

**NEXT GENERATION  
NETWORKS**

Customer Research Update  
April 2017  
Electric Nation Project



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## Glossary

Abbreviation	Term
BEV	Battery Electric Vehicles
EV	Electric Vehicle
NIA	Network Innovation Allowance
PIV	Plug-In Vehicle
PIHV	Plug-In Hybrid Vehicle

## 1 Introduction

This document provides an introduction to the information collected for customer research purposes by the Electric Nation project (“the Project”). Impact Utilities is conducting customer research for the Project. At the time of writing the Project is still at an early stage of recruitment and consequently only a limited amount of data has been collected via participant surveys. The data included in this report cannot therefore be presented as representative of the final trial groups, or as being statistically significant.

### 1.1 The Electric Nation Project

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 (the author of this report), DriveElectric, Lucy Electric GridKey and TRL.

Electric Nation, the world’s largest electric vehicle (EV) trial, is revolutionising domestic plug-in vehicle charging. By engaging 500-700 plug-in vehicle (PIV) drivers in trials, the project is answering the challenge that when local electricity networks have 40% - 70% of households with EVs, at least 32% of these networks across Britain will require intervention posed by the My Electric Avenue trial<sup>1</sup>.

The project is developing and delivering a number of smart charge solutions to support plug-in vehicle uptake on local electricity networks. The primary outcome of the Project will be a functional specification for PIV demand management services that GB Distribution Network Operators (including WPD) can use to procure such services as PIV demand grows to the point where distribution networks become stressed by PIV demand. A second key outcome will be a tool that analyses plug-in vehicle related stress issues on networks and identifies the best economic solution. This ‘sliding scale’ of interventions will range from doing nothing, to smart PIV demand management, possibly including taking energy from vehicles and putting it back into the grid (vehicle to grid, V2G, technology), through to traditional reinforcement of the local electricity network where there is no viable smart solution.

The development of the project deliverables is being informed by a large-scale trial involving PIV drivers that will:

- Expand current understanding of the demand impact of charging at home on electricity distribution networks of a diverse range of plug-in electric vehicles - with charge rates of up to 7kW+, and a range of battery sizes from 20kWh to 80kWh+.
- Build a better understanding of how vehicle usage affects charging behaviour.
- Evaluate the reliability and acceptability to EV owners of smart charging systems and the influence these have on charging behaviour. This will help to answer such questions as:

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<sup>1</sup> <http://myelectricavenue.info/>

- Would charging restrictions (PIV demand management) 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?

The results of this project will be of interest and will be communicated to the GB energy/utility community, to UK government, to the automotive and PIV infrastructure industry and to the general public.

## 1.2 Customer Research

Customer research is one of the many data sources being gathered by the Electric Nation trial (others include vehicle telematic data, charge point data, data from apps or demand control preference systems and customer enquiries). These sources of information will be used to provide an answer to the overall customer objective of the trial:

To prove which, if any trial charging systems are the most acceptable to customers given their potential for avoiding or delaying traditional forms of network reinforcement

A condition of taking part in the Electric Nation trial<sup>2</sup>, requires customers to complete a number of surveys during the course of the Project to enable the Project to understand participants' attitudes toward charging their EVs and their level of acceptance of varying degrees of managed charging. As the trial progresses and the level of managed charging changes, the customer research will map any alterations in the participants' attitudes towards charging their vehicles and managed charging.

Customer contact details are collected by DriveElectric, the project partner responsible for customer recruitment and associated data protection<sup>3</sup>, as part of the enrolment process. The graphic below demonstrates the exchange of participant data between DriveElectric and Impact Utilities.

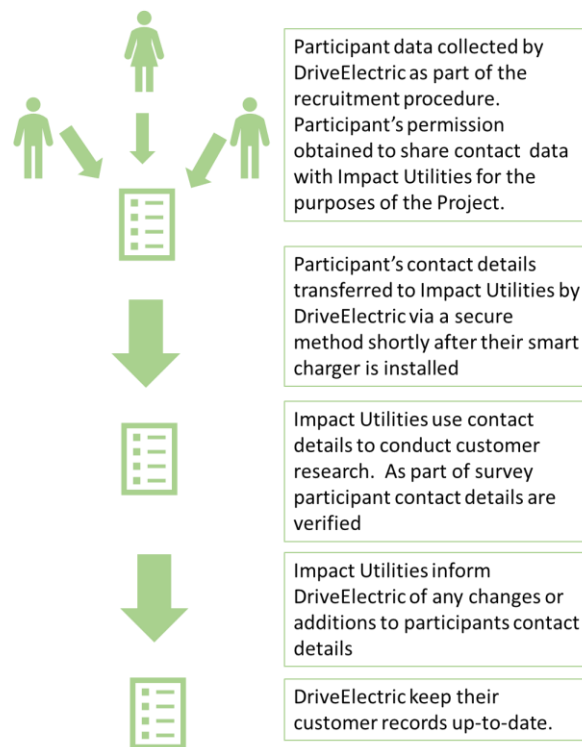
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<sup>2</sup> This condition is highlighted in project publicity literature, such as the Project website and brochure (which can be accessed via the Project website <http://www.electricnation.org.uk>)

<sup>3</sup> The Projects Data Protection Strategy can be found at: [http://www.electricnation.org.uk/wp-content/uploads/2016/11/NIA\\_WPD\\_013-CarConnect-Data-Protection-Strategy-FINAL.pdf](http://www.electricnation.org.uk/wp-content/uploads/2016/11/NIA_WPD_013-CarConnect-Data-Protection-Strategy-FINAL.pdf)

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Figure 1: Exchange of participant data between DriveElectric and Impact Utilities



Shortly after the installation of a participant's smart charger they are asked to complete the Recruitment survey (see Appendix 1). This survey concentrates on collecting demographic and socio-economic data, information about the participants, their PIV and their level of satisfaction with their smart charger installation experience. Approximately six weeks later participants are asked to complete a Baseline survey (see Appendix 2). This questionnaire gathers data about the participant's charging habits either (i) before they experience managed charging or (ii) as they enter the trial under managed charging<sup>4</sup>. Further surveys will be conducted during each managed charging cycle, and then a final survey will be conducted at the end of the trial.

