



Serving the Midlands, South West and Wales

DSO Development

**DSO and Future Networks Manager
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May 2019

Agenda

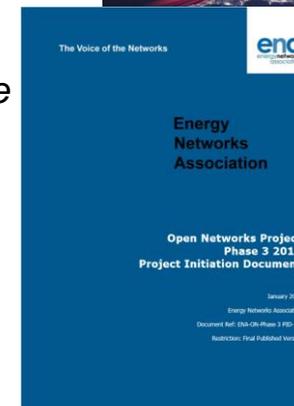
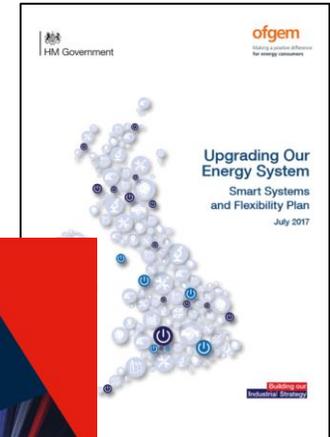
- What is a DSO?
- Drivers for change
- DSO Vision, Strategy and workplan
- Scenario planning
- Flexibility
- Future services/requirements
- Whole system working
- Our DSO structure – facilitating a neutral market

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

Drivers for change – Regulatory/Political

- Governments Industrial Strategy
- BEIS/Ofgem – Smart System and Flexibility Plan
- Speech by Secretary of State Greg Clarke (Nov 2018)
 - *‘How to evolve natural monopoly regulation that allows any credible supplier - be it Tesla, Nissan, Siemens, Rolls Royce, DeepMind or some brand new start-up - to help reduce system costs is one of the big challenges facing us. That is the challenge for today’s regulators.’*
 - *‘The principle of making sure that there is no conflict of interest between the network equipment owner and the network operator is very important. Distribution companies are currently taking action to resolve their conflicts of interest, but we need to accelerate reform. Network companies need to satisfy the public that they are structured in such a way as to provide infrastructure at the lowest cost.’*
- CEER conclusions paper
- Ofgem/BEIS support for ENA Open Networks Project



DSO Vision

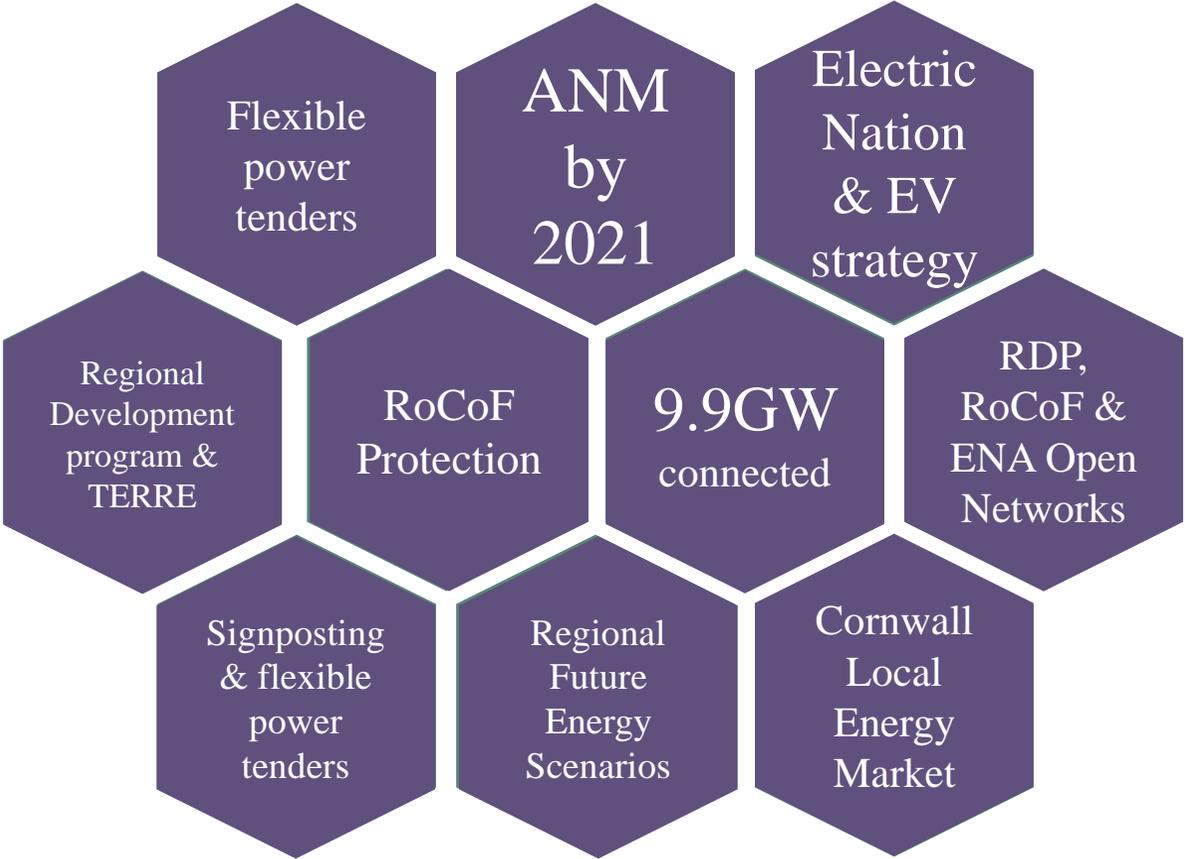
- Facilitate the transition to a low carbon economy
- Enhance system security
- Keeping network costs down and facilitating third party flexibility access to national and international markets
- Facilitate quicker and lower cost connections
- Trusted by all parties as a neutral market facilitator

