



Serving the Midlands, South West and Wales

Transition from DNO to DSO

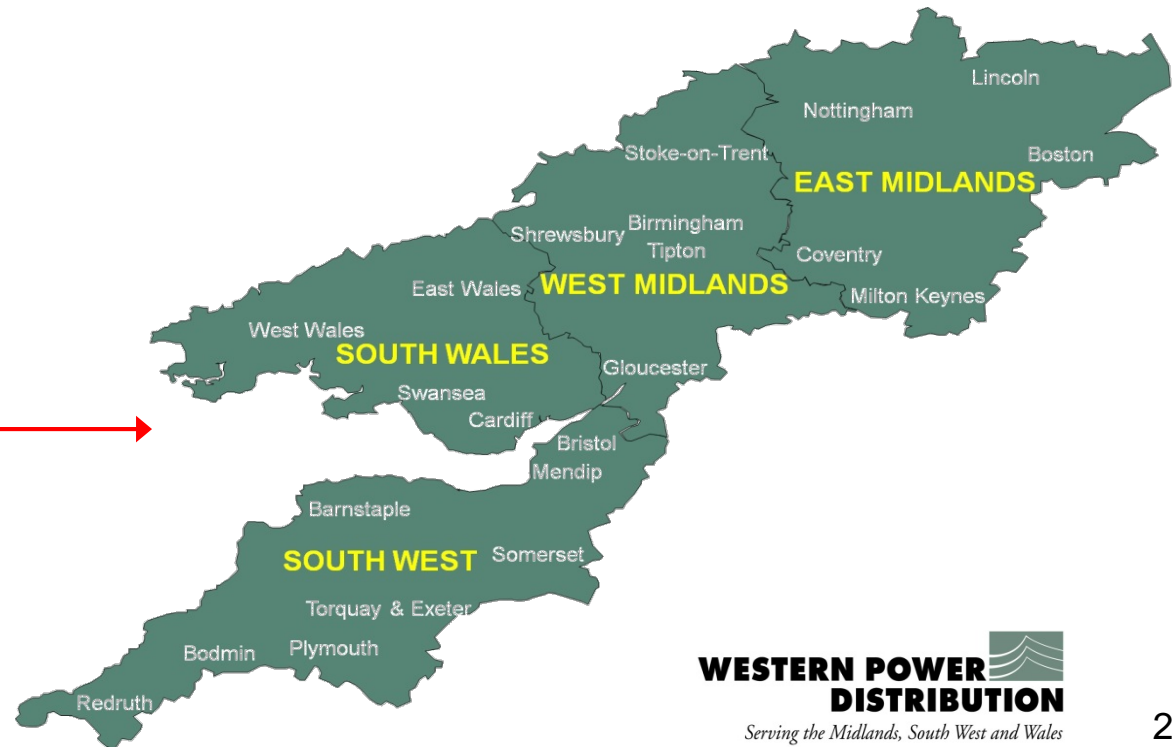
4th July 2017

Nigel Turvey – Network Strategy and
Innovation Manager

UK electricity distribution areas

- 14 Distribution Network Operators (“DNOs”) in the U.K - **WPD owns four of them**

- We operate the electricity network of poles, pylons, cables, wires and substations
- We are not a supplier
- 7.8 million homes and businesses rely on us every day

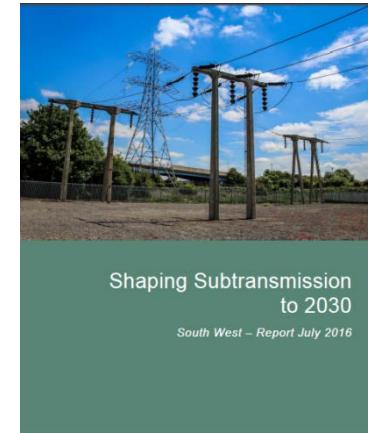


What is a DSO?

- A Distribution Network Operator (DNO) traditionally provides a network sized to support times of maximum demand and/or maximum generation output
- A Distribution System Operator (DSO) utilises:
 - Smarter network solutions (automation, power flow control technologies)
 - Non-network solutions (ancillary services, local and regional network balancing, constraint management)
 - A close relationship and interaction with the SO

Value of flexibility to Distribution Networks

- There is significant uncertainty in the growth of demand and generation shown by our 'Shaping Sub transmission' work and the associated demand/generation scenarios
- Flexibility gives value in terms of:
 - Potential for faster response to changing needs
 - A lower cost solution where requirement is for short periods of time
 - Managing the network where there is uncertainty of whether a 'build' solution is required , and
 - Where new assets are required, managing the network during the construction time
- In addition, with appropriate coordination, available flexibility at the distribution level also has significant value to the transmission system operator



