Auto characterization of PEDs for digital references

towards iterative process optimisation

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Deliverable D6.1

Deliverable Title: Objectives, guidelines, and framework for co-learning & co-creation

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Deliverable:

6.1. Objectives, guidelines, and framework for co-learning & co-creation

Related to:

D3.1 Review of the existing PED frameworks

D3.2 Urban building energy demand models for case cities

D5.1 Review report of machine learning algorithms for in-depth 5 learning of PED

Task 3.3 – Define physical scale and set up for data collection

Task 4.1 - Analysis of the needs of semantic interoperable tool

Task 5.2 - Develop matrix for multi-criteria characterization

Task 6.1. Map local stakeholder and establish a local city team

Task 8.1 - Cooperation plan

1.   Purpose of the deliverable

This document will inform the partners and support them in their efforts to engage and involve stakeholders. The document outlines the objectives of the co-learning and co-creation activities, drafts the guidelines to achieve those goals and create a collaboration framework for all pilot cases. It is at the same time the draft workplan for the work package 6, which will be adapted and further developed with the project further, to address on demand needs of the partners and the pilot cases.

Specific objectives of WP6 "Co-learning Processes and Co-design Strategies are:

- Create a stakeholder plan
- Building and maintaining local stakeholder networks
- In collaboration with public and private sector develop a PED roadmap and analyse potentials of implementations with various scenarios
- Identify energy actors and initiatives
- Choose tools and strategies for European collaborations
- Identify social entrepreneurs in the energy transition sector
- Identify and evaluate ecosystem potentials in the local and national context of the pilot cases
- Update this framework during the project progress

In PED-ACT we are employing quadruple helix model (Carayannis & Campbell, 2009), as the energy sector is strongly influenced by various actors. Energy providers are immediate partners in the pilots and are in-between local production and consumers, but also interlinked with international or global players, as well as decision makers. Municipalities in our pilots have different roles and rights in the energy sector, and therefore their role is very case specific. Local energy communities, organisations, cooperatives, and communities' possibilities are very much embedded in the national legislation, as well as depend on local ownership models. Thirdly partners with specific expertise are playing the role of independent and objective knowledge providers for all these actors, in order to develop a good roadmap which can lead to local change. The link between developers and the needs of users in the pilot case areas is not built very strong yet. Even if the role of actors will be differing from pilot to pilot a lot, the complex stakeholder structure is a big challenge and a precondition for a good collaboration. To put it simple, to achieve a positive energy balance the energy demand of a defined area needs to at least equal the local energy production. And this means, we need a stronger collaboration between all actors, to achieve this goal.

In a PED area we want to have a balance of energy use and energy production. On both sides the results are influenced by various aspects, which can be improved with the contributions of different stakeholders. Apart from the direct contribution to achieve a PED status, the involvement

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of stakeholders, can spark motivation to other groups and allow further replications (WP 7 in this project). Therefore, the work package 6's framework can support the effectiveness and impact of all work packages and tasks.
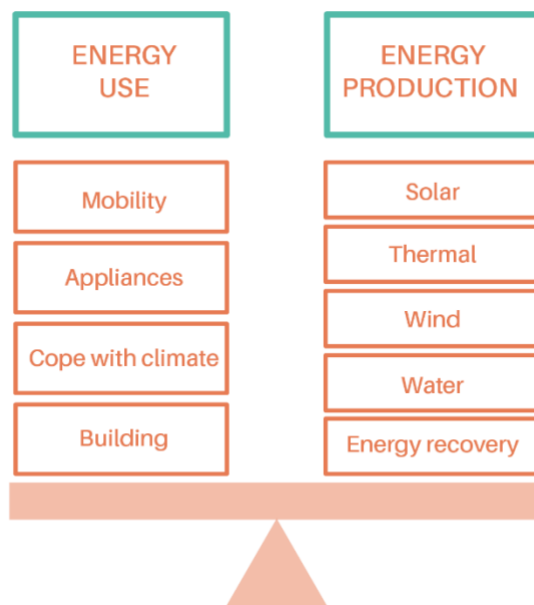

