

## REsCo - Transformation of the energy system towards sustainability focusing on community-based activities

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It is likely that without additional efforts Germany will miss its emission reduction targets. In particular, in the residential sector progress is slower than hoped for. The European Union (EU) considers active participation of citizens in the sustainable energy transition – particularly in energy communities – as vital for a successful transformation of Europe’s energy system. Taking the expected importance of energy communities into consideration, our study focuses on the following research questions: (1) To what extent or how can private households be motivated to participate in community-based activities? (2) To what extent or how can existing economic explanatory approaches of behaviour patterns be developed further by integrating psychological aspects? And (3) Regarding transformation processes: What is the relevance of joint activities by private households from the point of view of the economy as a whole?

For answering these questions, we employed a mixed-methods approach, which consisted of case studies, surveys, discrete choice experiments, cross-impact balance analysis, and input-output analysis.

Taking the results into consideration we conclude that social needs, social capital, social norms, social identity, and environmental awareness impact willingness to participate in energy communities significantly. Hence, information campaigns should not only address the environmental issues but also other aspects (such as the sense of community that comes from participating in energy communities).

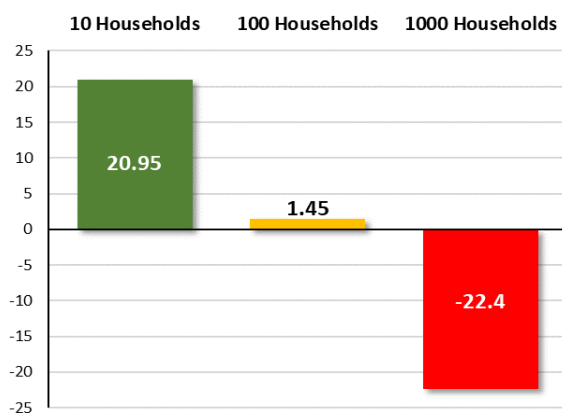


Figure 12 Part-worth utility for the number of participating households

Furthermore, the results indicate that small energy communities with only a few neighbors were clearly preferred to larger energy communities (see Figure 12). Thus, the legal framework and administrative conditions should enable and facilitate such small energy communities. Since implementation of local heating supply systems requires extensive competencies in the areas of planning and financing, networking of energy communities should be further strengthened. In addition, information about potential partners should be made available.

Currently, setting up a local heating supply is not economically attractive without subsidies. Rising gas and electricity prices lead to lower needs for subsidies. The total need for subsidies increases as the number of energy communities with community heat supply increases. Accordingly, an expansion of the budget available for this purpose is required on the government side. It has to be taken into consideration that without counter-financing measures, an increase in self-supply by households or energy communities leads to a low level of levies, a higher need for subsidy payments, and lower tax revenues.

The results suggest that energy communities could play a major role in the future. However, it should be noted that many stated preferences may not correspond to real behaviour. Research results should therefore be complemented by observational results on a larger scale (for example, via real laboratories).

#### **Publications**

Broska, L. H., Vögele, S., Shamon, H., & Wittenberg, I. (2022). On the Future(s) of Energy Communities in the German Energy Transition: A Derivation of Transformation Pathways. *Sustainability*.

Broska, L. H. (2021). It's all about community: On the interplay of social capital, social needs, and environmental concern in sustainable community action. *Energy Research & Social Science*, 79, 102165. <https://doi.org/10.1016/j.erss.2021.102165>

Wittenberg, I., Broska, L. H., Vögele, S., & Shamon, H. (2022). Menschliches Verhalten & Energiewende - Erklärungsansätze aus Psychologie, Ökonomie und Soziologie. REsCO Diskussionspapier I. <http://dx.doi.org/10.2139/ssrn.3861602>

# Economics of Climate Change – Transformation of the energy system towards sustainability focussing on community-based activities (REsCO)

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# The project's key research questions and goals

## Motivation

It is likely that without additional efforts Germany will miss its emission reduction targets. In particular, in the residential sector progress is slower than hoped for.

## Research questions

- To what extent or how can private households be motivated to participate in community-based activities?
- To what extent or how can existing economic explanatory approaches of behaviour patterns be developed further by integrating psychological aspects?
- Regarding transformation processes: What is the relevance of joint activities by private households from the point of view of the economy as a whole?

## Main project insights

**Social needs, social capital, social norms, social identity and environmental awareness impact willingness to participate in energy communities significantly**

➔ Information campaigns should not only address the environmental aspects but also other aspects (such as the sense of community that comes from participating in energy communities).

**Small energy communities with only a few neighbors were clearly preferred to larger energy communities.**

➔ Legal framework and administrative conditions should enable and facilitate such small energy communities.

## Main project insights

**The implementation of local heating supply systems requires extensive competencies in the areas of planning and financing**

→ Networking of energy communities should be further strengthened. In addition, information about potential partners should be made available.

**Currently, setting up a local heating supply is not economically attractive without subsidies. Rising gas and electricity prices lead to lower needs for subsidies. The total need for subsidies increases as the number of energy communities with community heat supply increases.**

→ An expansion of the budget available for this purpose is required on the government side. It has to be taken into consideration that without counter-financing measures, an increase in self-supply by households or energy communities leads to a low level of levies, a higher need for subsidy payments and lower tax revenues.

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