Distribution System Operator (DSO)
2012 to 2023
Price Control Review Forum
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Distribution System Operator (DSO) in ED1

Current work to define DSO

The drivers for a DSO

Current market mechanisms

Possible ED1 DSO vision

Some DSO questions for discussion
Potential DSO roles are broad and varied

Present

DNO

Non-flexible demand

Non-flexible DG

Possible Future

DSO

Technical Aggregation

Flexible Demand

Dispatchable Resources

Ev's, Heat, Cooling, White Goods, Storage, Network, Contracts, DG, Demand Response

INDUSTRY WORK

RIIO-ED1 Flexibility & Capacity Work group

Smart Grid Forum Work Group 6

Transmission System Operator - Demand Side Response workshops

Low Carbon Network Fund trials of specific components

ED1 package needs sufficient flexibility to enable DSO solutions to be implemented
Drivers for Distribution System Operation

Penetration of intermittent renewable generation throughout the network

Customer uptake of low carbon products uncertain and likely to happen regardless of network capacity

What our current stakeholders tell us

‘offer independent & comprehensive energy advice’

‘connect us quickly without lengthy and expensive reinforcements’

Traditional solutions unsustainable – active balancing will be needed at LOCAL LEVEL
## Current market mechanisms

<table>
<thead>
<tr>
<th>Product</th>
<th>Issue</th>
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</thead>
<tbody>
<tr>
<td><strong>Energy prices</strong></td>
<td>Primary driver for existing Demand side response products (e.g. off peak heating) – Supplier driven DNO network charges typically small component</td>
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<tr>
<td><strong>Transmission network balancing</strong></td>
<td>Primary driver for aggregators &amp; large generators Predominantly gas &amp; diesel generation (STOR) Value far in excess of DNO network costs</td>
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<td><strong>Contractual relationships</strong></td>
<td>Primary contract with Supplier DNO agreements with larger customers only</td>
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<tr>
<td><strong>Energy efficiency initiatives</strong></td>
<td>Suppliers have implementation responsibilities No link to network requirements</td>
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Limited customer price signals related to DNO locational and/or time of use charges

Timing of local DNO network constraints vary across network and can differ from transmission

*Distribution system operation specific products are necessary*
Possible ED1 DSO Vision (medium term to 2023)

<table>
<thead>
<tr>
<th>Products by customer type</th>
<th>Potential issues</th>
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</table>
| **EHV & large HV Generators** | - How to avoid locational charge penalties?  
- Can DSO product £ > TSO products £ |
  | • Agreements to match output to network (dynamic thermal ratings)  
  | • Contracts to commit to availability |
| **EHV & Large HV Demand** | - Are payments based on avoided costs sufficient?  
  | - Could additional payments be created by accessing transmission balancing products? |
  | • Locational pricing  
  | • Bilateral agreement with technology |
| **Small HV & Large LV** | - Will DNO time of use pricing affect behaviours?  
  | - Could additional payments be created by accessing transmission balancing products?  
  | - Should DNOs facilitate market for storage? |
  | • Time of use pricing to suppliers  
  | • Bilateral agreement with technology  
  | • Technology, e.g. storage, automation |
| **Small LV** | - Should DNOs have direct customer agreements?  
  | - Will DNO time of use pricing affect behaviours?  
  | - Greater DNO role in energy efficiency?  
  | - Should DNOs own storage? |
  | • Time of use pricing to suppliers  
  | • Technology, e.g. storage, automation  
  | • Leverage supplier efficiency activities |

*The ED1 package needs sufficient flexibility to enable DSO model to develop*
Some DSO questions for discussion

- What should the DSO : TSO relationship be?
- Could DSO products be enhanced by accessing transmission products? (e.g. STOR – short term operating reserve)
- Should DNOs own storage or facilitate a market for it?
- Should direct customer contracts be used more widely?
- Should DNOs have a greater role as independent energy experts?

The ED1 package needs sufficient flexibility to enable DSO model to develop