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CrowdFlex: Full Programme Executive Summary

Availability Payments Trials 2024-2025

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1. Introduction

CrowdFlex is a NESO led innovation project, funded by Ofgem’s Strategic Innovation Fund (SIF), which is investigating the potential of domestic flexibility to help operate the grid. CrowdFlex is aiming to establish domestic flexibility as a reliable energy and grid management resource by identifying the technology capability, understanding the statistical nature of flexibility and aligning NESO and DSO requirements. Through large-scale randomised control consumer trials, CrowdFlex is collecting data to develop demand and consumer flexibility prediction models using common APIs.

NESO is delivering CrowdFlex with a consortium of industry partners: OVO, Ohme, Centre for Net Zero, ERM, AWS, National Grid Electricity Distribution, Scottish and Southern Electricity Networks, and supported by Smart Grid Consultancy, CGI, Smith Institute and Centre for Sustainable Energy.

This report summarises the CrowdFlex Availability Payments trials, which tested whether payments made to customers for plugging in their EVs more frequently could expand demand response providers’ ability to control charging load during trial flexibility events while still meeting customer requirements for battery state of charge and ready-by times. The trials were conducted by two demand response providers, Ohme and OVO Energy, using randomised controlled trial (RCT) methodologies, though in some cases a matched control group was used instead of a randomised one to enable meaningful comparison while treating all customers who signed up.

The Winter 2024 trial included 16,610 participants, comprising 10,642 Ohme customers and 5,968 OVO Energy customers. The Summer 2025 trial included 33,060 participants, comprising 22,469 Ohme customers and 10,591 OVO Energy customers. (These figures exclude customers who dropped out or were deemed ineligible mid-trial.)

The Availability Payments programme was notable in bringing two distinct demand response providers into a single coordinated experimental framework. Running twinned, large-scale field trials with both Ohme and OVO Energy provided a unique platform for comparing how similar incentive and behavioural interventions performed across different commercial models and customer bases.

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Table 1: Trial focus across the three trials

Trial period	Trial focus area	Core treatment mechanisms	Key design refinements/objective
Summer 2024 (Pilot - Ohme Only) <i>May - July 2024</i>	Operational feasibility and price influence on availability	Tested viability of an availability proposition using Flat Payment and Escalating Payment structures.	Tested operational feasibility, customer engagement, and how price influenced plug-in frequency. Note: This was a pilot and did not use a strict RCT design.
Winter 2024 <i>September 2024 - April 2025</i>	Incentive and nudge impacts on participation and event performance	Tested Escalating Payment vs. Flat Payment structures. Examined the impact of adding weekly behavioural prompts/nudges.	Assessed incentive and nudge impacts on both participation (plug-in duration) and event performance (kWh shifted).
Summer 2025 <i>July - September 2025</i>	Refining incentives and targeting specific flexible energy delivery behaviours	Focused on payment level variation (Standard vs. Enhanced Escalating). Targeted influencing specific charging parameters, particularly customers' "ready-by-times" using nudges and financial rewards.	Introduced a Dispatched Control group to isolate the causal effect of availability payments. Revised the plug-in definition to require a minimum duration of six hours.

In the Availability Payments Trials, "flat payments" refer to payments provided regardless of how often customers plugged in, whereas "escalating payments" refer to payments that increased in value as customers plugged in more frequently.

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Table 2: Incentive structures across the three trials

Trial	DSRPS	Treatment group	Reward
Summer 2025 Pilot	Ohme	Flat	£9/month
		Escalating payment	- 3 plug-in sessions per week: £1.5/week - 4 plug-in sessions per week: £2.25/week - 5 or more plug-in sessions per week: £3/week
Winter 2025	OVO & Ohme	Escalating payment	- 0-2 plug-in sessions per week: £0/week - 3 plug-in sessions per week: £1/week - 4 plug-in sessions per week: £2/week - 5 or more plug-in sessions per week: £3/week
		Escalating payment + weekly nudge	As above + weekly prompt
		Flat payment	£8/month payment provided regardless of plug-in behaviour
		Flat payment + weekly nudge	£8/month payment combined with weekly emails encouraging participants to plug in more frequently
Summer 2025	OVO & Ohme	Escalating	- 0-2 plug-in sessions per week: £0/week - 3 plug-in sessions per week: £1/week - 4 plug-in sessions per week: £2/week - 5 or more plug-in sessions per week: £3/week
		Escalating + Prompt	As above + weekly prompt to extend ready-by-time
	OVO only	Escalating + Payment	As above, plus £1 per adjusted ready-by-time; max £2/week
	Ohme only	Enhanced Escalating	- 0-2 plug-in sessions per week: £0/week - 3-4 plug-in sessions per week: £3/week - 5 or more plug-in sessions per week: £4/week
		Enhanced Escalating + Prompt	As above + weekly prompt

