WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Distributed Generation

Stakeholder Workshop

November 2017

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Housekeeping

- Introductions
- Building Evacuation
- Facilities

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Who we are and what we do

Alison Sleightholm

Regulation and Government Affairs Manager

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Agenda

Welcome, WPD overview and purpose of the day	10:00 – 10:15
Progress and connections key areas of focus	10:15 – 10:30
Workshop 1: Connections key areas of focus	10:30 – 11:00
Key area of focus 1 – Outage management	11:00 - 11:20
Workshop 2: Outage management	11:20 – 11:40
Coffee Break	11:40 – 11:55
Key area of focus 2 – Distribution System Operator (DSO)	11:55 - 12:15
Workshop 3: DSO	12:15 – 12:25
Key area of focus 3 – Information provision	12:25 - 12:45
Workshop 4: Information provision	12:45 – 13:05
Summary & Lunch	13:05 – 14:00
Afternoon surgeries – Choice of: **1. Consents and Legals (Bruce Pollard)** **2. Competition in Connection (Paul Jewell)** **3. Storage (Tim Hughes/Faithful Chanda)** **4. Strategic Network Investment (Ben Godfrey)**	14:00 – 15:00
Close	

Our service territory and customer base

- WPD is a Distribution Network Operator (DNO)
- We distribute electricity to 7.8 million customers
- We operate 4 of 14 distribution licence areas in the UK

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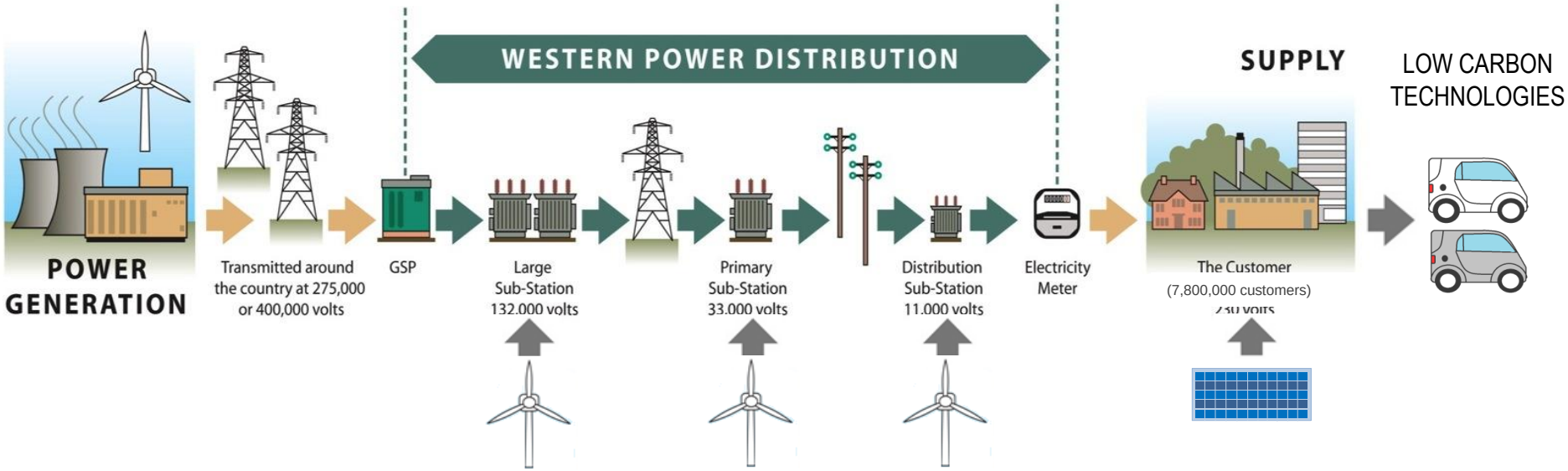
What we do



Our role is simple:

- We operate our network assets effectively to ‘keep the lights on’
- We maintain the network so it remains in a reliable condition and safe
- We fix our assets if they get damaged or are faulty
- We upgrade and expand the network to provide additional supplies and capacity

We do all of this with high levels of both operational and public safety

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Our objectives for today

- Set the scene for where we are now with connections performance
- Be honest about some of the challenges we face
- Provide an opportunity to give feedback
- Shape our plans for the future

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Progress and key areas of focus

