



**CROWD
CHARGE**

Milton Keynes trial shows how electricity networks can cope with charging more EVs

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This document contains a summary of the initial project findings. Further project information can be found at www.crowd-charge.com.

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A summary of the the key figures

- The Milton Keynes Domestic Energy Load Balancing EV Charging trial ran from **2020** to **2022**.
- A total of **12** participants were invited to take part in the Milton Keynes Council Domestic Energy Load Balancing EV charging project.
- Of these 12 participants, **4** were selected to have Vehicle to Grid (V2G) chargers installed.
- Of these 12 participants, **8** were selected to have smart (V1G) chargers installed.
- There were over **3,500** charge cycles during the 1-year customer trial.
- These charge cycles accounted for over **35** MWh of energy charged.

A summary of the cost and carbon savings

- The trial participants saved a combined **£2,242** during the 1-year customer trial. That's an average of **£15** per user per month.
- Participants were able to regularly reduce the carbon emissions of their charging by at least **25%**.
- And those with V2G chargers were able to sometimes reduce their charging costs to **zero** by taking charging at cheap times and then powering their homes at expensive times.
- By the end of the trial, with all CrowdCharge energy optimisation and management features enabled, the majority of charge cycles were at least **40%** cheaper than unmanaged charging.
- And those with V2G chargers were sometimes able to achieve **zero-emission** charges by charging at periods of low carbon intensity, and discharging at periods of high carbon intensity.

“We’ve shown that different technologies can help prevent local electricity networks being overloaded, but the key is the intelligent management of such technologies.”

“Successfully integrating these systems can mean that electric vehicle drivers can benefit from greener energy as well as energy cost savings.”

*- Mike Potter,
CEO at CrowdCharge*

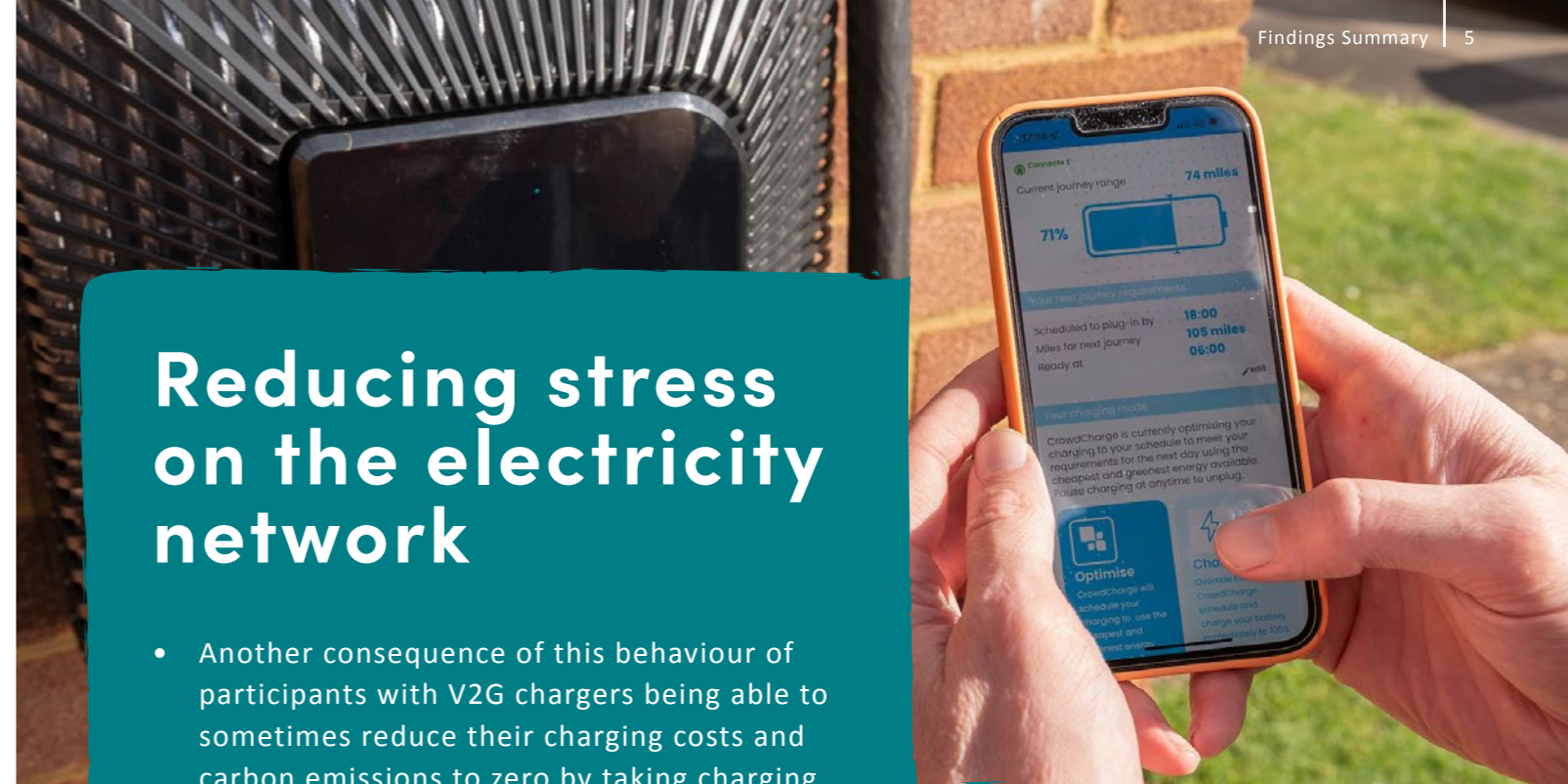
Reducing stress on the electricity network

