



ELECTRIC
NATION

YOUR
ELECTRIC
VEHICLE
YOUR
SMART
CHARGE

WELCOME

CHARGING

CHARGING AT HOME

Electric Nation is a research project, testing technology that could help mitigate the effect of many EVs charging on the low voltage electricity network simultaneously. This will be achieved by either altering the charging rate of the EV or pausing the charge. For this reason, there is a possibility that on a small number of occasions you may plug in your car to charge, but due to the normal operation of the demand management equipment, the car will not be as fully charged as you expect.

WHAT HAPPENS IF THE CHARGER FAILS?

In the event that you experience difficulties or a fault with your charger, please first refer to the Troubleshooting Guide that you will have received (it can also be found in the resource area of the Electric Nation website). If your charger is still inoperative after completing the checklist please then contact the dedicated charge point helpline on 0330 390 0455. DriveElectric may ask you some questions to try and establish why the charger is not working and consult our charger management system monitoring your charger. If necessary they will provide an estimated time for an installer to visit your property to establish the cause of the fault and to repair it. If the problem cannot be fixed than a new charger might be installed.

HOW DO I CLAIM BACK FOR A TAXI JOURNEY?

In the unlikely event that our charger management system monitoring your charger fails and you are unable to charge your vehicle, please notify DriveElectric as soon as possible. Please note, DriveElectric must have a record of your charger failure in order to provide reimbursement for taxi journeys. If you need to use a taxi, please keep your receipt. You will be asked to send a copy of the receipt to DriveElectric. DriveElectric will reimburse you for the cost of your taxi journey(s).

CHARGING AWAY FROM HOME

The system being trialled as part of the Electric Nation project will not have an impact when you charge your EV away from home. Being a part of the Electric Nation project in no way constrains you from using the wide range of charging points open to the public.

WHAT HAPPENS AT THE END OF THE TRIAL?

At the end of the trial you have the option to keep your smart charger and to continue to use it as you require. If you don't wish to keep the charger at the end of the trial DriveElectric will arrange for its removal.

At the end of the Electric Nation trial you will no longer have access to the trial app. Your charge point provider will be able to send you information about similar products that they may provide if you have given us permission to share your contact details with them.

Thank you for agreeing to participate in the Electric Nation project. The learning from this trial will provide essential information to help us understand the impact of electric vehicles (EVs) on the electricity network. The project will also allow us to investigate how effective a demand management solution would be to prevent overloading of local electricity networks and how acceptable this solution is to EV owners.

CONTACTS

Here are some telephone numbers for you and your drivers to keep in a safe place.

Cars DriveElectric

0333 300 1050

For information and queries about the trial and project.

Charge Point DriveElectric

0330 390 0455

24-hour helpline for further information or queries about the smart charger, including technical back-up and trouble shooting.

Customer Research Impact Research

01932 226 793

Lucy Upshall
Lucy.upshall@impactmr.com

For information and queries about the surveys.

If you would like any further information about the Electric Nation project, please get in touch:

ELECTRICNATION@DRIVE-ELECTRIC.CO.UK | 0333 300 1050

Fleetdrive Management Ltd, Harleyford Marina, Henley Road, Marlow, Buckinghamshire SL7 2DX

FOR MORE INFORMATION VISIT WWW.ELECTRICNATION.ORG.UK





Image shows local electricity network from substation to homes with electric vehicles, including possible transfer of energy back from vehicle to grid (V2G)

ABOUT THE PROJECT

EVs are becoming increasingly common on UK roads. Public charging points are becoming more widely available and new models of cars are being introduced with larger batteries. Home EV charging stations are becoming popular, which charge your vehicle more quickly, but also have the potential to increase the load on the electricity network. All of these developments are removing many of the barriers that have prevented wider EV ownership, making them a mainstream choice.

While the UK electricity system has plenty of capacity to deliver energy to EVs, if lots of people in one area have electric vehicles and clusters of cars develop, more EVs would have a greater impact on local electricity networks. Charging vehicles with larger batteries, at faster rates, and over longer periods could exacerbate this pressure.

