

BACKGROUND

Western Power Distribution commissioned the installation of 700 charge points in peoples homes, this was called the Electric Nation project. The project focused on the local electricity networks that supply homes and small businesses – the low voltage (LV) network. Electricity networks are run in a safe, secure, reliable and sustainable way to provide energy to local communities.



YOUR
ELECTRIC
VEHICLE
YOUR
SMART
CHARGE

The trial will help the Distribution

Network Operators, who manage these networks, increase their understanding of the impact of EVs on their networks and how this impact could be reduced using smart chargers.

The Electric Nation trial aimed to:

1. Expand current understanding of the impact on electricity distribution networks of charging a diverse range of electric vehicles at home. This project is seeking to discover how the impact will be altered by different types of vehicles with different sizes of battery that charge at different rates.
2. Build a better understanding of how vehicle usage affects charging behaviour given diversity of charging rate and battery size.
3. Evaluate the reliability and acceptability to owners of EVs of smart charging systems and the influence these have on charging behaviour. This will help to answer such questions as:
 - Would charging restrictions be acceptable to customers?
 - Can customer preference be incorporated into the system?
 - Is some form of incentive required?
 - Is such a system 'fair'?
 - Can such a system work?
4. Utilise home owner's broadband to communicate with the charger. Predominantly chargers communicate via Sim card.
5. The project will also develop a tool that will allow local network operators to identify which parts of their network are likely to be affected by the future adoption of EVs and recommend the most economical solution to solve any issues this could cause.

THE PROBLEM

Fleet Drive approached Hangar 19 with the issue of how best they could oversee the installation of 700 charging points, provide technical support, communicate with the chargers over the customers broadband and implement demand management over the charging points.

SKILLS & EXPERTISE REQUIRED

Electric Vehicle charging infrastructure consultation services and technical operations support.

PCB Design, Web engineering, System engineering, Software design, Project planning and App development

SOLUTION

We advised Drive Electric on the charging points in the market; how these could operate and put forward OLEV recommended installers. We proposed creating an Ops tool for the communication partner the Tech Factory so charging points and comms equipment could be thoroughly quality checked before dispatch to the installers. We then further proposed that we build an installers login so charging points could be commissioned on site.

We then showed them how charging points operate on our Asset Management system; Hubeleon and offered to create their own bespoke Charge Point management system – Crowd Charge. We would then guide their staff through inputting chargers and users in the system.

As the chargers we're going to communicate via broadband rather than the industry led Sim card technique we worked closely with the Tech Factory to create a secure system to create a VPN between a participant's broadband and the Electric Nation network. We offered to design and build a circuit board to be part of a charge point controller so that we could communicate with units via the VPN, record charging data and implement demand management.

We liaised with Future & Emerging Technologies Consulting Ltd to oversee the development and implementation of demand management algorithms onto charging points.

We further advised that their fleet leasing team may benefit from having a member of Hangar 19 manage their customer and operational support for charging points. The account manager would Offer technical support for Electric Nation participants on Hubeleon and Greenflux, liaise with key stakeholders in weekly review conference calls and submit weekly fault reports to be shared with Western Power Distribution.

We further offered to develop an App so that participants could opt to have higher priority charging during grid load management events.

OUTCOME

Drive Electric decided to purchase 350 Evolt charging points to operate on Hubeleon and 350 ICU charging points to operate on Greenflux. The project saw 354 Evolt charging points installed in people homes. Overall charging points had a communications uptime of 78% on Hubeleon. This would have been higher; barring ISP faults and participants switching off their charging and broadband equipment.

64% of chargers were used sufficiently to experience demand management. A further report outlining the key findings of the Electric Nation project shall be published in 2019 by [EA Technology](#).

While working on the project Hangar 19s energy consulting services were built into Drive Electrics business plan for the next three years. This has lead to our joint venture into Electric Vehicles, [Crowd Charge](#). In this format we are currently investigating the feasibility of vehicle to grid charging. We have installed a Nichicon V2G charger at EA Technology headquarters for testing and are aiming to roll out workplace charging solutions for fleets.