

ENVIRONMENTAL MOTIVATIONS BEHIND HOUSEHOLD'S ENERGY EFFICIENCY INVESTMENTS AND DAILY ENERGY SAVING BEHAVIOUR: EVIDENCE FROM GERMANY, THE NETHERLANDS AND BELGIUM

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Overview

In Europe, the residential sector accounts for approximately one third of the energy consumption and is responsible for 16% of total CO₂ emissions. According to *EIA (2016)*, households in Europe accounted for 21% of the world's total residential energy consumption in 2012. Households can reduce their energy usage by increasing the energy efficiency of their stock of appliances or by undertaking energy saving activities (*Jansson et al., 2010*). However, the motivations which lead households to adopt these energy-saving activities are very complex and depend on the type of behaviour and involvement. On one hand, economic factors such as saving money on energy bills seem to be the most important factors influencing energy efficiency investments and daily saving behaviour (*Sardianou, 2007*). On the other hand, environmental motivations and other related factors might also play an important role (*Urban and Scasny, 2012*). The present study investigates the impact of environmental motivations on the individual's decisions regarding investment in energy efficiency and the adoption of energy saving habits in Germany, the Netherlands and Belgium. The paper is organized as follows: After presenting the relevant literature review and providing theoretical background, empirical analysis is conducted. Based on the empirical results, we can draw conclusions and make possible policy recommendations.

Methods

The analysis is performed by employing data collected within the scope of the "Energy Efficiency of Households in Cities: A Multi-method Analysis" project undertaken by Maastricht University and the Chinese Academy of Sciences. The survey was carried out in 2016 in the Netherlands, Belgium and Germany. The sample size is approximately 400 individuals from each of Belgium and Germany and 450 from the Netherlands. A random sample has been drawn from the population using online questionnaires. Various kinds of energy efficiency investments and daily energy saving activities are taken into account. In order to explain the impact of environmental motivations, we run probit and ordered probit specifications on the pooled sample of individual responses regarding energy efficiency investments and daily energy saving activities. Since it is unclear whether environmental motivations cause relevant energy conservation behaviour or whether energy conservation behaviour causes environmental motivations, an endogeneity problem might exist. Thus we perform a regression-based test for endogeneity and additionally run instrumental variable analysis using personal experience with extreme weather events as an instrument for those activities and subsamples that suffer from endogeneity bias. Personal experience with one or more extreme weather events in the prior few years might provide an instrumental variable since it is correlated with environmental motivation but likely to be uncorrelated with energy efficiency investments and daily energy saving activities.

Results

Empirical results indicate that environmental motivations increase the probability of performing energy efficiency investments in all sub-samples. As regards individual's daily energy saving behaviour, this study provides empirical evidence that environmental motivations increase the probability of performing of such activities in the Dutch and the German subsamples. However, it must be noted that the cross-sectional design of the research dictates caution in the interpretation of correlations as causal relationships.

Conclusions

The above empirical results go in line with *Urban and Scasny (2012)* and *Jansson et al. (2009)*, who indicate that people with higher environmental concern are on average more likely to perform both energy-saving curtailments and energy-efficiency investments. Following *Urban and Scasny (2012)*, these results might have practical policy implications because they suggest that a strengthening of environmental motivations through policy intervention can

lead to an increase in both energy efficiency investments and daily energy saving activities. Thus, awareness-raising campaigns might be employed to stimulate environmental motivations. However, several studies concluded that even if a campaign is very intensive, and uses several forms of media, the effect in terms of new habits and a changed behaviour takes time to register (*Dexter, 1964; Windahl and Signitzer, 1992; Henryson et al., 2000*).

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