Before the mass installation of smart chargers for trial participants began, a small cohort of 10 pilot installations was carried out. These majority of these ten 'friendly' pilot installations were with members of staff of either DriveElectric or EA Technology, the benefit of the latter being the close proximity to the test rig at EA Technology. These pilot installations were used to finalise the installation procedure and uncover any technical bugs before trial participants received their smart chargers. The pilot participants were asked to complete the trial surveys to uncover any issues with the contact procedure or point out any ambiguous text in the surveys. The survey responses from the pilot participants will be included in the final survey data and because of the large sample size of trial participants to

<sup>4</sup> The first 100 customers entering each arm of the trial (arm being defined by which of the PIV demand management systems they are assigned to) will not be put under demand management for 3 months, in order to allow them to develop charging habits in a "charge at will" environment – this is a control population. After this 3 month period these customers will be put under demand management to allow comparison with those customers that join the trial and are put under demand management from the day they join the trial (i.e. those joining the trial after the control group is recruited)

be recruited (500-700) their data will not be significant; however, because of the small sample size recruited so far, the pilot installations may add a weighting to the responses included in this report.

## 2 Data Collection

Recruitment in the trial (and, so, installations of smart chargers into customer's homes) started in January 2017.

This report is based on the data collected from the Recruitment surveys of trial participants in the weeks after the installation of their Electric Nation smart charger and a small sample of data collected from the first Baseline survey. The table below summarises the number of Recruitment surveys completed as of 13<sup>th</sup> April 2017.

Surveys Sent	Surveys completed
100%	61%
56	34

Table 1: Recruitment surveys completed

A much smaller number of participants have been in the Project long enough to be asked to complete Baseline survey 1. The table below summarises the number of Baseline surveys completed. Pilot installation participants dominate these survey responses.

Surveys Sent	Surveys completed
100%	31%
23	7

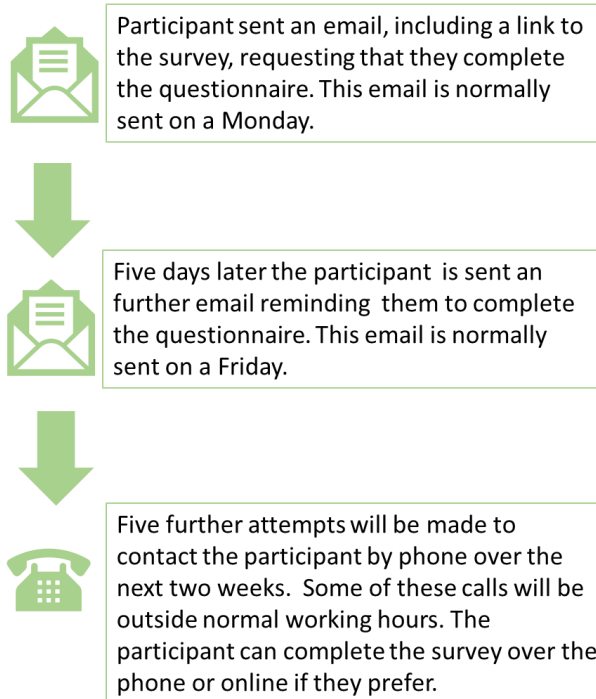
Table 2: Baseline surveys completed

The tables above represent a snapshot of the number of surveys completed at the time that this report was written – it is expected that many participants who have received their survey but not completed it, to date, will still do so.

The graphic below demonstrates the procedure used by Impact Utilities to encourage trial participants to complete questionnaires.



Figure 2: Procedure used to encourage participants to complete questionnaires



For all trial surveys, the participant is sent a link to the questionnaire by email (Appendix 3 and 4). If they fail to complete the survey within an allotted period then the link will be re-sent with a further email reminding them to complete the questionnaire. If the participant still does not complete the survey, then the survey company will attempt to contact the participant by telephone. The participant will be telephoned several times over the following weeks.

Participants will receive vouchers for an online store (such as Amazon) for completing each of the surveys **apart from** the Recruitment survey and the Baseline survey. Completion of the Recruitment survey and the Baseline survey are a mandatory condition of trial participation and therefore not rewarded.

The response rate to the surveys sent to participants thus far is above average for market research surveys of this type.

### 3 Participant Demographics

The Recruitment survey provides demographic and socio-economic data about the trial participants. This survey provides the Project with a survey population and frame of reference against which all future survey measurements will be compared. It should be noted that:

- The survey population is representative of the population **who have been recruited to date**



- As seen below, the population recruited is skewed towards affluent males, aged 36-55, so not representative of the WPD regional customer base,
- Surveys completed by participants after each demand management trial will be matched demographically to the Baseline survey population, so that the Project is always comparing a like for like population.