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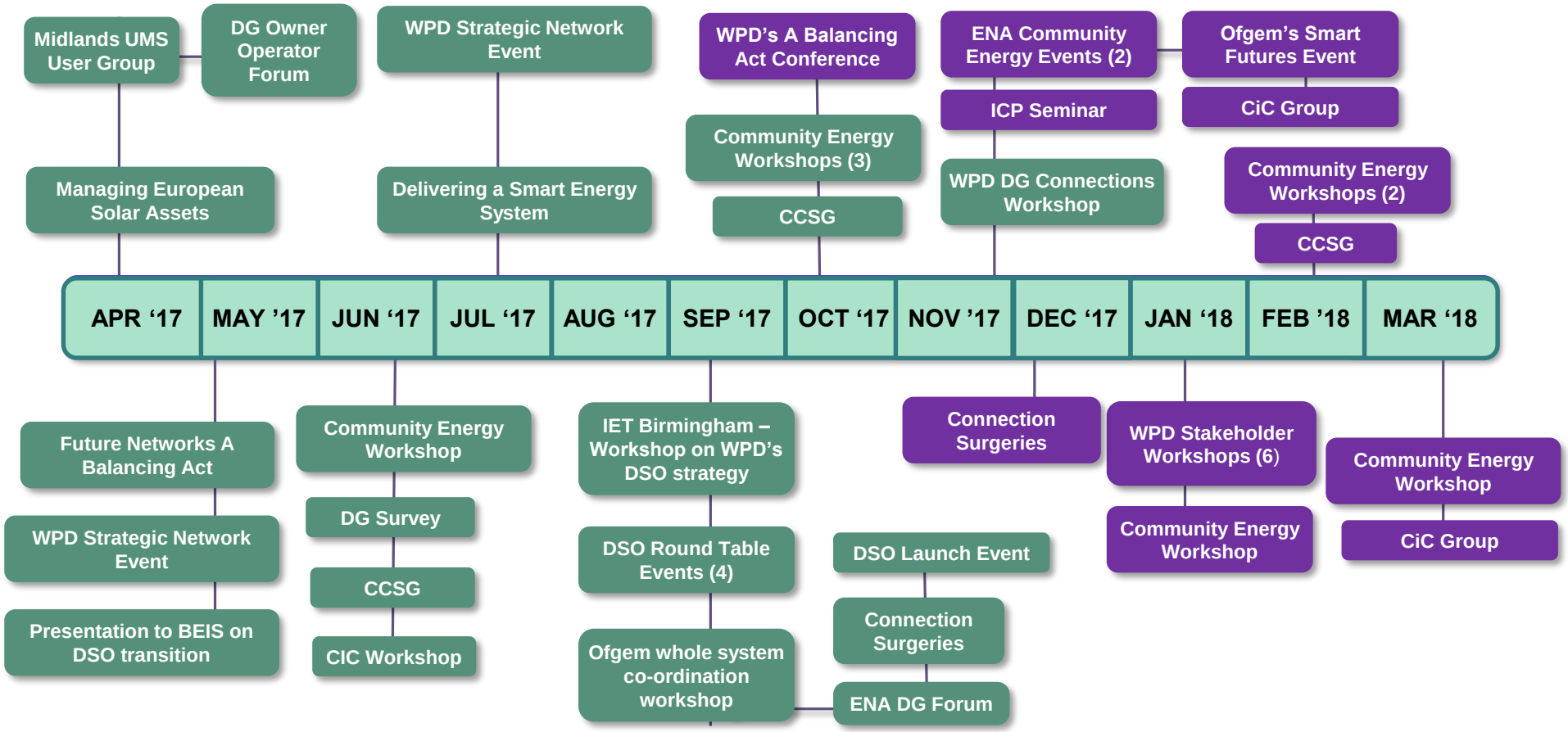
Incentive on Connections Engagement (ICE)

- ICE requires DNOs to submit evidence that they have:
  - Engaged with a broad range of customers
  - Responded to the needs of their customers
  - Set relevant performance indicators
  - Developed a forward looking work plan to improve performance
  - Reported actual performance against indicators and work plan
- Potential penalty of up to 0.9% p.a. of allowed revenue