The Electric Nation project is being hosted by the local electricity network operator, Western Power Distribution. Electric Nation is the customer-facing brand of CarConnect, a Western Power Distribution (WPD) and Network Innovation Allowance funded project. WPD's collaboration partners in the project are EA Technology, DriveElectric, Lucy Electric GridKey and TRL. The project aims to provide local network

operators with the tools to be able to ensure that their networks can cope with this massive new challenge, whilst avoiding replacing cables and disruptive roadworks.

WHAT WILL BE LEARNT?

The project will 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 project will also show how effective demand management using smart chargers is an alternative to costly network reinforcement. It will provide network operators with the information required to obtain a demand management service in the future. We will also learn how acceptable demand management technologies are to EV owners.

THE TRIAL

THE SMART CHARGER

As a participant in the Electric Nation trial you will be provided with a wall-mounted smart charger. The smart charger communicates with the demand management service via the small communication unit that will be installed next to your electricity consumer unit ('fuse board'). You will receive full operating instructions for your smart charger when it is installed.

THE TECHNOLOGY

By using smart chargers, a demand management provider can communicate with chargers to reduce the charging speed, or pause charging. Local network operators could use this type of service when local networks are stressed at peak electricity demand periods, as an alternative to replacing their equipment (e.g. cables in roads). **The system that we will be trialling as part of the Electric Nation project will:**

- Monitor your home charging habits (collecting information on when you charge, what rate, how much energy was used, and when the car is plugged in)
- Simulate network events that may require your car charge to be paused or the charging rate altered.
 - We may ask your permission to share your email address with your demand management provider so that you can view data about your EV charge history. We will only share this information with your permission.

In addition to the smart charger we will provide you with:

- A small communication unit (about the size of a paperback book) that will be installed next to your consumer unit
- A small unit that plugs into the back of your broadband router to provide secure, reliable communication with the smart charger over the internet.

This equipment will be installed at the same time as your EV charger. It will be removed at the end of the trial.

In some cases, and with your permission, your vehicle may be fitted with a telematics device to record information about the battery and distances travelled, but not your location.

CUSTOMER RESEARCH

An important part of the Electric Nation trial is to find out your opinion about smart charging. Impact Research will be contacting you so that you can tell us about your experiences as an EV owner and smart charger user. At the start of the trial you will be asked for some information about yourself (contact details, size and make-up of household, normal driving patterns, expected use of EV, attitude and any anxieties about being an EV owner). You will then be contacted four or five times during the trial at approximately three-monthly intervals. You will be asked to complete short online questionnaires (these should only take five minutes).

There will be no more than eight questionnaires in total. These questionnaires will cover how you are using your EV, your charging patterns and your attitude towards the demand management. You will then be asked to complete a final questionnaire a few months after the end of the trial. It will cover similar questions to those contained in the previous questionnaires, but will also ask you about your driving habits (and charging if you still have an EV) since the trial finished.

You will usually be contacted by email to complete these surveys online. However Impact Research may contact you by telephone to remind you to complete the survey or update information about you. If you prefer not to do your surveys online, please contact

the team at Impact Research and we can arrange an alternative way of collecting the information.

You will be given online gift vouchers worth £10 for each survey you complete after each trial, and £25 for completion of the post-trial survey. The two surveys conducted before the trials are a condition of participation and therefore there are no payments for completion of these.

Impact Research is registered as a data controller with the Information Commissioner's Office as required by the Data Protection Act 1998. Any results or analysis obtained from the customer will be published in an anonymous and aggregated format. We will ensure that trial participants cannot be identified from any information published unless you give us express permission otherwise.

If you would like to check the validity of this research survey or seek reassurance that Impact Research is a responsible organisation that will keep the information you give it safe, you can do so by calling the Market Research Society UK Freephone verification service free* on 0500 39 69 99 or visiting www.theresearchbuyersguide.com/freephone/alpha/all

**Calls to Freephone made from outside the UK or from a mobile may incur charges*

FAQS

© What is the aim of the Electric Nation trial?

Ⓐ The Electric Nation project aims to build an understanding of the potential impact that the increasing uptake of EVs will have on local electricity networks. Cars with different battery sizes and charge rates may have different impacts and this needs to be understood. The impact of human behaviour on these different technologies will also be investigated.

The project will also trial a system that will be able to alleviate some of the anticipated problems that mass ownership and simultaneous charging of EVs could cause to local electricity networks.

© What is the problem that needs solving?

