From Plans to Paralysis: What Holds Back Energy Efficient Renovation in Social Housing?

☒ "Academic contribution"

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EXTENDED ABSTRACT

1. INTRODUCTION

The decarbonization of the residential building stock is central to meeting the European Union's climate neutrality goals [1]. On a national level, the Netherlands introduced the National Climate Agreement ("Klimaatakkoord"), which sets ambitious targets for the building sector to reduce GHG emissions [2]. Especially Dutch social housing associations (HAs) are expected to contribute to the national goal of CO_2-neutral housing stock by 2050, by transforming their existing housing stock with poor energy labels such as E, F, and G to at least energy label D [3], [4].

Dutch HAs, which manage a large share of low-income social housing in Europe, are increasingly engaging in energy-efficient renovation (EER) to reduce energy consumption and improve living conditions [5]. However, while insulation and passive measures are widely implemented, the integration of regenerative technologies, such as district heating networks, heat pumps, or renewable electricity systems, remains limited [6]. The rooftop organization Aedes recently adjusted its sectoral goals from a minimum of energy label B to energy label D, suggesting that significant barrier remain [4], [7]. These challenges include the realization of organizational transformations and large-scale retrofit complexity [3]. Other practical barriers that Dutch HAs encounter are asset heterogeneity, limited option of financing and investment or internal capacity of professionals [8]. Further decisive "hidden barriers" are suspected.

Dutch HAs operate in a complex institutional context. Their decision-making is shaped by regulatory frameworks, stakeholder interactions, and market uncertainties [8]. Identifying and understanding barriers within this context is critical to accelerating EER. . The aim of this study is to investigate and understand the barriers that HAs encounter, using Transaction Cost Theory (TCT) and Behavioral Insights (BI) as complementary lenses.

2. THEORETICAL FRAMEWORK

TCT has been applied in energy research to uncover "hidden barriers" in project planning and implementation [9], [10], [11]. TCT focuses on the costs associated with due diligence, coordination, negotiation, monitoring, and enforcement, especially under uncertainty and asset specificity. TC-categories identified in energy related research are due diligence cost, search for information cost, negotiation cost; approval and certification cost, monitoring and verification cost, trading cost; and enforcement cost [9-11]. Notably, Williamson [12] integrates Simon's concept of bounded rationality into TCT to account for limited decision-making capacity. In "*The Mechanism of Governance*," Williamson [13] further emphasizes that behavioural assumptions are central to understanding transaction costs in complex environment as part of TC-research. Alongside TCT, BI provide a cognitive lens on decision-making. This perspective emphasizes how psychological limitations and heuristics shape organizational behavior. Key concepts include bounded rationality [14], status quo bias [15]; loss aversion, and present bias [16]. These behavioral traits contribute to organizational inertia, slow decision-making, and risk aversion, especially when innovations deviate from well-established practices [17].

In recent years, BI has become increasingly pivotal in shaping the design, implementation, and evaluation of energy policies, as highlighted by Mundaca et al. [18] and the OECD [19]. This is especially relevant for the energy-efficiency context, where complex decision-making environments are influenced by cognitive biases and limited information processing [20]. Behavioural barriers are now widely recognized as shaping how decisions are made and sustained within organizations [21]. Reports from the European Environment Agency emphasize that phenomena such as bounded rationality, status quo bias, and loss aversion not only affect individual but also institutional behaviour. Consequently, even when financial and technical conditions are favourable, these psychological constraints can limit the willingness to adopt more ambitious renovation strategies. Integrating TCT and BI offers a multidimensional understanding of the structural and behavioral mechanisms that constrain EER in the social housing sector.

3. METHODOLOGY

This study adopts a multiple case study design involving eight Dutch HAs that have executed EER projects. The empirical data was collected between January 2023 and July 2024 and includes semi-structured interviews with decision-makers, as well as document analysis of renovation plans, strategy documents, and internal reports. The interviewees consisted of key decision makers such as technical managers, project leaders, asset managers, and sustainability coordinators. Interview durations ranged between 50 and 90 minutes and addressed topics such as renovation planning, regulatory compliance, technology adoption, tenant engagement, and risk assessment.

Data analysis was guided by a deductive coding scheme derived from TCT and BI. Codes included transaction cost categories such as due diligence cost, negotiation cost, and monitoring cost, as well as behavioral patterns such as choice overload, loss aversion, and status quo bias.

4. EXPECTED RESULTS

Preliminary findings from the case studies indicate that Dutch HAs approach EER with considerable caution, often favouring low-risk, and default solutions such as insulation. Despite the growing policy pressure towards higher energy labels, decision-making processes within HAs are characterized by both transactional inefficiencies and behavioral constraints.

From a TC perspective, several stages in the EER process are perceived as excessively complex, costly, and uncertain. The need to individually assess each building's energy potential and technical feasibility contributes to high due diligence costs, particularly in portfolios that contain heterogeneous building types. Moreover, the necessity to coordinate with external actors, including municipalities and contractors, further increases negotiation and coordination costs. Once projects enter the implementation phase, HAs must invest considerable resources into monitoring and enforcing contractor performance, aligning renovation schedules with tenant needs, and resolving unexpected disruptions, which significantly increases enforcement

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costs. In addition, behavioural traits play a crucial role in shaping EER-projects. HAs display strong status quo bias, which leads them to default to familiar measures even when more innovative approaches may offer long-term benefits. Decision-makers often express a reluctance to adopt new technologies due to fear of tenant dissatisfaction, uncertainty over energy savings, or reputational risks should projects underperform. The complexity of renovation options, compliance frameworks, and regulations, further contributes to decision paralysis and cognitive overload. As a result, even when financial and regulatory conditions are relatively supportive, associations tend to delay or minimize interventions that require more extensive planning, cross-departmental coordination, or technical innovation.

These transaction cost and behavioral barriers often reinforce one another. For example, asset heterogeneity not only increases the technical and administrative complexity of planning renovations but also amplifies the psychological burden of making the "right" choice. This results in a higher tendency to delay decisions or settle for incremental, low-risk interventions.

5. CONCLUSION & OUTLOOK

This study reveals that EER in Dutch HAs is hindered not only by external constraints but also by internal decision-making dynamics. Transaction cost barriers, such as high due diligence and coordination costs, combine with behavioural bottlenecks, such as loss aversion and decision inertia, to discourage HAs from adopting more ambitious renovation strategies leading to decision paralysis. In sum, the decision-making processes of HAs reflect a complex interplay between structural transaction costs and behavioral barriers.

Looking ahead, this research contributes to the fields of behavioural public administration, organizational decision-making, and transaction cost economics in energy transitions. The findings underscore the need for integrating behavioural insights into policy design, such as using nudges, simplified compliance schemes, or default options, can empower HAs to make bolder decisions aligned with climate neutrality goals.

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