Connections engagement



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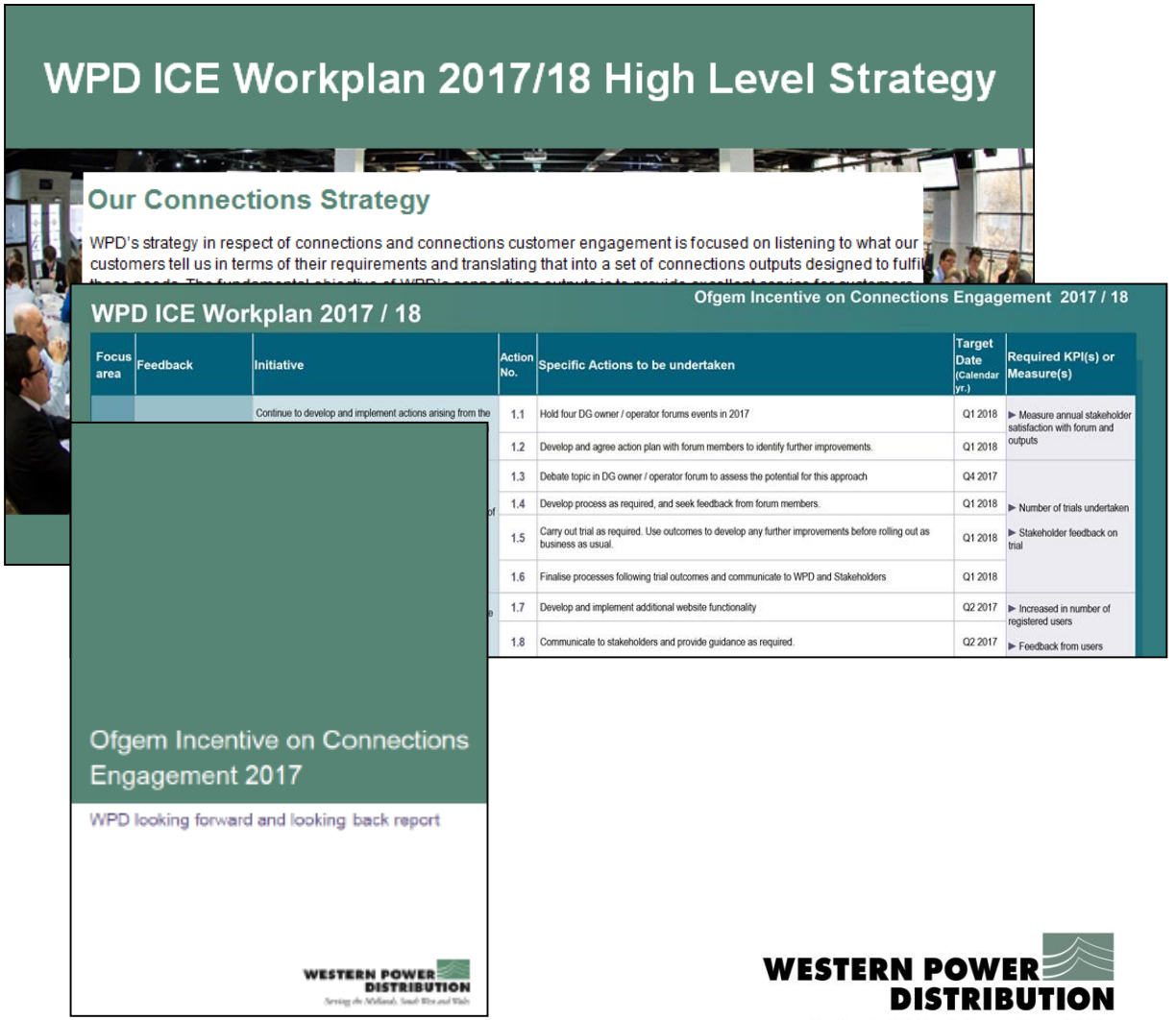
What have we delivered for DG customers so far ?

Based on feedback received so far we have:

- Improved the availability of network information including capacity maps/registers and asset information
- Introduced Key Account Managers
- Improved the process of legals and consents
- Implemented the Code of Practice in Competition and developed new option for HV self-connection
- Rolled out alternative connection offers across WPD
- Completed South West and South Wales strategic investment studies and commenced East and West Midlands study
- Published a consultation on our plans for DSO

WPD's ICE work plan

- Published online
- Updated every six months in line with customer feedback and progress updates published quarterly
- It comprises actions structured around 10 key areas of focus



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What does our current plan look like ?

