IEA EBC

Annex 83 Energy in Buildings and Communities Programme

Introducing Annex 83
PEDS, POSITIVE ENERGY DISTRICTS

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Austrian lead of Annex 83

Joint Workshop
IEA SHC Task 66 and IEA EBC TCP Annex 83
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ANNEX 83

- **Status:** Ongoing (2020 - 2025)
- **Operating Agents**

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What are PEDs?

Reference Framework definition for PED/PENs

(https://jpi-urbaneurope.eu/ped/)

“Positive Energy Districts 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.”

Role of ANNEX 83

Annex 83 combines the knowledge and experience of the international scientific community on PEDs

- collecting
- systematizing
- synthesising
- and preparing in a form that is understandable for practical use.

https://annex83.iea-ebc.org/

https://drc.ait.ac.at/sites/annex83austria/ in German

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Main Objectives of Annex 83

- Objective 1. Map the relevant city, industry, research, and government (local, regional, national) stakeholders and their needs and roles to inform the work on Objectives 2, 3, 4 and 5. The main purpose is to ensure the involvement of the main stakeholders in the development of relevant definitions and recommendations.
- Objective 2. Create a shared in-depth definition of PED through a multistakeholder governance model. To date, international activities have developed generalized definitions that leave many questions unanswered.
- Objective 3. Develop the necessary information and guidance to implement the necessary technical solutions (at building, district and infrastructure levels) that can be replicated and progressively scaled up to the city level, with emphasis to the interaction of flexible assets at the district level and on economic and social issues such as acceptability.
- Objective 4. Explore new technical and service opportunities related to monitoring solutions, big data, data management, smart control and digitalization technologies as enablers of PEDs.
- Objective 5. Develop the necessary information and guidance for the planning and implementation of PEDs, including both technical planning and urban planning. This includes assessing the economic, social and environmental impacts of different alternative development pathways.