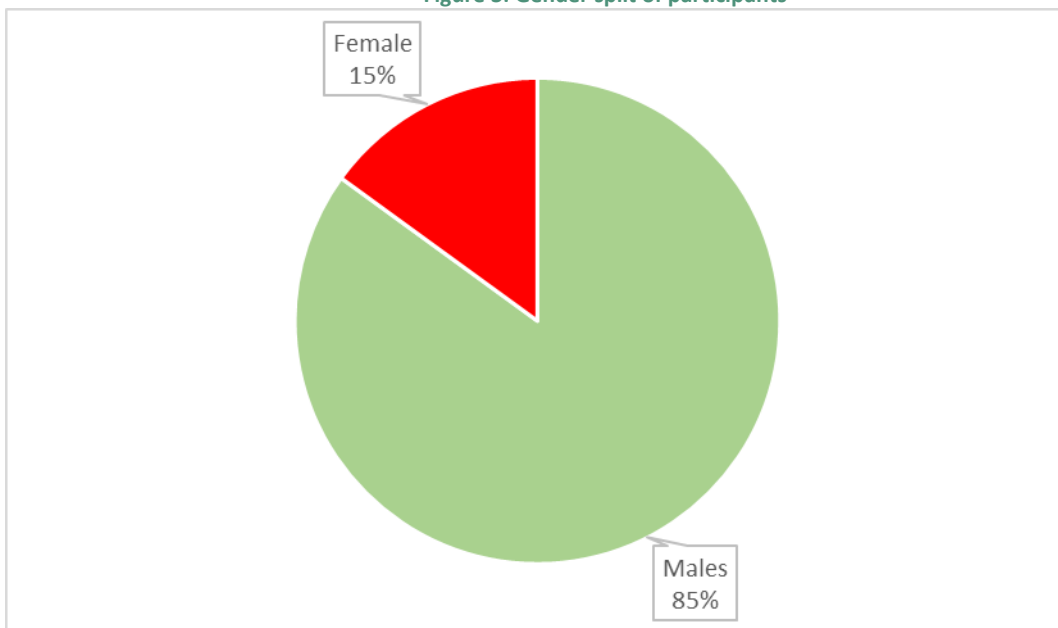
Recruitment for the trial is still at an early stage and the sample size is therefore limited; the data below is not statistically sound nor necessarily representative of the final participant cohort. The charts and graphs below illustrate the demographics of the trial participants who have completed the recruitment survey to date.

The Recruitment and Baseline survey data includes those pilot installation participants whom it has been agreed can be included in the trial data.

### 3.1 Gender

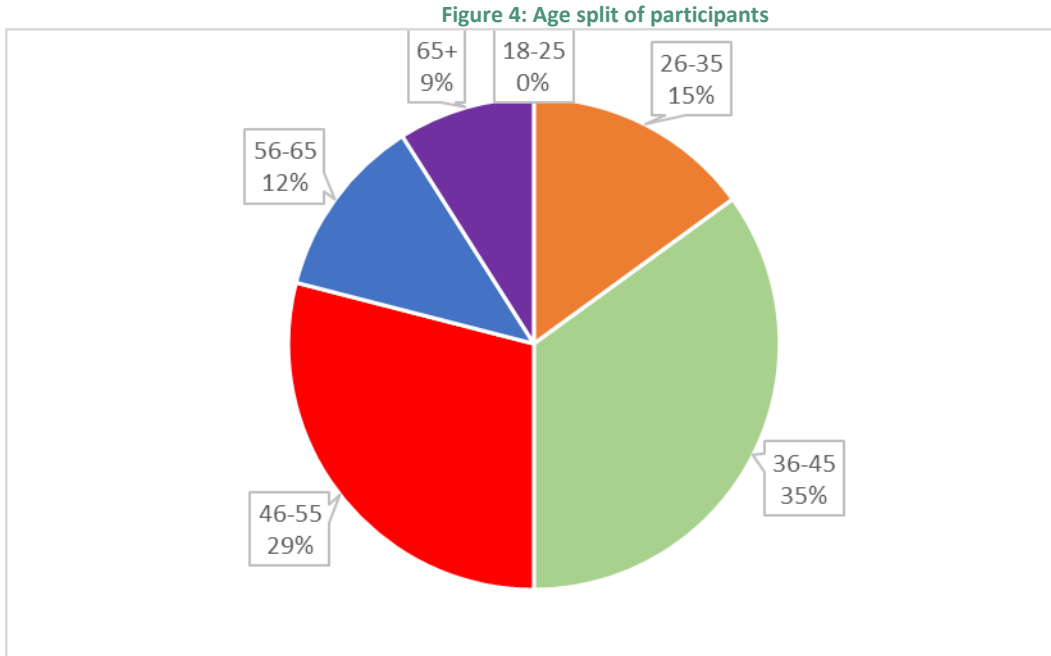
There is a pronounced gender split amongst participants. 85% of participants are male, compared with 15% female.