- Our focus areas are:
 - Using third party flexibility where economic compared to asset solutions
 - Whole system solutions in both planning and operating timescales
 - Open data wherever possible

DSO Strategy

There are a number of key challenges within the energy transition which our DSO strategy addresses:

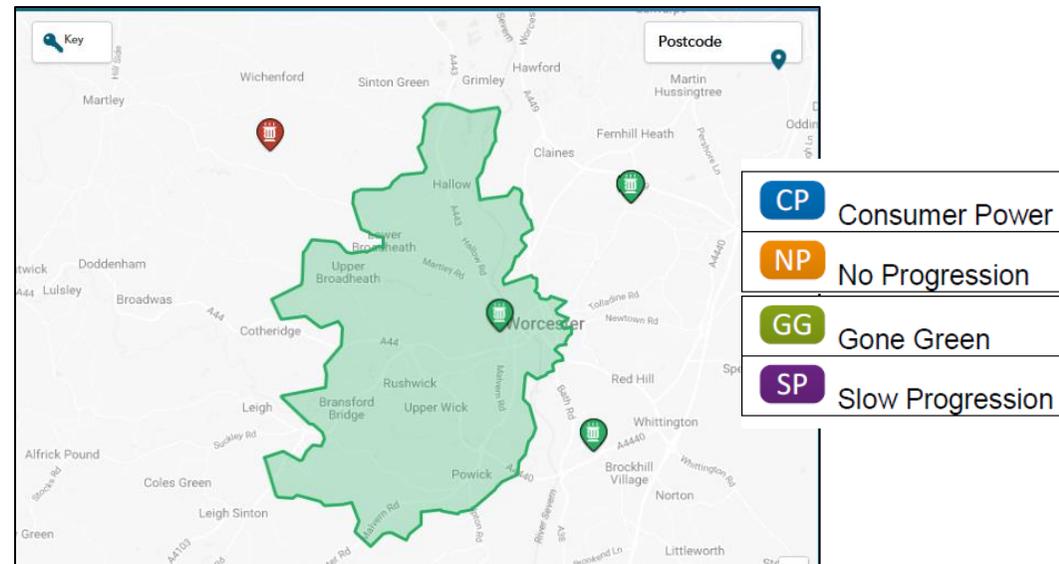
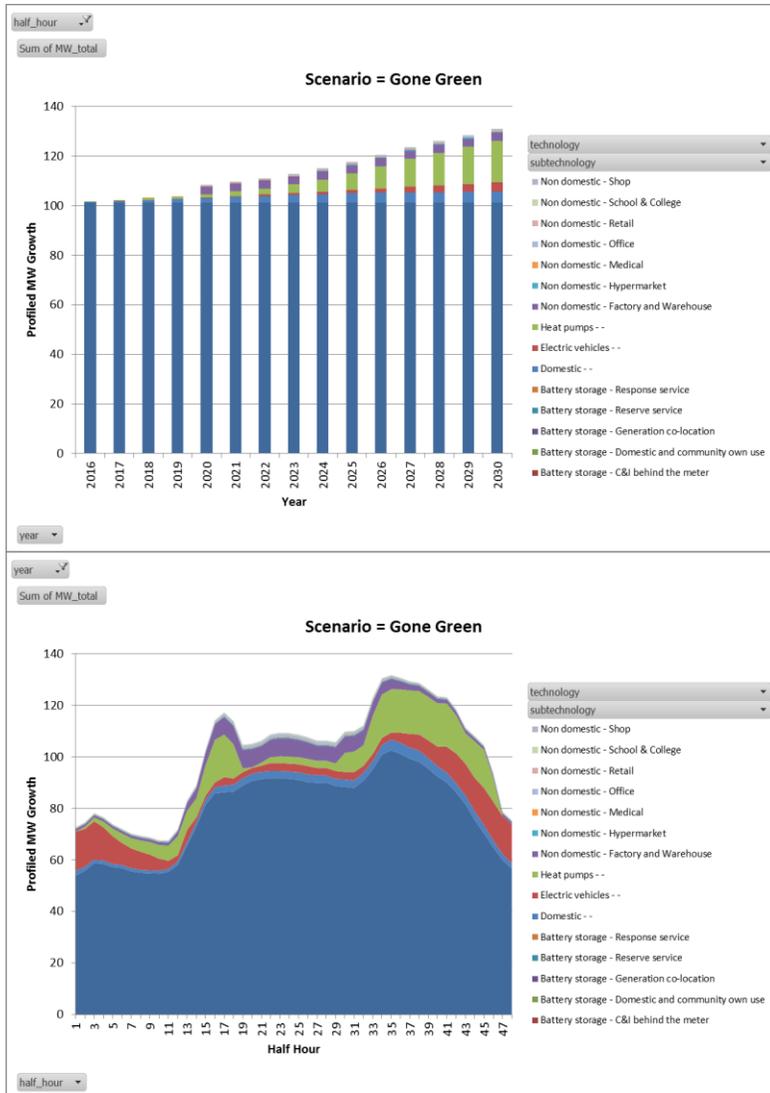