Ⓐ The uptake of EVs is accelerating quickly and is expected to continue to do so. There were 1,056 cars eligible for the plug-in car grant in the UK in 2011. This figure has risen each year to a total of 35,447 cars in 2016. This is a significant increase over a period of just six years. While the UK can generate enough electricity to charge these vehicles, some local electricity networks may be unable to cope with the extra demand, especially if it coincides with existing peaks (e.g. after returning home from work in winter).

This trial is necessary to build an understanding of how different car battery sizes and speeds of charging may impact on this problem, and also to trial a potential solution.

© What is the proposed solution?

Ⓐ By using smart chargers, a demand management provider could communicate with chargers to reduce the charging speed, or pause charging. Some EV owners will be able to programme some of their preferences and this information will be used to charge the car battery at a time or rate best suited to the network but within the car owner's tolerances.

Local network operators could use this type of service when local networks are stressed, as an alternative to replacing their equipment (e.g. cables in roads).

Data gathered from the trial will be used to help local network operators identify which parts of their network are most at risk as EV ownership increases. It will also develop a tool that will aid them to identify the most effective way to deal with areas of the network with problems.

© Who are the collaboration partners?

Ⓐ The Electric Nation project is hosted by Western Power Distribution (WPD). **It is delivered by the following collaboration partners:**

- EA Technology
- DriveElectric (a brand name of Fleetdrive Management)
- Lucy Electric GridKey
- TRL

In addition, there are a number of supporting collaborators:

- CrowdCharge
- Greenflux
- Impact Research
- e-Volt
- ICU Charging Equipment



ⓐ Who is responsible for different parts of the project?

Ⓐ Western Power Distribution

The host Distribution Network Operator, providing funding and direction to the project.

DriveElectric

Responsible for recruiting participants and all customer-facing activity, including charger installation.

EA Technology

EA Technology is responsible for testing the EV charge point demand management systems developed by Crowd Charge & Greenflux. These systems will change the charging rate or pause your car charge. EA Technology is also responsible for creating the event simulations that will be used to see if the systems could be used to help the electricity network, as well as managing all aspects of customer research, PR, marketing and dissemination of learning for the project.

Lucy Electric GridKey

Lucy Electric GridKey is monitoring local low voltage substations with the GridKey system with the aim of assessing the load profile of various types of electric vehicles and developing an algorithm that can automatically detect the presence of EVs charging on the network.

TRL

Providing project oversight.

CrowdCharge and Greenflux

Developers of EV demand management systems which will send signals to the smart chargers and in some cases provide end user mobile app.

Impact Research

Conducting customer research.

e-Volt and ICU Charging Equipment

Providing the smart chargers.

ⓐ How is the project funded?

Ⓐ Electric Nation is the customer-facing brand of CarConnect, a Western Power Distribution (WPD) and Network Innovation Allowance funded project. WPD's collaboration partners in the project are EA Technology, DriveElectric, Lucy Electric GridKey and TRL.

ⓐ What subsidies will Electric Nation participants benefit from?

Ⓐ We will provide a top-up contribution towards the smart charger and its installation, in addition to any applicable OLEV electric vehicle home charge scheme grant. Assuming the participant meets all eligibility criteria, they will receive the smart charger with no costs incurred. This is subject to a survey of the property and based upon a standard installation process. If the survey reveals any complications, then the participant may be subject to additional costs. If this is the case, the participant will be informed of these additional costs prior to installation and asked if they wish to proceed.

Should the participant wish to leave the trial early or decide not to continue to engage then they will be asked to reimburse a proportion of the £150 installation fee paid on your behalf by the project. The exact amount will be calculated according to the length of time that you participate in the trial.

Additionally, drivers will be given online gift vouchers worth £10 for each survey they complete during the trial, and £25 for completion of the post-trial survey. The two surveys conducted before the trials are a condition of participation and therefore there are no payments for completion of these.

ⓐ What are the channels of communication for the project?

Ⓐ More information about the project can be found at: www.electricnation.org.uk.

Alternatively contact the project on our dedicated email address electricnation@drive-electric.co.uk or phone us on **0333 300 1050**.

There is also a 24-hour charge point helpline available to participants which can be contacted by telephoning DriveElectric on 0330 390 0455 or emailing support@drive-electric.co.uk.

ⓐ What type of information will I be asked for during the trial?