Figure 1. The use and production in balance ©wonderland/Batuhan Akkaya

2.   Explanation of the work

The work in PED-ACT focuses on national frameworks in Sweden, Austria, and Turkey, with the municipalities Borlänge, Umea, Schönbüchel-Aggsbach, as well as Karşıyaka and Ankara. Over the past few decades, the energy transition has been one of the most pressing topics and the pilot municipalities need the support to reach their sustainability goals, as they all are lagging in reaching them. The chosen municipalities are diverse in climatic challenges, demographics, and size as well as location or capacities. The aim is to create a co-creation pathway with the selected municipalities and develop a PED plan for them. Secondly learnings regarding PED relevant needs of such municipalities are being recorded for the database, which potentially will provide services and suggestions for the ecosystem actors to enable replication of PED developments.

Aiming to empower the actors to be active in their communities, we established local collaborations. In Austria we are working with an energy community in the pilot area, and the regional energy institute both located in Lower Austria. In Sweden's cases we are working with the local housing provider, energy provider and the municipality. In the Turkish cases we are working with the municipalities. The aim is in all cases to work in a differentiated way but employ

a quadruple helix approach, with varying roles of the different stakeholders. This is necessary, as the situation in all pilot cases, the rights and obligations are differing very much.

Why do we develop a stakeholder action plan?

The stakeholder plan outlines the roles and responsibilities of stakeholders in the project. It will be used to ensure that all stakeholders are aware of their roles and responsibilities and that they are working together to achieve the project's goals. Since the constellation in each pilot is differing, actions and outcomes have to be appropriately adopted to the local conditions. The plan includes a list of stakeholders, their roles and responsibilities, and a timeline for when tasks should be completed. It also entails a communication plan to ensure that stakeholders are kept informed of progress and any changes to the project. Finally, a risk management plan is included as well, to identify and mitigate any potential risks associated with the project.

While seeking for and working with possible stakeholders there are basically four levels in how to engage with them: informing, consulting, involving and collaborating. In categorizing the stakeholder exchanges in a pyramidical structure, we identify the level of communication with its boundaries and potentials, which will serve the most effective outcome for the project. As the stakeholder interactions move up the pyramid, they´ll be fewer and more influential as well as more inclusive and participatory engaged with the process and decision making. Subsequently the approach to potential partners can vary from a one-way informative communication (websites, newsletters, …), to two-way feedback and opinion inquiry (online surveys, webinars, …) or finally an equal collaboration culture (face-to-face communication, permanent seat at project meetings, …). The difference modes of collaboration will be important details for the machine learning aspect in PED-ACT.
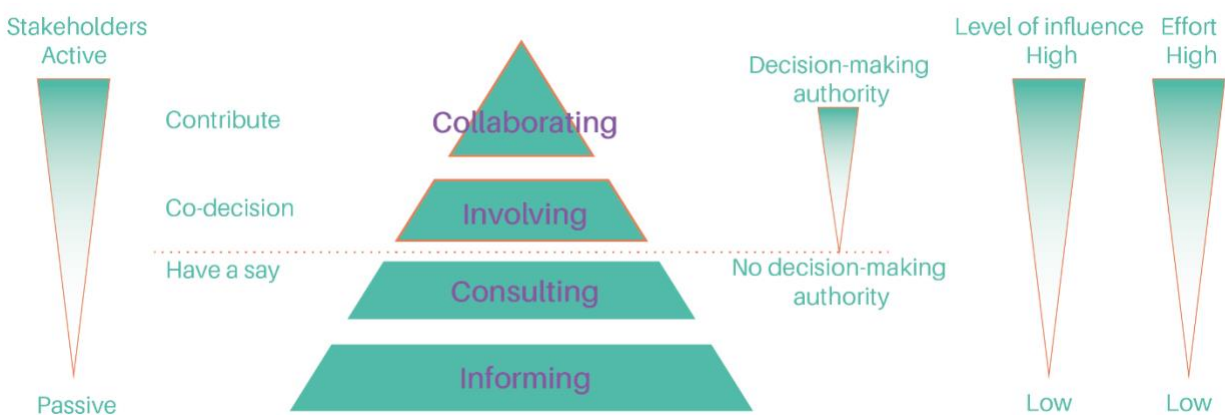

Figure 2. Stakeholder engagement pyramid ©wonderland/Batuhan Akkaya

3. Tasks & deliverables & Lessons Learnt

3.1 identifying local objectives

The collaborative definition of the objectives of co-learning and co-creation is the first step in involving stakeholders. The energy transition presents different sets of challenges in the pilot cases, the bottle necks are complex and interrelated, that is why the local consortium and collaboration is so important. In addition, a wide range of national and international actors and stakeholders from different sectors and backgrounds are interested in the project, which underlines the value of collaboration and co-creation in such transitions.

