Consumer attitudes to electric vehicles in the UK: emerging results from the national ultra low carbon vehicle demonstrator

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• The UK innovation agency investing in business to drive economic growth

• Working across business, universities and government

• Investment of around £300m a year

• Started in 2007!
Low Carbon Vehicle Innovation Platform Goals

• Growth of the UK Automotive Sector

• Acceleration of the introduction of Low Carbon Vehicles

• Reduction of carbon dioxide emissions from transport
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Driving Innovation

- Near to Market £16m + £12m
- Demonstrator £12m + £13m
- IDP1 Efficiency £5m + £7m
- IDP2 Roadmap £5m
- IDP4 Supply Chain £6m + £9m
- IDP6 Capability £9m
…ULCV Demo is the first major step in a journey…

2010

- Ultra Low Carbon Vehicle Demonstrator

2015

- ‘Plugged In Places’ (OLEV)
- Consumer Incentives (OLEV)

2020

- Volume Commercialisation

UK means business
The Competition was designed to provide:

- Evaluation by multiple drivers and drive cycles
- Real World Testing through in-vehicle logging and analysis (supported by Cenex)
- Opportunity to understand customer perceptions and concerns (supported by Oxford Brookes University)
- Examination of interface challenges with infrastructure
- Use of passenger cars on the road for 12 months each
- Total Funding Value £25m
Driving Innovation

Technology Strategy Board

Ford
Scottish and Southern Energy
Strathclyde University

Allied Electric Vehicles
Scottish Power
Axeon Batteries
Strathclyde University,
Glasgow City Council

Toyota
EDF Energy
MET Police, Transport for London,
GCDA

BMW Mini-E
Scottish and Southern Energy
Oxford Brookes University

Jaguar Land Rover (Tata), Smart,
Mitsubishi, Microcab
Eon Energy
Arup
Coventry and Birmingham City Councils
Aston and Coventry Universities

Delta Motorsport, Westfield Sports Cars,
Ecotricity Cars, Lightning
AEA Technology
Green Motion Eco Car Hire

Nissan, Smith Electric Vehicles,
AVID,
Liberty Electric Cars, Peugeot
Gateshead Council
Future Transport Systems
Newcastle University (TORG)

Nudge Advisory

Smart UK

Nudge Advisory
...and what has happened...

- **329** vehicles have been used in the trial
- Over **500** charging points installed
- **680,505** km travelled
- **80,414** individual journeys recorded
- **10,916** charging events
Comparison of individual journey distance from Quarter 1 and Quarter 4 data.

- **Average single journey:** 6.5m
- **96% of journeys less than 25m**
- **Furthest single journey:** 98m
Does the speed of charging suit the daily routine?

Charts showing whether the charging time would suit their daily routine.
How long should charging take?

• ‘Sufficiently good’
  • Down to 4hr 44 mins from 5hr 30 mins

• ‘Exceptionally good’
  • Up to 2hr 40 mins from 2hr 18 mins
Is the charging process difficult?

Charts showing evaluations of charging difficulty.
What is a “low charge”?*

*After 3 months use

Chart showing what users considered to be ‘low charge’*
When do you recharge?

- Whenever possible
- When prompted by the warning light
- At regular intervals

Chart showing when users charged their cars
Distribution of battery state of charge at the start of a charge.

- **prompted by warning light**
- **habitual charging?**
Is public charging necessary? (In principle)

Pre Experience

3 Months Experience

Charts showing whether a public charging infrastructure is essential
Is public charging necessary? (for real trips)

- Pre Experience
  - Agreed
  - Disagreed

- 3 Months Experience
  - Agreed
  - Disagreed

Charts showing whether daily trips could be completed without using a public charging facility
## Carbon impact...

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<thead>
<tr>
<th></th>
<th>Petrol / Diesel</th>
<th>EV Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Well to Wheel</strong></td>
<td>170.63 gCO$_2$e</td>
<td>120.13 gCO$_2$e</td>
</tr>
<tr>
<td><strong>Tank to Wheel</strong></td>
<td>144.2 gCO$_2$</td>
<td>0</td>
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Average CO2 emission estimates for this EV trial compared to petrol or diesel cars.
Conclusions…

- Over 300 vehicles have been involved in the trial.
- The typical usage of the trial vehicles aligns to the national data.
- Users learn and adapt to charging routines quickly.
- The perceived need for publicly available charging points reduces with experience.
- Electric Vehicles produce less CO2 than equivalent petrol/diesel cars, tailpipe and well to wheel.
- Further analysis will be conducted and disseminated during this year and next.
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