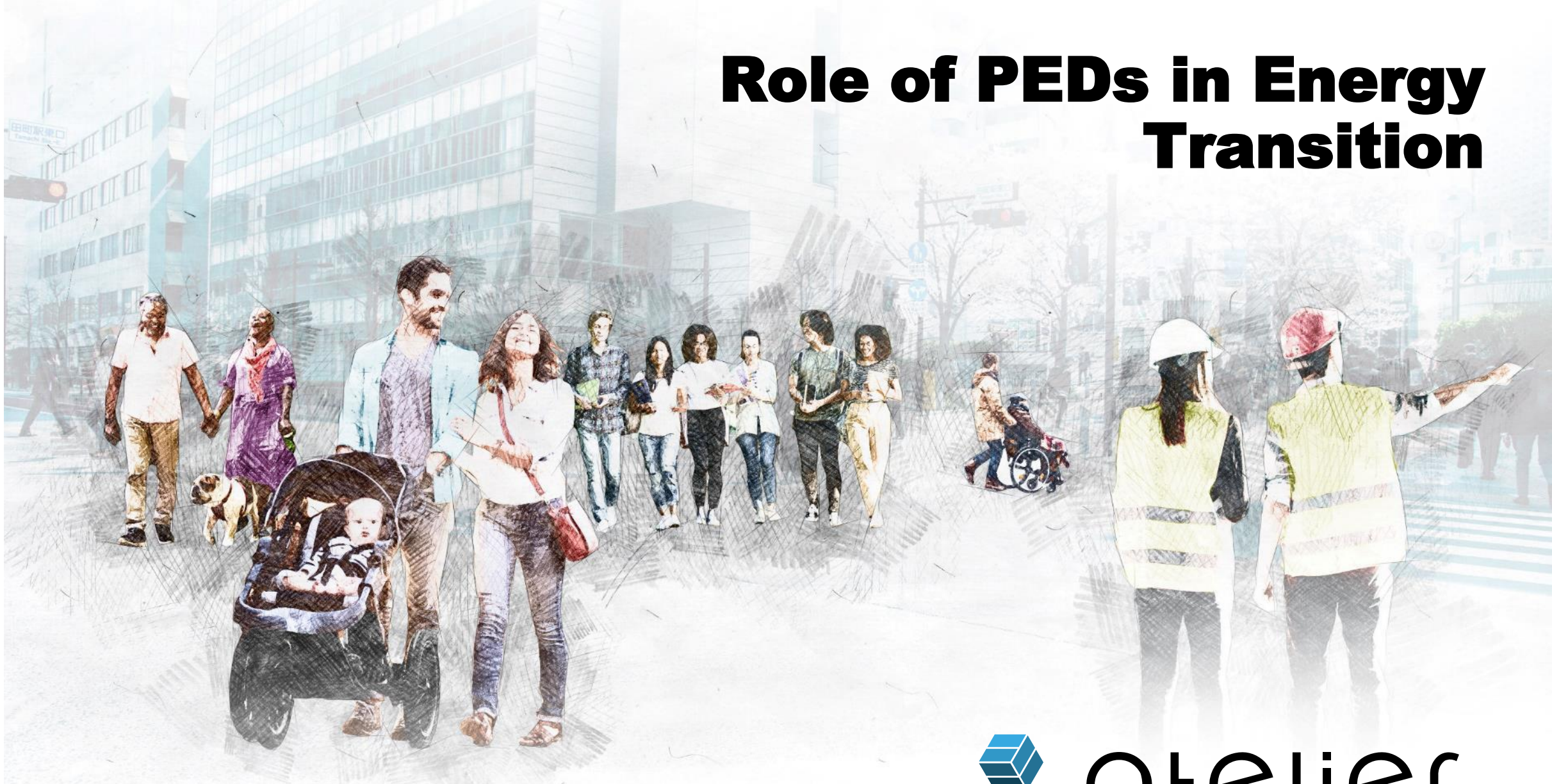


Role of PEDs in Energy Transition



AmsTERdam BiLbao citizen drivEn smaRt cities



atelier
Positive Energy Districts



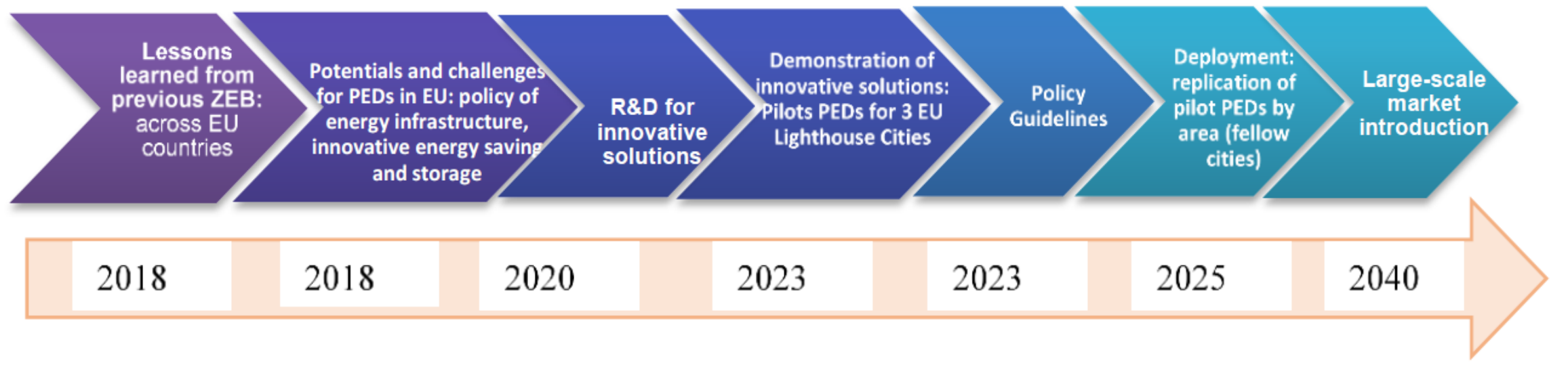
PED/PEN Definition

“PED/PEN are energy-efficient and energy-flexible urban areas or groups of connected buildings which produce net zero greenhouse gas emissions and actively manage an annual local or regional surplus production of renewable energy. They require integration