MY ELECTRIC AVENUE

DRIVING TOGETHER FOR A CLEANER FUTURE

Agenda

DRIVING TOGETHER FOR A CLEANER FUTURE

- EA Technology
- Electric vehicles in context
- Home energy use today
- My Electric Avenue
- Key learning
- A solution
- Legacy and next steps

Who is EA Technology?

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An engineering SME based in the Northwest of England

We support energy networks to become more cost-effective and reliable through:

- Power Engineering Consultancy
- Specialist Electrical Engineering Services
- Power Skills Training Services
- Specific products

We excel at partnership brokering, customer engagement and innovation:

- Customer-Led Network Revolution
- New Thames Valley Vision
- My Electric Avenue

- Employee-owned
- Values-led
- Innovation focused
- SME

ELECTRIC VEHICLES IN CONTEXT

EV uptake – a fast ramp up

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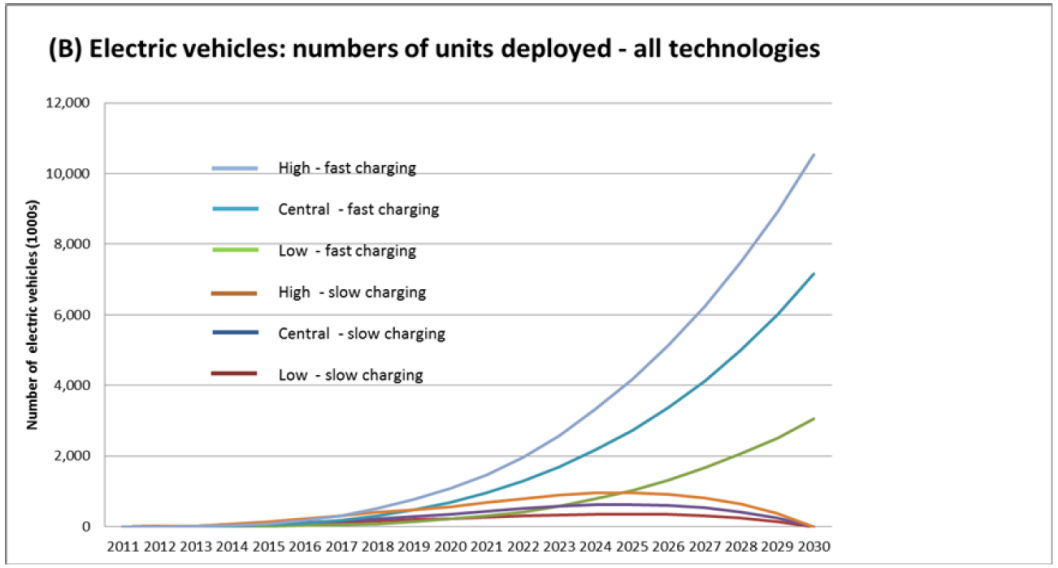
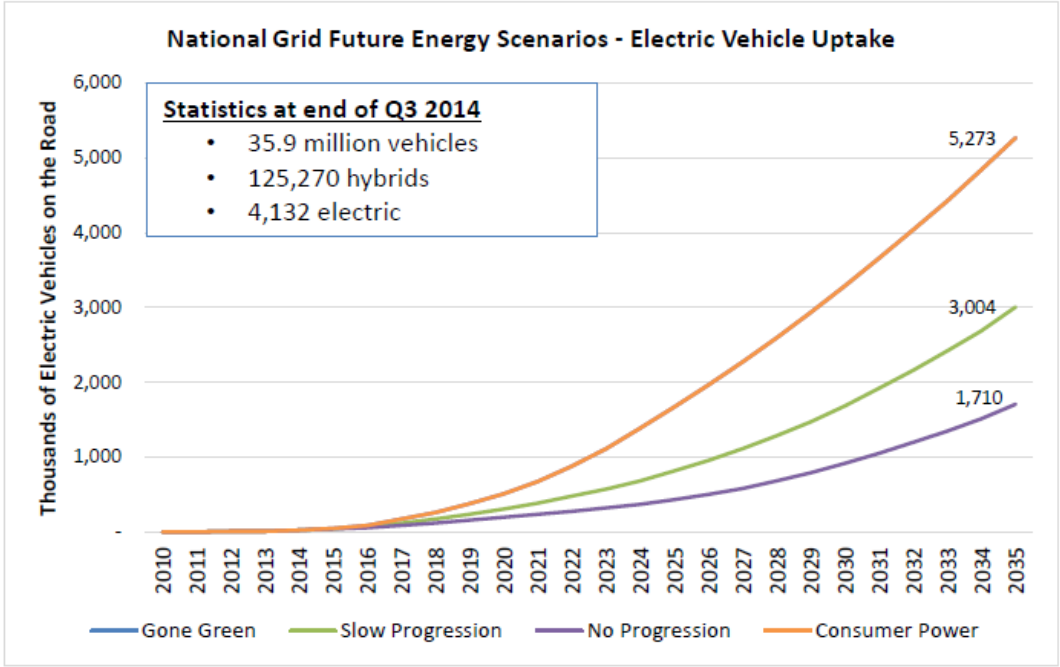