To work better in a transnational project, we will work with stakeholder or actor profiles, which will allow partners from different disciplines and also national context to understand the profile and aims of the stakeholders. A basic profile table will be used for this.

Attribute	
Actor	Who are individuals within the actor categories?
Agenda	What are the mandates, missions, and objectives of this actor?
Arena	In which part of the system is the actor present and active? Where exactly does the actor perform his/her actions (e.g. in which locations)? Which is the scope of these actions?
Alliances	Which relationships exist with other actors in the system? Which other actors does the actor cooperate with? What is the cooperation based on (e.g. information exchange, use of common resources, institutionally regulated dependency)?
Role in a PED	Which potential role can the actor play in a PED scenario?
Limitations	Which limitations, bottlenecks, challenges, capacities do actors have?

Table 1 Actor profiles template

The guidelines can support the independent work of partners in local circumstances and allow the creation of a sustainable framework for further developments. Within the reporting period following activities and preparations could be developed/implemented.

Wonderland:

Wonderland's role on the project is to develop, facilitate and lead participatory and co-creation processes, as well as to steer exchange with other organisations outside of the consortium and contribute to the dissemination activities to relevant stakeholders. We identified on a regional/national level supporters and facilitators as possible ecosystem actors.

Schönbühel-Aggsbach:

The energy community communicated within their group the projects objectives and identified the potential implementation areas. With the help of HDA and AIT the local potentials will be identified and accordingly necessary actors will be contacted in fall 2023.

DEM:

HDA:

HDA's role is to assist the local municipality and construction company in (1) interpreting the PED concept through knowledge transfer and characterization of a potential local PED, (2) developing simulation model for the targeted district, (3) visualizing the results for decision making during the design and planning of PED and carbon neutral city of Borlänge, and (4) proposing characterization matrix by communicating with different stakeholders and in-depth learning from existing databases.

METU:

METU`s role is to model simulations of the two pilot studies in Türkiye. METU's primary objective is to thoroughly evaluate the current state of the pilot studies and propose a comprehensive set of measures to transform the pilot areas into sustainable PEDs. It is important to note that this task necessitates the active involvement of stakeholders through a process of co-learning and co-creation. Furthermore, METU supports the municipalities of Ankara and Karşıyaka in raising awareness about PEDs in the pilot cases. This support is conducted in collaboration with the municipalities, aiming to introduce the local communities to the technical aspects of PEDs and outline the necessary steps to be taken. By doing so, the simulation models will be validated, and the PED models can subsequently be applied to other pilot projects within the scope of the overall project. This will help facilitate co-learning and co-creation across various partners and locations.

3.2 Co-learning and co-creation guidelines

Figure 3. Collaboration in quadruple helix model ©wonderland/Batuhan Akkaya

As we take the partners presented above together with any furtherly acquired stakeholders into account, we have to consider a balanced communication. The Quadruple Helix model comprises academia, industry, government, and civil society, each playing unique roles in innovation. More specifically,

- within the energy industry, in all case areas energy providers are responsible for supplying electricity to local consumers. However, they not only interact with local residents but also maintain connections with larger energy corporations, along with their national and global interests. These affiliations can influence over their strategies related to Positive Energy Districts (PEDs), potentially affecting initiatives within the local energy landscape.
- Depending on the nation and region but also the type of the municipality (such as district and metropolitan), municipalities can assume an active or limited role in energy policy and production as part of the government.
- Local energy cooperatives and communities, composed of residents aiming to generate renewable energy, face constraints imposed by national laws and regulations governing energy production and grid access. This emphasizes how local energy initiatives operate within the confines of broader legislative frameworks.
- Academic institutions, functioning as third-party research organizations provide impartial research and insights into energy-efficient technologies and practices.