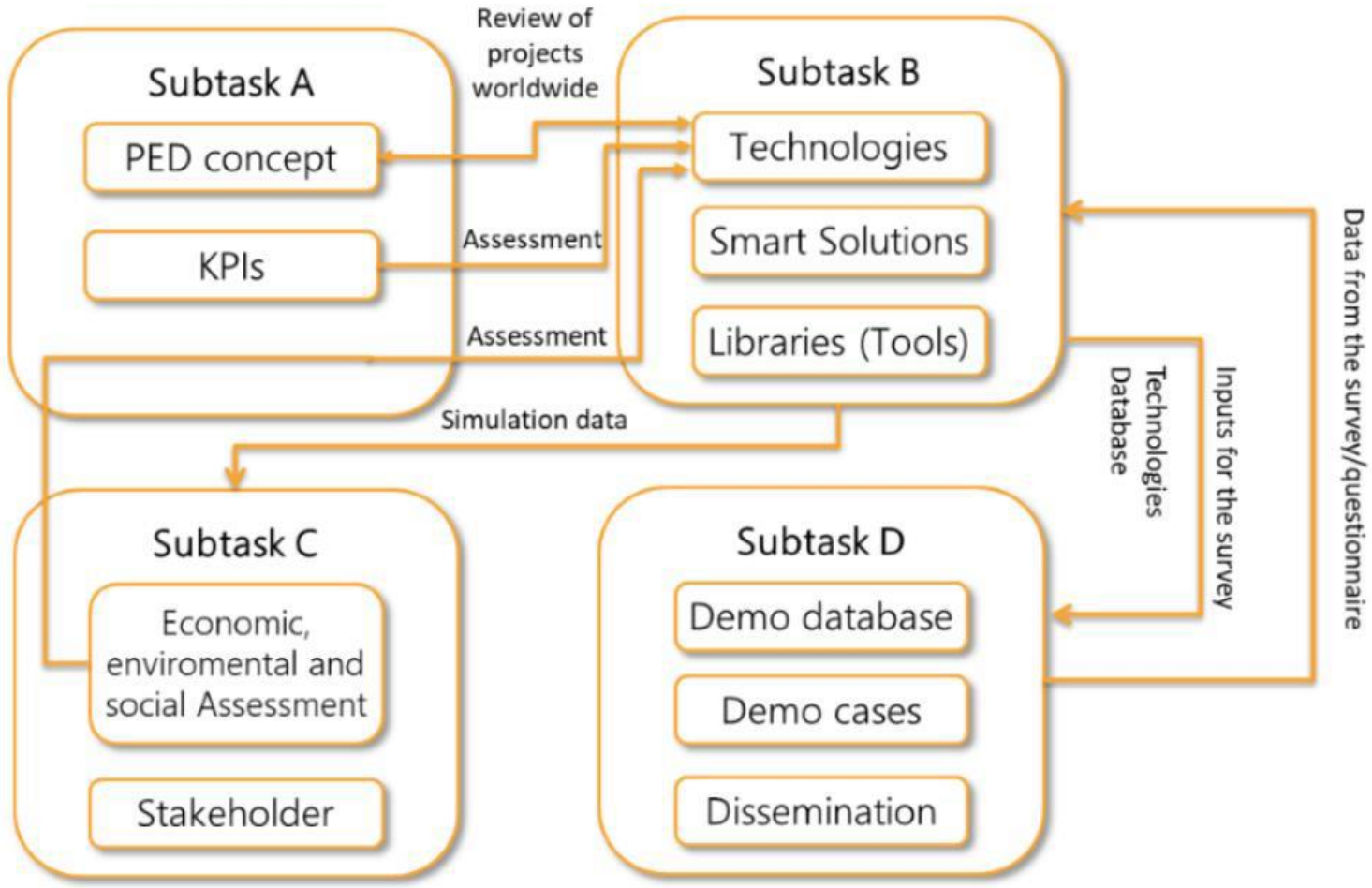
Annex 83 Subtasks

A Definitions and context

B Methods, Tools and Technologies for Realizing Positive Energy Districts

C Organizing principles and impact assessment

D Demos, implementation and dissemination



Some insights from Annex83

	Chapter	Sub-chapter
01	1. State of the art	1.1 Evolution of the concept of PEDs 1.2 Existing PED-related Initiatives 1.3 Existing PED-related Projects (PED definition, project objectives and key concepts) 1.4 Comparison and discussion of existing PED definitions
02	2. Definition of PEDs – Energy Balance Calculation Methods	2.1 Review of energy balance calculation methods in existing PED definitions 2.2 Test of selected PED definitions and energy balance calculation methods: A case study 2.3 Recommendations on ways forward
03	3. PED Characteristics and PED Archetypes	3.1 General Characterisation of PEDs 3.2 PED Characteristics: District scale 3.3 PED Characteristics: Technical components 3.4 PED Characteristics: Life quality indicators 3.5 Development of PED archetypes
04	4. PED Processes	4.1 Mapping of stakeholders 4.2 PED-related regulations and legal barriers 4.3 Process flow of PED development
05	5. Evaluation of PEDs	5.1 Proposal of KPIs for the evaluation of PEDs 5.2 Validation of the KPIs

Subtask A

Subtask B

Aim & subtasks

B1: Mapping technical solutions

- **Identify the different technical solutions** that can be implemented in a PED and assess them (PESTLE analysis, KPIs…)

TB1.1: Review of the most common technologies applied in PEDs
TB1.2: Create an inventory of the most common technologies
TB1.3: Evaluation of the technical solutions

