The Value of Data
Carol Choi – Innovation Analyst
Agenda

• Who is UK Power Networks?
• What are the data challenges?
• What are we doing about it?
• What next?
• Q&A
UK Network Structure

Transmission

400/275/132kV

132kV

33kV

6.6/11kV

400/230V

Network boundaries

Distribution
# UK Power Networks

<table>
<thead>
<tr>
<th>Measure</th>
<th>Data</th>
<th>% of industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>End customers</td>
<td>8.3m</td>
<td>28%</td>
</tr>
<tr>
<td>Population served</td>
<td>c. 20m</td>
<td>28%</td>
</tr>
<tr>
<td>New metered connections</td>
<td>46,000</td>
<td>32%</td>
</tr>
<tr>
<td>Distributed generation connected</td>
<td>9GW</td>
<td>32%</td>
</tr>
<tr>
<td>ED1 tolex allowance</td>
<td>£6,029m</td>
<td>25%</td>
</tr>
<tr>
<td>Energy distributed</td>
<td>85TWh</td>
<td>29%</td>
</tr>
<tr>
<td>Peak demand</td>
<td>16GW</td>
<td>28%</td>
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</table>
What are the data challenges?

**Network Efficiency & Effectiveness**
- What can we do with the existing data?
- How do we extract more from existing assets?

**Low Carbon Transition**
- Where are the electric vehicles charging?
- How do they charge?

**DSO Transition**
- What data do we need?
- What are the data flows?
Real Time Thermal Ratings (RTTR)

Traditionally, we rely on static thermal ratings & do not account for ambient temperature.
Real Time Thermal Ratings (RTTR)

RTTR allows assets to operate beyond the fixed manufacturer’s limits.

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Power Potential

The world’s first **whole-system collaboration** to improve voltage stability and therefore **connecting more generation**

**Solutions**

- Dynamic voltage control from DERs
- Active Power Support
- Establish new reactive power market from DERs

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• 3.7 GW additional renewable generation could connect in the South East by 2050
• Proof of concept for whole system approach and transition to DSO

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Using data to **forecast EV uptake**

The most granular **EV load forecasting** model to assess the effects of **geospatial variation**

We sourced external data sets to inform our model:

- EV uptake by location
- Charging profiles
- Utilisation of different charging infrastructures

**up to 4.1m**

plug-in cars across **UKPN by 2030**

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Data Onion – having the right data is key
LV Visibility and Control

Today

2020

• We are investing £30m on strategically targeted LV monitoring 5,834 distribution substations driven by LCT constraints

• Live LV Network Diagram developed that will visualise the collected data and allow control of the network

Supporting our EV Readiness Strategy and Transition to DSO

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To conclude...

Innovative solutions targeted at key challenge areas

Unlocking benefits for the networks and customers

Collaborating across industry to address data challenges

Think you can help?

Submit your ideas on our website or email us at innovation@ukpowernetworks.co.uk
Thank you