Learning and Improving

Distribution System Operation

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23 May 2019

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Our Duty…

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Our Duty…

The UK can end its contribution to global warming within 30 years by setting an ambitious new target to reduce its greenhouse gas emissions to zero by 2050, the Committee on Climate Change (CCC) - 2 May 2019

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DSO Vision

"Our VISION is to make the best use of our electricity networks and emerging technology to facilitate the decarbonisation of transport and heat at maximum pace, and minimal cost to UK plc"

HOW WILL WE ACHIEVE THIS?

1. **Enabling low carbon transition through networks – Our share of 10 million EV by 2030**
2. **Flexibility Now (Connections)**
3. **Transparency of Procurement of services or investment decisions to meet customer needs.**
4. **Community/ Local Energy Plans**
5. **Demonstrate broader value to customers i.e. DO THE RIGHT THING avoid unintended consequences.**

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DSO Keeping costs down to trade between A and B

B

Smart Solutions

Price Signals

Congestion

Active Management

Network Investment

A

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SAVE – Customer Behaviours

A story of two halves

SAVE Stage 1 discounted LED bulbs

19% of participants visit webpage

0.4% buy bulbs

OPT IN

No Discernible Network Impact

5-7% reduction in peak

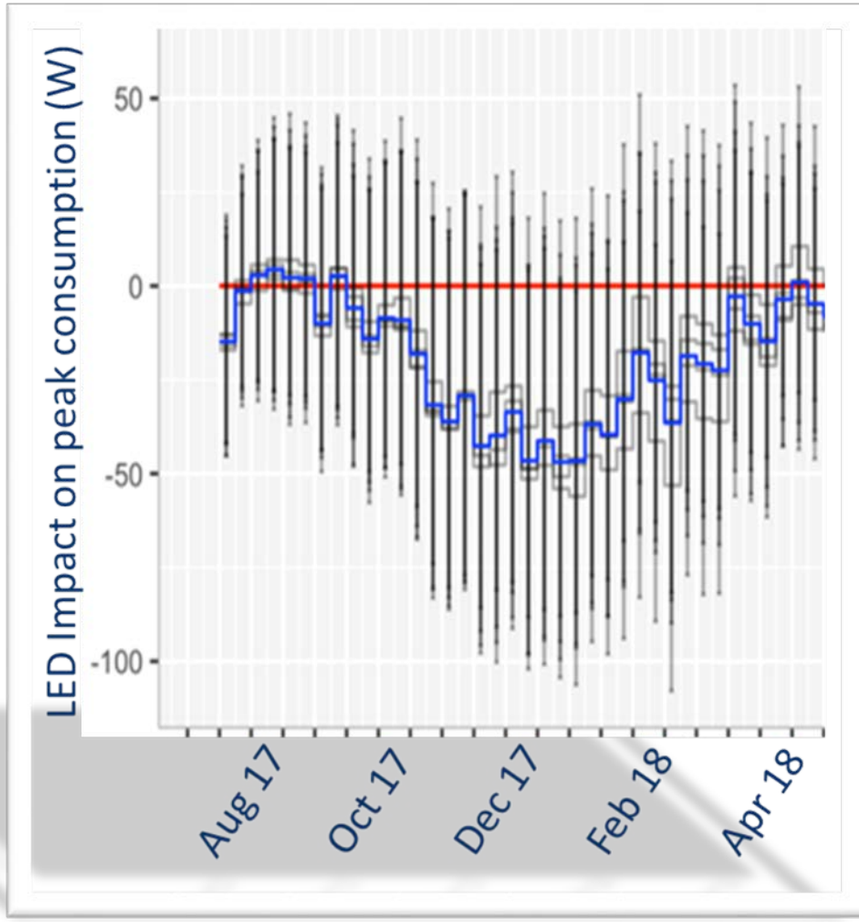
