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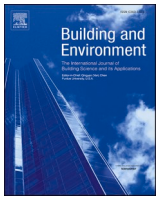

Ten questions concerning positive energy districts

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ABSTRACT

Positive Energy Districts (PEDs) constitute an emerging energy transition paradigm, with an ambitious timeline for rapid upscaling to match the urgency of climate mitigation and adaptation. Increasingly networked and coordinated actors aim to realise 100 PEDs across Europe by 2025. This resonates with the mission orientation turn of the European Green New Deal, to inspire and enable target-driven innovation. Yet it raises questions that have long perplexed scholars and practitioners in energy transitions: how can rapid diffusion be achieved in a sustained and replicable manner in diverse socio-technical contexts? Identifying the key questions to address and implement fit-to-purpose solutions within short-term project timescales is essential in order to mainstream PEDs. Such solutionism must be accompanied by a healthy dose of scepticism, in order to avoid undesirable outcomes such as exacerbated inequalities, societal backlash, and spatial displacement of invisible burdens. But it also requires proactive sharing of experiences, responsive learning and dissemination, and cooperation across sectors and disciplines. In this timely contribution, thirteen researchers from nine European countries flag ten questions concerning PEDs, and offer preliminary responses in line with cutting-edge insights informed by science and practice. This contribution draws on multidisciplinary competence in steering the Positive Energy Districts European Network, and aims to make emerging knowledge widely available, while also inviting constructive critique and engagement within the PED arena which features a broad range of diverse stakeholders. Authors highlight key pathways forward for a rapid, far-reaching translation of the ambitious PEDs agenda into multi-sited, district-scale beacons of sustainable energy transition.

1. Introduction

Setting energy transition targets by moving beyond individual buildings towards a district or neighbourhood scale is a relatively new endeavour in both scientific research and realised projects. Positive Energy Districts (PEDs) have steadily gained importance and recognition on the energy transition policy agenda of the European Commission, as a key part of societal solutions towards low-carbon futures. Several PED concepts exist, but in terms of a legal framework, no formal definition is embedded in European legislation yet [1].

According to the Joint Programming Initiative Urban Europe (JPI Urban Europe), which manages the PED programme on behalf of the European Commission, PEDs are defined as: "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. They require integration of different systems and infrastructures and

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