- Covers 10 key areas
  - Availability of information and online services
  - Customer service
  - Connection offers and agreements
  - Competition in Connections
  - Legals and consents
  - Storage
  - Queue and capacity management
  - Community energy
  - Strategic reinforcement and forecasting
  - Distribution System Operator

Connection priorities

- **Availability of information:** further improve information on outages & constraints, the SoW process, improve capacity information including demand and storage
- **Customer service:** continue to improve consistency in service and application of policy across WPD teams including SoW, design approval, post-acceptance communication
- **Connection offers and agreements:** early sight of connections agreements
- **Competition in connections:** refine processes to make improvements to Competition in Connections Code of Practice activities including HV self-connection, design approval and other self-service activities
- **Legals and consents:** introduction of targets for completion

Connection priorities

- **Storage**: provide guidance and policy on the connection of energy storage schemes
- **Queue and capacity management:** review the processes, relating to how network capacity is offered on new connection and infrastructure schemes, as well as the management of capacity in ongoing schemes
- **Community energy:** community energy workshops and dedicated web page
- **Strategic network forecasting and investment:** continue with strategic network studies giving connection stakeholders visibility of the level of investment, reinforcement and timescales
- **Transition to DSO:** develop policies, processes and technology facilitating move to DSO. Engage with stakeholders on the development of the DSO role

ICE Priorities for the future

- We are identifying the priority areas our stakeholders want us to address in our next ICE workplan
- From stakeholder feedback we have so far we are are seeing similar themes requiring our focus
- We will be using our stakeholder engagement over the coming months to identify priorities and actions

We are seeking your views on the ICE workplan priorities which WPD should be focussing on to ensure we are undertaking the appropriate improvements

Workshop 1 – Discussion questions

1. What has your experience of applying for a connection with WPD been like?
2. Do you think that WPD have correctly identified the key priorities – anything missing ?
3. Do you have any suggestions regarding the actions for the following sections of the ICE work plan ?
   - Availability of information and online services
   - Customer service
   - Connection offers and agreements
   - Competition in Connections
   - Legals and consents
   - Storage
   - Queues and capacity management
   - Community energy
   - Strategic reinforcement and forecasting
   - Distribution System Operator
4. Please prioritise the sections of the ICE work plan in terms of importance (1 to 10).

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Spotlight on outage management

Sean Sullivan

Control Room Manager

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Progress so far

- Operational forum for Distributed Generation owners & operators established July 2016
- Established a Distributed Generation ‘Single Point of Contact’
- Timely communication of outages & associated generation constraints
- Dedicated website portal
- Publication of Distributed Generation post-outage details
- Consortium arrangements to reduce outage impact where possible

WPD DG operational forum

- Forum specifically to engage with DG connection stakeholders to establish requirements for provision of information on outages and constraints for connections at 33/66/132kV
- Regular meetings with clear WPD/DG agreed action plan
- Developing open and honest engagement encouraging positive solutions
- Forum feedback integrated into ICE plan and BAU

Communication of outages & constraints

- WPD policy changed to provide longer term outage forecast that includes confirmed and proposed outages
- Forecast is for outages/constraints on 33 66 & 132kV networks
- Advance outage plan emailed to DG owners/operators
- Communication includes ‘person in charge’ and reason for outage details
- Control centre based ‘single point of contact’ for outage enquiries

Four Week Constraint Plan for Sample Solar Ltd

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This report lists the expected constraints that will affect sites owned by Sample Solar Ltd connected to Western Power Distribution's (South West and Wales) network over the next 4 weeks based on current proposed work.