Ⓐ DriveElectric is the data controller for the Electric Nation project. Details of the data protection strategy for the project can be found in the Resources section of the Electric Nation website.

Impact Research will need information about participants and their households, for example contact details, age, gender, number of people in the household and number of cars etc. They will also ask about experiences using EVs, for example about the types of trips that are

undertaken and decisions about when to charge the vehicle and about any problems or concerns when using or charging the EV. This will help the project to understand how different types of people and households use their EVs.

CrowdCharge and Greenflux may collect or be given data regarding the charging of the trial participant's EV, journey data or vehicle specification data.

ⓐ How often will Impact Research make contact and how will information be collected?

Ⓐ When a person agrees to be part of the Electric Nation project they will be asked some questions about the household and circumstances as well as expectations about being an EV owner. This is most likely to be online, though they may make contact by telephone from time-to-time to remind people to take part in a survey or update information they hold. Participants will then be asked to complete up to eight short online questionnaires about experiences of being an EV owner before, during and after the trial, each one lasting no more than 10 minutes.

ⓐ How long does the trial last?

Ⓐ The trial lasts for two years from January 2017 to December 2018. Participants joining after the start of the trial will only participate for the remaining period.

ⓐ Are there any potential inconveniences associated with taking part in the trial?

Ⓐ As part of the Electric Nation trial a demand management system will be used to change the rate or pause when your EV is charging, simulating an event designed to prevent the network being overloaded. It is expected that this can be carried out whilst ensuring that EVs are still charged when required. The trial will seek to prove that this is the case. There is therefore a possibility that participants' cars may not be sufficiently charged, causing some inconvenience.

Should the charge point supplied as part of the trial fail, alternative transport can be arranged. The charger will be checked and if necessary replaced.

ⓐ How long will the installation of the smart charger take?

Ⓐ The smart charger installation will be carried out by an OLEV-approved installer. Each installation is different, however a typical visit will take between 3-6 hours.

ⓐ Will there be a disruption to my electricity supply while the smart charger is being installed?

Ⓐ There will be a short interruption to your electricity supply of no more than half an hour whilst the charge point is being installed. You will need to be at home when the charge point is installed, even if it is going to be outside.

ⓐ Who will install my smart charger?

Ⓐ DriveElectric will be working with a preferred selection of OLEV-approved installers who will carry out the installation work.

ⓐ Will the smart charger track other energy usage in my house?

Ⓐ The smart charger will only monitor the electricity supplied to your EV.

ⓐ How will the data that I provided be protected? Who will have access to my data, to what extent will it be visible in project outputs, and what will happen to it after completion of the trials?

Ⓐ DriveElectric is the data controller for this project. DriveElectric has 21 years' experience managing customer data through its car lease business and experience in implementing data protection procedures across project partners and suppliers. During recruitment, the Electric Nation project will collect some personal data from you. With your permission your contact details will also be shared with Impact Research who will be conducting the customer research aspect of the project. Impact Research is also a registered data controller as defined by the Data Protection Act 1998. Both companies are registered with the Information Commissioner's Office.

The project has carefully selected its suppliers who may handle your data (e.g. collecting your contact details or installing your smart charger) to ensure they comply with the requirements of the Data Protection Act; this will ensure that your personal data is managed appropriately. Your personal data will not be shared outside the project delivery partners and suppliers, and any data shared with project partners or suppliers will be limited to what they require to deliver their role in the project.

Data such as when you plug your car in, when it charges, how long for and the charge rate will be collected via the demand management system. This data will not include personal data and participants will not be recognisable from this information. It will be

encrypted according to strict protocols. In some cases, and with your permission, the project may access data from your EV. This may include information such as journey lengths and the state of charge of your EV's battery and, with your permission, may require fitting of a telematics device to your vehicle.

At the end of the project all personal data kept about you by the project will be destroyed unless you provide us with express permission to keep it.

All results, data or analysis published by the project will be in an anonymous and aggregated format. The project will ensure that no trial participant can be identified from any trial publication unless an individual has provided express permission for their details to be made available, for example in a case study or newsletter.

A full copy of the Electric Nation Data Protection Strategy can be found in the Resources section of the Electric Nation website.

ⓐ What are trial participants obliged to do?

ⓐ As a participant in the Electric Nation trial we want you to use your EV the way you want to – driving it where you want to go, when you want. Therefore plug in your EV at home as and when you need to charge it!