Source: Office for Low Emission Vehicles (OLEV)



EVs in London

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- Mayor's Air Quality Strategy: commits to 100,000 EVs on London streets by 2020
- Mayor's EV Delivery Plan 2009: 1,300 charge points by April 2013 (exceeded)
- UK Government (Office for Low Emission Vehicles) supports the EV market
- London is a Go Ultra Low city: £13m to create 'Neighbourhoods of the Future'
  - Hackney: >12 streets to go electric (e.g. street light car charging)
  - Harrow: Low Emission Zone to be developed (giving ULEVs same priority as buses at traffic lights)

Go Ultra Low

HOME ENERGY USE TODAY

Home energy use today

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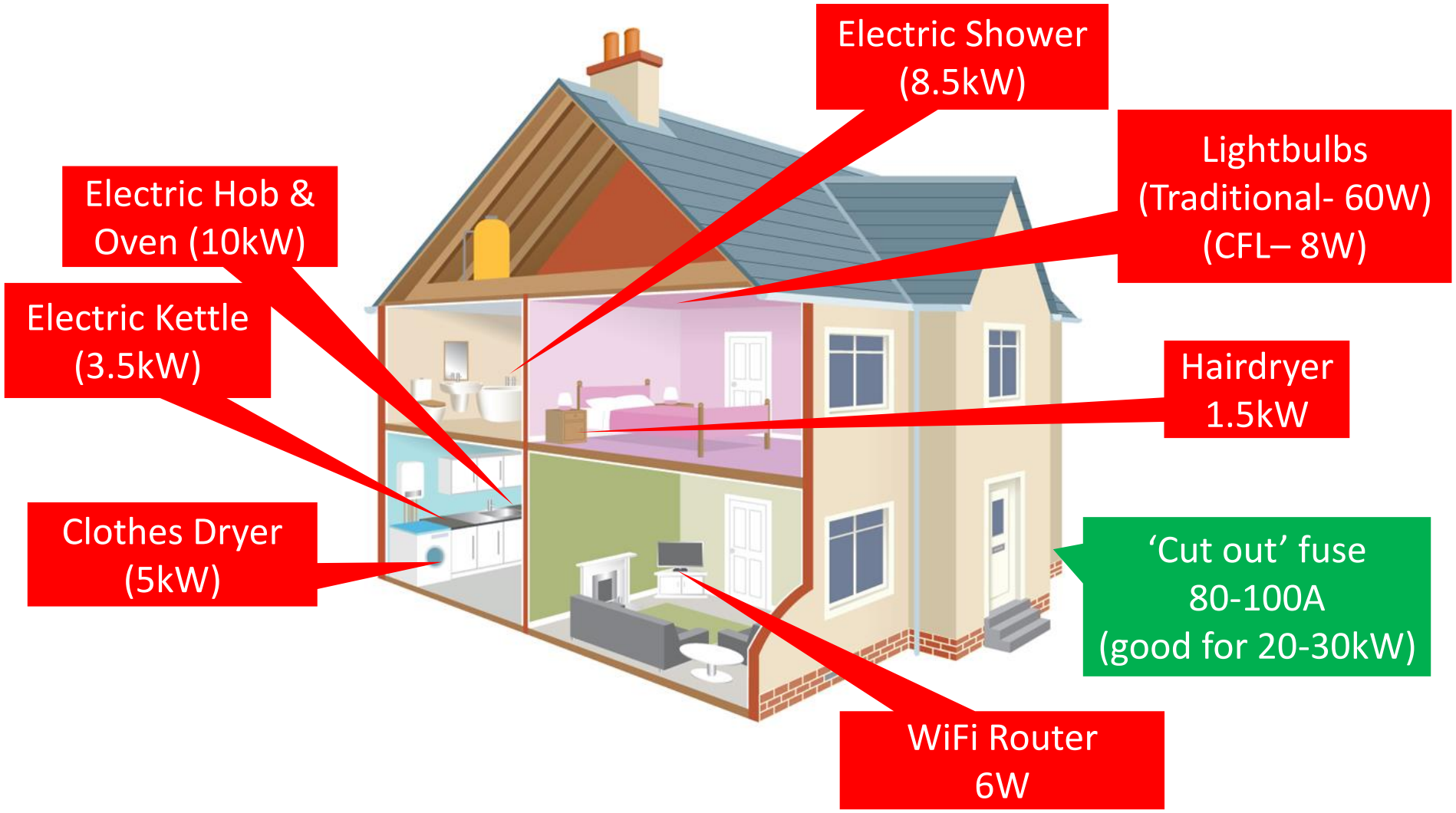