Figure 3: Gender split of participants



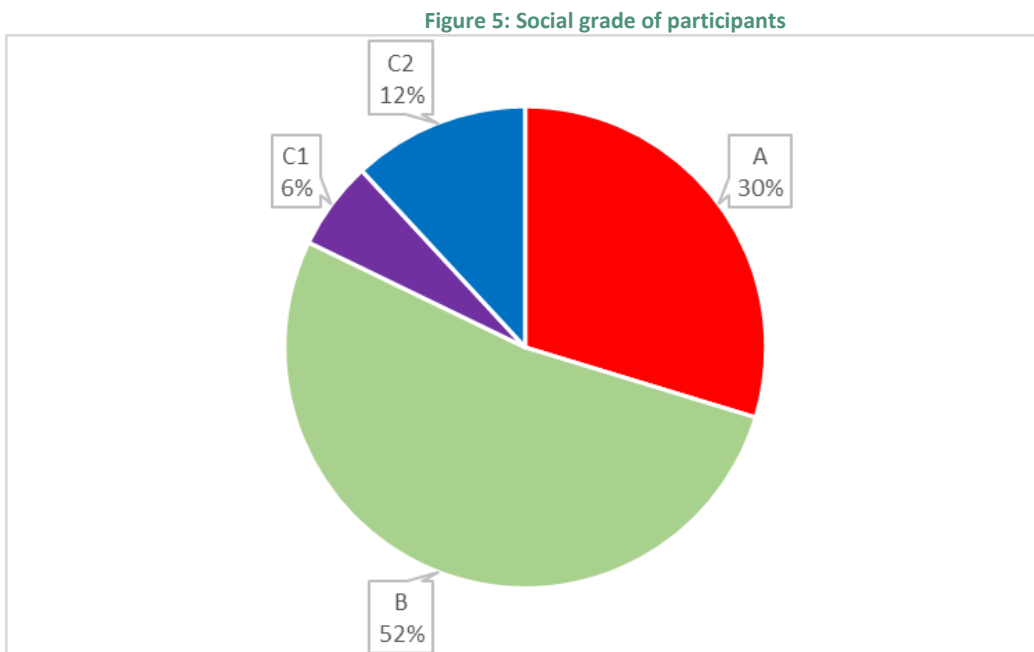
### 3.2 Age

The chart below demonstrates the age split of participants. Most participants are aged between 36 and 55.



### 3.3 Socio-economic data

The chart below shows the professional background of participants.



The table below provides a breakdown of the socio professional segmentations of the categories above.

Category	Definition
A	Higher Managerial, administrative, and professional
B	Intermediate Managerial, administrative, and professional
C1	Supervisory, clerical and junior managerial, administrative and professional
C2	Skilled manual workers
D	Semi-skilled and unskilled manual workers
E	State pensioners, casual and lowest grade workers, unemployed with state benefits only

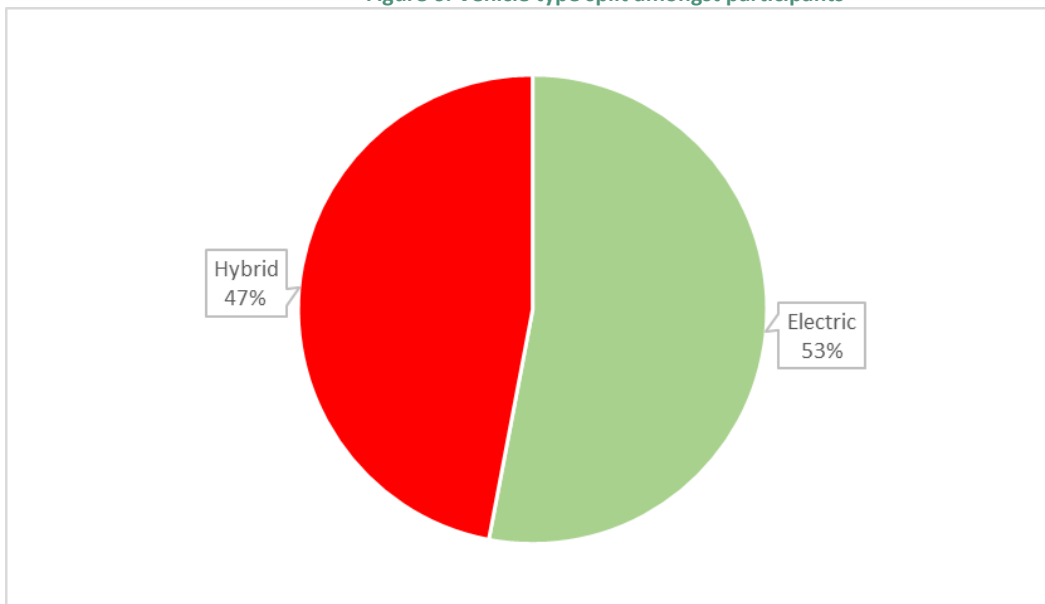
Table 3: Socio-professional categories

Most trial participants are engaged in Higher or Intermediate professions.

### 3.4 Car type

The chart below shows the split among participants who own Plug-in battery electric vehicles (BEVs) and hybrids (PIHVs).

Figure 6: Vehicle type split amongst participants



Based on current data the trial has recruited slightly more participants driving BEVs than participants driving PIHVs.

The recruitment survey results so far suggest that the trial population is skewed towards affluent males aged 36 to 55.

## 4 Baseline survey

The data from the baseline surveys is taken exclusively from the pilot installation group and is a relatively small sample group. This data has therefore not been analysed for inclusion in this report.

All measurements of acceptability will be compared with the Baseline survey so it is important for the Baseline survey to be statistically robust. So far, 86% of trial participants are satisfied with the current charging requirements based on scores of 8, 9 and 10 out of 10. This is only an indication, as there are many more participants who will complete the Baseline survey. Ideally, the trial will need to achieve parity with this Baseline survey or achieve a score which is not statistically significantly below 86% at the 95% confidence level, in order to prove that a particular demand management alternative is acceptable to the trial population.

## 5 Ongoing and Future Work

At the time of writing (April 2017) Impact Utilities are in the process of creating the survey to be used after each demand management trial that Project participants experience. Trial participants will normally experience between four and six different demand management regimes each lasting about four months. The trial surveys will be based on the Baseline survey (Appendix 2) to allow comparison of results between the population who are not experiencing managed charging, and each demand management trial population. It will allow Impact Utilities to be able to compare, and calculate with statistical confidence, whether the trial population change their charging or driving habits as a result of experiencing demand management. It will also allow a judgement to be made about the acceptability of particular demand management solutions to the trial population.