WESTERN POWER
DISTRIBUTION
Serving the Midlands, South West and Wales

WESTERN POWER
DISTRIBUTION

regensw

**Distributed generation and demand study -
Technology growth scenarios to 2030**

South west licence area

January 2016

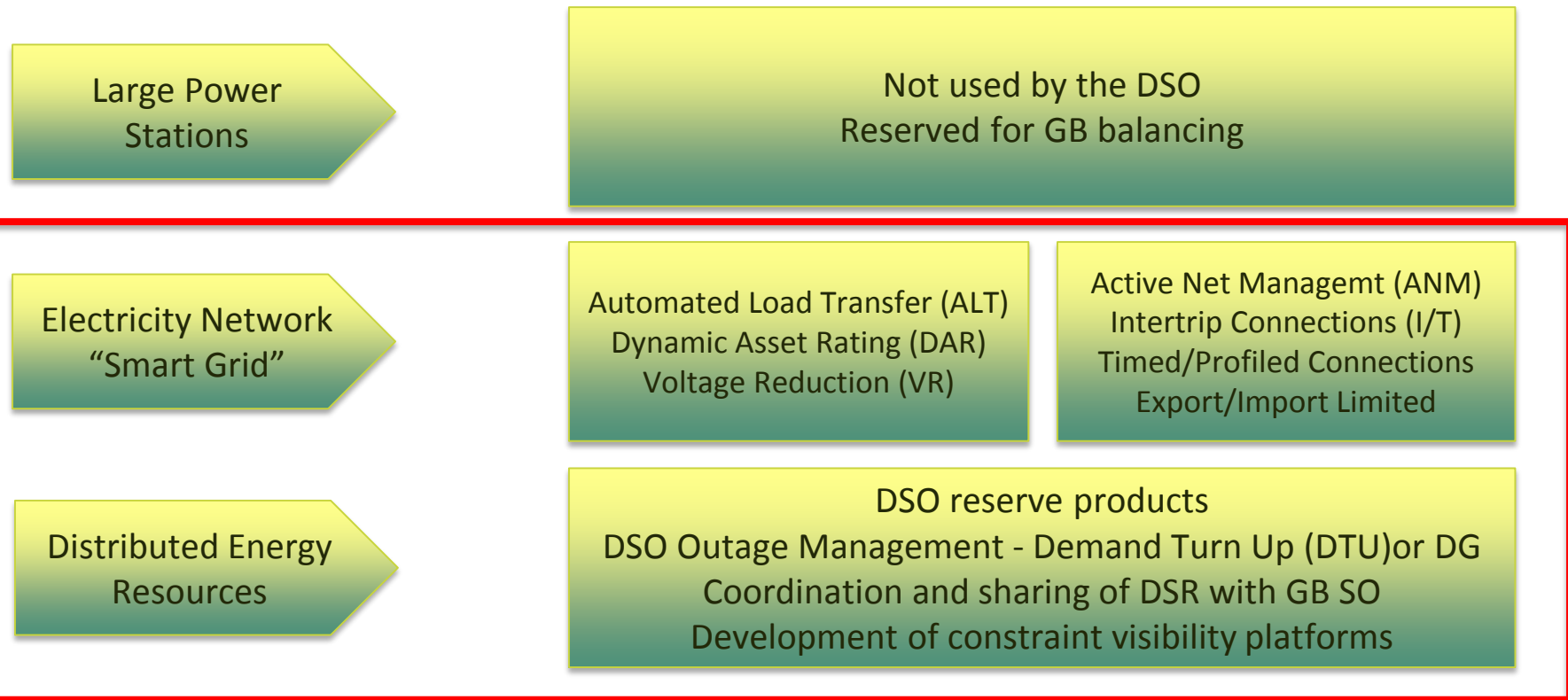


Final version

Report title: The Innovation Centre, Avenue Drive, Exeter, EX4 5HS
T: +44 (0)1392 463000 E: admin@western-power.co.uk
Report number: 10000000

DSO Flexibility Services

- Electricity System Flexibility can come from three sources:



Projects and key learning to date

- Number of trials involving DSR at distribution level:
 - Falcon (11kV, I&C Demand turn down)
 - Sync (I&C Demand turn up)
 - Community energy action/sunshine tariff (Domestic demand turn down)
- Domestic DSR is very challenging. Onerous engagement and minimal flexible load
- I&C flexibility available, mainly from control of embedded generation
- Interaction with other DSR services such as STOR is key to ensure customer interest and reliability
- Longer times between dispatch and calls allow for more participants and increased reliability (week ahead notification in Falcon)
- Contract with the voltage level below the constraint

Incorporating this learning we have launched project Entire

- I&C Demand turn down
- Focus on commercial mechanisms and revenue stacking
- How to make DNO led DSR commercially viable by interaction between DNO and SO led DSR
- Fits into wider DSO and active networks innovation
- Looking for alternative solutions to 132kV reinforcement by facilitating 5 WPD CMZs
- Create customer sales capability
- Developing technical systems and processes
- Looking for transition to BaU



Transition to DSO – our four-point plan

- A consultation on our DSO strategy and work plan has just been published – key aspects are to:

Expand the existing roll out and application of smart network solutions to the higher voltage networks, prioritising areas which are the most likely to benefit. From this we will optimise investment decisions, deliver greater network flexibility and maximise customer connection choice (flexible connections for demand, generation and storage).