The impact of new (big) loads

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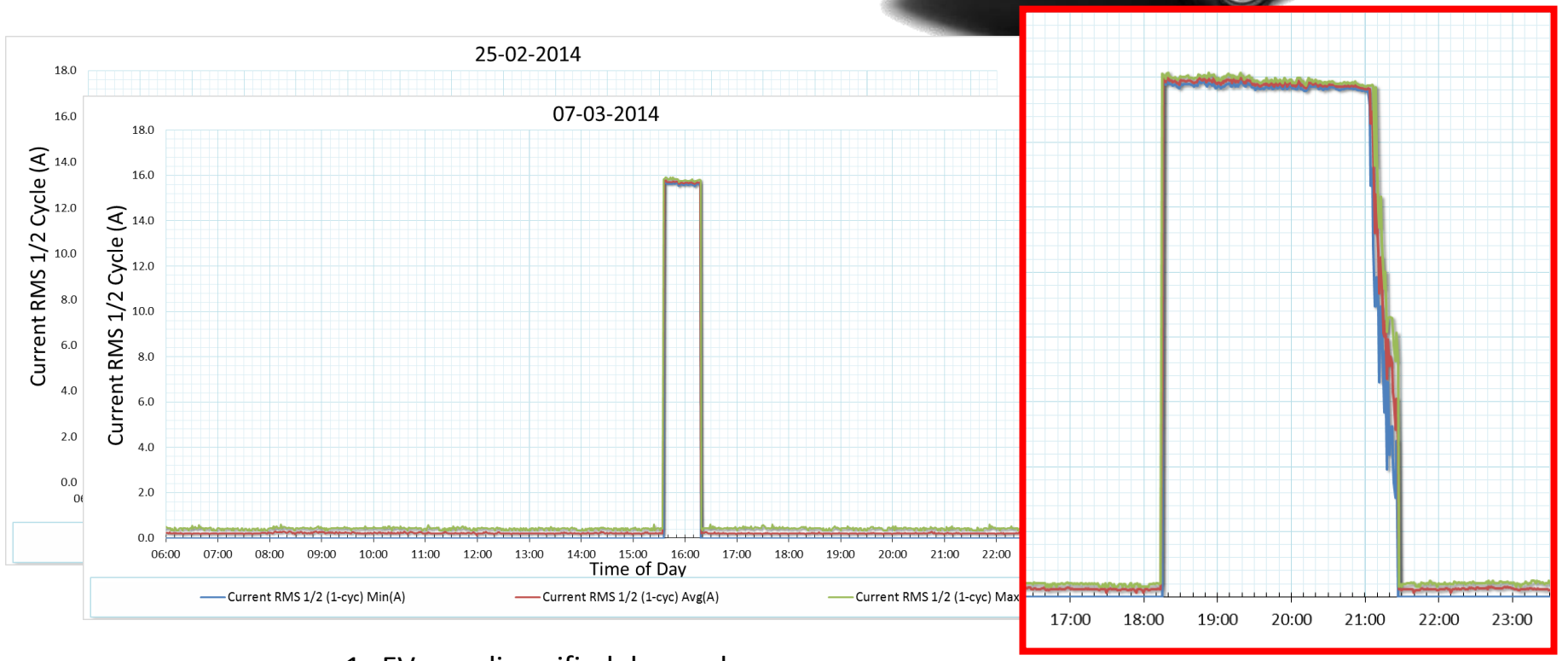
Charging demand of one EV

- 3.5kW or 7kW
- Demand depends on level of discharge
- Limited diversity



1x EV – undiversified demand

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MY ELECTRIC AVENUE

Innovation Squared: EVs

- **£10m, 3 year project** to understand the issue and trial a mitigation solution (Esprit)
- **Led by EA Technology**, working with SSEPD, Nissan, Northern Powergrid, Fleetdrive Electric, Zero Carbon Futures, plus many others
- £4.5m funded via **Ofgem's Low Carbon Networks Fund**

Largest network related **EV trial** in Europe:

- 220x 3.5kW charging Nissan LEAFs
- 18 month lease deals
- Locally clustered
- Controlled at peak times
- Datasets analysed