- Another consequence of this behaviour of participants with V2G chargers being able to sometimes reduce their charging costs and carbon emissions to zero by taking charging at cheaper and greener times, and then powering their homes at expensive, high-carbon times, was that the traditional evening peak of demand disappeared for these V2G users as they were running their homes from their cars during this peak time, therefore reducing the strain on the grid.
- Additionally, this ability for V2G users to almost disappear from the from the grid, defers reinforcement costs for the Distribution Network Operator (DNO).
- The project has shown that the combination of these different technologies has the potential to reduce the load on the electricity grid from charging EVs, when used in conjunction with a smart charger and battery energy management platform such as CrowdCharge, as demonstrated in the 1-year customer trial.
- All of this was possible whilst making sure that the total demand across all the project participants was kept within group limits to support the Distribution Network Operator (DNO).
- **In other words, this project showed that it is possible to get the best outcome for users while also supporting the electricity network.**

“This is yet another Milton Keynes project that will help tackle climate change by informing the wider industry on ways that they can make owning and running an electric vehicle more appealing. It’s shown that a combination of different charging technologies working together can help to balance the grid, which is becoming increasingly important as we head to a future where virtually all new cars sold will be electric.

“We look forward to implementing what we’ve learnt as part of our range of initiatives in Milton Keynes to future-proof our infrastructure for electric vehicles.”

- Cabinet member for Climate and Sustainability Councillor Jenny Wilson-Marklew



Hardware summary

V1G smart charger summary: Chargepoint Inc. Home charger

ChargePoint is bringing smart charging to your home with the smallest and most advanced home electric vehicle (EV) charger, offering high charging speed and convenience in an ultra-sleek, beautiful and durable design. More details from Chargepoint [here](#).



V2G charger summary: Wallbox Quasar charger

Wallbox has created a direct current (DC) bi-directional electric charger for home. Quasar is light-weight and compact enough to fit within a home, without losing all the premium Wallbox styling cues. More details from Wallbox [here](#).



Key learnings summary

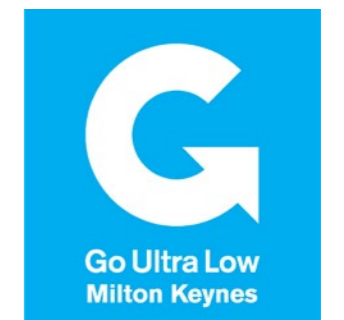
- A range of new dynamic energy (or 'flexibility') services, which can be used to reduce demand on electricity networks, are due to be introduced in the UK energy market in the next 2-3 years.
- Our project demonstrated the feasibility of doing this to support the DNO and helped to inform the evaluation of such services.
- One of the outcomes CrowdCharge believe is that flexibility services need to be on a more focused network, as they can end up being too expensive and inefficient, but the market for this is currently too immature.
- As well as the positive project outcomes such as reduced stress on local electricity networks, lower energy costs and reduced carbon, challenges were also identified as important learning points. A key barrier is that technologies such as battery storage are currently difficult to integrate into home energy systems; more work is needed to overcome this.

Opportunities

- CrowdCharge are continuing to offer opportunities for V2G users by now offering the energy optimisation services that were trialed on the project as a service.
- CrowdCharge has V2G users on its platform, and the EV drivers with V2G are achieving real-life savings on their energy bills, especially when combined with the generation of energy at home from solar panels, and/or balancing their homes energy consumption.

Project partners

The Milton Keynes Domestic Energy Load Balancing project has been a Milton Keynes Council and Milton Keynes Go Ultra Low Programme funded project. The Milton Keynes Go Ultra Low project was supported by the Office for Zero Emission Vehicles as part of a £9 million investment into the growth of electric vehicles.



Notes...

The Milton Keynes Domestic Energy Balancing EV Charging trial ran from 2020 to 2022 and included 12 participants – four with vehicle to grid (V2G) chargers and eight with smart chargers – with over 3,500 charge cycles taking place and over 35 MWh of energy charged.

Participants utilised the CrowdCharge platform and dynamic energy services from the project partner, Flexitricity, to combine domestic smart electric vehicle charging (V1G) and vehicle to grid charging (V2G), to serve a range of new flexibility services, which can be used to reduce demand on electricity networks, and which are due to be introduced in the UK energy market in the next 2-3 years.

CrowdCharge, through its aggregated smart charging platform, utilised various profiles which ensure the protection of the Distribution Network Operator's low voltage network to address the network operator's concerns about anticipated rapid EV uptake in the coming decade. CrowdCharge is a digital platform, accessed via an app, to manage multiple electric vehicle chargers to provide EV owners with cheaper and greener electricity, while at the same time reducing the impact from EV charging on the electricity grid.

- *Milton Keynes Council hosted the project*
- *CrowdCharge delivered the project*
- *Flexitricity was the energy demand response partner*
- *The project was funded by OZEV through Go Ultra Low Milton Keynes*