After the end of the trial the trial population will be asked to complete a final survey. This survey will seek to establish if trial participants were happy with the trial experience, if they still drive EVs, and if so to establish if being part of the Electric Nation trial altered either their driving or charging habits.

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## Appendix 1 – Recruitment Survey

### Electric Nation Recruitment Questionnaire

December 2016

568 Electric Nation	ONLINE SCRIPT DRAFT 14/12/16	Susie Smyth, Michael Branch, Lucy Upshall, Helen Rackstraw
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#### INTRODUCTION TO THE RESEARCH AND ADHERENCE TO MRS CODE OF CONDUCT

**CATI ONLY:** Hello, may I speak to **NAME FROM SAMPLE** please?

C1. I am calling from Impact Research about the Electric Nation project that you recently agreed to take part in. We recently sent you a survey link by email, can I check whether you received that email?

Yes

No – **CONFIRM EMAIL ADDRESS WITH RESPONDENT MATCHES SAMPLE**

C2. We would be really grateful if you would be able to complete this survey as soon as possible, I can take you through the questions now on the phone, or if you prefer you can complete it online? The survey should take no longer than 10 minutes.

Phone - **CONTINUE**

Online – **CHECK IF NEED LINK RE-SENDING, THANK AND CLOSE.**

Thank you for agreeing to participate in this important project about the future of electric vehicles. This is the first of a number of surveys you will be asked to take part in during the trial and should take no more than 10 minutes to complete, depending on the answers you give us. The purpose of this survey is to check the information we hold about you and gather some background about your household before you start the trials. This information will be used in combination with that from the other trial participants to understand how perceptions might vary by different groups.

This is a genuine market research study and no sales call will result from our contact with you. The interview will be carried out in strict accordance with the Market Research Society's Code of Conduct. Your identity and any information you provide to us will be kept confidential and will not be used for any purposes other than this research. Your details were provided to us

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by DriveElectric and only Impact Research and DriveElectric will have access to your personal contact information so that we can keep in touch with you throughout the trials.

### SAMPLE CONFIRMATION

We already have some details about you that were passed to us by DriveElectric that we would like to check all are correct before we continue.

**S ASK ALL**

**A1** Can we check your full name is **INSERT FROM SAMPLE** .....

Correct

Wrong – **INSERT NAME HERE**

**S ASK ALL**

**A2** And is this your home address where your charging point is installed? **INSERT FROM SAMPLE** .....

Correct

Wrong – **INSERT CORRECT ADDRESS HERE**

Is your postcode?

**INSERT FROM SAMPLE** .....

Correct

Wrong – **INSERT CORRECT POST CODE HERE**

**QHIDDNO**

**AUTOCODE DNO FROM POSTCODE LIST:**

- 1) WPD (East Midlands)
- 2) WPD (South West)
- 3) WPD (Wales)
- 4) WPD (West Midlands)
- 5) Electricity North West
- 6) Guernsey Electricity
- 7) Jersey Electricity
- 8) Manx Electricity Authority
- 9) Northern Ireland Electricity
- 10) Northern Powergrid
- 11) Scottish Hydro
- 12) Southern Electric
- 13) SP Distribution
- 14) SP Manweb
- 15) UKPN

**S ASK ALL**

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**A3** Is this the best telephone number on which we can contact you on for the duration of the trials?

Correct

Wrong – **INSERT CORRECT NUMBER HERE**

**S ASK ALL**

**A5** And is this your preferred email address?

Correct

Wrong – **INSERT CORRECT EMAIL ADDRESS HERE**

**A6** And can I confirm your vehicle is...

FROM SAMPLE:

FULL EV OR HYBRID

CAR MAKE AND MODEL

(ALLOW EDITING FOR ANY FIELDS THAT ARE WRONG)

**S ASK ALL**

**A7** Does your household have regular access to any other vehicles apart from the electric/hybrid vehicle registered for this trial?

Yes (**SPECIFY MAKE AND MODEL**)

No

**S ASK IF YES AT A7**

**A8** How many other vehicles does your household have regular access to?

1

2

3+

**S ASK ALL**

**A9** Which of these best describes how you personally use the electric/hybrid vehicle registered for this trial?

I am the main driver

I drive the car regularly but am not the main driver

I rarely or never drive the vehicle **CONFIRM WITH RESPONDENT, CLOSE, AND CONTACT IMPACT AS ALL DRIVERS SHOULD BE REGULAR DRIVERS OF THE VEHICLE.**

**M ASK ALL**

**A10** Apart from you, who else is likely to drive the electric/hybrid vehicle registered for this trial?

Please select all that apply.

My partner

---



Another household member  
Someone who does not live in the household  
Only me EXCLUSIVE

Thank you for confirming that information. We will now ask you some questions about your household.