Real people, real cars, real networks. REAL LIFE

Esprit technology

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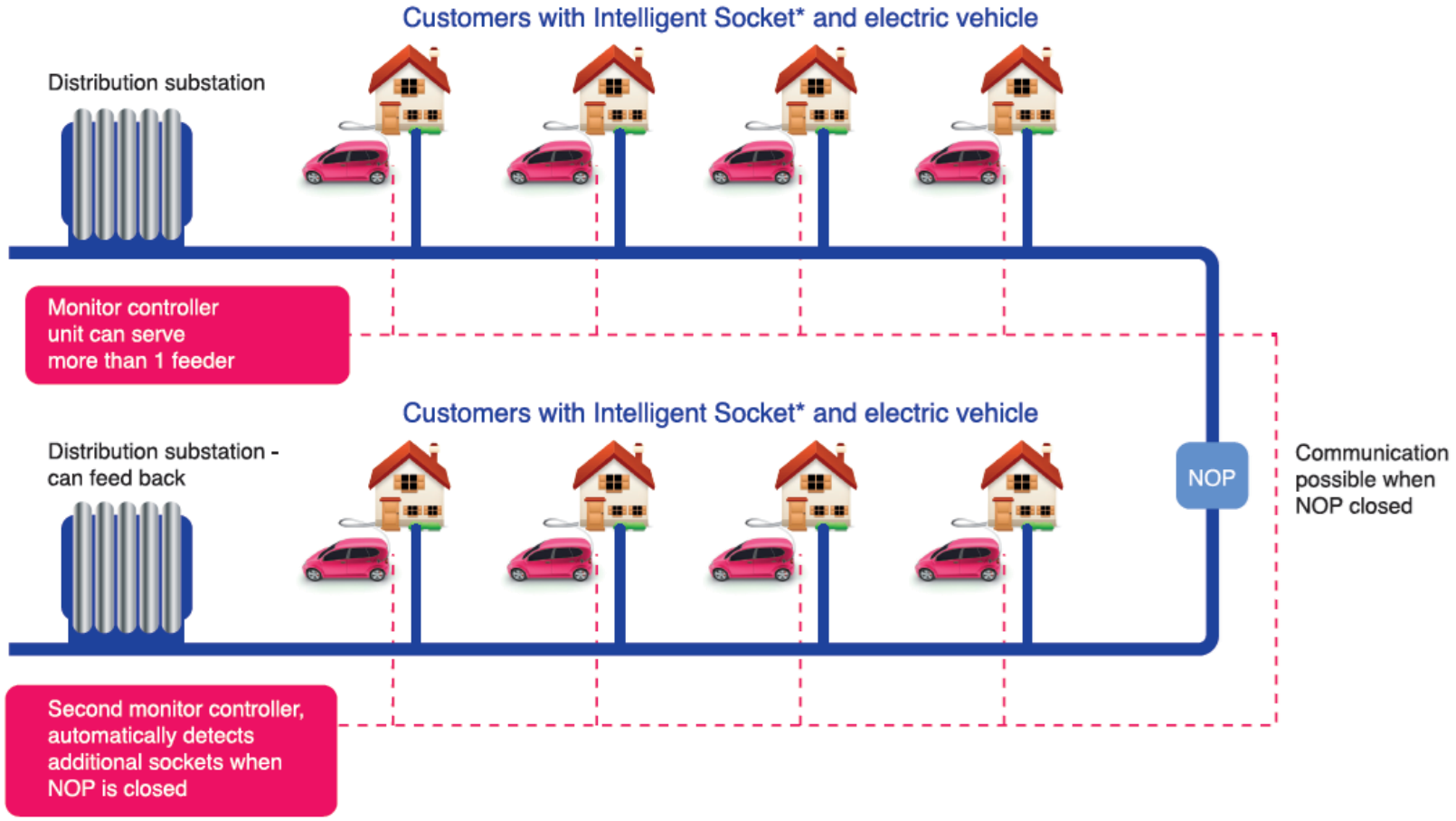

*the Esprit technology

Low Voltage cable

Communication, normally via PLC

NOP = Normally Open Point

PLC = Power Line Carrier

The need for customers

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Technical trial

Minimum of 100 customers in (very) local ‘clusters’

Social trial

Minimum of 100 customers across GB to improve statistical significance

The cluster challenge

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Key Milestones	
3 clusters	Sept 2013
5 clusters	Dec 2013
7 clusters	Mar 2014
100 EVs	Mar 2014



You'll never get 10 people on one street!…

Even if you do, you'll only get two or three clusters

…The contract stated

- *"No funding for cars / kit 'allowed' until **all** customers recruited"*
- *"Project would be halted if [above] criteria was not met"*

Stepping up to the mark

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See our website for test drive videos: www.myelectricavenue.info