A smarter, more flexible energy system will enable customers to be able to actively participate in new flexibility markets through a variety of pathways.



Scenario Based Forecasting

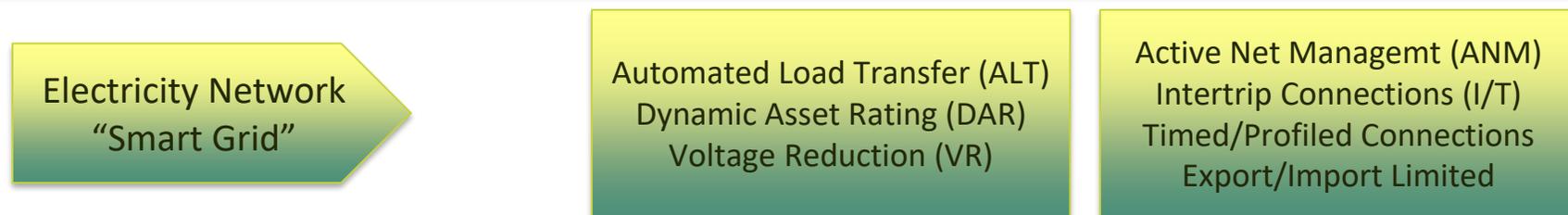
Since 2016, WPD has been using scenario based forecasting to build a regional picture of demand, generation and storage uptake

We have built a bottom-up understanding of demand, generation and storage growth out to 2032 across 260 individual zones within our region and share this information.