B2: Smart solutions for optimization and flexibility of PEDs

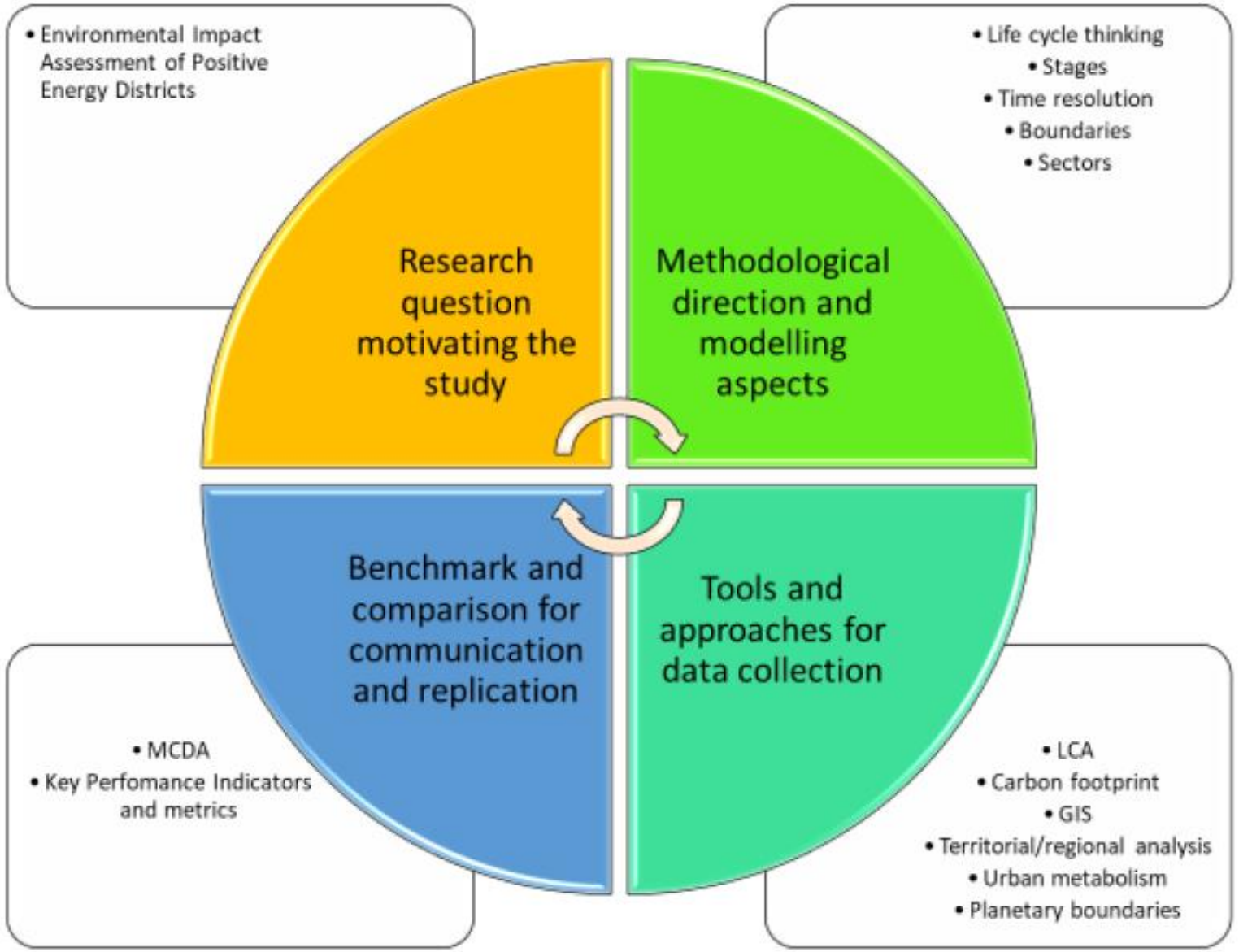
- **Investigate how flexibility management can help to balance energy flows within and beyond the PED boundaries**

TB.2.1: Review on decision making process algorithms for planning/design a PED
TB.2.2: Review and assess control strategies (focusing in flexibility)

