Driving Urban Transitions

EUROPEAN PARTNERSHIP

Deep-dive #1: How to operationalise the PED Framework

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Driving Urban Transitions to a sustainable future

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1 Introduction & Background

The Positive Energy Districts Transition Pathway (PED TP) is one of three thematic priorities of the Driving Urban Transitions Partnership (DUT) and builds on the PED Programme as a joint initiative between the SET Plan and JPI Urban Europe. In this context, five transnational calls have been launched so far[1], with 25 R&I projects working on the strategic and operational development of the PED concept. It is a central ambition of DUT to synthesise outcomes of the different projects, promote exchange and cooperation between them and stimulate the conceptual discourse in perspective of delivering substantial inputs for Europe's ambition of becoming climate-neutral (Green Deal, Cities Mission).

At the DUT projects meeting in Brussels in April 2024, many project partners clearly expressed a need for thematic exchange between PED. The **PED Thematic Deep-Dives** have been set up as a series of thematic exchanges between the JPI UE- and DUT-funded PED projects – they represent an excellent opportunity to share insights, collaborate with fellow professionals, and explore best practices in the field of sustainable urban development. Furthermore, the PED Deep-Dives shall serve as a starting point for synthesising approaches, achievements and learnings in different areas from the PED projects. The PED Deep-Dive event series has been initiated and organised by the PED Expert Support Facility (ESF)[2], and takes place between December 2024 and May 2025 within the ESF, and might continue within the new Knowledge Hub-function across all 3 pathways within DUT, and serves as a build-up to the PED Conference in autumn 2025:

#	Deep-dive thematic area	Date
1	**How to operationalise the PED Framework**	6 Dec 24, 13:30-16:00
2	**Stakeholder engagement and social aspects**	6 Feb 25, 13:30-16:00
3	**Digital Twins and decisionmaking tools for PED**	6 Mar 25, 13:30-16:00
4	**Energy balance, Flexibility Services and Climate Impact Assessment**	8 May 25, 13:30-16:00

Focus of the first deep-dive – **How to operationalise the PED Framework –** is on the **updated Framework definition**, **assessment methodology** and **PED in relation to the Mission of 100 climate-neutral and smart cities by 2030**. Starting with an overview of the updated Framework definition for PED, approaches, experiences and learnings from the projects were pitched and discussed. Furthermore, the implications of the (updated) framework definition were in focus of the discussions.

The recording of Deep-Dive one is available here.

[1] as of January 2025

[2] The PED ESF is a panel of experts from JPI UE PED Call II projects, aiming at promoting cooperation between the projects and developing joint outcomes. It is operating from 2022 to 2025.

2 PED Framework 3.0

With the PED framework definition we aim to establish a joint European policy-relevant PED Framework[3]. This framework is meant as a guiding tool for policy makers and practitioners at European, national, regional and local level. It offers a flexible, yet consistant approach which can be adapted to the local context. The PED Framework strives to be inclusive and accesible, enabling a wide range of urban districts to engage with and achieve sustainability targets. It supports mission oriented progress toward climate-neutral cities and regions accross Europe.

The PED framework definition has a concentric structure, which revolves around three main questions. At the heart it gives an answer to **WHAT** a Positive Energy District is. The What-question is centred on the three key functions: energy efficiency, energy flexibility and local renewable energy production. PEDs are energy-efficient and energy-flexible urban areas which produce local renewable energy, achieve net zero greenhouse gas emissions and play an active role in the energy system for achieving overall climate neutrality.

The second layer focusses on the **WHY**-question. For a PED, striving to become **climate neutral** is essential to both limit and adapt to climate change, enhance its resilience and protect the environment. By taking ambitious and coordinated actions, PEDs can contribute to global efforts to create a more sustainable and resilient future for all. Secondly, a PED approach could be a response tackling **multiple challenges**. By addressing environmental, social and economic impact, PEDs provide answers to for example the current energy crisis, the climate crisis and cost of living crisis in the urban context. Thirdly, the EU building stock is relatively old and not adapted to the future of a carbon free environment and actions are needed to reduce energy needs, therefore PEDs promote reuse, **retrofitting** and repurposing of existing districts and neighbourhoods. Moreover, PEDs promote a **high quality of life** within an urban neighbourhood that prioritizes human well-being, social harmony, environmental stewardship, and sustainable development. It emphasizes the importance of holistic and inclusive approaches to societal progress. **Energy justice** is a concept that encompasses the fair and equitable distribution of energy resources among individuals and communities within a certain area (in this case, within a PED). Overall, energy justice aims to transform the energy system into one that is socially equitable, environmentally sustainable, and economically viable for all. And lastly, PEDs create **new market opportunities** and contribute to making sustainable energy accessible and affordable to all.