76% uptake of bulbs

Community &

OPT OUT

SAVE Stage 2- DNO led LED installs

Peak reduction % relative to control group



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Learning Points

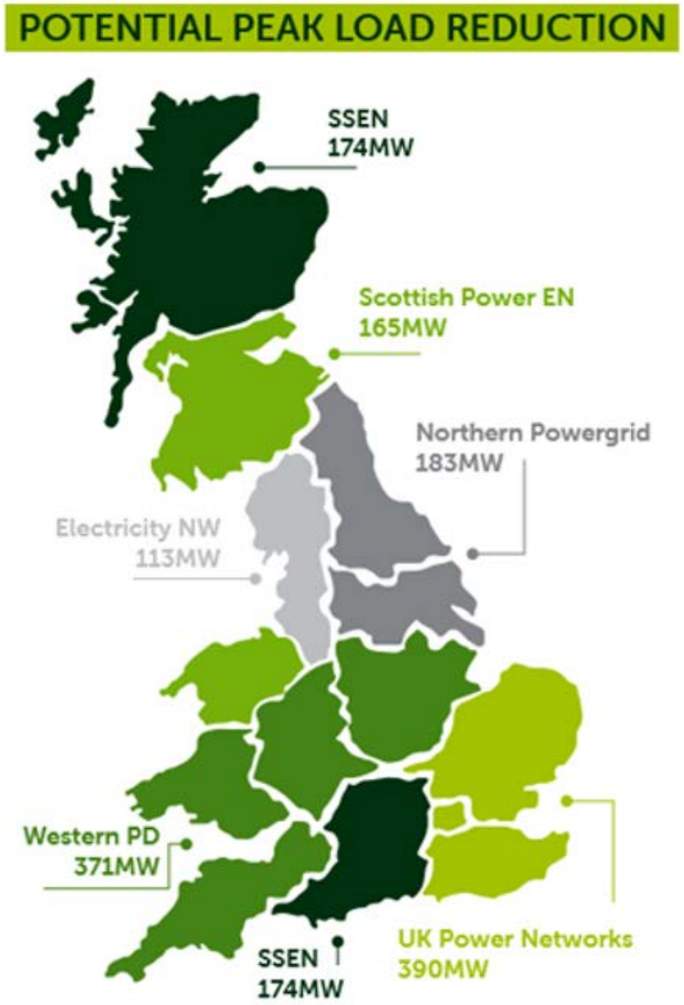
Smarter networks are safer, lower carbon networks

Behavioural changes required

- Cross learning from behavioural trials + ‘nudge’ messaging
  - Community Groups drive change rather than individual households
  - ‘Opt out’ rather than ‘opt in’ gain far better participation

Wider Social benefits – reduced energy requirement.

- Bill savings circa £16 per annum per participating customer
- UK Carbon reduction equivalent output 1 nuclear power station
- Impact greater on vulnerable customers
- Cross Utility and stacked rollout to make more cost effective:
  - Dealt with safety issues of light fittings etc when on site.
  - Electrical efficiency alongside water efficiency and gas/elec safety



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TASS - Transformer Auto Stop Start

LEAN (Low Energy Automated Networks) project used TASS technology to reduce losses at primary substations

➡ **60 MWh** Savings in 1 year (two trial sites)

Key high-level risks:

- Operational - consider the potential for:
  - Customer interruptions and Security of Supply
  - Power quality variance
  - Decrease in asset health
- Safety - automated switching
  safety risk if someone is near the switchgear or transformers when switching occurs.

TASS Trial - Risk Mitigation Strategy

Communicate risks and guide requirements:

Real Time Systems

Operational Technology

Network Management Centre

Maintenance & Inspection

Strategic Investment

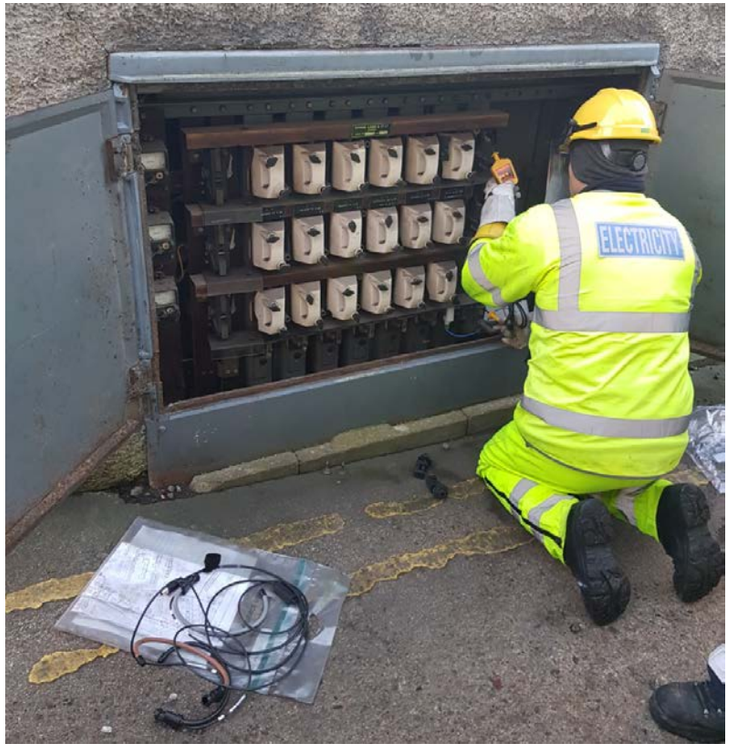
Protection & Substation Design

Cyber Risk & Information Security

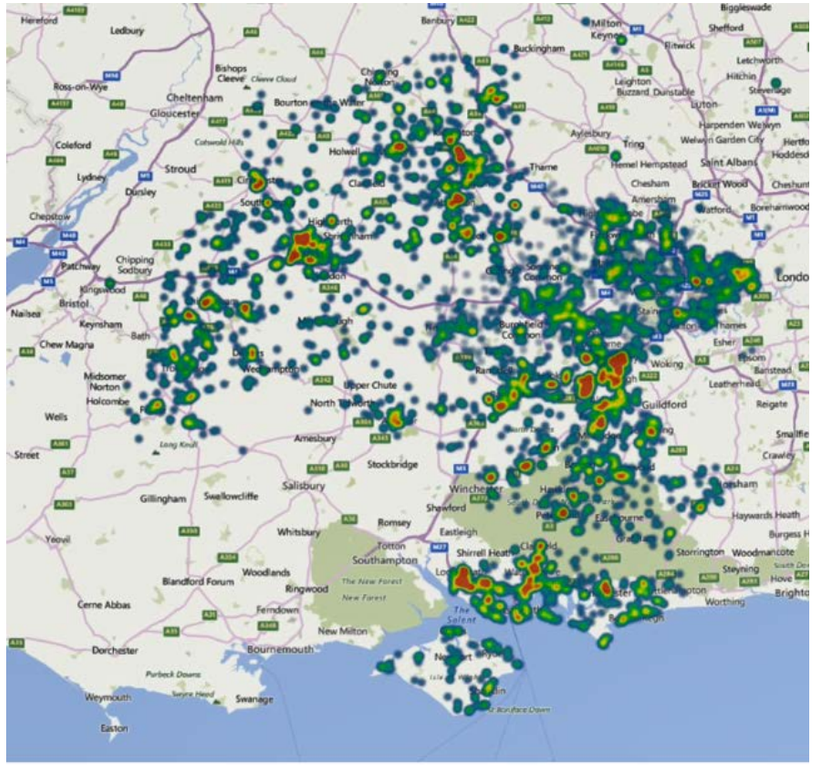
- Governed the deployment of the technology and operational principles
- Supported engagement with colleagues to ensure that all requirements could be incorporated into project plans and scheme design
- Promoted measures to address safety, operational and data security risks

LV substation monitoring to support Electric Vehicles

Learning by doing



- Deployed 250 in a trial
- Installation procedure modified existing procedures for other equipment
- Approved for use by teams
- Now deploying 350 in BAU in EV ‘cluster areas’
- Revised procedures include lessons from challenges highlighted by larger groups of BAU staff.



