



# Bending over backwards?

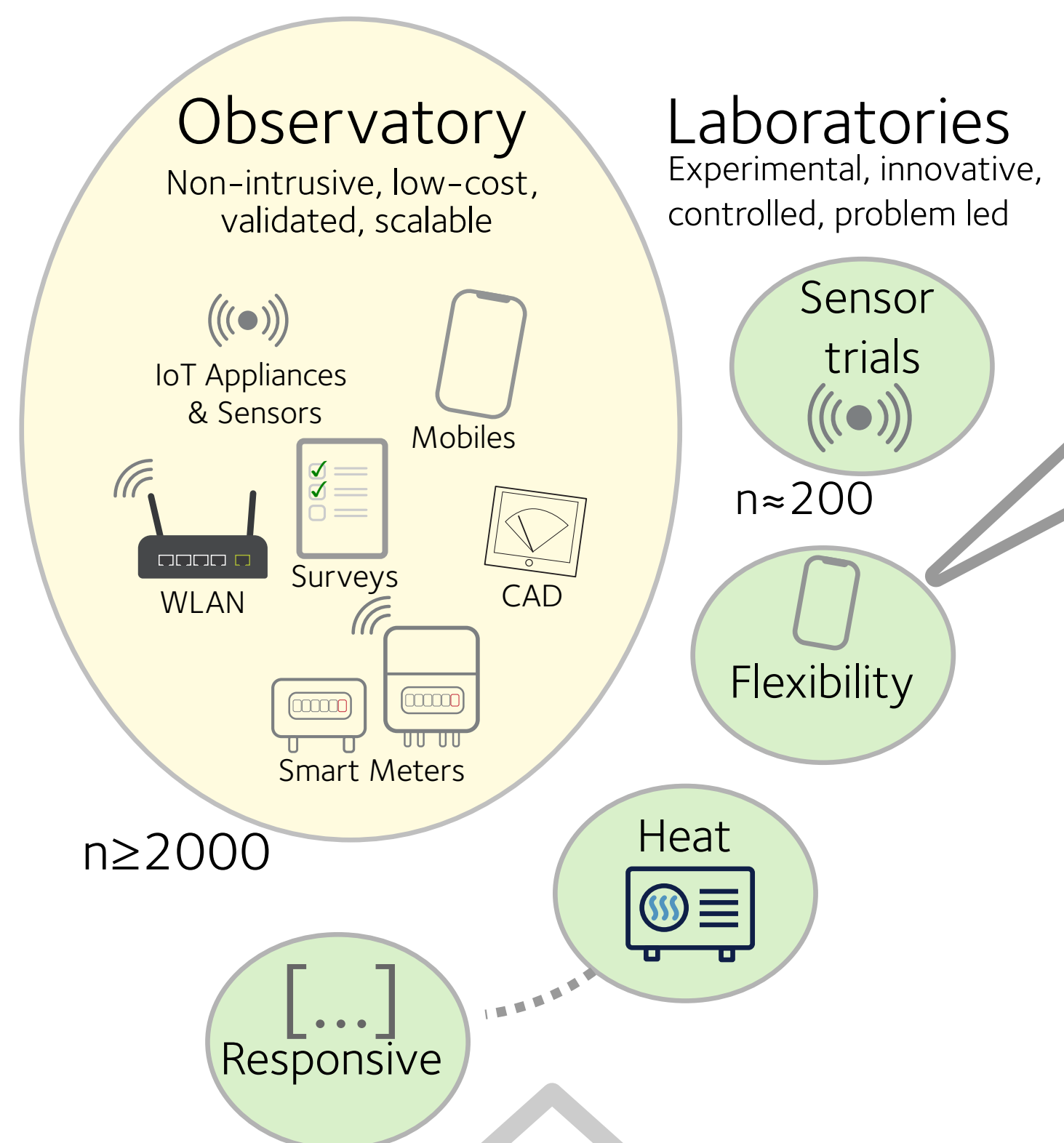
How (some) people respond to demand flexibility requests

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### The Energy Demand Observatory and Laboratory (EDOL)

EDOL is a major UK energy data infrastructure investment, funded by the Engineering and Physical Sciences Research Council (EPSRC), led by University College London in partnership with the University of Oxford. The programme seeks to provide a longitudinal, disaggregated, consistent and flexible resource of UK residential energy data. Representative and reliable data are made available to scientists, industry and policymakers. EDOL will innovate new, cost-effective, smart data solutions for collecting energy data at scale. EDOL's **Observatory** builds on the 12,000 households for which SERL is making smart meter and survey data available. In addition, EDOL will implement contextual data, such as temperature readings and occupancy.