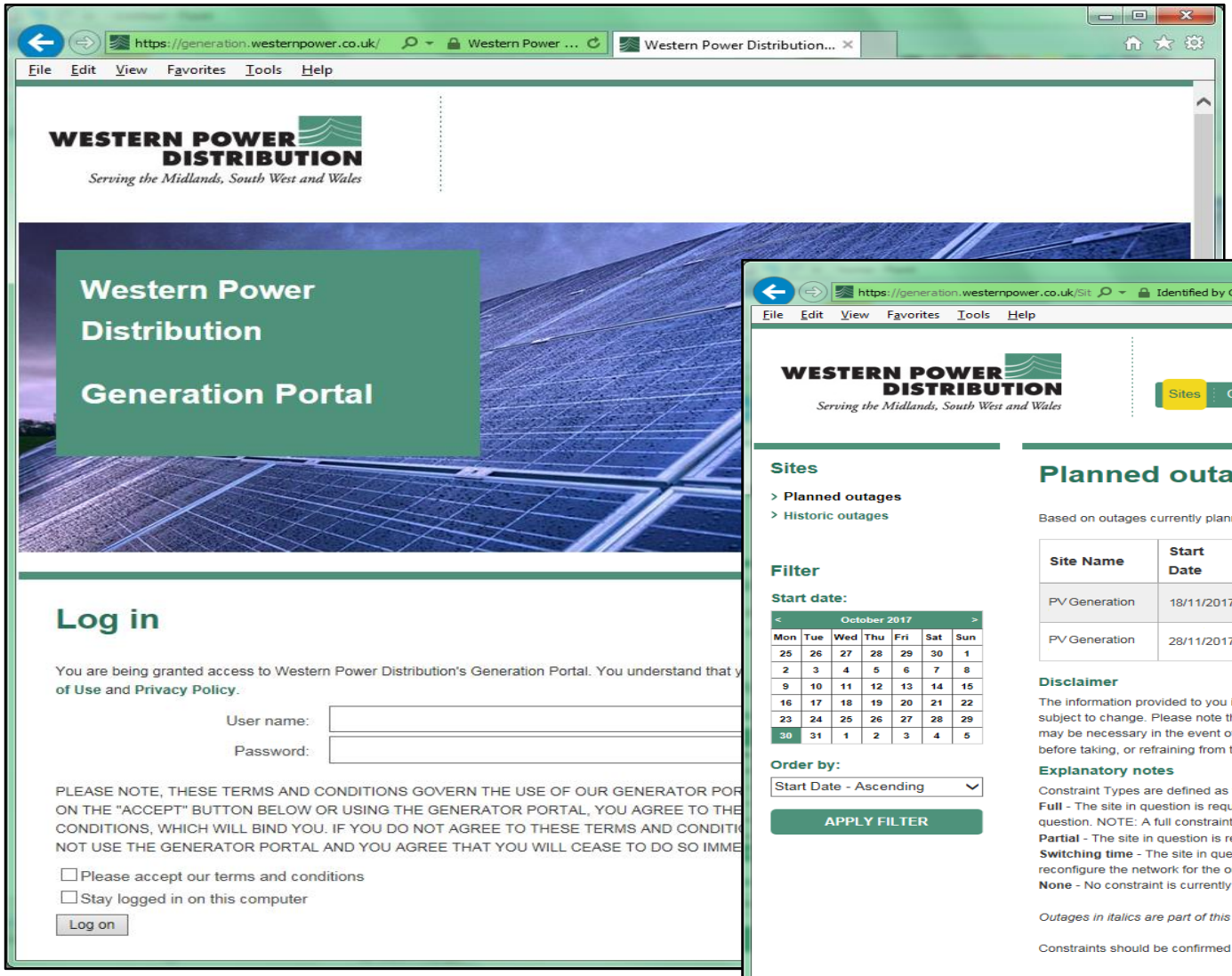
Report produced at 07/07/2017 15:53:04

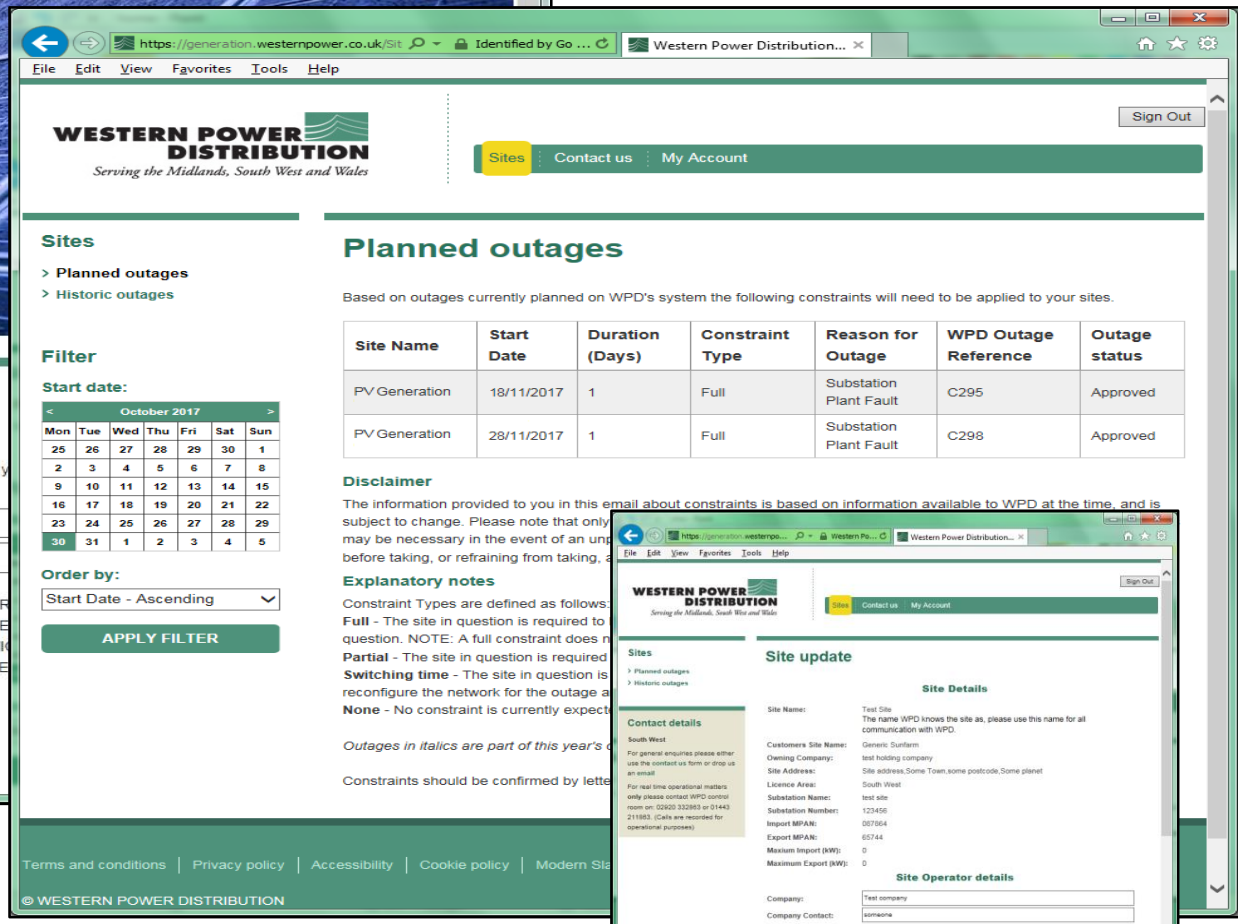
Constraints will be confirmed in writing by local teams, which will include relevant contact details for any queries, once outages are finalised.

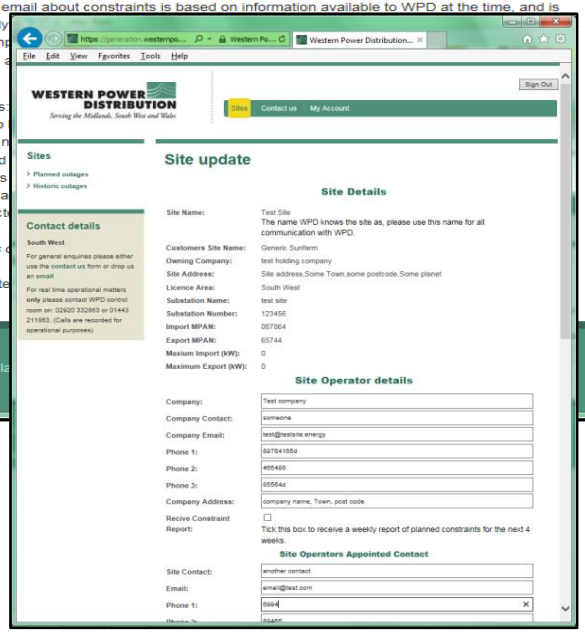
Site Name	Start Date	Duration (Days)	Permitted Export (kW)	Reason for Outage	Outage Status
	WPD Outage Reference	WPD Engineer in charge of works			
Abbey Close Biogas	20/07/2017	5	1000	National Grid Outage	Approved
	E24358	National Grid (For queries relating to this outage please contact: wpdswestwalesgen@westernpower.co.uk))			
Central Station Solar Park	26/07/2017	Switching time*	0	Isolation of Customer's Equipment	Approved
	W28245	Smith, Andrew (asmith@westernpower.co.uk)			
Central Station Solar Park	30/07/2017	Switching time*	0	Isolation of Customer's Equipment	Approved
	W28245	Smith, Andrew (asmith@westernpower.co.uk)			
South Bank Solar	29/07/2017	1	0**	Overhead Network Refurbishment	Approved
	C25427	Reinder, Glen (greinder@westernpower.co.uk)			
Gate House Wind Farm	10/07/2017	4	3000	Substation Installation Works	Approved
	S28535	Wallace, Dan (dwallace@westernpower.co.uk)			
Gate House Wind Farm	14/07/2017	1	3000	Maintenance at Substation	Approved
	S27253	Harlan, Leanna (lharlan@westernpower.co.uk)			
Sabre Wavehub	There are no outages currently planned that would affect this site				