The third question is about **HOW** to realize PEDs. It elaborates on the crucial elements and processes to make the transition happen. 1: Realization of a PED is a (long-lasting) process. 2: The PED development relies on multi-level governance and alignment of initiatives. 3: PEDs require cooperation among all main problem owners and key stakeholders. 4: PEDs need to empower local initiatives and energy communities. 5: Integrate different systems and infrastructures - sector coupling and cross-sectorial integration. 6: Connect various urban elements and improve spatial planning: Interactions between buildings, the users and the regional energy, mobility and ICT systems. 7: Unlock responsible investments and lowest cost of green energy for districts and communities.

Positive Energy Districts function as building blocks for climate-neutrality and sustainability. In this context, PEDs need to be positioned as integral parts for achieving the European Green deal for overall climate-neutrality by 2050 and specifically be integrated into pathways towards the Mission of 100 Climate-neutral and Smart Cities by 2030.

[3] PED Framework 3.0: A Policy Guide to Advance Positive Energy Districts in Europe | dut

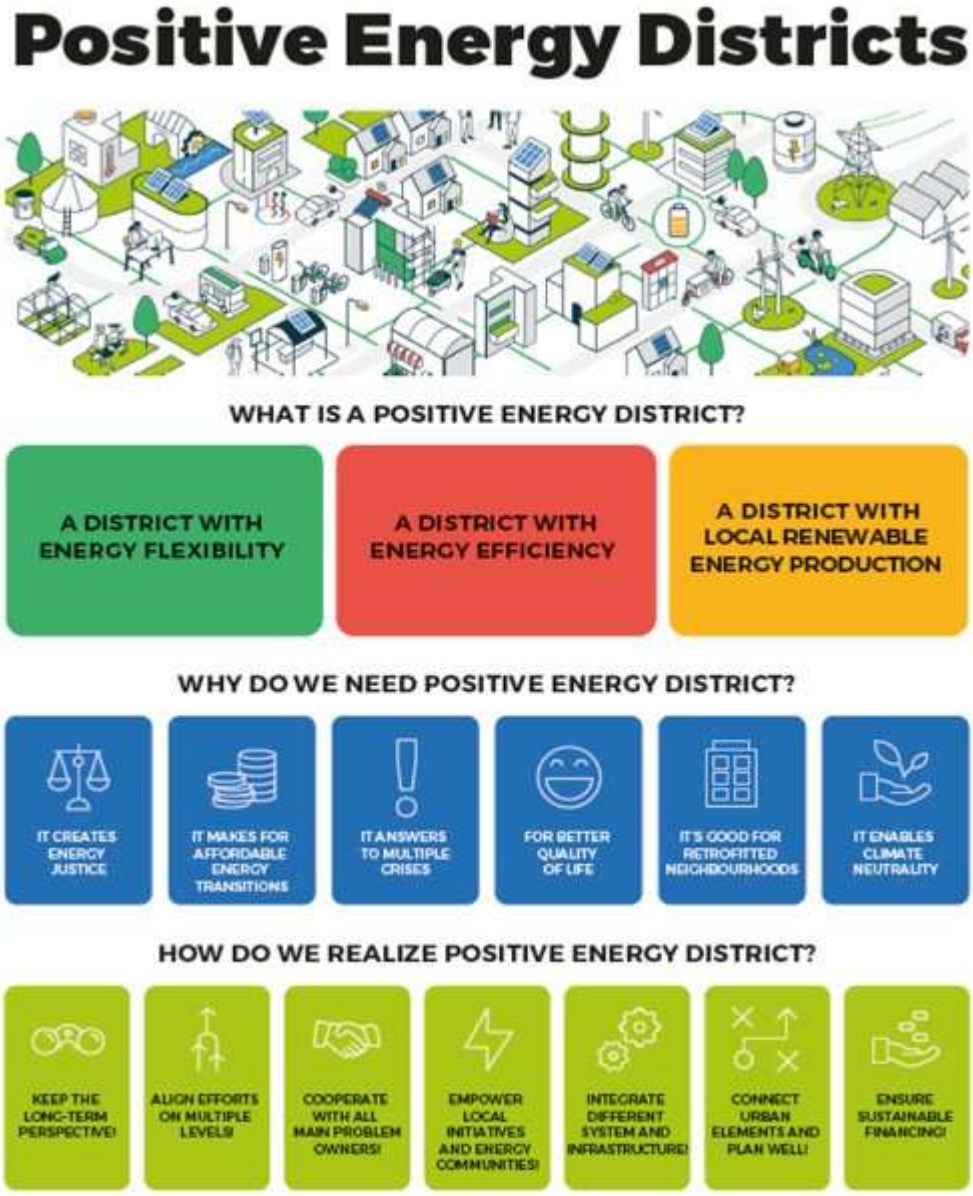

Fig. 1: PED Framework 3.0

3 Project pitches

Within the Deep dive two projects were invited to share their thoughts on the PED framework and how they approached the PED concept within their project.

3.1 KINETIC

Presenter: Codrut Papina. Website: [KINETIC | JPI Urban Europe]

The KINETIC project has focused on three demo cases in Copenhagen, Bucharest and Parma. The project advocates PEDs as a process. The project worked on a co-creation methodology starting with stakeholder identification, followed by developing scenarios for local Energy Communities. An important aspect was to align the PED ambitions with other strategic development ongoing in the district and city in order to be able to embed PED goals. In a second phase a PED strategy was elaborated, using co-creation methods to develop a vision and development scenarios. These were then put into a hands-on transformation road map.

In the KINETIC project PEDs are approached as innovation hubs and as sandboxes. The focus was on the active involvement of citizens in the design of PEDs, since PEDs are only valuable when local communities are closely involved and owners are empowered. This also resulted in a focus that was not purely on an autonomous PED, with a positive energy balance in the strict sense, but rather using the concept to trigger a process of PED development. In that sense, it is important to embed PEDs within comprehensive urban projects while still paying attention to enhance data infrastructure for energy management.