**DEMOGRAPHICS AND HOUSEHOLD INFORMATION**

**S ASK ALL,**

**B1** Please record your gender below.

- 1) Male
- 2) Female

**S ASK ALL**

**ADD VALIDATION RULE NO YOUNGER THAN 16 AND UP TO 99 YEARS OLD**

**B2** Please record your age below.

..... Years old

**AUTOMATICALLY CODE INTO THE FOLLOWING AGE BREAKS (HIDDEN VARIABLE]**

**IF CODE 1 CLOSE**

**QHIDAGE** Please record **age** below

- 1) Under 18
- 2) 18-25
- 3) 26-35
- 4) 36-45
- 5) 46-55
- 6) 56-64
- 7) 65+

**S ASK ALL**

**B3** Which of the following best describes **your** employment?

- 1) Self employed
  - 2) Employed over 30 hours a week
  - 3) Employed part time, 15-30 hours a week
  - 4) Employed part time, less than 15 hours a week
  - 5) Full time Student
  - 6) Unemployed- seeking work
  - 7) Unemployed- other
  - 8) Looking after the home/children full time
-

- 9) Retired
- 10) Unable to work due to sickness or disability
- 11) Other (please specify)

**S ASK IF CODE 1, 2, 3, 4 AT B3**

IF CODE 5, 6, 7, 8 SKIP TO B5

**B4** Is your work...

1. Mainly daytime work
2. Mainly evening work, from 7pm to 11pm
3. Mainly night work, 11pm to 5am
4. Shifts that change from day to day or week to week

**B5** How many people (including children) are there in your household altogether (that is currently living at home with you)?

Please include yourself in the total.

**ENTER NUMBER 1-20**

IF 2 OR MORE AT B5 ASK B6

**B6** How many children live permanently in your household?

**ENTER NUMBER 0-20**

**S ASK ALL**

**B7** Which ONE of the following categories best describes the employment status of the **Chief Income Earner** (CIE) in your household?

- 1) Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc)
  - 2) Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus/ Ambulance Driver, HGV driver, pub/bar worker etc)
  - 3) Supervisory or clerical/ junior managerial/ professional/ administrative (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc)
  - 4) Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) doctor, Solicitor, Board director of small organisation, middle manager in large organisation, principle officer in civil service/local government etc)
  - 5) Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc)
  - 6) Student
  - 7) Casual worker – not in permanent employment
  - 8) Housewife/ Homemaker
  - 9) Retired and living on state pension
-

- 10) Retired and not living on state pension
- 11) Unemployed or not working due to long-term sickness
- 12) Full-time carer of other household member

**S ASK IF CODE 10 AT B7**

**B8** Which ONE of the following categories best describes the employment status of the Chief Income Earner *before* they retired?

**SHOW THE SAME LIST AS B7, EXCLUDING CODES 9 AND 10**

**AUTOMATICALLY CODES OF QUESTIONS B7 AND B8 INTO SOCIAL ECONOMIC GRADE AS FOLLOWS:**

CODE 1	D
CODE 2	C2
CODE 3 OR 6	C1
CODE 4	B
CODE 5	A
CODE 7 OR 8 OR 9 OR 10 OR 11 OR 12	E

**S GRID ASK ALL**

**B9** Which of these best represents your **total** household income before tax and other deductions, either per month or per year.

This information will only be used to check that we have surveyed a mixture of different customers.

**ONLY ALLOW ONE ANSWER IN ONE COLUMN**

	PER MONTH	PER YEAR
1	Up to £539	Up to £6,499
2	£540 - £789	£6,500 - £9,499
3	£790 - £1289	£9,500 - £15,499
4	£1290 - £2079	£15,500 - £24,999
5	£2080 - £3329	£25,000 - £39,999
6	£3330 - £4999	£40,000 - £59,999
7	£5000 - £7499	£60,000 - £89,999
8	£7500 and over	£90,000 and over
98	Don't know	Don't know
99	Prefer not to say	Prefer not to say

**S ASK ALL**

**B10** Which of the following do you have in your main charging address?

Mains electricity only  
Mains electricity and mains gas  
Mains electricity and another fuel source such as oil

**S ASK ALL**

**B11** Do have solar panels (photovoltaics) at your home address?

Yes  
No  
Not sure

**S GRID ASK ALL**

**B12** On average, how much is your combined spend, on gas **and** electricity?

**ONLY ALLOW ONE ANSWER IN ONE COLUMN**

	<b>PER MONTH</b>	<b>PER YEAR</b>
1	Less than £35 per month	Less than £400 per year
2	£35 - £49	£400 - £599
3	£50 - £65	£600 - £799
4	£66 - £85	£800 - £999
5	£86-£100	£1,000 - £1,199
6	£101 - £115	£1,200 - £1,399
7	£116 - £130	£1,400 - £1,599
8	£131-£149	£1,600 - £1,799
9	Over £150 per month	£1,800 or more per year
98	Don't know	Don't know
99	Prefer not to say	Prefer not to say

**QHIDFUELPOV:**

**1 FUEL POOR – IF MORE THAN 10% OF INCOME SPENT ON FUEL BASED ON RESPONSE AT B9 AND B12**

**2 NON-FUEL POOR – IF LESS THAN 10% OF INCOME SPENT ON FUEL BASED ON RESPONSE AT B9 AND B12**

**C1** Finally, Have you experienced any technical difficulties while taking the survey?

1. No
2. Yes (Please specify)

Thank you for the information you have provided today. We will be in touch again once you have had your vehicle and been charging it for a few weeks to understand a little more about how you use and charge you vehicle.

If you have any questions in the meantime about the survey you have just done, or future surveys, please contact Impact Research on 01932 226 793 and ask for a member of the Electric Nation team. Our full contact details and those of the Electric Nation project partners such as DriveElectric were provided to you in your welcome pack. Please do not hesitate to get in touch if you have any questions.

Thank you.