Participant demographics

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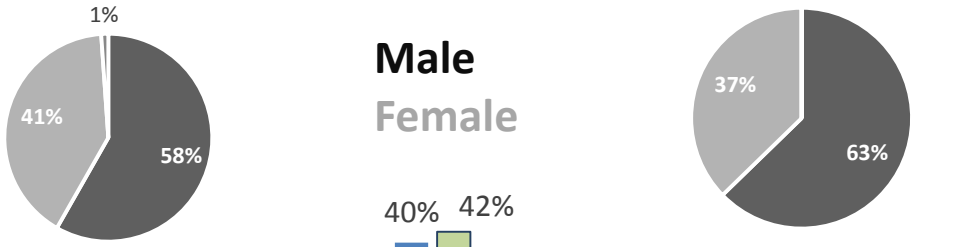
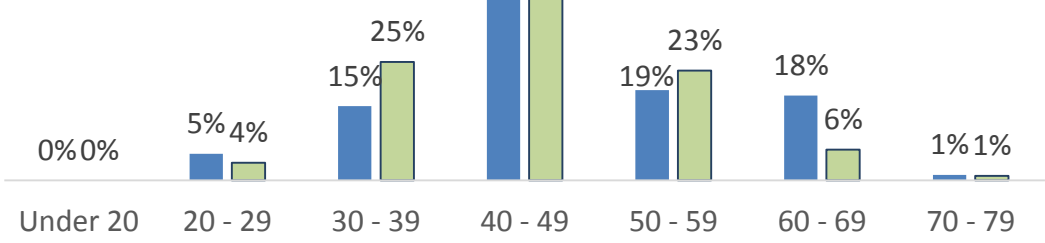
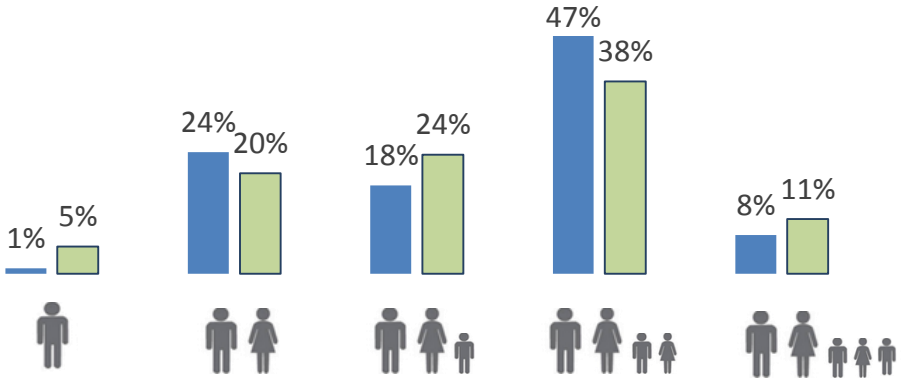
Technical trial
100 customers

Social trial
120 customers







KEY LEARNING

Time to charge

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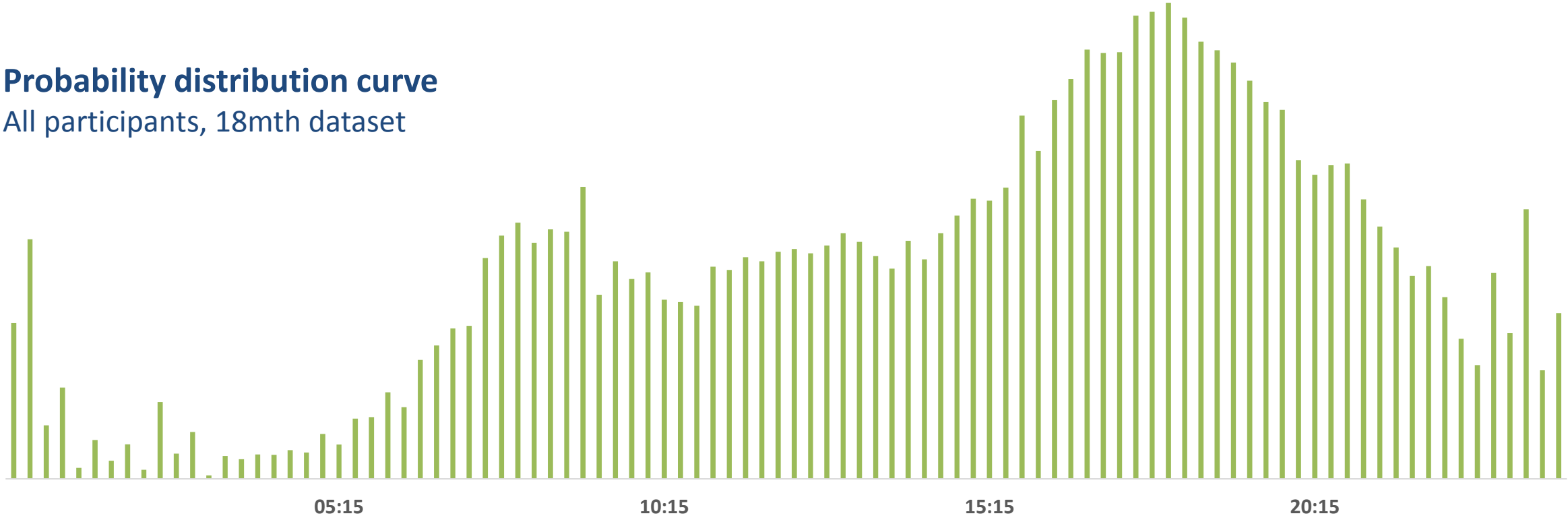
Charging happens during ‘peak’ demand hours – if unmanaged:

