Cooperative Models for the Heat Transition

Barriers and Enablers in Decarbonising Building Stock

This Research Brief synthesises findings from a multi-level analysis of enabling and hindering factors for the decarbonisation of heating systems in existing buildings. Combining international literature, empirical insights from demonstration projects, and expert validation, the study highlights that while technical solutions are largely available, social, financial, and regulatory complexities remain key barriers. Cooperative models emerge as a promising approach to address these challenges by enabling collective action, risk-sharing, and local engagement. Successful implementation depends on aligning organisational structures, financing mechanisms, and participatory processes across different project phases.

MAIN TAKEAWAYS

Introduction

Decarbonising heating systems in existing urban areas is a central challenge of the energy transition. While technological solutions for low-carbon heat supply are mature, implementation is often hindered by organisational, financial, and social barriers.

This research investigates how cooperative models can support the transition by enabling collective decision-making and shared investment structures. The analysis focuses on identifying key factors that influence the success or failure of such projects, drawing on both theoretical and practical perspectives. The objective is to derive actionable insights for structuring and implementing cooperative heat transition initiatives.

Methodology

The research applies a three-level analytical framework combining literature review, empirical project experience, and expert validation.

- First, a structured analysis of international studies was conducted to identify general barriers and enabling factors for building decarbonisation, including user behaviour, regulatory frameworks, and market structures.
- Second, these findings were complemented by insights from multiple demonstration projects, focusing on real-world implementation challenges across technical, social, legal, and financial dimensions.
- Third, results were validated and refined through a stakeholder workshop involving practitioners and experts from cooperative and large-scale heating projects.

Across all levels, factors were systematically categorised and mapped along different project phases, from initiation to operation, enabling a process-oriented understanding of success drivers.

Results

Structural Barriers to Decarbonisation

Across both literature and empirical project experience, financial constraints emerge as the most significant barrier to the decarbonisation of heating systems. High upfront investment costs, combined with uncertainty regarding long-term returns and funding conditions, create strong reluctance among property owners. This is further intensified by limited access to suitable financing models and a general aversion to complex, long-term investments.

A key structural challenge is the "landlord-tenant dilemma," where investment costs are borne by owners while tenants benefit from reduced energy costs. This misalignment of incentives significantly reduces investment willingness, particularly in multi-unit buildings.

Information deficits and decision complexity further hinder progress. Many stakeholders lack knowledge about technologies, processes, and funding schemes, while fragmented institutional responsibilities complicate planning. Technical constraints, such as missing building data, spatial limitations, and heterogeneous building conditions, restrict the applicability of standardised solutions. Legal complexity, especially in multi-owner settings, makes consensus-building difficult and time-consuming.

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Key Enabling Factors

Several enabling factors significantly increase the likelihood of successful implementation. Stable and clearly defined policy frameworks are among the most important. Long-term targets and regulatory clarity provide planning security and create strong incentives for investment.

Accessible and transparent funding schemes reduce perceived risks and lower entry barriers. In addition, low-threshold advisory services and professional guidance support stakeholders in navigating complex processes.

Social dynamics also play a crucial role. Peer effects and visible best-practice examples increase trust and willingness to participate. Community engagement strengthens acceptance, particularly in residential contexts.

Economic benefits remain a central driver. Clearly communicated long-term savings, improved living conditions, and increased property value can motivate investment decisions. Projects that combine decarbonisation with additional visible benefits, such as comfort improvements, tend to achieve higher acceptance.

Role of Cooperative Approaches

Cooperative models offer specific advantages in addressing structural challenges. By pooling resources and sharing risks, they help overcome financial barriers and enable economies of scale.

They also provide organisational structures for coordinating diverse stakeholder groups and facilitating collective decision-making. This is particularly relevant in complex ownership situations.

Participation mechanisms within cooperatives strengthen local ownership and acceptance. However, they also increase coordination effort and may slow decision-making. Successful projects therefore depend on balancing inclusive participation with efficient and professional management structures.

Importance of Project Phases

The relevance of barriers and enabling factors varies across project phases. In early stages, social factors such as initiative, leadership, and a shared vision are critical triggers.

During planning, access to expertise, structured participation, and robust financial models become central. Clear communication is essential to maintain stakeholder support.

In later phases, technical feasibility, legal clarity, and efficient project management dominate. Data availability and digital tools support decision-making and implementation. This highlights the need for adaptive strategies across the project lifecycle.

Cross-Cutting Success Factors

Across all phases, successful projects combine bottom-up engagement with professionalised structures. Transparent communication tailored to different stakeholder groups builds trust and supports participation.

A holistic approach integrating technical, social, legal, and financial dimensions is essential. Projects addressing these aspects in isolation are more likely to face delays or fail. Overall, aligning participation, governance, and financing within a coherent framework is a key condition for scaling cooperative heat transition models.

Literature

DekarboGen Project (2026). Leitfaden Wärmewende-Genossenschaften.

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