of different systems and infrastructures and interaction between buildings, the users and the regional energy, mobility and ICT systems, while securing the energy supply and a good life for all in line with social, economic and environmental sustainability.”

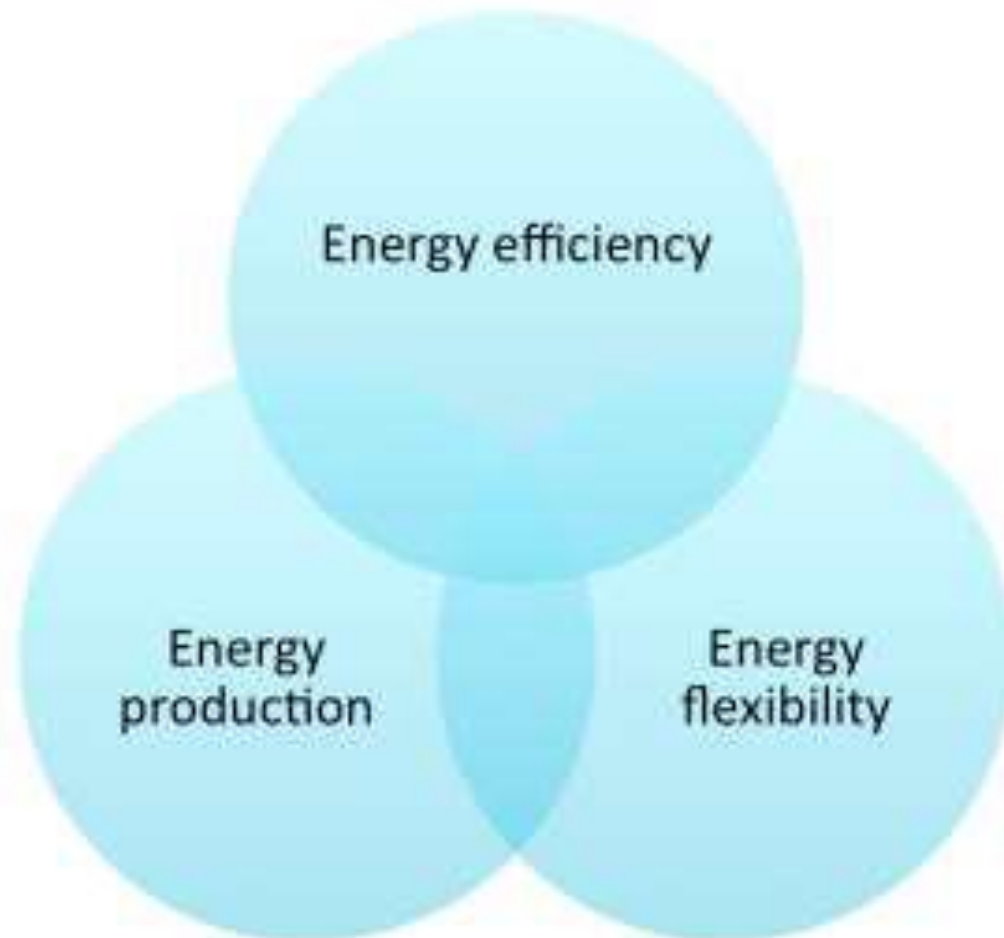
JPI Urban Europe / SET Plan Action 3.2 (2020). White Paper on PED Reference Framework for Positive Energy Districts and Neighborhoods. <https://jpi-urbaneurope.eu/ped/>

