Accelerating the Energy Transition through Networks (part of the NWA program SYNERGY)

Aim

Theorizing and testing how network interventions can be used to accelerate participation in the energy transition and to reach difficult to reach groups in society.

Theoretical background

The energy transition represents a complex societal transformation that extends beyond technological change, requiring the integration of socio-economic developments and active participation of end users. Social networks are central in this process, as they mediate interactions and influence between households, enabling the diffusion of innovations from individual adoption to neighborhood-level uptake (Goedkoop et al. 2022). These dynamics are shaped by group heterogeneity, where different end users respond differently to social norms and incentives, making outcomes unpredictable. Theories of diffusion of innovation, social contagion, and agent-based modeling provide useful lenses for understanding how behaviors and attitudes spread through such networks (Ou et al. 2022). This PhD project examines how social dynamics within networks can accelerate or hinder household engagement in the energy transition, with particular attention to those less willing or able to participate.

Research design

Using survey and register data, typical household profiles will be developed to discover groups of household with related attitudes and behaviors towards the energy transition. Based on this, an agent-based model will be designed and improved to predict impact of potential network-related interventions to involve more members of different groups in energy transition activities. In collaborations with municipalities, interventions will be tested in Dutch local neighborhoods. The results will deliver scalable, evidence-based tools for municipalities to accelerate the energy transition.

Literature

Goedkoop, F., Dijkstra, J., & Flache, A. (2022). A social network perspective on involvement in community energy initiatives: The role of direct and extended social ties to initiators, *Energy Policy* 171, https://doi.org/10.1016/j.enpol.2022.113260.

Ou, J., Buskens, V., van de Rijt, A., & Panja, D. (2022). Influence maximization under limited network information: seeding high-degree neighbors. *Journal of Physics: Complexity* 3(4), 045004.

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