Sources of Flexibility

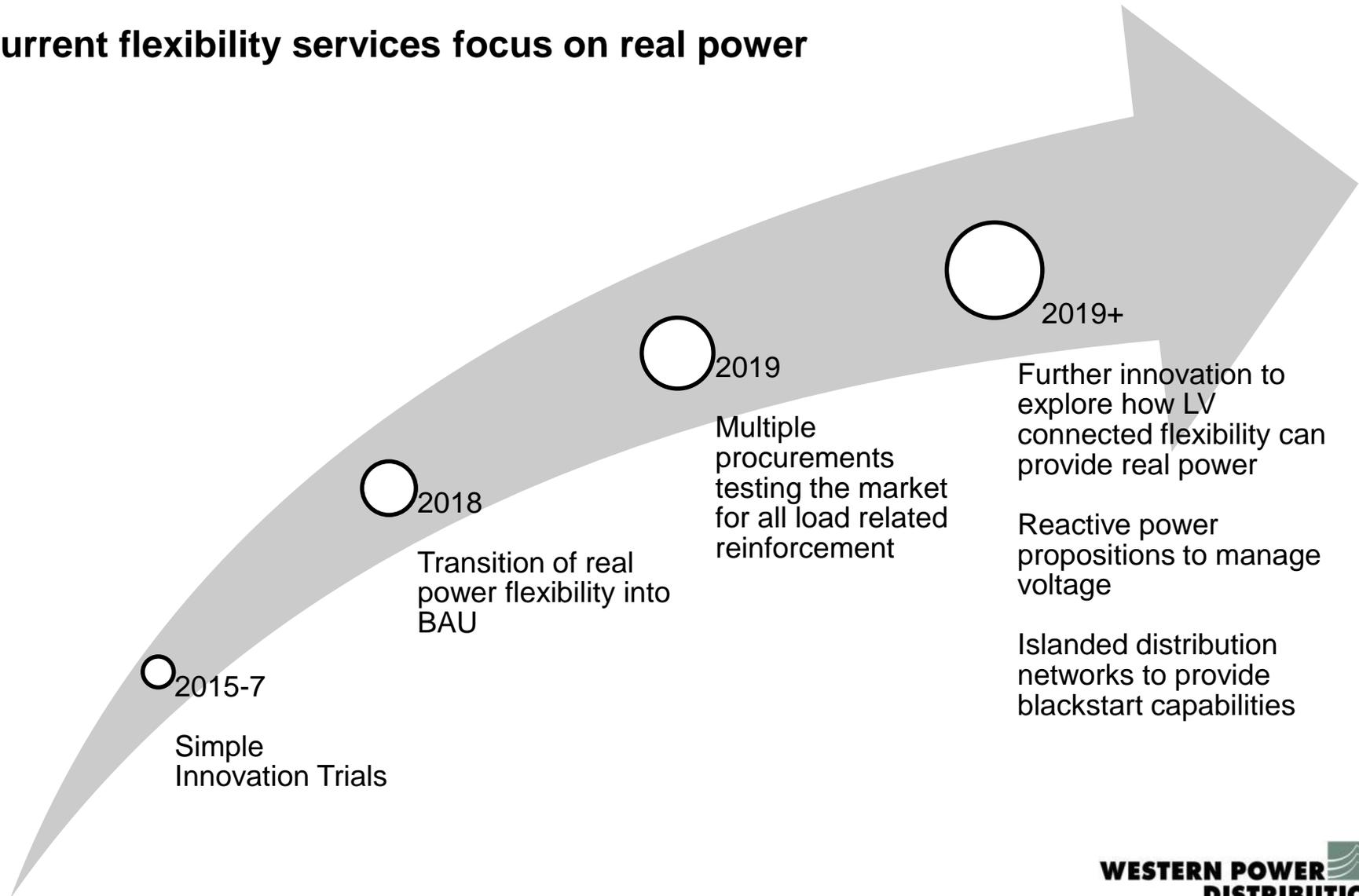
- Electricity System Flexibility can come from three sources:



DSO

Future Flexibility Services

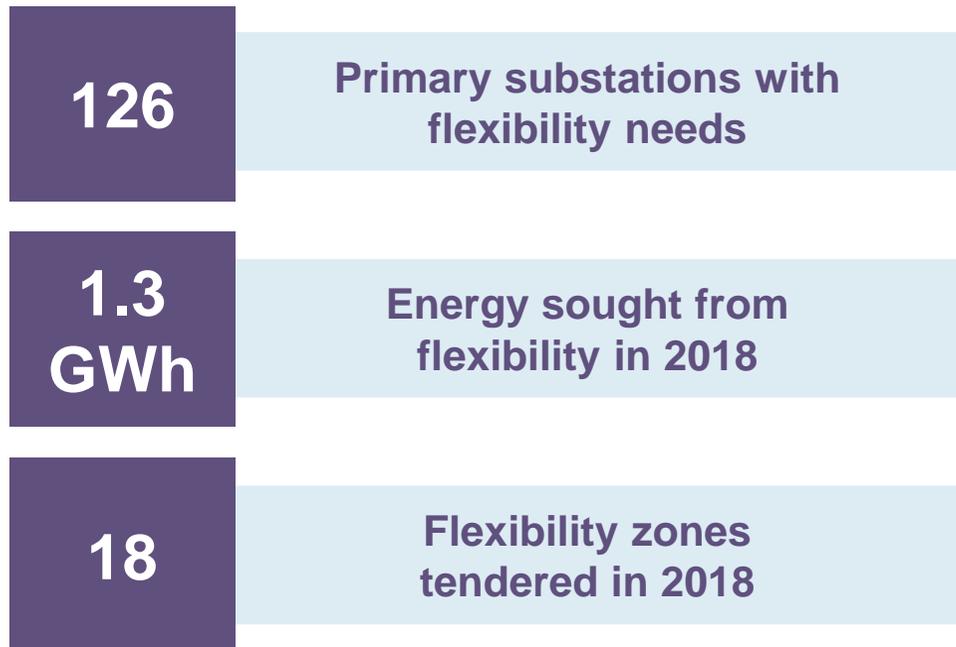
Current flexibility services focus on real power



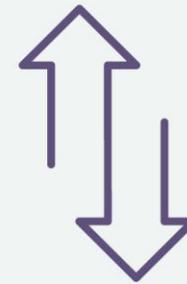
Flexibility First

WPD has always used the flexibility inherent in its networks to provide an economic and secure supply ahead of undertaking conventional reinforcement

- We are now expanding this to include market-provided flexibility and will seek this in the areas triggering load related reinforcement within ED1



Throughout the rest of ED1 we will assess 90% of our load related reinforcement investment for a more economic delivery by flexibility services.