If managed charging changes your driving and charging habits – for better or worse – we would like to know what's changed.

If you are provided with an app to programme in your journey and charging preferences, please use it. It will help the control system to make better decisions.

So that we know what you think about the demand management system that you are trialling, please complete the customer research survey whenever you are requested to (usually approximately every three months).

If for any reason you cannot carry on participating in the Electric Nation trial please let us know as soon as possible by contacting DriveElectric, either by email electricnation@drive-electric.co.uk or by telephone on **0333 300 1050**.

Please let us know if you change your contact details, either by email electricnation@drive-electric.co.uk or by telephone on **0333 300 1050**.

ⓐ Will my electricity supplier be told or be able to find out that I am having a charge point installed?

ⓐ No, electricity suppliers (for example British Gas, E.ON, npower) are not told about your charge point and they do not need to be informed. Electricity suppliers cannot tell what equipment or loads you have at your house. Your charge point installer will inform your local electricity Distribution Network Operator (for example Western Power Distribution) – this is an obligation required of the installer as part of the Domestic Wiring Regulations.

ⓐ What is the voltage and current of the charger?

ⓐ It is a 240V/32A (7kW) charger.

ⓐ Who will complete the application for the home charger grant?

ⓐ DriveElectric will complete this form on your behalf.

ⓐ What happens if I need to stop participating before the end of the project?

ⓐ If you leave before the end of the trial you will be asked to reimburse a proportion of the £150 installation fee paid on your behalf by the project. The exact amount will be calculated according to the length of time that you participated in the trial.

ⓐ If I move property can I take the charge point with me? Will I be able to continue to participate in the trial?

ⓐ If you move house during the trial then you can take your charger with you although you will have to pay for an installer to move it. You can then continue to participate in the trial. Please let DriveElectric know if you are moving house so that they can keep their records up to date. They will also be able to help you find a qualified installer to move your charge point.

If you do not want to take your charge point with you when you move house you can leave it at your old house when you move and it will become the property of your old house's owner. If you move before the end of the trial you will be asked to reimburse a proportion of the £150 installation fee paid on your behalf by the project. The exact amount will be calculated according to the length of time that you participated in the trial.

Our FAQs are constantly updated on our website, see: WWW.ELECTRICNATION.ORG.UK/FAQS





DRIVEELECTRIC

DriveElectric is a trading name of Fleetdrive Management Ltd. Established in 1995, the company based in Marlow, Buckinghamshire has been the UK's leading provider of leased ultra-low emission vehicles since 2011. Providing both business and personal vehicle leasing solutions, for all makes and model of vehicle, DriveElectric delivers expertise, impartial advice and excels in engaging customers in support of a low carbon transport future.

WWW.DRIVE-ELECTRIC.CO.UK

FUNDED BY



WESTERN POWER DISTRIBUTION

Western Power Distribution (WPD) is the distribution network operator for the Midlands, South West England and South Wales, and is responsible for delivering electricity to approximately 7.8 million customers in the UK.

WPD is not an electricity supply company and does not bill customers in the UK. Its responsibility is to distribute electricity from the point of generation to homes and businesses.

WWW.WESTERNPOWER.CO.UK

COLLABORATION PARTNERS



EA TECHNOLOGY

EA Technology is the recognised UK authority on the impact of electric vehicles (EVs) on the electricity network, and the pioneer of smart solutions to mitigate this impact. Through its Smart Interventions business it delivers innovative end-to-end solutions to facilitate the introduction of low carbon technologies to future proof electricity networks, resulting in lower cost connections, prompt adoption and reduced risk to business.

WWW.EATECHNOLOGY.COM



LUCY ELECTRIC GRIDKEY

Lucy Electric is monitoring local LV substations with the GridKey system with the aim of assessing the load profile of various types of electric vehicles and developing an algorithm that can automatically detect the presence of EVs charging on the network.

WWW.GRIDKEY.CO.UK



TRL

TRL (the UK's Transport Research Laboratory) provides independent and impartial world-class research and consultancy for all aspects of transport. Commercially independent and with more than 80 years of knowledge and experience embedded in its history, TRL's work encompasses a breadth of areas that shape and form today's transport decisions.

WWW.TRL.CO.UK