

Working title: Using social relationships and community networks to involve a wider, more diverse range of households in the clean energy transition

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Project description

The aim of this project is to study the social dynamics between households to help stakeholders like municipalities engaging a wider, more diverse range of households in the clean energy transition. Firstly, we look at the different types of households we can distinguish in terms of their behaviour, their attitudinal profiles, and their socio-economic status, including contextual factors like their dwelling type. We do this by applying a cluster analysis on known indicators of engagement with the energy transition – either in the form of daily, habitual behaviour (e.g. turning down the thermostat) or one-off investments (e.g. retrofitting) – and by evaluating the resulting clusters based on their explanatory power and interpretability when it comes to such pro-environmental behaviour. The goal is to find interpretable household profiles based on these indicators, and see to what extent they predict daily, habitual behaviour or one-off investments.

The next step is to study how these behaviours spread through networks of households and community energy initiatives using social network analysis. How do different household profiles interact with one another regarding such energy decisions? Do households within a certain profile only interact with others of the same profile (homophily), or is there meaningful interaction between e.g. highly engaged and less engaged profiles? We aim to identify key (types of) households or local communities that can bridge the gap between the different profiles, and to identify the role of different types of social relationships in influencing a household's energy transition engagement.

Then, we build an agent-based model (ABM), using the household profiles and their interactions to define decision heuristics based on group membership and network position. We aim to use this ABM to discover potential group-based interventions for policy makers to activate low-engagement household profiles, using bottom-up strategies targeting key households or communities. A core question is how the social makeup of a neighbourhood influence the effectiveness of such strategies.

Finally, we aim to test these simulated neighbourhood initiatives in real-world contexts such as in Haarlem or Utrecht, to find out to what extent real-world engagement outcomes match our simulated predictions, and where they differ.