PED initiative created by SET-Plan Action 3.2 with the goal of implementing more than 100 PED/PENs in Europe by 2025.

Roadmap to deploy PED/PENs in Europe



PED Framework: Functions of PED/PENs in the regional energy system



Target:

Optimisation of the three functions of PEDs (energy efficiency, energy flexibility and energy production) towards climate neutrality and energy surplus by taking into account the guiding principles

Guiding principles:

- Quality of life
- Inclusiveness, with special focus on affordability and prevention of energy poverty
- Sustainability
- Resilience and security of energy supply

Enablers:

- Political vision and governance framework
- Active involvement of problem owners and citizens
- Integration of energy and urban planning
- ICT and data management

Advantages of Planning with PED/PEN perspective

The purpose is to enable an integrated and aggregated approach **maximizing energy efficiency, energy production and optimal management of flexibility.**

- Aggregation can lead to economies of scale.
- Integrated approach:
 - Within the same building (e.g. energy efficiency measures)
 - Between buildings (e.g. shared energy systems)
 - Between building and district level infrastructures (e.g. district heating, grid, etc.)
 - Between building sector and other sectors such as energy (e.g. demand flexibility), mobility (e.g. recharging systems), and industry (e.g. use of waste heat).

Why PED/PENs in energy transition?

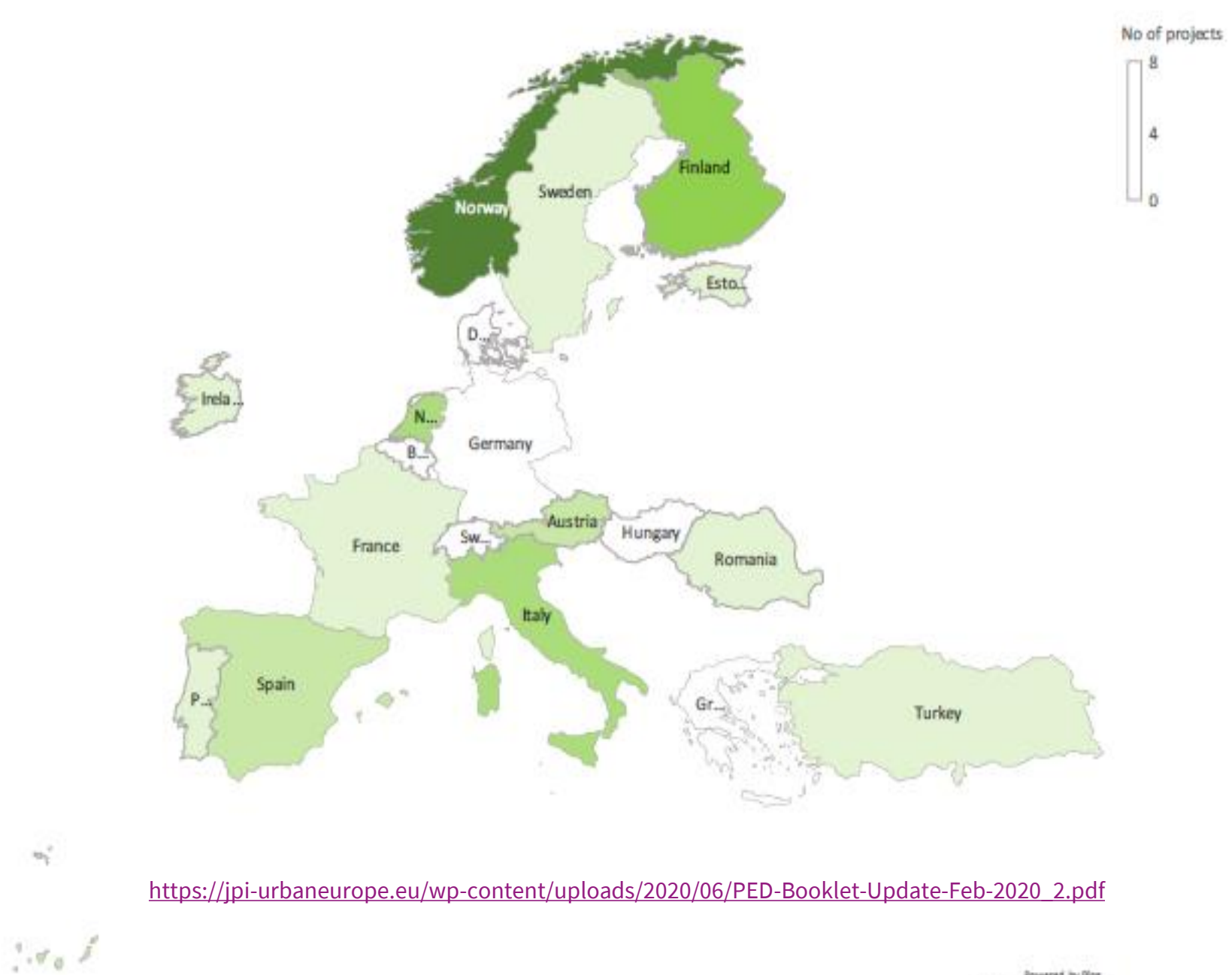
Urban Development must move from mere building solutions to a more integrated approach.

Self sufficiency energy-wise

Surplus in energy production at local level allows development of local energy market services with:

- Storage (electric and thermal)
- Active management of PED/PENs that will allow for **balancing and optimisation**, peak shaving, load shifting, demand response and reduced curtailment of RES, and district level self-consumption of electricity and thermal energy.
- New players and solutions: e.g. Aggregators, Energy communities, ...

POSITIVE ENERGY DISTRICTS IN EUROPE



https://jpi-urbaneurope.eu/wp-content/uploads/2020/06/PED-Booklet-Update-Feb-2020_2.pdf