Probability distribution curve

All participants, 18mth dataset



‘Connection’ or ‘plug in’ time

Potentially doubling the load

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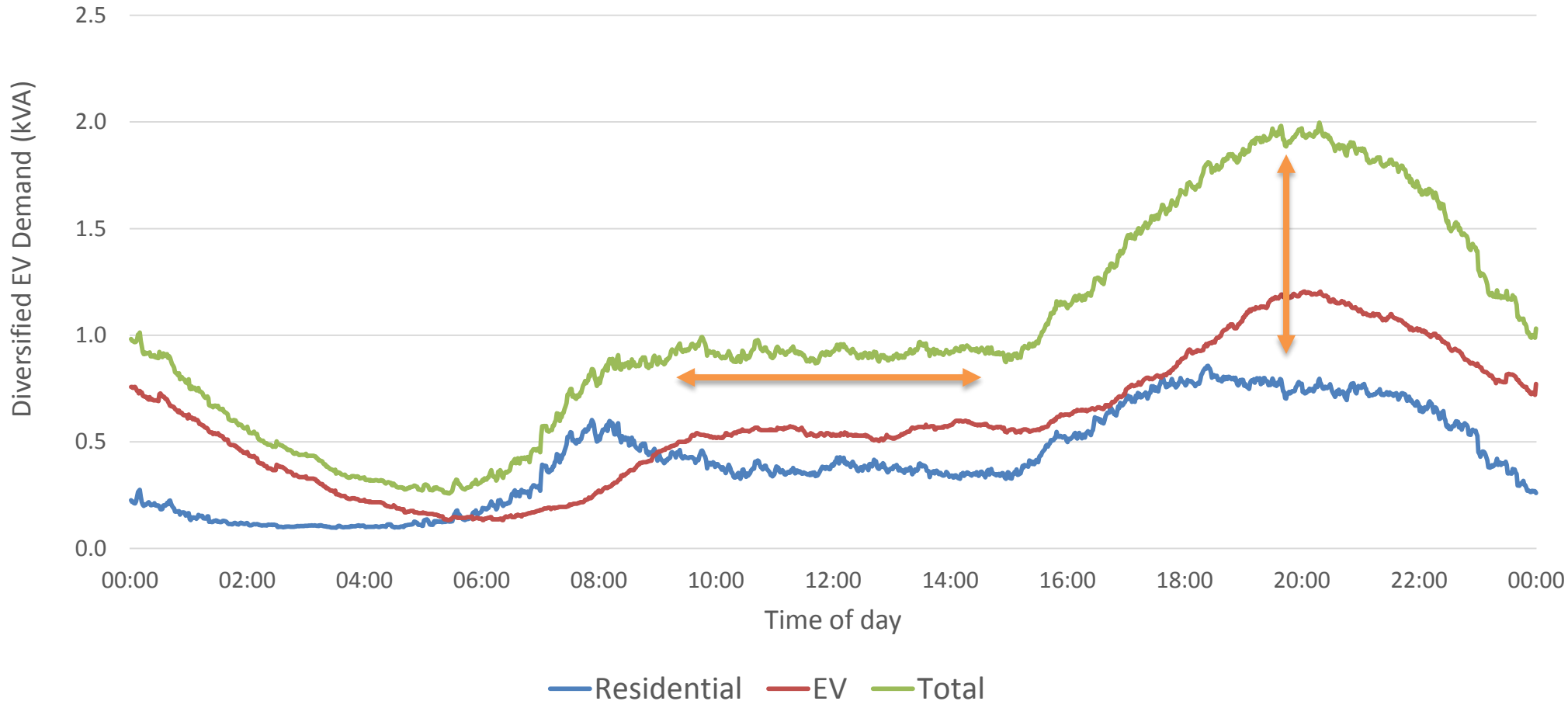

EV demand based on 1000 EVs (3.5kW charging) – impact is larger for fewer customers

So when should we start worrying..?