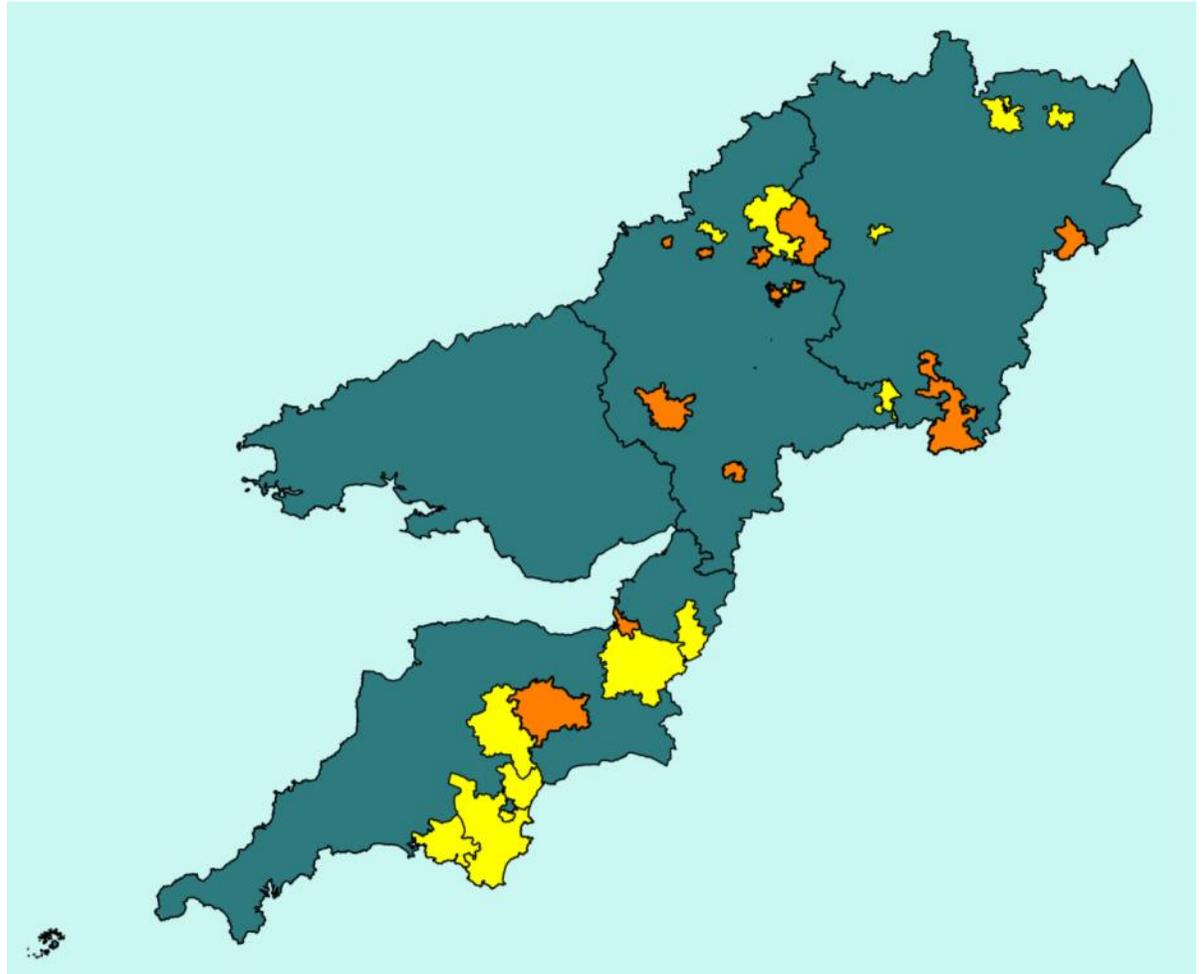
90%

LRR investment assessed against Flexibility

For the remaining 10%, which is predominately at LV, we will continue to develop, test and evaluate other markets.

Procurement in 2019

- 12 constraints across 80 primary substations
- 93.4MW required
- ITTs out for March
- To operate over the summer and winter of 2019
- Affects over £25m of reinforcement
- Second round in July/August
- **Additional zones** signposted with future requirements over 5 years



Flexibility – Learning by doing

After agreeing the principles of approach with Ofgem, we will begin using flexibility to provide quicker and more efficient options for new connections. This approach will be piloted in Lincoln to develop new commercial arrangements.

Flexibility can provide alternatives to reinforcement and benefits to the whole electricity system