Figure 2: KINETIC Co-creation methodology

3.2 SIMPLY POSITIVE

Presenter: Simon Schneider. Website: SIMPLY POSITIVE | JPI Urban Europe

The presentation of the SIMPLY POSITIVE project focused on the need for a broad PED concept at the EU level, that needs further refinement at the national, regional and local level. At these levels, there is indeed a need for clear quantifiable targets in order to see if the efforts made are sufficient to reach the goals of climate neutrality taking local contexts into account. In this sense, the national, regional and local contexts are crucial to further quantify emissions and energy use targets taking for instance local climate, urban density and heritage into account to be able to assess PED feasibility. The SIMPLY POSITIVE project therefore advocates defining these context factors at a national or regional level to be able to offset these (dis)advantages.

Within Austria, the Klimaactive label was used to approach this quantification. The label defines three levels going from a Positive Energy District as a first step, by adding mobility in the second step and ending with a climate neutral PED as a final level. The top-down concept has been developed in such a way that it could be applied in every district in Austria, by including context factors which are specific for Austria. The main design goals of the Klimaactiv PED label revolves around a quantitative definition that tackles the question on what is actually "sufficiently" decarbonized. The PED target score then depends on local potential using the context factor of local density. This score can however improve when energy flexibility measures are also present in the district. These individual scores are connected to the national climate and energy goals for the building sector. In 2025 the first declarations have been made, but they did not add up to reach the overall national target, but it proved to be a good first step.

Regarding other KPI's important for district development, like the number of green spaces, the SIMPLY POSITIVE project considers them to also be important but regards the quantifiable energy and emissions balance as quintessential in order to define whether or not a district is sufficiently decarbonized. So, in the end both approaches (the quantitative and the qualitative) are needed, but within the PED concept the focus should be on energy as such.

