Empowering Local Stakeholders: Effective Stakeholder Mapping Approaches for Positive and Clean Energy Districts

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Keywords: stakeholder mappings, urban retrofitting, vulnerable groups

Abstract The transition to climate-neutral cities necessitates inclusive urban strategies that prioritize sustainability, resilience, and social equity. Positive and Clean Energy Districts (PCEDs) have emerged as a crucial mechanism in achieving these goals by fostering collaboration among diverse local stakeholders to create livable and energy-positive urban neighborhoods.

To ensure effective stakeholder engagement, it is vital to understand the varying roles, needs, and capacities of local actors. Stakeholder mapping serves as a strategic tool to facilitate this understanding and promote collaborative efforts in energy-related activities. This paper explores different approaches to stakeholder mapping and assesses their impact on fostering co-creation processes and collective action in mitigating energy poverty. By applying these methodologies in six pilot sites across Europe, we provide insights into how local actors can work together to address energy vulnerabilities, challenges, and opportunities. Energy efficiency measures and coordinated urban retrofitting processes towards climate-neutrality in urban neighbourhoods are complex, time consuming and require intense cooperation between public authorities, the building sector, owners and tenants, investors and other stakeholders (Cheng et al. 2021). Thus, the participating sites address the complex nature of energy efficiency measures by acting at the intersection with social innovation (Baer et al. 2021) for selecting, evaluating and implementing technological solutions for neighbourhood-oriented strategies for retrofitting and refurbishment of buildings. It aims to foster promote co-creation with the local residents and relevant stakeholder groups to enhance the implementation of PCEDs in Europe and increase local resilience against energy crisis.

PCEDs rely on the cooperation of key stakeholders and problem owners. Their realization requires a long-term commitment, cross-sector collaboration, and governance at multiple levels. To maximize the potential of PCEDs, local initiatives and energy communities must be empowered, ensuring that all voices, especially marginalized groups, are heard in decision-making processes.

Several challenges hinder the participation of energy-vulnerable citizens in research and decision-making, including economic constraints, lack of awareness, policy barriers, and social stigmas. To counter these barriers, stakeholder mapping must account for the specificities of energy needs in different spatial contexts and integrate historical and structural inequities, cultural influences, and governance models. This paper provides analytical insights from stakeholder mappings across Europe (Innsbruck, Austria; Krakow, Poland; Iasi, Romania, Budaörs, Hungary; Karlsruhe,

Germany; Helsingborg, Sweden), revealing that place-based and context-sensitive approaches are vital in ensuring meaningful participation.