While academia conducts research, industry focuses on commercialization, government steers policies, and civil society voices public interests. Collaboratively, they form a robust innovation ecosystem. An advantage is that the model ensures innovations match societal needs, enhancing acceptance and sustainability. Referring to this model we assure that the ideas and concerns of all 4 pillars are considered equally and consequently establish a multilateral work culture.

In the process of engaging with possible stakeholder one needs to undertake a widespread scan of the project environment and all relevant players. While getting in touch with new actors it is necessary to permanently evaluate the power of decision-making and the motives. These factors should be considered to build a professional relationship and create a goal-oriented workflow.

For the co-learning and co-creations process we will be working with the design thinking method, with the cycles of empathizing with local conditions and actors, and identify regional and national actors, who can be involved in the process. The outcomes of the first cycle will be elaborated in a baseline study. With the exchanges, the local potentials and goals will be defined. In the ideation phase the main goals in technical context will be stimulated and the needed capacities identified. The roadmap to achieve the PED status is the prototype for the PED-ACT project and will be "tested" in exchanges and will provide the local actors with suggestions on how to seek for financial and technical support for implementation. The use of design thinking for the process will allow to enrich the PED platform with useful resources and examples to replicate the process in other places. It is part of the guidance to show the necessary steps for implementation, as well as opportunities of the implementation to stakeholders, as well as on how to find financial investment for the implementation. It is the focus of this project to empower the stakeholders to make informed decision and see the best roadmap/ways to develop their area to a PED.

In the PED-ACT project a variety of partners are working together, such as funded members of the consortium, self-funded partners, and not funded stakeholders. As the resources therefore differ a lot, we developed a process outline for the stakeholders, so they can estimate their efforts and imagine what they can expect from us when. The PED-ACT process will be used in different intensities in the pilot cases.

Phase 1:

The design process is informed through a clear pathway, which is followed in all cases. Initiated by a kick-off process with bilateral exchanges and talks among stakeholders about the local needs, actors and opportunities are mapped out. The academic and technical partners support the local actors in the selection of a proper PED demonstration area and with energy modelling. In bilateral interviews, potential roles within the energy transition paths are defined for the local actors.

Phase 2:

The outcomes of the first phase are presented and discussed with the local community, with an open invitation to take up a role in the scenario, as well as to define the goals of the roadmap. The outcomes of the first phase have to be concrete enough to show potentials of participation and engagement, but flexible enough to further shape the roadmap collectively. After this open invitation workshop, roles and partnerships will be further developed and key milestones for the scenarios collectively defined.

Phase 3:

In bilateral collaborations the scenarios are developed to be a part ~~paths~~ of a comprehensive roadmap to become a PED.

Phase 4:

The last public event is the moment, where the cohesive roadmap is handed over to the local actors. Potential supporters (e.g. funding givers) are invited to participate in the implementation phase.

Figure 5. 4 phases of PED-ACT ©wonderland/Batuhan Akkaya

While working with local actors these steps could help PED-ACT project partners to establish a long-lasting local collaboration**.**

1. **Identify stakeholders,** actors or individuals who have an interest or could be affected by a possible PED initiative. This may include not only those directly involved such as property owners but also those indirectly impacted such as tenants, or potential future stakeholders like investors.
2. **Study stakeholders** and emphasize their problems, needs, concerns, expectations, and how they may be impacted by a PED action. The roadmap will be customized to address these topics of the pilots.
3. **Prioritize stakeholders** based on their significance to PED-ACT project context. Consider their willingness to volunteer in participation, knowledge on the topic, urgency, disadvantage positions and proximity to the issue at hand.
4. **Contact stakeholders** and reach out to them through appropriate channels, whether it's a face-to-face conversation, digital meetings, email, meetings, surveys, or other means. Express our intention to engage and collaborate with them.
5. **Focus on influential Stakeholders**, while engaging with all actors would be ideal, due to project life cycle constraints we need to focus on those with influence, interest or decision-

making capacity. Their support or opposition to a PED process can significantly impact project success. At the same time, we are aware of the risks of stakeholder-fatigue.