EDOL **Laboratories** provide an environment for interventions, targeted panels and additional instruments. Technology trials, retrofits or engagement will be tested for their effectiveness with respect to the observatory, which acts as a control group.



- 1) Keep a diary
- 2) Reduce demand 5pm to 7pm

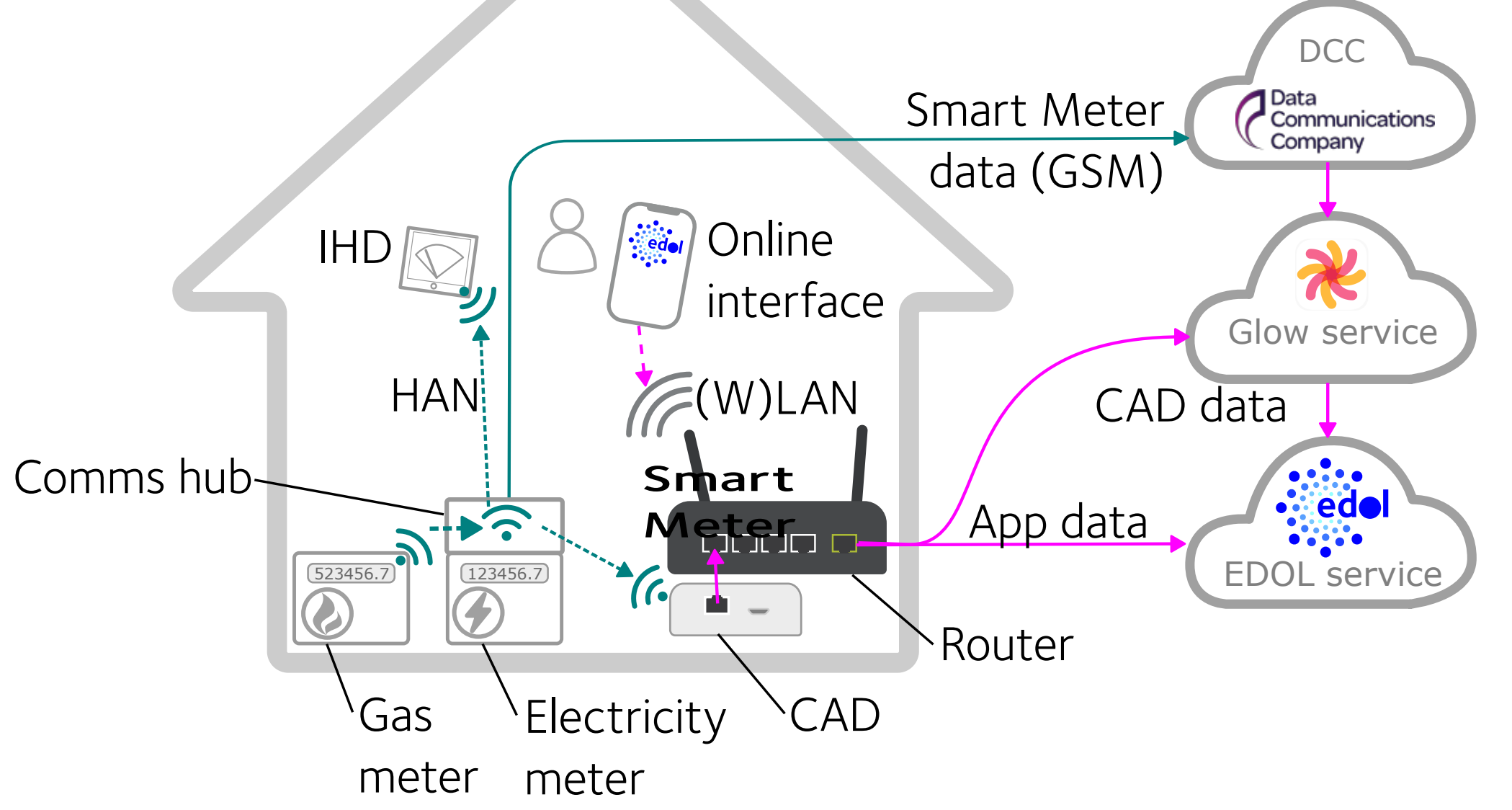
**EDOL Flexibility Lab**  
The flexibility is an EDOL subset of 146 smart metered homes, which periodically receive requests to reduce demand. To assess how different publics respond to such requests, electronic diaries need to be submitted for the intervention day and a control day. The **reward** for two complete diaries and at least 10% demand reduction is £10.

**Activity diaries**  
The JoyMeter interface allows participants to record everyday activities and appliances they use. It is also possible to annotate one's load data directly.

