

Predicting homeowner retrofit decisions using one-stop shop data

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Public Summary

The residential building sector represents a critical component of the Netherlands' climate strategy. The country is committed to reducing greenhouse gas emissions by 55% by 2030, yet current policies place it on track for only 44% to 52% reduction. One-stop shops have emerged as a policy response to address the barriers that prevent homeowners from adopting energy efficiency measures, offering integrated advice, contractor coordination, and quality assurance. However, conversion rates from initial contact to completed installation remain modest, and the factors that drive homeowner decisions across different measures and operational models are not well understood.

The present research analyses 38,762 customer journeys from three Dutch one-stop shop operators with distinct business models: Winst Uit Je Woning (municipality-collaborative), Bureau voor Verduurzamen (resident-focused execution), and Reimarkt (commercial). Transaction data were combined with household and dwelling microdata from CBS Statistics Netherlands, enabling analysis of actual conversion behaviour rather than stated intentions. The research delivers two products: policy recommendations for municipalities and one-stop shop operators, and a prediction tool to support decision making in targeting households for energy retrofit outreach. The project was conducted within the Engineering Doctorate (EngD) program at Eindhoven University of Technology.

The analysis generated the following insights. First, dwelling characteristics, particularly construction period and dwelling type, exert stronger and more consistent effects on conversion odds than household socio-demographic factors such as age, education, or household composition. Second, financial factors operate heterogeneously across measures: high mortgage debt is associated with lower insulation conversion odds but shows no significant effect on solar panels, while high energy costs relative to income are associated with higher solar panel conversion odds but lower glass insulation conversion odds. Third, pre-existing solar panels or insulation measures are associated with higher conversion odds for subsequent measures, providing evidence of gateway effects. Fourth, marketing channel effectiveness varies by product and dwelling segment, with no single channel performing optimally across all contexts. Based on the findings, recommendations for policy making aimed at improving volume and conversion rates were formulated. In addition, the research produced a machine learning prediction tool that identifies postcode areas with higher or lower adoption potential based on observable area characteristics, supporting municipalities in prioritizing outreach efforts.

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