

Demand response in households: Encouraging shifts from peak to off-peak energy consumption



Behavioural study for the ministry of Economic Affairs and Climate

In collaboration with researchers from TiU, we investigate which **behavioural interventions** in the Buurtnet app are most effective in encouraging households to shift their electricity use and thereby reduce consumption during periods of potential grid congestion.

Buurtnet: an app developed by Netbeheer Nederland

The app provides users with insights into their electricity use and encourages them, e.g. through Watt Challenges (“Use no more than 1.5 kWh between 4pm and 9pm”), to reduce electricity use during peak periods. Based on our prestudy, three variants of the app were developed:

- **Financial reward:** users earn points from challenges that can be redeemed for rewards.
- **Sustainability:** in-app communication stresses that users are “doing something good” by joining the challenges.
- **Control:** in-app communication is neutral in tone.

Prestudy: survey and online experiment in the LISS panel

We conducted a survey in the representative LISS panel (N = 1154) to gain initial insights into motivations for (not) using the app and potential ways to improve it. We employed an **experimental design** to test different communication strategies for the invitation letters and push notifications. Messages emphasizing a **financial reward** proved to be the most effective, followed by those highlighting sustainability. Neighbourhood-focused messages (“helping the community”) were less effective and were therefore not included in the field experiment.

Field experiment | Work in progress

- From December 2025, households in 39 neighbourhoods across the Netherlands were invited to download the Buurtnet app. They can use the app until the **end of March 2026**.
- Following a one-week **baseline period** to measure typical electricity consumption, users are randomly assigned to one of the **three app variants**.
- We assess **which variant** results in the lowest peak-period consumption. For practical reasons, no control group of households not using the app is included.
- App users regularly receive invitations (via push notifications and/or email) to participate in **Watt Challenges**, which encourage them to stay below an individually determined usage limit during a peak period.
- Initial results suggest that the **financial variant** is most effective: users participate in challenges more frequently and are more successful in staying below the limit. Overall participation, however, remains low.