Dedicated website portal

- Details of approved & pending outages
- Ability to update owner/operator contact details
- Direct link to DNO outage management database for up-to-date visibility of proposed outages
- Ability to view historic outages
  - Connected Distributed Generator customers
  - Prospective customers (Future)
- Website : generation.westernpower.co.uk







Register via email

- wpdswestwalesgen@westernpower.co.uk
- wpdeastmidgen@westernpower.co.uk
- wpdwestmidgen@westernpower.co.uk

Outage management consortium

- Working group set up with DG owner/operators to establish ground rules
- WPD to identify outage affecting multiple sites that may benefit from a consortium type arrangement
- Awaiting trial opportunity

Next steps - post outage details

- WPD to produce historic outage details
  - Basic information populated (Jan17- Aug17)
  - Introduced accurate process driven by Network Management System (Sept 17)

- Report on potential generation lost due to outages
  - Initial report in MWhrs (2018)
  - Develop to report in financial terms (future)

- Establishing independent measurement criteria

Next steps

- Continue with DG Owner Operator forum
- Prospective customers to view historic outages via online portal
- Report on potential generation lost due to outages & constraints (MWhrs & ‘£’s)
- Visibility of known outages & constraints as part of an annual plan updated in real time
- Development of industry good practice with regard to management & notification of outages/constraints

Workshop 2 – Discussion questions

1. What has your experience been of working with WPD in this area?
2. How do we develop and improve the Operational Forum?
3. How can we improve the communication of outages and constraints?
4. What improvements would you like to see to on our dedicated website portal?
5. What factors should we consider as we trial outage management consortiums?
6. Is our post outage information adequate or are there any details you would like to see included?
7. Are there more actions we should be looking at as part of our future ICE plans?

COFFEE BREAK

Please remember to sign up for afternoon surgeries

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DSO Transition

Nigel Turvey

Network Strategy & Innovation Manager

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Agenda

- What is a Distribution System Operator?
- High level feedback from our DSO Strategy and Transition consultation
- Market models
- Demand Side Response

What is a DSO?

- A Distribution Network Operator (DNO) provides a network sized to support times of maximum demand and/or generation output. It is sufficiently large to enable the GB Market to consider it having infinite capacity.
- A Distribution System Operator (DSO) exploits ICT to deliver a network that makes optimal use of capacity:
  - smarter network solutions (e.g. DAR; ALT, Meshing, ANM, Intertrips)
  - Non-network solutions (e.g. DSR, DG, Storage, Reactive Power Services)

Distribution Network Operator

Passive networks managing maximum power flows

Distribution System Operator

Active networks managing real-time energy flows

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Our DSO consultation

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1. Foreword 2

The way we generate, distribute and consume electricity is changing due to advances in technology affecting the entire energy system. Generation is becoming cleaner and more distributed. Networks are becoming smarter and more active. Customers are beginning to benefit from an increasingly efficient and flexible system.

WPD recognises that the change from a Distribution Network Operator (DNO) to a Distribution System Operator (DSO) is essential to driving performance and efficiency from our network and to ensure it can meet the future energy demands of all our customers. The enhanced capabilities we are developing will also give our customers the freedom to access other opportunities within the developing energy system.

WPD views the planning and operation of a more active regional distribution network as a natural extension of its current role and believes it is uniquely placed to lead the management of an efficient and cost effective electricity system at a local level. With DSOs managing the co-ordination of transmission and distribution services at a local level, it enables the GB System Operator (GBSO) to concentrate on balancing the national network using un-conflicted services competitively made available.

There is currently no singular set view of what the future energy system will look like, and the Government has put the onus on industry to come up with the answer.