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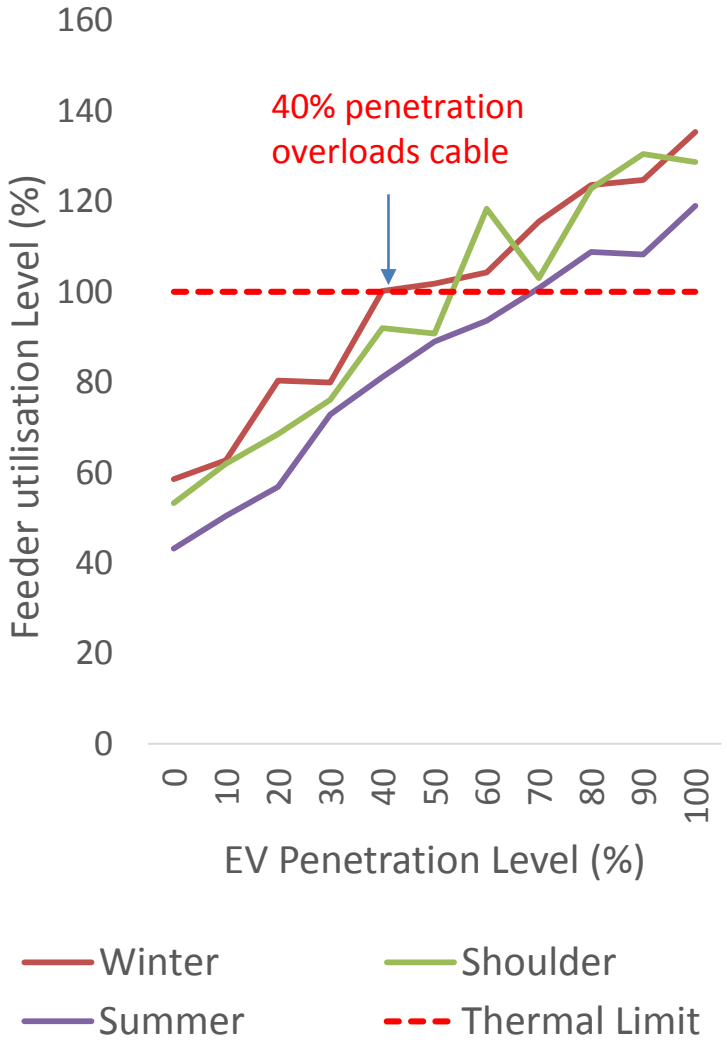
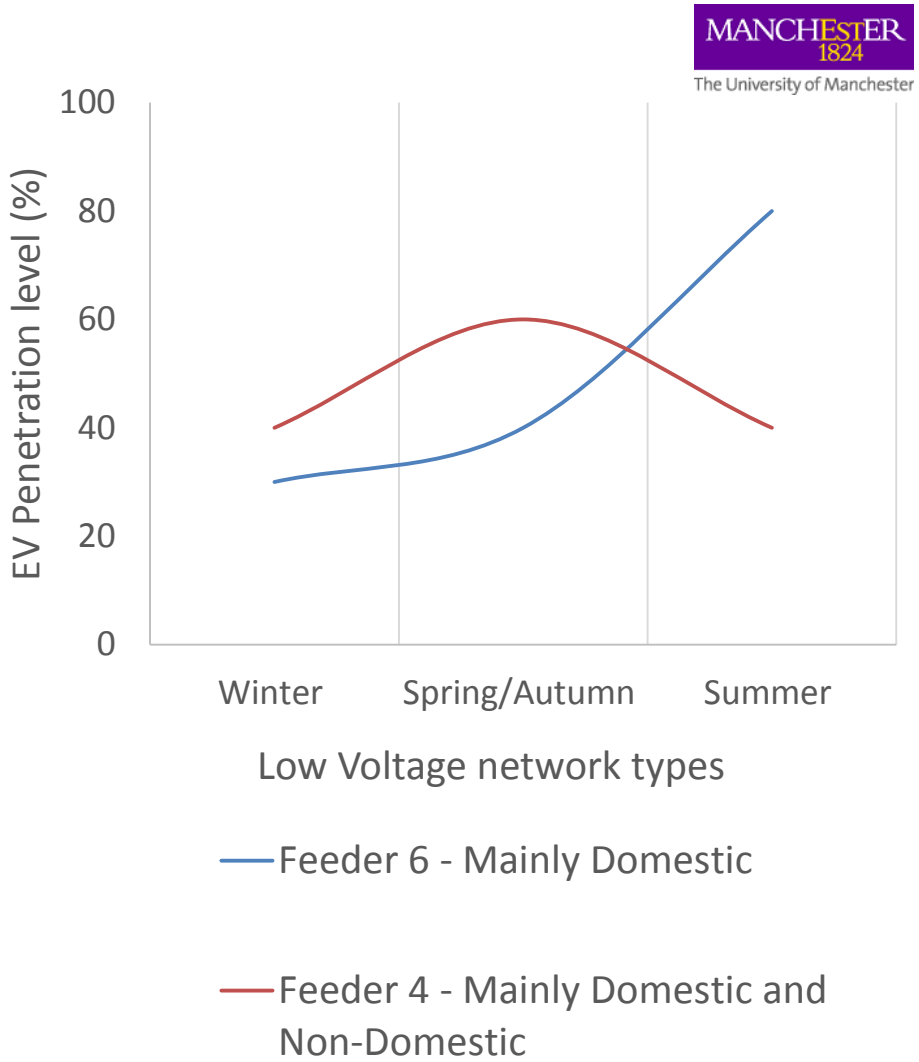
Figures for some of the real networks in the trial (with 3.5kW EV charging)





A SOLUTION

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Esprit and ‘DNO driven’ demand side response