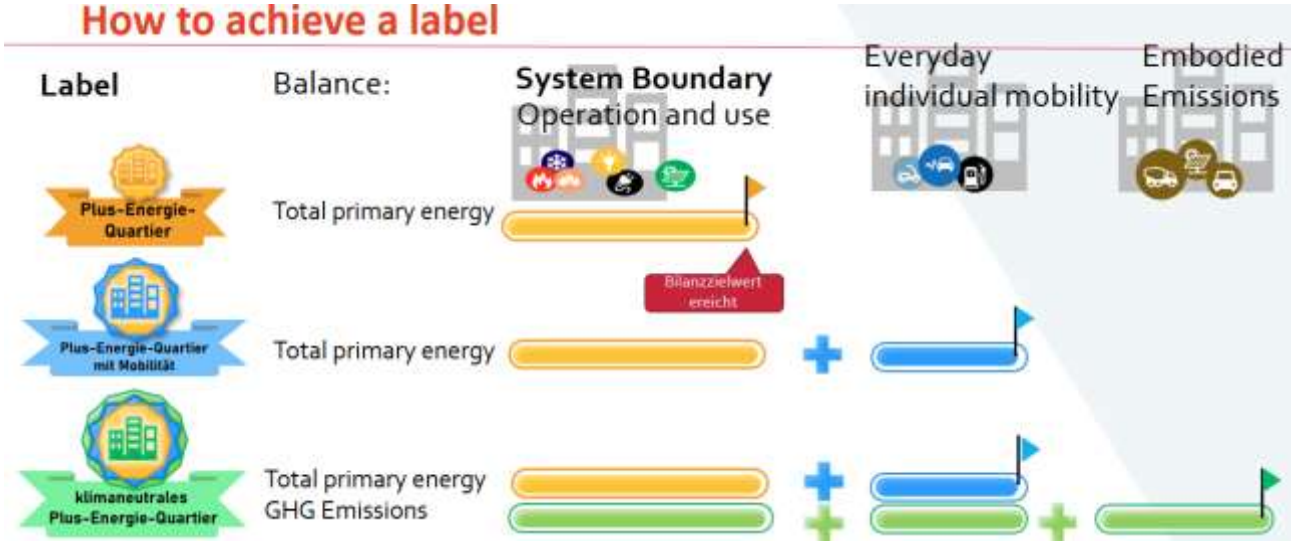

Figure 3: Different Klimaactiv labels and how to achieve them

4 Discussion

After the presentation on the PED framework and the two project pitches, the audience was invited to discuss the updated PED framework definition, the project approaches and operationalization and come to some strategic and policy insights.

The audience appreciated the strategic focus of the PED concept, prioritizing energy efficiency, production and flexibility while also taking co-benefits like resilience and affordability into account. Moreover, the adaptability of the new PED framework was evaluated positively, allowing local adaptations and reflecting diverse urban settings. It also provides qualitative guidance suitable for varied preconditions and energy systems. The comprehensive approach was also considered a strength. It encourages integration of spatial and energy planning and emphasizes social aspects, such as community engagement and sustainability.

However, some limitations were also identified. There remains an ambiguity in definitions with a lack of explicit connection to achieving a positive energy balance and a need for a clearer distinction between carbon neutrality and climate neutrality. Also, the application of the PED framework remains a challenge, with the holistic approach undermining the understanding of what is at the core in a PED. It also risks adhering to too ambitious results, promising outputs which are not realistic and require nuanced communication.

Overall, the audience agreed on a contextual application of the PED concept, using co-creation and iterative approaches to help adapt PEDs to local needs and link it to existing narratives. By using local vision development or processes like the PEPP (Positive Energy Planning Process), PEDs can be integrated into the local context. On the other hand, energy balance calculations are still needed to be able to get into the specificities of a certain district.

For the ongoing PED projects, it became clear that the focus should be on finding synergies to create impact and enhance resilience. It is important to integrate urban strategies with climate neutral pathways and incorporate standardized indicators for progress tracking and comparability. For future PED development, the emphasis should be on increasing the amount of R&D on the identified weaknesses, to explore scalable, sustainable business models and financing. Early community empowerment should be balanced with scalable solutions and technological and regulatory challenges in relation to PEDs should be addressed.

To conclude, (1) PED strategies should be embedded in wider climate strategies and city plans for heating, cooling and urban development by providing detailed definitions and suggestions for policy integration, (2) Citizens and community capacities should be mobilized to challenge and expand existing frameworks, (3) a (quantifiable) distinction between PED-capable and PED-aspiring districts should be introduced and (4) Visualizations should be developed to communicate the PED concept effectively.