UNLOCKING THE POTENTIAL OF SMRs FOR DISTRICT HEATING: THE IMPORTANCE OF STAKEHOLDER ENGAGEMENT

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Decarbonizing district heating in Europe remains a major challenge, with fossil fuels still supplying 60% of the 450 TWh currently generated through district heating networks. Existing alternatives such as biomass face scalability constraints, highlighting the need for a reliable, low-carbon solution. Small Modular Reactors (SMRs) present a promising pathway to achieve full decarbonisation by 2050 while ensuring secure and stable heat supply. However, this transition requires careful consideration of site selection and supporting infrastructure, ensuring optimal integration of SMRs into existing district heating networks. Key factors influencing site selection include proximity to urban centres, land availability, and access to existing district heating networks, while balancing regulatory constraints and public acceptance. This work aims to address these barriers by analysing the critical role of stakeholder engagement in facilitating SMR integration. Unlike conventional infrastructure projects, deploying SMRs for district heating is not solely a technical challenge but a multi-stakeholder effort requiring trust-building, collaboration, and ongoing communication. Successfully navigating this transition relies on the coordinated efforts of various key actors, including governments, regulatory bodies, local authorities, energy operators, utilities, investors, and the public, each playing a distinct yet interconnected role in the process. Governments and regulatory bodies must develop clear planning frameworks that facilitate site approvals while addressing safety regulations and public concerns. Local authorities play a crucial role in land-use planning, coordinating network expansion, and engaging communities to ensure integration within urban energy strategies. Energy operators and utilities must assess site feasibility, network adaptation, and the development of supporting infrastructure such as heat transfer stations and redundancy measures to ensure reliability. Early involvement of investors and financial stakeholders is essential to align project risks with funding strategies and long-term investment viability. Public engagement is equally critical, requiring transparent dialogue to address concerns about nuclear safety, environmental impact, and cost-effectiveness. Poor stakeholder engagement increases project risks, delays decision-making, and may result in resource constraints or public opposition, even when technical feasibility is proven. A structured approach to engagement ensures stakeholder alignment, reduces uncertainties, and strengthens decision-making at every stage. By fostering collaboration between policymakers, energy operators, investors, and the public, SMRs can be effectively integrated into district heating networks, enabling Europe to transition toward a low-carbon, secure, and sustainable urban heating system.

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