- Add activity
- Your diary
- Enjoyment or comfort
- Description
- Time, date

### Smart meter access

Smart Meters are accessed via the Hildebrand Glow Service. Participants register and grant consent by providing and validating their GUID and postcode.  
GUID: 1A-2B-3C-4D-5E-6F-7G-8H



### CAD installation instructions

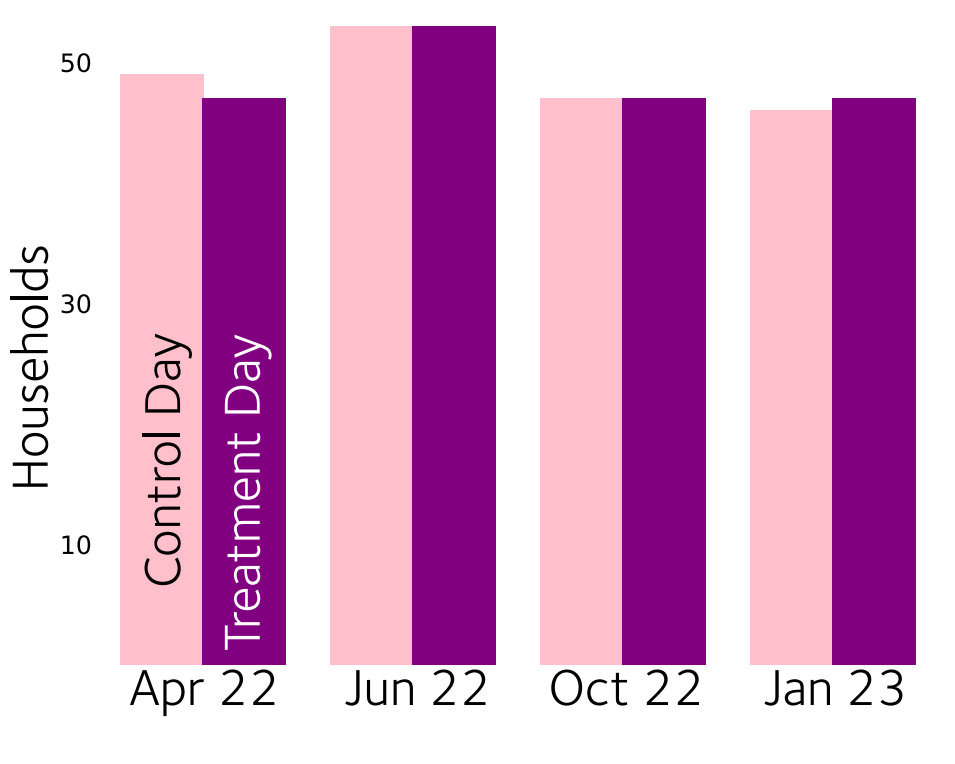
Devices are self-installed and require no user configuration or WiFi connection. Smart meter access is pre-configured.

- 1 Connect the USB cable to power
- 2 Connect the Ethernet cable to your router. Done.

The device automatically connects your smart meter. Please leave it plugged in during the study. If you have any questions, email [support@joymeter.uk](mailto:support@joymeter.uk)

### Participants

The panel receives an email a week before the treatment day. From a sample of 147 households, around a **third participated in each trial**. A personalised link takes them to the diary tool. Anyone who submits at least 20 activities on the control day receives a reminder email on the treatment day.