Generators seeking connections

Demand seeking connections

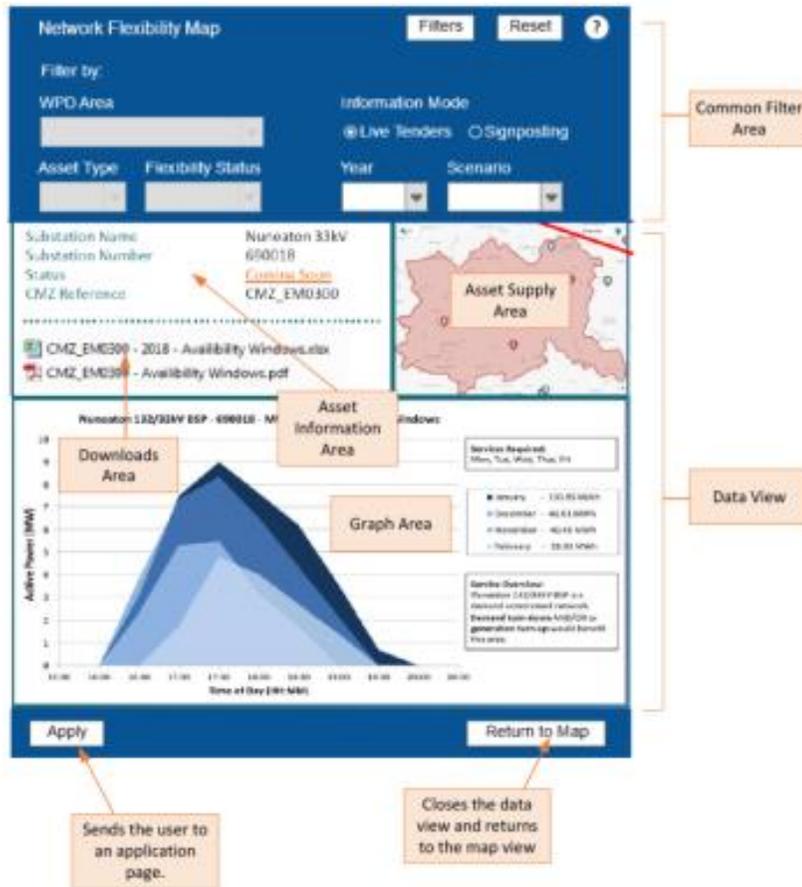
Storage seeking connections

Flexibility providers seeking a revenue

Flexibility can be shared across the transmission boundary to access National Markets

Signposting

To inform flexibility markets of our requirements both now and into the future, we have committed to publishing “signposting” information which describes the constraints triggering any significant load related reinforcement



Using a similar functionality to our network capacity map, our network flexibility map is publically available on our website:

www.westernpower.co.uk/signposting

This displays information on:

- Geographic supply area
- MW peak and length for availability
- Estimated MWh utilisation
- Months/days/hours applicable
- Raw data downloads
- Four Industry-aligned future energy scenarios
- 5 year window

Whole System Work to date

- Regional Development Programme in S West
- Loss of mains vector shift protection changes in S West
- Roll-out of 'Appendix G'
- RDP in West Midlands
- ESO Reactive power requirements in S Wales
- FREEDOM project
- Distribution system operability framework published
- Open Networks work:
 - to expand ESO NOA process
 - to develop whole system process
 - on 'Future Worlds'



DSOF Topic	Assets	Network Operations	Customers
Introduction, background and supplementary information	✓		✓
Network modelling and Analysis	✓	✓	✓
Network Monitoring and Visibility	✓	✓	
Data and Forecasting	✓	✓	✓
Arc Suppression Coils	✓	✓	
Low Frequency Demand Disconnection	✓	✓	✓
Flexibility Services	✓	✓	✓
Power Quality	✓	✓	✓
Loss of Mains Protection		✓	✓
Changing Load Profiles	✓	✓	✓
Whole System Fault Level **NEW FOR 2019**	✓	✓	



WPD DSO Structure

- To address both the expanding DSO activity and the perceptions around the potential conflicts of interest between asset solutions and use of third party flexibility we have separated DSO activities into a separate management structure

- Our DSO and Future Networks area will be responsible for:
 - development of future energy scenarios
 - identification of future network capacity needs
 - assessment of whether third party flexibility is more economic than traditional asset solutions
 - contracting for flexibility where economic along with development of flexibility products and where appropriate, markets
 - Working with the ESO to develop whole electricity network solutions to capacity, voltage or fault level issues
 - the development and implementation of operational and SCADA systems to support a smart flexible electricity network, and
 - the associated data, strategies, policies and innovation activity

Summary

- Significant change and uncertainty
- Clear vision for the future
- Actively using network flexibility
- Seeking third party flexibility
- Seeking whole system solutions
- Addressing perceptions around conflicts of interest