Table 3: The number of trial events and trial event hours

Trial	# of events	
	Turn-up	Turn-down
Summer 2024	13	20
Winter 2024	144	212
Summer 2025	80	40
Total	317	312

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2. Results from CrowdFlex’s Availability trials

The tables below present the main findings from the availability trials. As the Winter 2024 and Summer 2025 were RCTs, each treatment group can be directly compared with a control group to estimate the effect of different incentive structures on electricity demand during turn-down and turn-up events. The results are based on regression analyses, which estimate how much average hourly electricity demand (in kW) differed in each treatment group versus the control group during event periods.

- The % difference column shows the percentage difference in demand in each treatment group, relative to either the Control group’s average demand (Winter 2024) or the Dispatched Control group’s average demand (Summer 2025).
- A negative percentage in the *Turn-down* row indicates charger demand in the treatment group was lower than control group demand.
- A positive percentage in the *Turn-up* row indicates participants increased demand more than the control group.
- Stars reflect the statistical significance of the difference, based on the *p-value* from the regression. *** = $p < 0.001$. ** = $p < 0.01$. * = $p < 0.05$.

Larger percentage differences indicate stronger behavioural responses to the incentives, while the number of stars indicates a smaller p-value, where the p-value is the chance that an effect as large or larger would have occurred if the true effect was zero.

The first two trials had one control group, a Non-dispatched Control group. The Summer 2025 trial also had a Dispatched Control group.

- The Non-dispatched Control groups were excluded completely from dispatch during turn-up and turn-down events (but were dispatched for non-CrowdFlex reasons, such as in response to wholesale prices).
- The Dispatched Control group in Summer 2025 was dispatched for CrowdFlex events automatically, but participants did not receive any availability payments or interventions to attempt to increase the flexibility provided.

This allowed the Summer 2025 trial to identify the additional impact of availability payments, over and above the automated dispatch provided by demand response providers.

These estimates are calculated across all participants assigned to each treatment group, including those who engaged only intermittently or became disengaged after sign-up. As a result, the effects reflect an average, diversified response rather than the behaviour of a fully engaged participant, which supports more robust extrapolation to real-world deployment contexts.

Differences in effect sizes between OVO and Ohme likely reflect differences in customer bases and commercial models, as well as trial design nuances, rather than like-for-like differences in provider performance. In particular, OVO participants were drawn from their "Charge Anytime" add-on, which provides automatic dynamic smart-charging capability by default, whereas Ohme's participants could be on any energy tariff with any supplier.

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Table 4: Summary of main results across the three availability trials

Trial	Variable	Comparison	OVO	Ohme
			% difference	
Summer 2024 (Ohme only)	The initial pilot study demonstrated that both Flat and Escalating Payments increased plug-in rates. These findings – and operational learnings gained during the pilot – laid the groundwork for the design of the subsequent large-scale trials.			
Winter 2024	Plug-in hours	Escalating v Control	25.58%***	18.62%***
		Flat v Control	21.43%***	17.85%***
	Turn-up	Escalating v Control	51.78%***	17.35%***
		Flat v Control	45.48%***	15.70%***
	Turn-down	Escalating v Control	-38.68%***	-17.60%***
		Flat v Control	-38.20%***	-18.50%***
Summer 2025	Plug-in hours	Non-dispatched Control vs Dispatched Control	3.26%	-1.13%
		Treatment groups vs Dispatched Control	26% - 29%***	33% - 41%***
	Turn-up	Dispatched Control vs Non-dispatched Control †	37.49%***	10.17%*
		Treatment groups vs Dispatched Control	20% - 21%***	29% - 36%***
	Turn-down	Dispatched Control vs Non-dispatched Control †	-24.11%***	-47.92%***
		Treatment groups vs Dispatched Control	-8% to 0%	-12% to 14%

† These two comparisons' reference group is the Non-dispatched Control group. All other Summer 2025 comparisons' reference group is the Dispatched Control group and show response due to the treatments on top of dispatch.

2.1 Incentive structures

Across both the Winter 2024 and Summer 2025 trials, availability payments significantly increased plug-in frequency and duration. Financial incentives effectively encouraged customers to plug in their vehicles more frequently and for longer, thereby making them more available for flexibility events.

In Winter 2024, the Escalating Payments structure produced significantly stronger behavioural responses than Flat Payments for OVO, though this difference was not significant for Ohme. In both cases, Escalating Payments were less expensive overall (in

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terms of £ spent per kWh flexibility delivered), making them the more cost-effective mechanism.

