

Energy Innovation Summit



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Exploring domestic flexibility for a smarter grid

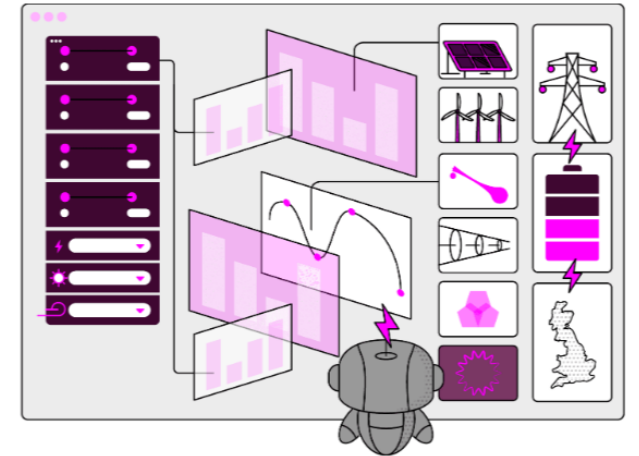
National Energy System Operator (NESO)

- Great Britain's independent system planner and operator, **established in October 2024**
- Built on previous experience as the **Electricity System Operator (ESO)**
- Balancing electricity **supply and demand 24/7**
- **NESO takes a whole systems view**, offering a holistic approach



What is CrowdFlex?

- **Ofgem SIF (Strategic Innovation Fund) project led by NESO**
- Exploring the **potential of domestic flexibility** as a reliable grid management resource
- **3 seasons of large-scale trials** involving over 100,000 customers across **two flexibility service providers – OVO Energy & Ohme EV**
- Aggregated **residential** flex from both **manual and automated** response
- **Two pioneering models** being built and deployed, to support the forecasting and procurement of residential flex in the NESO control room



The CrowdFlex Consortium

CrowdFlex partners



Centre for Net Zero
Powered by Octopus Energy Group



ERM

nationalgrid



Scottish & Southern
Electricity Networks

Supported by



CGI



Smith Institute



Why CrowdFlex?

We need a smart, flexible energy system

- Finding new ways to **balance supply and demand**
- Help **reduce operational costs** related to constraints and balancing
- Reduce system costs through **less grid reinforcements**
- Supporting the **uptake of renewables** and accelerating whole system decarbonisation
- Contributing to the **four to fivefold increase in demand flexibility** needed to reach **Clean Power 2030**
- CrowdFlex aims to **save money for consumers**



The CrowdFlex Trials

- Consumers incentivised to adjust electricity usage in **utilisation** trials or make assets like EVs available for automated charge in **availability** trials
- **Utilisation trials** explore the response to events where consumers were asked to **turn up** their electricity use, **turn down** their electricity use or a **mixture** of the two, over a set time period
- **Availability** trials explore the extent to which customers **change their EV plug-in behaviour** and willingness to allow their EV charger to be remotely managed
- Robust trial structure using **gold-standard behavioural science RCTs** (Randomised Control Trials)
- **Testing** recruitment messaging, incentive levels, fatigue and other event parameters
- Trial data used to build two **pioneering models of consumer behaviour**, to support the forecasting and procurement of residential flex in the NESO control room

Customer feedback

- 31,000 participants provided feedback
- Survey and interviews
- Gaining valuable insight into customer experience
- Focus on inclusion and vulnerable consumers
- Six customer surveys conducted over the duration of CrowdFlex
- Tracking the same customers over an 18-month period

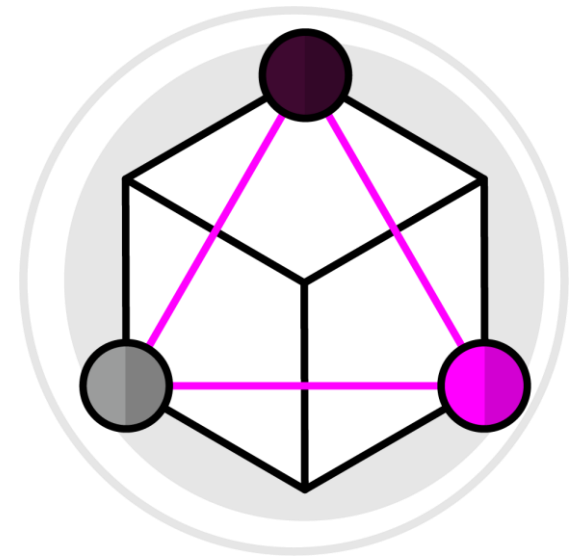


Latest trial results

55,000 OVO customers took part in 76 utilisation trial events

14,000 OVO & Ohme customers took part in 375 availability trial events

- **Financial incentives are proven to be effective** in stimulating flexibility, with turn-up events eliciting over twice the response of turn-down events
- **Lower incentives were more cost-efficient per unit of flexibility**, though higher incentives delivered slightly greater absolute response but with diminishing returns in terms of overall value
- Data demonstrated **automation tools helped users shift 30% more electricity** and earn more rewards, suggesting automation is key to scaling domestic flexibility
- The inclusive nature of the trials ensured that **vulnerable customers and renters were included**, although due to typical lower energy use, they contributed smaller or less consistent volumes of flexibility



Latest consumer feedback

- **Two-thirds said they felt they were making a difference**, and across the board the majority enjoyed participating
- **One-third cited habit** as a reason for continued participation, even when financial interest declined
- **12% of repeat participants reported waning interest**, but those who developed habits were **8% less likely to disengage**



What's Next?



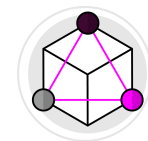
Forecasting models development with trial data



Latest trial results and feedback published



Holistic analysis of trial results



Model integration with NESO operations

Innovation at NESO aims to accelerate the path towards a sustainable GB energy system for everyone.

We do this by generating and testing new ideas, technologies or approaches to solve critical challenges and by sharing innovation insights. We champion transformational, scalable innovation that contributes to clean power.

Learn more about how NESO facilitates innovation, our projects and the funding routes available: innovation@neso.energy

neso.energy/about/innovation