



Position paper

May 2026

This position paper synthesises insights from nine projects within DUT's Positive Energy District Transition Pathway (PED TP). The recommendations proposed are for municipalities and focus on how to effectively facilitate PEDs in cities. All were developed with input from 4A4PEDS, DigiTwins4PEDs, EDUPED, FLEDge, FlexPED, NEEDS Repowered, PERSIST, Pol4PED, RESPED, and the RISE Institute.

AUTHORS:

Dominic Stephen & Rolf Bastiaansen
Bax Innovation

CONTRIBUTORS:

Sara Ghaem, RISE | **Marcin Mielewczyk** and **Aleksandra Wagner**, Jagiellonian University | **Baldiri Salcedo**, THUAS | **Andreas Tuerk**, Joanneum Research | **Vanja Djinlev**, EMPA | **Eszter Kiss**, The Urban Institute Hungary | **Daniele Vettorato**, EURAC | **Dagmar Juchelkova**, TUO | **Omar Shafqat**, AUAS | **Beatriz de Mello**, Universidade de Coimbra | **Marinos Themistocleous** | **Rizal Sebastian**, THUAS | **Sasak Falay Schweiger**, AIT | **Matthias Betz**, HFT Stuttgart | **Dessislava Petrova**, GATE Institute

PEDs: GRID PARTNERS OR GRID PROBLEMS? How cities can advocate for PEDs as a new urban energy standard

KEY MESSAGES

- Positive Energy Districts (PEDs) are now technically proven, yet the challenge is to embed these districts into formal urban energy planning strategies.
- While a scaled PED sector conflicts with Distribution System Operators' (DSOs) service provision, cities ultimately set legal frameworks for DSOs and other business to follow.
- Overcoming the systemic inertia of legacy grid business models requires municipal authorities to work closely with DSOs as active flexibility partners.
- To unlock the potential of PEDs, DUT projects suggest four key action pathways. Authors urge cities to proactively fulfil a new role of strategic energy system orchestrators, using their utility shareholder power and legislative authority to advocate for new energy market models for local benefit.



EUROPEAN PARTNERSHIP



Co-funded by
the European Union

PEDs IN EUROPE TODAY

Positive Energy Districts (PEDs) offer a transformative alternative to Europe's energy system currently characterised by fossil fuel dependence and centralised generation, and rising costs. Indeed, PED technical feasibility is now established through over 100 DUT-funded projects since 2015.

However, a clear pathway for establishing PEDs as a mass market alternative energy model remains unknown. The challenge is to move beyond successful demonstrators to creating a scalable model providing real benefits for European homes and businesses.

GRID PARTNERS – OR PROBLEMS?

Most fundamentally, PEDs run counter to the grid's legacy business model, encountering systemic institutional inertia from energy utilities, energy suppliers, energy system operators and Distribution System Operators (DSOs). Whilst a core value proposition of PEDs anchors on reduced usage of central grid energy (local production where possible, and grid as backup), DSOs depend inversely on high-volume grid usage to recoup their enormous investments over several decades. A scaled PED sector therefore fundamentally threatens DSO service provision, risking stranded assets, lost revenue, and reduced market share.

PEDs introduce new energy system complications for DSOs. The energy load of PED districts varies widely between seasons (high demand during the winter, and high grid export during the summer), effectively using the grid as a seasonal storage buffer. This requires complicated forecasting and management by the DSO.

A lack of data transparency from DSOs around building-level energy consumption prevents the detailed modelling required to prove PED feasibility and benefits. DSOs typically cite market sensitivity factors or GDPR as justification for this.

Finally, the definition of PEDs is not fixed or legally recognised, unlike energy cooperatives and energy communities which have recognition as legal organisational models in Europe. While some PED initiatives focus on achieving a measurable annual positive energy surplus through fine-tuned technology integration, others use the PED concept as a more general launching point for demonstrating a range of local energy system, market, and community innovations. DUT PED projects also highlighted that the scope and definition of a "district" is highly variable, making many PED projects unique and incomparable.

The RESPED DUT project cites new energy regulation in Austria legislating energy communities and energy trading. DSOs initially resisted this because energy sharing reduces their revenue, and ultimately increased grid tariffs to compensate their losses, shifting new costs back to consumers.

CITIES – EUROPE’S LOCAL ENERGY SYSTEM CATALYSTS

Regional and municipal authorities can adapt European policy for the specific needs of their citizens and businesses. Cities define urban planning priorities and building codes, setting legal frameworks for DSOs to follow. Municipalities also hold a **unique position of public trust** with citizens, essential for orchestrating fragmented energy stakeholders (tenants, owners, DSOs) who otherwise would not have reason to collaborate.