In Summer 2025, all payment structures led to statistically significant increases in plug-in activity compared to the dispatched control group. However, more generous payment structures (e.g. standard vs enhanced) made little difference to the overall level of plug-in achieved in Ohme's trial (OVO's trial did not have an enhanced payment arm).

The impact of increased plug-in rates differed between turn-up and turn-down events. Turn-up response was significantly increased by availability payments, above and beyond automated dispatch. In contrast, they did not cause additional turn-down response beyond the effect already achieved by automated dispatch. We hypothesise this was because turn-down events often occurred at times when demand response providers were already avoiding charging (e.g., evening peaks), limiting the available capacity for further reduction.

2.2 Behavioural interventions

Behavioural interventions, introduced in addition to availability payments, showed mixed effects across the Winter 2024 and Summer 2025 trials.

In Winter 2024, weekly nudges had a clear positive impact on plug-in behaviour. For OVO, the introduction of a weekly nudge significantly increased both plug-in sessions and plug-in hours under both the Flat and Escalating payment structures. For Ohme, nudges improved plug-in rates only within the Flat Payments group, with no measurable effect when combined with Escalating Payments. These findings suggest that nudges can reinforce behaviour to boost plug-in activity, but their marginal benefit may diminish when strong financial incentives are already in place.

In Summer 2025, similar patterns emerged but with mixed implications for flexibility outcomes. For OVO, ready-by-time nudges and associated payments successfully expanded OVO's charging window, but this behavioural change did not translate into significant improvements in turn-up or turn-down flexibility beyond the effect of Escalating Payments. We hypothesise that although customers adjusted their ready-by-times as intended, customers' adjustments were too small to materially expand the scope for additional flexibility delivery.

For Ohme, behavioural prompts focused on changing ready-by-time and other settings that could plausibly increase Ohme's ability to shape charging demand. These prompts led to significant improvements in turn-up and significant reductions in demand during turn-down compared with no prompt. However, these effects should be interpreted cautiously due to group imbalances arising from possible randomisation implementation issues.

2.3 New charging demand at home

Availability payments increased overall household charging demand, indicating that the extra plug-in caused moderately higher demand for charging in the home. In OVO's Winter 2024 trial, both Flat and Escalating Payment groups showed statistically significant increases in weekly electricity use compared to control, while Ohme showed no significant

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differences. In Summer 2025, all OVO *and Ohme* treatment arms recorded significant increases in weekly consumption relative to the Dispatched Control.

It remains unclear whether this increased demand reflected a shift from other charging locations - such as in the office or at public chargers - or genuine net demand creation. Future research could help distinguish between these effects.

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3. Conclusion

The CrowdFlex availability trials provided clear evidence on how financial and behavioural mechanisms can shape EV charging behaviour and enhance system flexibility. The Winter 2024 and Summer 2025 trials pointed to some consistent lessons:

- **Incentive design:** Escalating payment structures were generally more effective and cost-efficient than flat payments. For OVO, they drove higher plug-in frequency and greater turn-up flexibility. For Ohme, outcomes under escalating and flat payments were similar, but escalating incentives achieved comparable results at lower cost.
- **Effect of behavioural prompts:** Across trials, behavioural reminders and prompts provided modest, context-dependent boosts to engagement, with mixed evidence that they increased the amount of flexibility delivered. In the Summer 2025 trial, simple, low-cost nudges such as weekly reminders or ready-by-time prompts increased engagement, particularly under weaker financial incentives; however, their incremental effect diminished when combined with stronger payments. In OVO’s Summer 2025 trial, ready-by-time nudges achieved the desired behavioural change (later ready-by-time) but failed to translate into a statistically significant improvement in actual flexibility delivered beyond the baseline Escalating Payment arm. Ohme’s Summer 2025 trial suggested some impact on flexibility delivery from similar prompts to customers to change their app settings.
- **Turn-up vs. turn-down asymmetry:** Availability payments consistently boosted turn-up flexibility beyond what automated dispatch alone achieved. In contrast, additional turn-down response was limited, likely because many turn-down periods overlapped with times when charging was already minimised for price or operational reasons.

Overall, the trials demonstrated that carefully designed availability incentives could meaningfully expand controllable EV load and offer a scalable pathway to higher-volume, lower-cost flexibility. Escalating payments offered a cost-effective foundation, with behavioural nudges providing a complementary means of sustaining participation. As EV ownership grows – and bidirectional charging technology enables exporting to the grid - such availability-based models can play a valuable role in a clean, flexible electricity system, unlocking new capacity for addressing grid constraints and helping to deliver a lower-cost transition to net zero.