PROJECT No	CITY	STATE	ENERGY EFFICIENCY			ENERGY PRODUCTION	ENERGY FLEXIBILITY	ENVIRONMENTAL SUSTAINABILITY	SOCIAL SUSTAINABILITY		ECONOMIC SUSTAINABILITY			
			PED AMBITION	BUILDING/ INFRASTRUCTURE	MOBILITY	SUSTAINABLE CONSUMPTION	LOCAL/REGION RENEWABLE ENERGY PRODUCTION	REGIONAL ENERGY SYSTEM	ENVIRONMENTAL IMPACT	ZERO EMISSION/ CARBON FREE/ CLIMATE NEUTRAL	SOCIAL/SOCIETAL IMPACT	CITIZEN/OWNER INVOLVEMENT	ECONOMIC IMPACT	BUSINESS MODELS
1	Åland Island	FI	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
2	Carquefou/Nantes	FR	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
3	Alkmaar	NL	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓
4	Amsterdam	NL	✓	✓	✓	-	✓	✓	✓	✓	✓	-	✓	✓
5	Baerum	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓
6	Bilbao	ES	✓	-	✓	✓	✓	-	✓	✓	-	✓	✓	-
7	Bodø	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	Elverum	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Évora	PT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Graz	AT	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓
11	Groningen	NL	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	-	✓
12	Istanbul-Kadıköy	TR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	Limerick	IE	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
14	Lund	SE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15	Măgurele	RO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16	Oslo	NO	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓
18	Oulu	FI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18	Rome	IT	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
19	Stor-Elvdal	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20	Trondheim	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
21	Trondheim	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
22	Võru	EE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
23	Bergen	NO	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓
24	Espoo	FI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
25	Parma	IT	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
26	Paterna (Valencia)	ES	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
27	Tampere	FI	✓	✓	-	✓	✓	-	✓	✓	-	✓	✓	✓
28	Trento	IT	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓
29	Vienna	AT	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓

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30	Drammen	NO	-	✓			✓	✓	✓	✓		✓	✓	
31	Espoo	FI	-		✓		✓	✓	✓	✓		✓	✓	
32	Grenoble	FR	-	✓			✓	✓	✓	✓		✓	✓	
33	Győr	HU	-	✓			✓	✓	✓	✓		✓	✓	
34	Lund (Linero)	SE	-	✓		✓	✓	✓	✓	✓		✓	✓	
35	Mieres	ES	-	✓		✓	✓	✓	✓	✓		✓	✓	
36	Milano	IT	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
37	Mostoles (Madrid)	ES	-	✓		✓	✓	✓	✓	✓		✓	✓	
38	Stockholm	SE	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
39	Vienna	AT	-			✓					✓	✓	✓	
40	Zurich	CH	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
41	Bolzano	IT	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
42	Firenze	IT	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
43	Graz	AT	-	✓	✓		✓	✓	✓	✓		✓	✓	
44	Florina	GR	-	✓		✓	✓	✓	✓	✓		✓	✓	
45	Helsinki	FI	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
46	Henningsdorf	DE	-	✓		✓	✓	✓	✓	✓		✓	✓	
47	Hoje-Taastrup (Østerby)	DK	-	✓			✓	✓	✓	✓		✓	✓	
48	Hoogeveen	NL	-		✓	✓	✓	✓	✓	✓		✓	✓	
49	Kaiserslautern	DE	-		✓		✓	✓	✓	✓		✓	✓	
50	Brunnshög/Lund	SE	-	✓		✓	✓	✓	✓	✓		✓	✓	
51	Lund	SE	-	✓		✓	✓	✓	✓	✓		✓	✓	
52	Malmö	SE	-		✓	✓	✓	✓	✓	✓		✓	✓	
53	Munich	DE	-	✓	✓		✓	✓	✓	✓		✓	✓	
54	Odense	DK	-				✓	✓	✓	✓		✓	✓	
55	The Netherlands	NL	-				✓	✓	✓	✓		✓	✓	
56	Arnhem	NL	-			✓			✓	✓		✓	✓	
57	Brussels	BE	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
58	Freiburg im Breisgau	DE	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
59	Lecce	IT	-	✓	✓		✓	✓	✓	✓		✓	✓	
60	Trento	IT	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	
61	Turku	FI	-	✓	✓	✓	✓	✓	✓	✓		✓	✓	

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Back to knowledge

Near Zero/ Positive Energy Districts (PEDs)

The two pillars of the decarbonisation of the buildings sector in Europe are a) improving energy efficiency and b) supplying with renewable energy sources both new and existing buildings. Recent developments show that energy developments at the neighbourhood or district scale can accelerate and improve the required quality to meet the requirements of the Paris agreement (1,2). Acting at the neighbourhood level permits to better consider the energy interactions between the buildings and the local

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Tags

Circular economy

Climate resilience

Local resource

Analytics and modelling

Building

Carbon capture

Energy

Industry

Materials

Sustainable fuel

Technology

Thank you



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