For PEDs, cities represent the optimal facilitation actor towards collective clean energy pathways, leveraging available EU resources to advantage local energy systems over grid energy, including new business models like energy sharing. Where EU policies are not yet available, cities can actively advocate for them towards policymakers. Cities also have an increasing responsibility to ensure urban resilience against energy shocks and price volatility for their citizens. PEDs represent a core anchor of this strategic defence, stabilising cost of living whilst supporting wider net zero ambitions.

“Since PEDs are still a new and largely academic concept, the City of Zurich is only starting to engage with their practical relevance. To better integrate PEDs into urban planning, we shifted our approach from ‘How can you implement our PEDs?’ to ‘How can PEDs help you achieve your urban climate goals?’”

Vanja Djinlev, EMPA,
Pol4PEDs project

CASE STUDIES

Malmö, Sweden

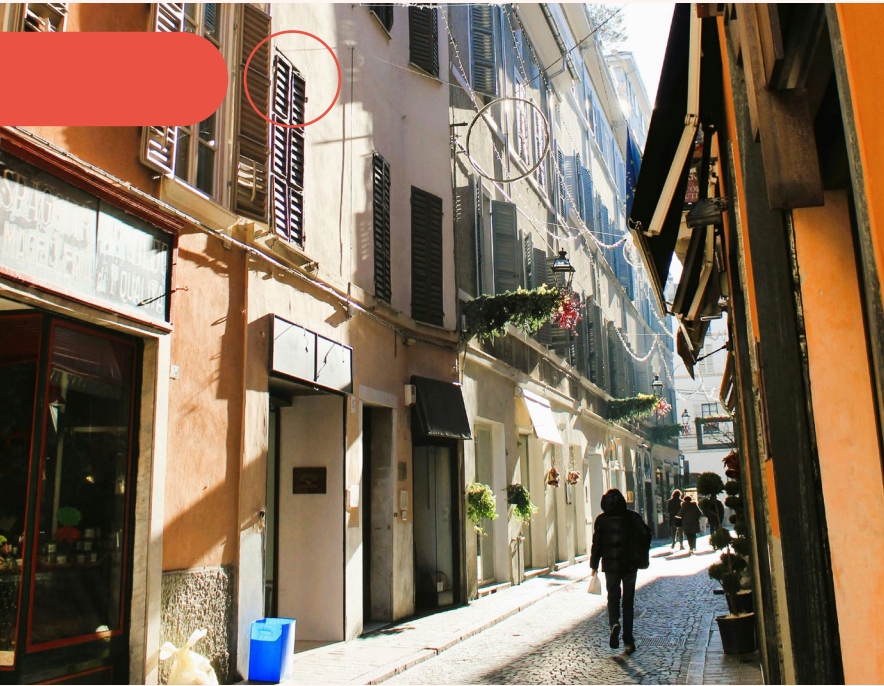
City-owned energy companies as potential PED facilitators

Sara Chaem (RISE Institute, Sweden) noted that the City of Malmö established *Malmö Energi och Hållbarhet AB* (MEHAB) in 2023 as a municipality-owned entity supporting climate neutrality and energy initiatives, including digital infrastructure. Having sold their district heating system in the 1990s, MEHAB represents a novel attempt at bold, municipality-led energy system governance.

MEHAB’s municipal ownership could provide strong institutional legitimacy, coordination capacity, and financial support needed for to facilitate the development of PEDs.



© Marek Lumi



Parma, Italy

Formalising PEDs within city master planning

Daniele Vettorato (EURAC, Italy), from the 4A4PEDs DUT project, highlighted the City of Parma for embedding the PED concept within formal urban climate strategy. Parma's 2030 *Climate Neutrality Action Plan*, submitted in September 2023, links PEDs to the city's broader planning framework.

By placing PEDs inside the city's formal planning architecture, Parma turns them from niche pilot projects into legitimate, long-term urban development tools with strong legal backing.

© Kateryna Kamenieva

Vienna, Austria

Neighbourhood scale collaboration

Vienna's Grätzl 20+2 district serves an example where a PED vision is pursued through coordinated building-level and neighborhood-wide interventions. PEDs often struggle to bridge fragmented ownership and planning regimes. However, Grätzl brings together property owners, businesses, and researchers, to co-design a climate-neutral and resilient quarter that treats the neighborhood as a shared spatial and governance unit rather than a collection of isolated upgrades.