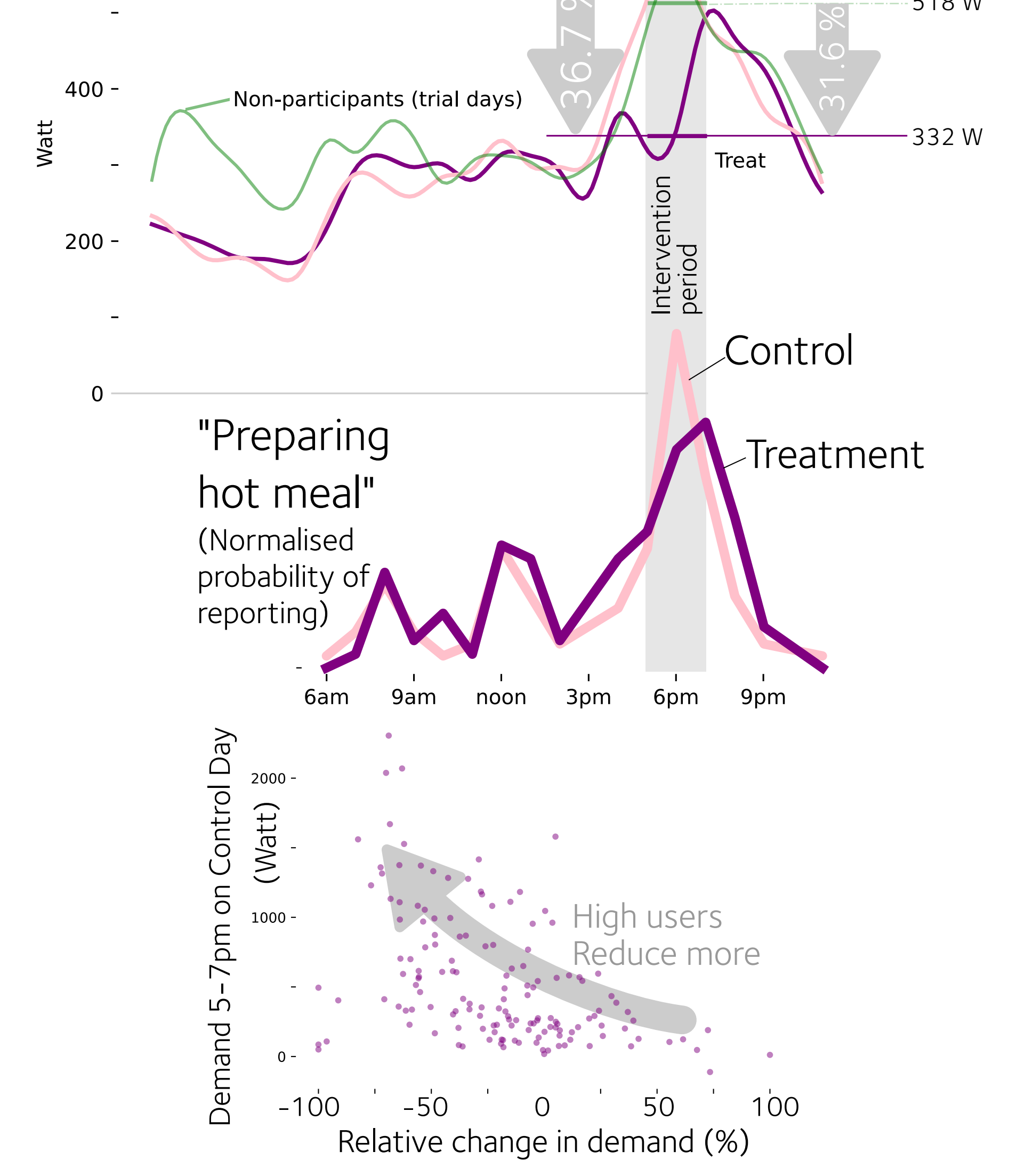


9682 activities over 382 participant days

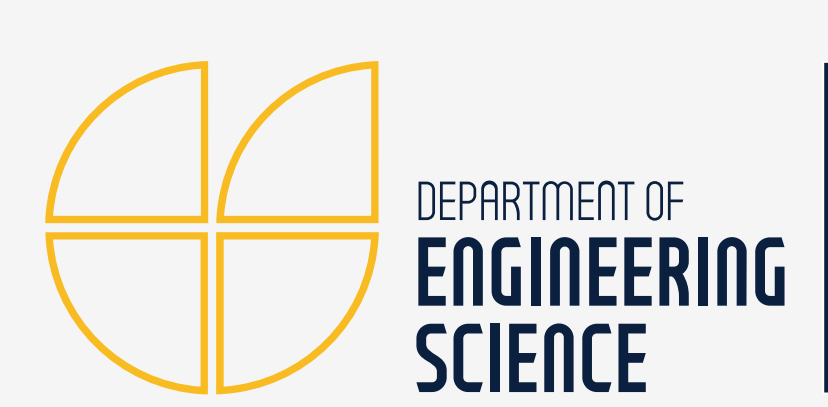
### Conclusions

- A third of participants participate in each trial, of which two thirds successful reduce demand at peak times.
- The monetary incentive is not the only motivation. Participants report enjoying the challenge and repeat their participation.
- The ability to reduce demand depends on previous demand patterns, with high users most able to act flexibly.
- Hot meal preparation is among the most consistently shifted activities.

### Results



**Two thirds** of participants successfully **reduce demand by at least 10%**, regardless of season. The profiles of participants and non-participants exhibit similar peak time demand, suggesting that participants have not unduly gamed the challenge by increasing demand on the control day. Comparing 'opt-in' participants with themselves, the **peak demand reduction is 36.7%** (relative change). When using non-participants on the same day as control, it is 31.6%. The activity records suggest that **most activity patterns remain unaffected** by this intervention. A notable exception is "preparing hot meals", which is reported noticeably fewer times during the treatment period. Household with lower demand on the control day are less likely to reduce demand.



**Acknowledgements**  
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