B3: Simulation and modelling tools

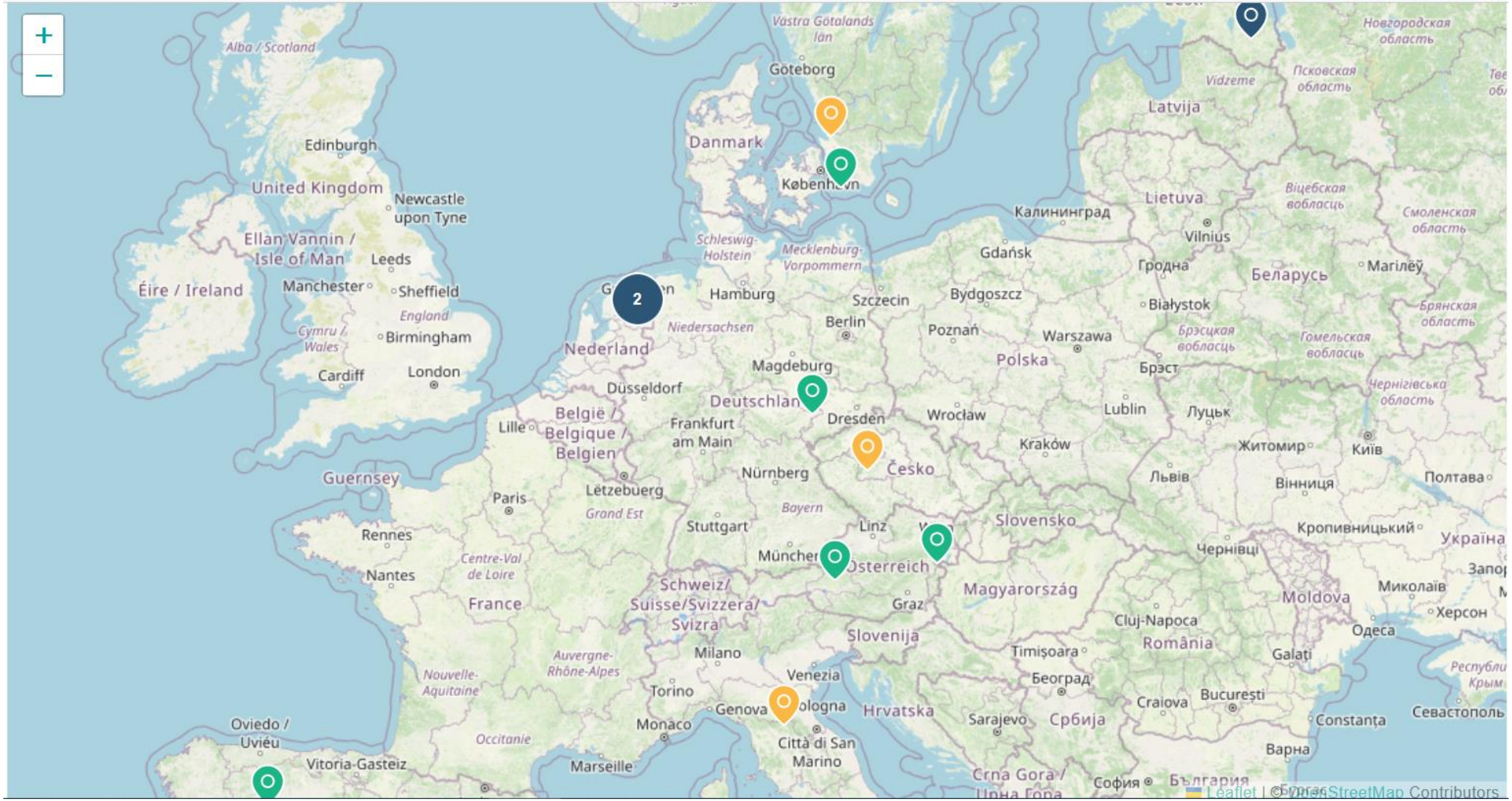
- **Develop and implement joint international library concepts (B1) and populate them with data**

TB.3.1: Data necessary (and data organization) for modelling tools used in PEDs
TB.3.2: Use libraries for modelling district scale case studies
TB3.3: How to document and utilise data from case studies.


• Environmental Impact Assessment of Positive Energy Districts
• Life cycle thinking
• Stages
• Time resolution
• Boundaries
• Sectors
Research question motivating the study
Methodological direction and modelling aspects
Benchmark and comparison for communication and replication
Tools and approaches for data collection
• MCDA
• Key Perfomance Indicators and metrics
• LCA
• Carbon footprint
• GIS
• Territorial/regional analysis
• Urban metabolism
• Planetary boundaries

Subtask C

Subtask D and a cooperation with PED-EU-NET | COST ACTION CA19126



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Results from the collaborative projects

1. **SYSPEQ, Systemic solutions for postive energy districts**
2. **Austrian Certification of Climate-neutral Positive Energy Districts according to “Zukunftsquartier” Method**
3. **Campagne: Demonstration project towards PED**
4. **Cost-optimal analysis of EXCESS demo**
5. **Anergy2Plus, Demonstration and expansion of an energy network as part of a holistic energy concept and plus-energy district**

Driving urban innovation with YOU

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