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## Appendix 2 – Baseline Survey

### Electric Nation Recruitment Questionnaire

February 2017

568 Electric Nation	ONLINE SCRIPT FV 22/02/17	Susie Smyth, Michael Brainch, Lucy Upshall, Helen Rackstraw
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#### INTRODUCTION TO THE RESEARCH AND ADHERENCE TO MRS CODE OF CONDUCT

**CATI ONLY:** Hello, may I speak to **NAME FROM SAMPLE** please?

C1. I am calling from Impact Research about the Electric Nation project that you recently agreed to take part in. We recently sent you a survey link by email, can I check whether you received that email?

Yes

No – **CONFIRM EMAIL ADDRESS WITH RESPONDENT MATCHES SAMPLE**

**CATI ONLY:** C2. We would be really grateful if you would be able to complete this survey as soon as possible, I can take you through the questions now on the phone, or if you prefer you can complete it online? The survey should take no longer than 5 minutes.

Phone - **CONTINUE**

Online – **CHECK IF NEED LINK RE-SENDING, THANK AND CLOSE.**

#### ASK ALL

Thank you for agreeing to participate in this important project about the future of electric vehicles. This is the second survey that you will be asked to take part in during the trial and should take no more than 5 minutes to complete, depending on the answers you give us. The purpose of this survey is to gauge how you are currently charging your electric vehicle. This information will be used in combination with that from the other trial participants to understand how behaviour might vary by different groups.

This is a genuine market research study and no sales call will result from our contact with you. The interview will be carried out in strict accordance with the Market Research Society's Code of Conduct. Your identity and any information you provide to us will be kept confidential and will not be used for any purposes other than this research. Your details were provided to us

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by DriveElectric and only Impact Research and DriveElectric will have access to your personal contact information so that we can keep in touch with you throughout the trials.

## USE

We have some details about you we would like to check are correct before we continue.

### **M ASK ALL**

**A1** Firstly, what do you use your electric vehicle for? Please select all that apply.

- 1) Social
- 2) Business
- 3) Commuting

### **S ASK ALL**

**A2** Does your household have regular access to any other vehicles apart from the electric/hybrid vehicle registered for this trial?

- 1) Yes
- 2) No

### **S ASK IF A2=YES**

**A2a** How many other vehicles does your household have regular access to apart from the electric/hybrid vehicle registered for this trial?

- 1) ..... **(SPECIFY MAKE AND MODEL FOR EACH)**

### **M ASK IF A2 = YES PLEASE SHOW ON SAME PAGE AS A2**

**A3** Is your other vehicle(s)... Please select all that apply.

- 1) Electric
- 2) Range extended electric
- 3) Plug in Hybrid
- 4) Hybrid
- 5) Petrol
- 6) Diesel
- 7) Other (please specify)

Thank you for confirming this information. We will now ask you some questions about your electric vehicle.

## CHARGING BEHAVIOUR

### **M ASK ALL, ROTATE ALL**

**B1** To what extent do you agree or disagree with the following statement, where 1 is strongly disagree and 5 is strongly agree.

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- 1) My charging behaviour varies considerably from day to day
- 2) My charging behaviour has a regular routine
- 3) Whenever I have access to a charger, I plug in, regardless of the level of charge of the vehicle
- 4) I will only plug in to charge when the battery is too low to complete my current/next journey

**M ASK ALL, MULTICODE**

**B2** Where do you charge your electric vehicle? Please select all that apply.

- 3) Home
- 4) Service station (motorway) / Petrol station
- 5) On street charge point
- 6) Work
- 7) Supermarket/Shopping centre car parks
- 8) Other Car parks (please specify)
- 9) Friend/relative's house
- 10) Other (please specify)
- 11) Don't know

**S ASK ALL, SINGLE CODE**

**B3** And, where do you charge your electric vehicle most often?

**INSERT ALL SELECTED AT B2**

**S ASK ALL, SINGLE CODE BY ROW**

**B4** How often do you charge your electric vehicle in the following locations?

	1)	2)	3)	4)	5)	6)	7)	8)
<b>Location</b>	More than once a day	Once a day	5 -6 times a week	3-4 times a week	Once – twice a week	Once a fortnight	Less than once a fortnight	I don't have charging routine / Don't know
<b>INSERT ALL SELECTED AT B2</b>								

**M ASK ALL, MULTICODE**

**B5** When do you typically charge your electric vehicle at the following locations? Please select all that apply to each location.

	1)	2)	3)	4)	5)
<b>Location</b>	Morning	Afternoon	Evening	Overnight	I don't have a standardised charging routine
<b>INSERT ALL SELECTED AT B2</b>					

**S ASK ALL**

**B6** Thinking about when you charge your electric vehicle in the following locations, how long do you charge your electric vehicle for on each occasion?

	1)	2)
<b>Location</b>	<b>PROGRAMMER: NUMERIC BOX</b>  _____ hours	I don't have a charging routine / Don't know
<b>INSERT ALL SELECTED AT B2</b>		

**S ASK ALL**

**B7A** How do you tend to judge when to charge your electric vehicle?

- 1) Number of miles left
- 2) Percentage of battery left
- 3) Other (please specify)

**S ASK IF B7A = 1**

**B7B** At what point would you feel like you need to charge the battery of your electric vehicle?

- 1) 10 miles or below
- 2) 20 miles or below
- 3) 50 miles or below
- 4) 100 miles or below
- 5) 150 miles or below
- 6) More than 150 miles

7) Other (please specify)

**S** **ASK IF B7A = 2**

**B7C** At what point would you feel like you need to charge the battery of your electric vehicle?

- 1) Below 75% charge
- 2) Below 50% charge
- 3) Below 25% charge
- 4) Other (please specify)

**S** **ASK ALL**

**B8** On a scale of 1 – 10, where 1 is completely unacceptable and 10 is completely acceptable, how **acceptable** are your current charging arrangements?