© Anna Hunko

RECOMMENDED ACTION PATHWAYS

A subgroup focused on PEDs within the DUT Knowledge Hub proposed the following priorities for city authorities to effectively facilitate PEDs within their evolving energy systems:

1. Market-oriented PED support

Cities can, and must, advocate for new mechanisms which reshape existing energy markets in favour of local systems. This could involve targeted subsidies for new local energy infrastructure, ownership, and delivery models, or introducing dynamic tariffs which encourage energy flexibility measures as an alternative to further grid infrastructure usage and investment. Further, while energy sharing represents a critical component of commercial viability for PEDs, restrictive regulations and tariffs hinder its uptake in many countries. Through taxes and negotiation, cities should remove these barriers to clearly establish locally shared green energy as the most economical option.

2. Advocate for PED policy and local energy markets

Cities are not a neutral audience, but active stakeholders in the energy transition, often holding positions on the Boards of DSOs who manage district-level energy grids. By recognising and proactively leveraging this shareholder status, **cities could influence new pricing models** away from grid energy. Municipalities should form strategic coalitions to advocate at the national level, driving regulatory reform away from centralised distribution and establishing clear legal frameworks for local energy markets.

3. Demonstrate compelling PED impact to escape the “pilot trap”

To advocate effectively for sustained political commitment, **municipal leaders need concrete evidence for the impacts of PEDs**, including reduced energy bills, enhanced energy security, and societal inclusivity. Rare examples, such as ASTER in Flanders, offer clean energy at €0,19/kWh, compared to a high Belgian average of €0,35/kWh. Future innovations must favour economic and policy research which demonstrate PEDs no longer as just technically possible, but highly preferable and able to be standardised as a real energy alternative for millions of homes.

“While the cost of solar and storage trends downwards, grid energy goes up. Owning local energy is not just cheaper for cities but offers long-term stability. While some cities facilitate new energy system solutions such as PEDs, others work to expand self-consumption regulation and reduce local grid fees for their citizens.”

Rolf Bastiaanssen, Bax Innovation,
Strategic support for DUT

4. Institutionalise PEDs by embedding within master planning

PEDs are invariably viewed by policymakers and financiers as niche research initiatives rather than genuine energy system alternatives. To achieve widespread adoption, **cities must systematically embed PED principles¹ as priorities within urban planning and municipal building codes** – not just green add-ons. Municipalities can also legitimise PEDs through alignment with existing legal structures such as Energy Communities. Finally, cities can facilitate the creation of urban data spaces, trusted digital ecosystems where DSOs can share data and PED energy models created.

¹ <https://dutpartnership.eu/news/dut-updates-its-strategic-direction-new-roadmap>



CLOSING REMARKS

This position paper synthesises insights from 25 experts, 9 projects, and 15 European countries within DUT's Positive Energy District Transition Pathway (PED TP).

The DUT Knowledge Hub held three separate co-creation meetings, using Miro, to gather contributions from PED projects 4A4PEDS, DigiTwins4PEDs, EDUPED, FLEDge, FlexPED, NEEDS Repowered, PERSIST, Pol4PED, RESPED, and the RISE Institute.

In this publication, authors argue for four priorities and propose recommendations for municipalities focusing on how to effectively facilitate PEDs in cities.

For further insights about DUT projects and contact details to project coordinators visit www.dutpartnership.eu

ABOUT THE DUT KNOWLEDGE HUB

This publication is an output from the Knowledge Hub.

The Knowledge Hub is DUT's instrument to gather a knowledge community, capitalise on project results and facilitate the transfer of the project results to practitioners.

Each DUT project is represented by an expert who spends at least 5 person-months on Knowledge Hub activities. The experts, together with the management team of the Knowledge Hub(s) and the specific Transition Pathway programme management, are set to:

- Contribute to the strategic development of the Transition Pathway
- Synthesise results in collaboration with other projects
- Develop publications and participate in specific events
- Communicate with the scientific community and stakeholders





This publication was developed by projects funded under the Driving Urban Transitions Partnership, which has been co-funded by the European Commission. The content, views and recommendations are the authors' own, and do not necessarily represent the views of DUT.

Editors: Ana Calvo and Katarina Schylberg, IQ Samhällsbyggnad

Design and layout: Hearts&Minds, Brussels

Photo credit: Purchased images from iStock.

Driving Urban Transitions (DUT) Partnership

<https://dutpartnership.eu>



EUROPEAN PARTNERSHIP



Co-funded by
the European Union