6. **Be clear about goals:** Communicate PED-ACT project's objectives, scope, and expected outcomes clearly but very simple to the stakeholders.
7. **Engage with interested stakeholders:** Some stakeholders may show more interest and willingness to participate more in the process than others. Engage actively with those who are eager to collaborate and contribute, while ensuring a balanced interest advocacy.
8. **Attain Enough Agreement:** Strive to reach a consensus or agreement with stakeholders on key aspects of the project. This may involve sharing project results. While it may not always be possible to satisfy all stakeholders completely, aim for a level of agreement that ensures their participation.

Figure 4. Engaging with stakeholders ©wonderland/Batuhan Akkaya

These steps will help PED-ACT project to establish a strong (international and local) collaboration culture. Due to nature of the pilots, the local actors consist of housing owners, energy communities, energy distributors, entrepreneurs, artists, students, researchers, civil society actors and civil servants from the public sector. To increase the project, impact an elaborated role and timeframe for these diverse actors will be developed, especially for the stakeholders in the local cases. These local experiences will relate to international projects and organisations, with the aim to create new opportunities for future collaborations and projects (work package 7). The tasks will facilitate machine learning and support potential replicators through the database. During the project we've been organizing and participating in a variety of (international and national) events (online and in person) to create exchange and build connections with engaged energy actors.

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3.3: Lessons learnt: framework for co-learning and co-creation

The co-learning and co-creation framework will collect all lessons learned from the PED-ACT project and support replicators. At this stage, the approach to the framework can be outlined.

Six key principles of networking and collaboration:

- Cross-sectoral collaboration with stakeholders from the public, private and non-profits sectors is key for improving energy transitions in our built environment.
- Use municipal, local, and personal networks to create change.
- Co-creating with the community is the key to success. Listening, exchanging, and discussing with local stakeholders is crucial to create ownership and long-term impact. But the energy sectors in our pilot cases are not ready yet for co-creation. Different activities and scenarios are needed for the pilots.
- Long-term engagement and a planned continuation of efforts creates trust among stakeholders and enhance the collaboration to co-creation.
- Adapt collectively, creatively, and innovatively to ongoing changes and challenges.
- Exchange of skills, resources and knowledge through networking events is very important. New collaborations also emerge during these events.

4. Critical implementation risks and mitigation actions

Due to the differences in national context, we needed to organize and participate in online webinars for most parts of the work individually with the pilots. The face-to-face events are programmed to be strategically on key moments of the process.

"The 'stakeholder landscape' is by no means a stable one. It constantly changes according to interests, changes in external conditions, and the different phases of the process" (Zimmermann and Maennling, 2007: 9).

For each pilot the different levels of participation will be used, with the aim to develop capacities for full co-learning and co-creation. The aim is within the PED-ACT project to always be able to decide collectively with the local actors in all pilots. Allow a debate based on potentials and possibilities. While we will be steering local actors towards "acting together" or "supporting local initiatives" with potentially follow up projects.

5. Deviations

Due to the differences in funding schemes and national processes, pilots, selection of demo area and mapping the local work took longer as planned, but these deviations are minimal and do not currently present any risks.

6. Future Plans

There is a growing interest in the roadmaps from the local partners side, but also future opportunities to collaborate with other projects with the database. The partners will be further developing these plans in the second year.

7. Summary

Within the first months of the project, the exchanges with local pilots allowed to have a preliminary mapping of needs and challenges. Collaboration and Co-creating among local stakeholders are rather weak, as per start of the project. Also, the collaboration cultures differ a lot across the participating nations. Therefore, wonderland developed a common process for all pilots, with open and individual exchanges in between the process steps. Also, the roles of actors will be different in all pilots. So, this deliverable lays out, how the process will be and which methods will be employed. This document acts as a living document, which can be adopted to the needs in future, with the partners.

The results of first months of work helped to formulate following goals:

- Establishing a strong and long-lasting (international and local) network.
- Three user-friendly roadmaps for the pilots of the project
- Collecting practices and lessons learned during the project.
- collect responses to the local challenges.
- Empowering and mentoring of local actors to be the changemakers.
- A more comprehensive roadmap for local stakeholders.

8. Impact indicators

On a local level, the interest is growing, and the exchanges are motivating to elaborate local scenarios. The ultimate indicator will be, if the process will be useful enough for the local actors to keep on working with us (maintaining interest and engagement).

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