- 1) 1 – Completely unacceptable
- 2) 2
- 3) 3
- 4) 4
- 5) 5
- 6) 6
- 7) 7
- 8) 8
- 9) 9
- 10) 10 – Completely acceptable
- 11) Don't know (Please specify why)

**S** **ASK ALL**

**B9** On a scale of 1 – 10, where 10 is very satisfied and 1 is very dissatisfied, how **satisfied** are you with your current charging arrangements?

- 1) 1 - Very dissatisfied
- 2) 2
- 3) 3
- 4) 4
- 5) 5
- 6) 6
- 7) 7
- 8) 8
- 9) 9
- 10) 10 – Very satisfied
- 11) Don't know

**S** **ASK ALL**

**B10** Which statement best describes your attitude to changing your charging behaviour

- 1) I am very willing to continue with this current charging arrangement indefinitely
  - 2) I am willing to continue with this current charging arrangement for a limited time only
  - 3) I would prefer alternative charging arrangements
  - 4) I cannot continue with these current charging arrangements
-

**OE ASK IF CODES 2 – 4 SELECTED AT B10**

**B11** Why do you say that?

**S ASK ALL**

**B12** How do you feel about having your charging arrangements managed as part of the trial?

- 1) Not at all concerned
- 2) Slightly concerned
- 3) Quite concerned
- 4) Very concerned
- 5) Not sure

**OE ASK ALL**

**B13** Why do you say that?

**INSTALLATION QUESTIONS (DE)**

Thinking back to when you had your charge point installed....

**G ASK ALL**

**I1** Overall can you tell us what you thought of your experience with DriveElectric in terms of... **ROWS**

- a) Contact with DriveElectric
- b) Information provided to you about the project
- c) Administration of your application for the charger

**COLUMNS**

- 1) Very poor
- 2) Poor
- 3) Neither poor nor good
- 4) Good
- 5) Very good

**S ASK ALL**

**I2** How was your experience of the install itself?

- 1) Very poor
- 2) Poor
- 3) Neither poor nor good
- 4) Good
- 5) Very good

**S ASK ALL**

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- I3** Did the installer explain how safety would be managed as part of the installation?
- 1) Yes
  - 2) No
  - 3) Can't remember

**OE ASK ALL**

- I4** Is there anything you feel you need more information on regarding the project?  
**OPEN ENDED**

Thank you for providing that information. I would just like to confirm your contact information is up to date.

**CONTACT INFORMATION**

**S ASK ALL**

- C1** Can I confirm that this is still the best number to contact you on?
- 1) Yes
  - 2) No

**S ASK IF C1 = 2**

- C2** Please provide the best number to contact you on in the future?
- \_\_\_\_\_

- C3** Finally, have you experienced any technical difficulties while taking the survey?

1. No
2. Yes (Please specify)

Thank you for the information you have provided today. We will be in touch again once the first trial is underway and you have had few weeks to charge your vehicle.

If you have any questions in the meantime about the survey you have just done, or future surveys, please contact Impact Research on 01932 226 793 and ask for a member of the Electric Nation team. Our full contact details and those of the Electric Nation project partners such as DriveElectric were provided to you in your welcome pack. Please do not hesitate to get in touch if you have any questions.

Thank you.

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## Appendix 3 – Recruitment Survey Invitation

Dear

You are receiving this survey invitation based upon you signing up to the **Electric Nation** research project. Your details were given to us by our project partner **Drive Electric**.

This initial survey will collect some background information about yourself and your electric vehicle, which will be used throughout the duration of the project. All details collected will be kept confidential and only be used for the purpose of this research as outlined in the welcome back. The information you provide for us is important to help us understand how different electric vehicle users' experiences might vary.

**To take part in the survey, please read the following and click on the relevant link below:**

<SURVEY LINK>

This survey should take approximately 10 minutes to complete. Please aim to complete the survey within the next seven days, after which time we may be in contact with you to remind you to complete the survey as soon as you can.

As part of this research you will be asked to complete up to seven further surveys throughout the next two years as previously explained.

If you have any queries about the Electric Nation surveys we send you please contact us at Impact Research on 01932 226 793 or [electricnation@impactmr.com](mailto:electricnation@impactmr.com). If you have any other questions about the research then please refer to your welcome pack for relevant contact details. We look forward to receiving your feedback.

Kind regards,

Impact Utilities

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## Appendix 4 – Baseline Survey Invitation

Email subject: Electric Nation Survey 2

Dear

Thank you for completing the first survey as part of the **Electric Nation** research. **Now you have had your charger for a few weeks** we would like to ask you about your experience so far.

This survey is to understand your initial charging habits before the demand management trial begins. All details collected will be kept confidential and will only be used for the purpose of this research, as outlined in the Welcome Pack. The information you provide for us is important to help us understand how different electric vehicle users' experiences might vary.

**To take part in the survey, please read the following and click on the relevant link below:**

<SURVEY LINK>

This survey should take approximately 5 minutes to complete. Please aim to complete the survey within the next seven days, after which time we may contact you to remind you to complete the survey as soon as you can.

As part of the Electric Nation project you will be asked to complete up to six further surveys throughout the next two years, as previously explained.

If you have any queries about the Electric Nation surveys we send you, please contact us at Impact Research on 01932 226 793 or [electricnation@impactmr.com](mailto:electricnation@impactmr.com). If you have any other questions about the Electric nation project then please refer to your Welcome Pack for relevant contact details. We look forward to receiving your feedback.

Kind regards,

Impact Utilities

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