Contract with customers and aggregators for non network solutions. Co-ordinate with other parts of the industry by helping to establish visibility platforms for suppliers, aggregators and customers. This will include the requirement to raise the awareness of DSR and to help customers to value stack where appropriate.

Co-ordinate with SO at the T/D interface. Share data and forecasts in multiple time horizons. Maintain overall system security. Consider whole system issues and propose solutions. Secure additional flexibility through prosumer awareness – actively support Power Responsive. No exclusivity in DSO flexibility contracts.

Protect the integrity and safety of lower voltage networks. We will maximise the use of smart meter data, apply additional network sensing where relevant and implement simple control schemes. We aim to develop wider flexibility for the use of import/export capping as an alternative to conventional solutions only reinforcing the networks when these solutions cannot deliver what is required.

Towards DSO – 2017 progress

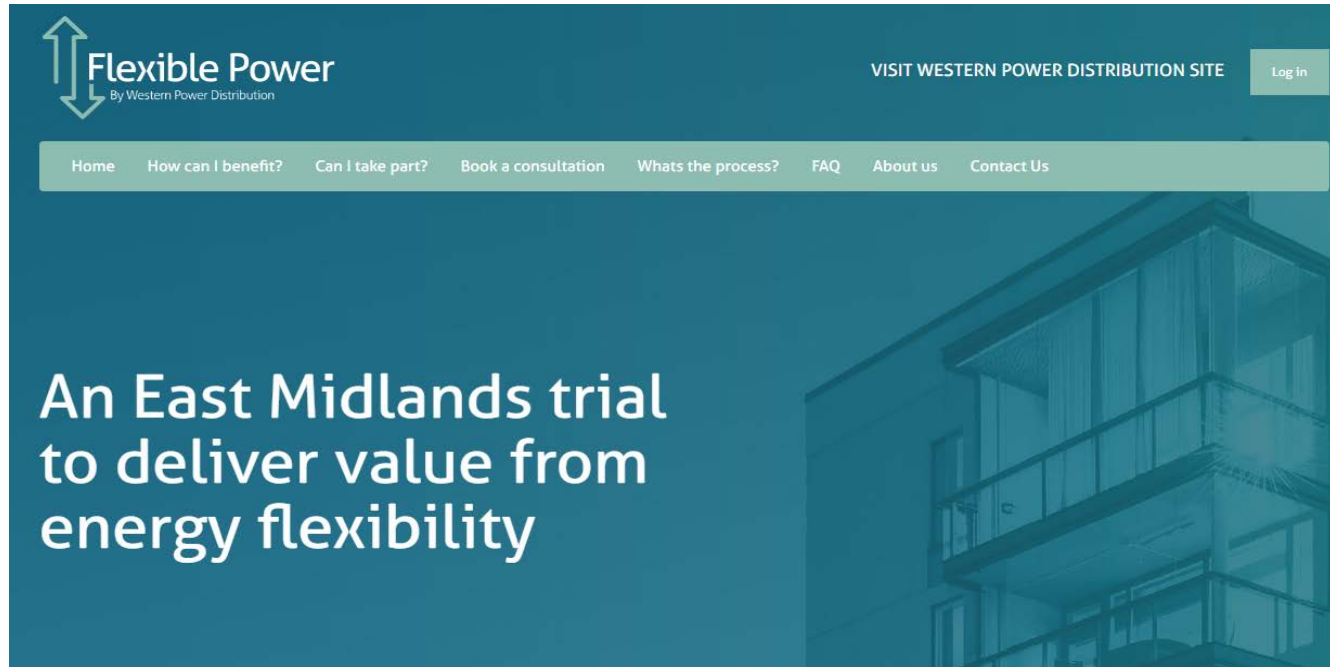
- Full consultation with our stakeholders on our DSO Strategy and Transition Plan
- Tender for services in 5 ‘Constraint Managed Zones’ using Demand Side Response underway
- Evaluate energy storage services (from smaller domestic to larger grid scale)
- Continue to add telemetry data points
- Progress our ‘Electric Nation’ electric vehicle trial - smarter connections for Electric Vehicles
- Develop and test ‘Local Energy Markets’

Joint work between DNOs and NGET – Open Networks Project

- Via our Trade Association, the DNOs and NGET are running the Open Networks Project
- The objectives of the Project for the first phase of work in 2017 are to:
 - Develop improved **T-D processes** around connections, planning, shared TSO/DSO services and operation
 - Assess the gaps between the **experience our customers** currently receive and what they would like and identify any further changes to close the gaps within the context of ‘level playing field’ and common T & D approach
 - Develop a more detailed view of the required **transition from DNO to DSO** including the impacts on existing organisation capability
 - Consider the **charging** requirements of enduring electricity transmission/distribution systems

How to get involved

- www.flexiblepower.co.uk



- Wpdflexiblepower@westernpower.co.uk