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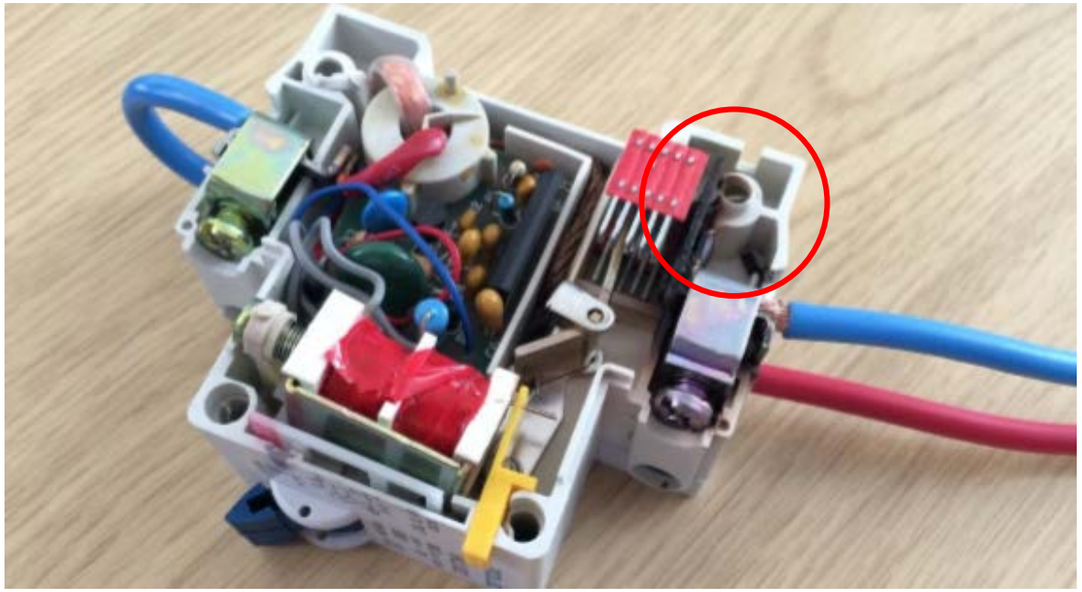
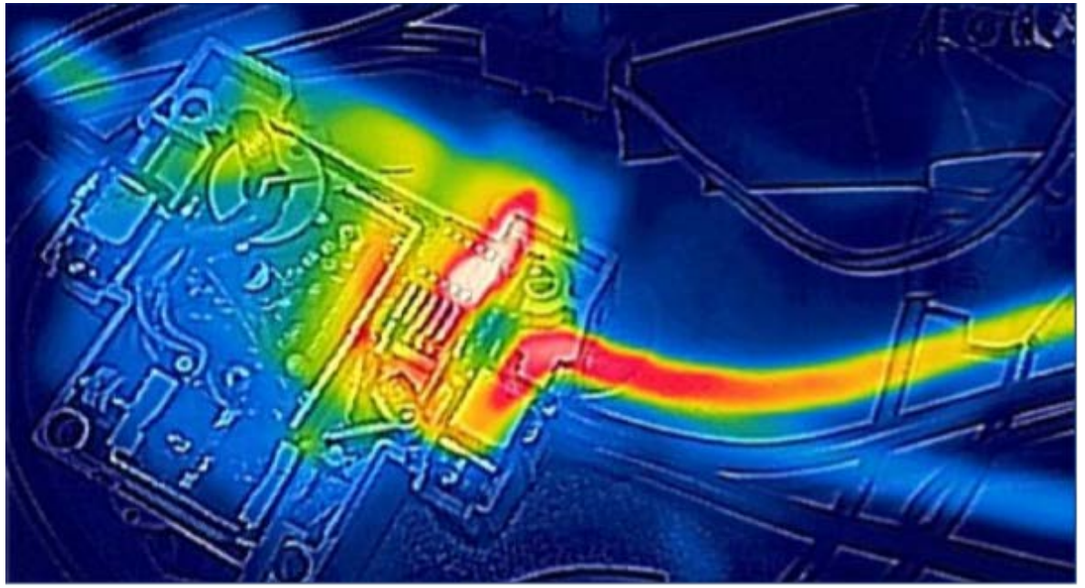
OEM (Original Equipment Manufacturer) Risk



EV Charge point Contactor Normal Image



EV Charge point Contactor Thermal Image

- Failure can just be disruptive
- Can also put customers at risk especially if installed in homes
- Quality control crucial from early development to scaled production

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DSO - Our opportunity to deliver low carbon future

"Our VISION is to make the best use of our electricity networks and emerging technology to facilitate the decarbonisation of transport and heat at maximum pace, and minimal cost to UK plc"

- Customers will consume and produce energy, buy and sell energy and services
- DSO is the route to allow further penetration of renewables and decarbonisation
- DSOs must lead and provide the pathways and technologies to facilitate this
- Engaging customers and staff is key to making it happen
  - Make it easy for customers so they don't opt out
  - Involve staff in roll out and assessing new technology
  - Learn by doing – consider impact new environments
  - Use our licence when we're not sure.

…Our duty to deliver the transition

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