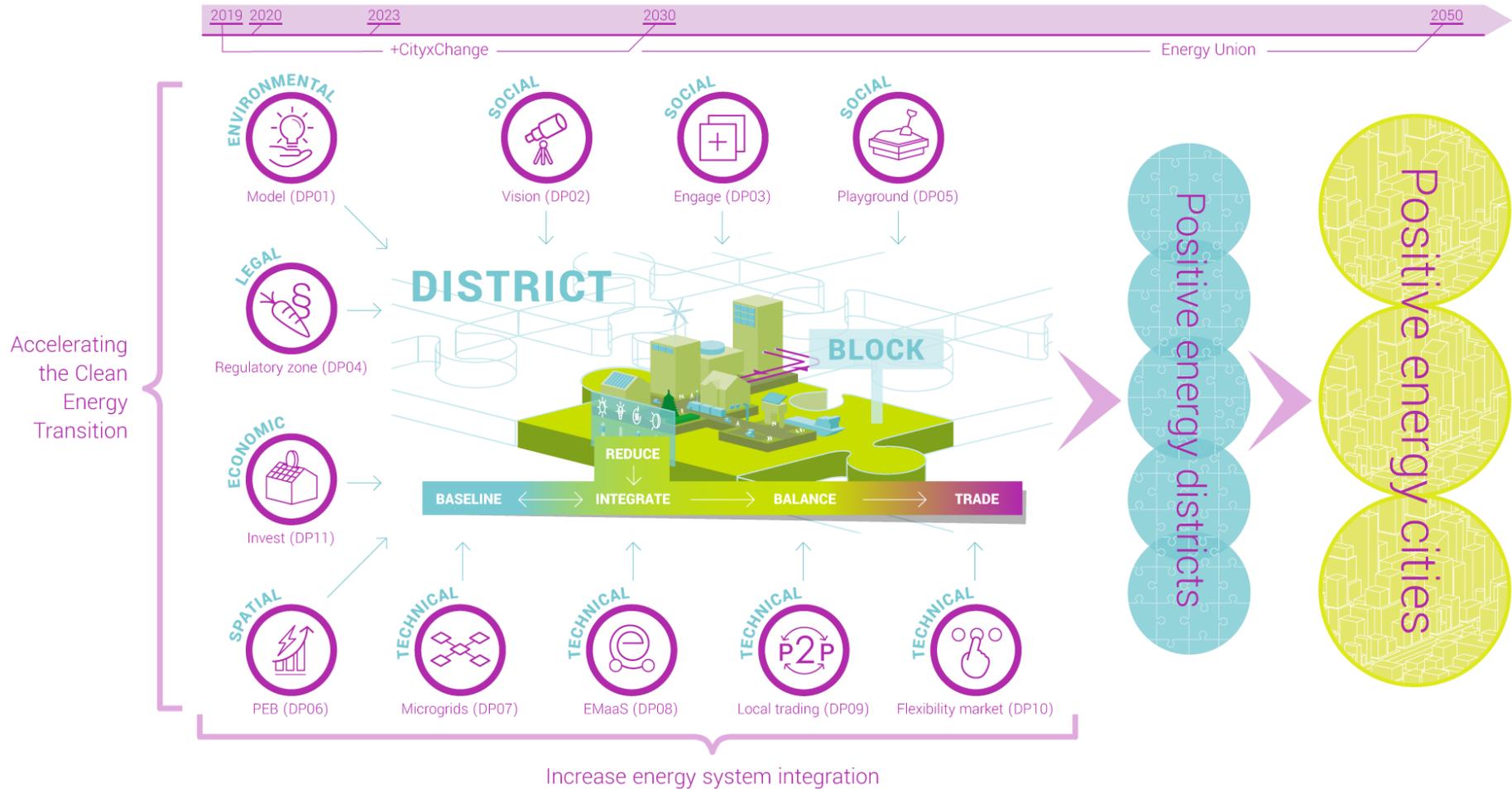


# Strategic Research Agenda of the EERA Joint Programme Smart Cities:

Define, plan and orchestrate the research required to create Positive Energy Districts (PEDs), and to scale up towards Positive Energy Cities (PECs), in a concerted effort between 44 European RTOs and universities from 17 countries

1. **What are PEDs?** Propose & review/validate PED definition(s), KPIs & boundary conditions.
2. **What are PED Labs?** Protocols for testing, monitoring and evaluating PED Labs
3. **How do we create, manage & fund them?** Develop a toolbox of planning instruments for PEDs, including data and metrics, planning and design, and investment and business models
4. **How do we monitor them?** Create, collect, qualify, compare & analyse data from the 100 European PEDs
5. **Why aren't there more PEDs already?** Identify & document barriers, challenges & opportunities in existing PED projects. What are the main causal mechanisms that either enable or inhibit successful diffusion of PED innovation, systems, or policies, & how can PED innovations be scaled up both within the EU and beyond
6. **How do we scale up towards Positive Energy Cities?** How to take into account the diversity of cities in terms of size, geography, demographics, climate, infrastructure, economic context etc? What is required in terms of urban design & planning, investment & risk models, citizen empowerment, collaborative governance, impact assessment,... ?

# Realise Europe wide deployment of Positive Energy Districts by 2050



## Working Definition for Positive Energy Districts:

Positive Energy Districts (PED) are mixed-use energy-efficient districts that have net zero carbon dioxide (CO<sub>2</sub>) emissions and actively manage an annual local surplus production of renewable energy (RES). They require interaction and integration between buildings, the users and the regional energy, mobility and ICT system, while ensuring social, economic and environmental sustainability for current and future generations.

### PEDautonomous

Net positive yearly energy balance

within the geographical boundaries of the PED

internal energy balance at any moment in time (**no imports from the hinterland**) or even helping to balance the wider grid outside

### PEDdynamic

Net positive yearly energy balance

within the geographical boundaries of the PED

dynamic exchanges with the hinterland to compensate for momentary surpluses and shortages

### PEDvirtual

Net positive yearly energy balance

within the **virtual** boundaries of the PED

dynamic exchanges with the hinterland to compensate for momentary surpluses and shortages

### Pre-PED

**No** net positive yearly energy balance

within the geographical boundaries of the PED

energy difference **acquired on the market** by importing certified green energy (i.e. realizing a zero carbon district)