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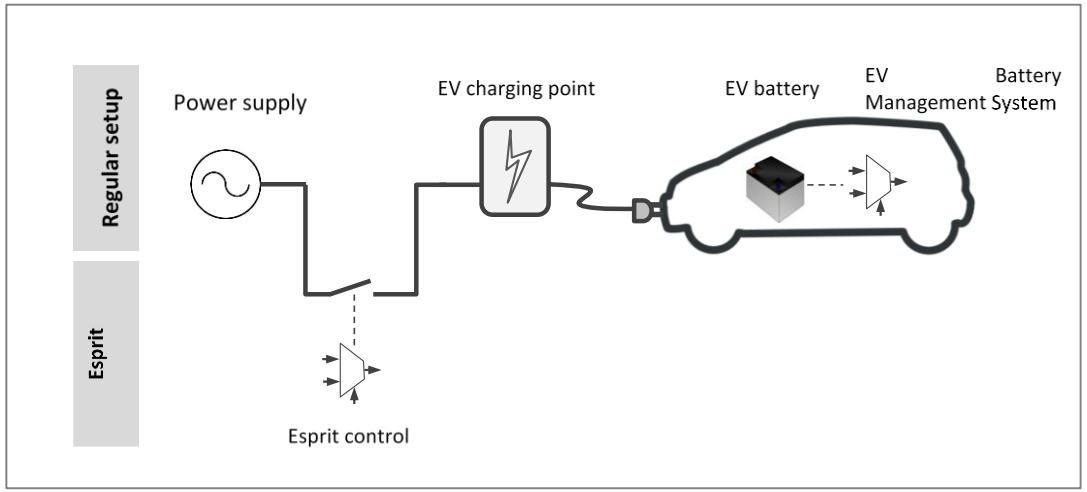

Esprit and 'DNO driven' demand side response Customer Acceptance

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Curtailment was / is accepted

It worked better in residential than workplace clusters

Educating the customer is essential

Our customers cited they were comfortable:

- ..because they only did short journeys or charged for 10 to 12 hours overnight
- ..they could work around any lack of charge by charging elsewhere
- .. they could always use another vehicle if necessary

THE LEGACY

Next steps – EV Network Group

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Office for Low Emission Vehicles

Transport for London

ofgem

cenex

Scottish and Southern Electricity Networks Power Distribution

beama

ena energynetworks association

citizens advice

SMMT DRIVING THE MOTOR INDUSTRY

IET The Institution of Engineering and Technology

nationalgrid

Institution of MECHANICAL ENGINEERS

ea technology

Next Steps – Smart EV project

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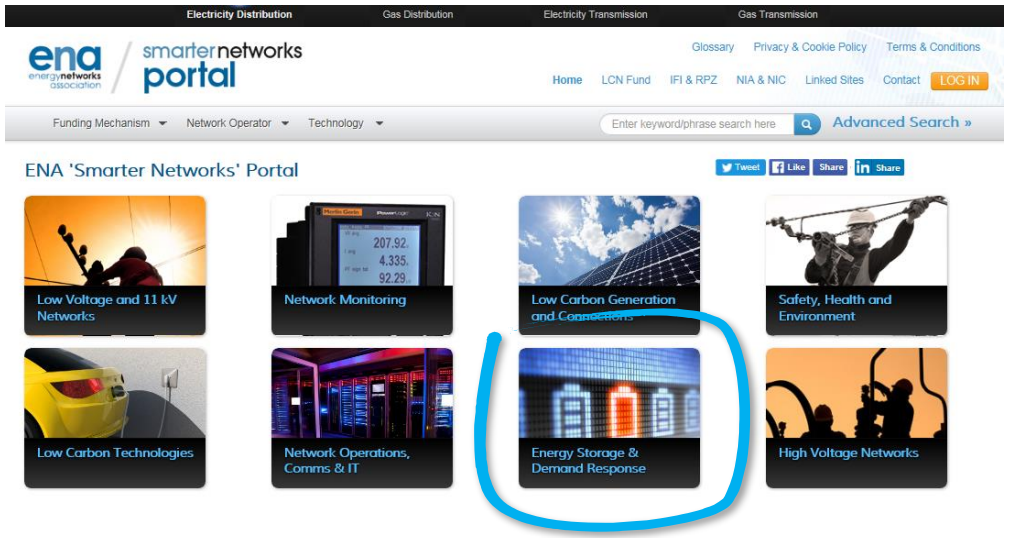

- New NIA project registered by SSEPD
- Desk-based with consultation
  - Led by EA Technology
- Supported by
  - All GB DNOs plus National Grid
  - Engagement of OEMs, Charging manufacturers, customer groups and Government organisations
- 18 month duration

Scope

1. Industry agreed **material to inform an ENA Engineering Recommendation (or equivalent)** available to third parties for supply and manufacture of the home end and the substation end controllers (the Solution).
2. A **functional specification** describing the system components and operation to allow vendors to produce a compliant Solution.
3. Evidence of UK EV **industry acceptance** of the Solution, including OEM engagement and clear path to adoption.
4. **Customer Messaging Strategy** to facilitate customer understanding and buy-in to PIV-network demand response tools to improve customer acceptance of the solution(s).

Sharing our Learning

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www.myelectricavenue.info

- Learning reports
- Project templates
- Presentations
- Downloadable datasets

Coming soon: Final (designed) versions of learning reports

Thank you

www.myelectricavenue.info

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Esprit and 'DNO driven' DSR Vehicle Acceptance

The switching of EV charging on and off will **damage the vehicle battery life**

The switching of EV charging will **affect relay life in the charger**

Switching of demand (or the threat of) **will affect EV uptake**