In this document, we set out our proposed actions to becoming a full DSO and consult our stakeholders upon the strategic decisions we think will provide the most benefit to our customers as we move to a smarter system.

We will review our proposed actions and workplan in line with views received from our stakeholders to this consultation and following the conclusions of the BEIS/Ofgem Smart, Flexible Energy System call for evidence.

Phil Swift
Operations Director,
Western Power Distribution

> OUR INVESTMENT OF £125M TO TRANSITION TO A DSO WILL SUPPORT THE CUSTOMER ADOPTION OF ELECTRIC CARS, LOW CARBON HEATING AND FOR FURTHER DISTRIBUTED GENERATION. DURING ED1 WE ARE INVESTING £600M IN REINFORCING THE NETWORK.

33

Our DSO transition programme complements our main business plan and focusses around improving three core areas: Assets, Customers and Network Operations.

We have set out a £125m programme of business change to move all of WPD's four licence areas to a DSO model of operation.

We sought customer and stakeholder views on our proposed approach.

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The need for flexibility during uncertainty

Traditional DNO operations would require very substantial investments in passive grid infrastructure, which would be underutilised much of the time.

- There is an increasing risk of stranded assets or reinforcement lagging development as the growth rate of DER and LCT demand increases
- Traditional investment planning may not be able to deal with new scenarios – i.e. rapid clustering, temporary constraints, changes in diversity
- Asset replacement and traditional reinforcement will be supplemented by increasing the agility of networks and enabling customers to deliver additional flexibility when required

Our DSO transition programme

Data Integrity	2016	2017	2018	2019	2020	2021	2022	2023	Cost (£m)
Alignment of Data – Common Information Model	Testing	Testing	Testing	Rollout					5
Energy and Utilisation Data – MWh not MW	Rollout	Rollout	Rollout	Rollout	Rollout	Rollout			5
Network Connectivity		Testing	Testing	Testing	Rollout	Rollout	Rollout		10

Market Integration	2016	2017	2018	2019	2020	2021	2022	2023	Cost (£m)
WPD regional energy scenarios	Testing	Testing	Testing	Rollout	Rollout	Rollout	Rollout	Rollout	0.5
WPD Operability Framework		Testing	Testing	Rollout	Rollout	Rollout	Rollout	Rollout	0.5
DSR Shared Service (link to TSO)		Testing	Rollout	Rollout	Rollout	Rollout			2
Visibility Platform (link to aggregators / suppliers)		Testing	Testing	Testing	Testing	Rollout	Rollout		5
Network Charging Methodology				Testing	Testing	Testing	Testing	Rollout	2

IT Systems	2016	2017	2018	2019	2020	2021	2022	2023	Cost (£m)
Power System Modelling	Testing	Testing	Testing	Rollout	Rollout				2
Energy Management and Forecasting		Testing	Testing	Testing	Testing	Rollout	Rollout		10
Time Series Data Storage and Visualisation	Testing	Rollout	Rollout						2
LV Connectivity / GIS				Testing	Rollout	Rollout	Rollout		5
Settlement and Billing					Testing	Rollout	Rollout	Rollout	2

Customer Propositions	2016	2017	2018	2019	2020	2021	2022	2023	Cost (£m)
DSR products by customer segment	Testing	Testing	Rollout	Rollout	Rollout	Rollout			1
DSM tariff structure						Testing	Testing	Rollout	1
Alternative Connection Agreements	Testing	Rollout	Rollout	Rollout	Rollout	Rollout			2
Managed Connection Agreements		Testing	Testing	Testing	Rollout	Rollout	Rollout		1

Equipment	2016	2017	2018	2019	2020	2021	2022	2023	Cost (£m)
Telecommunications readiness	Testing	Testing	Rollout	Rollout	Rollout				5
Transducers and measurement equipment	Testing	Rollout	Rollout	Rollout	Rollout	Rollout	Rollout	Rollout	5
Settlement and metering data for Network Operations			Testing	Rollout	Rollout	Rollout			5
Managed Connection Interface Devices	Testing	Testing	Rollout	Rollout					2
Active Network Management Technology	Testing	Testing	Rollout	Rollout	Rollout	Rollout			2

Key: Testing, Rollout

We have outlined our programme activities which will provide the necessary steps towards DSO operations.

High-level costs and timescales have been allocated against the tasks to provide greater details to our stakeholders.

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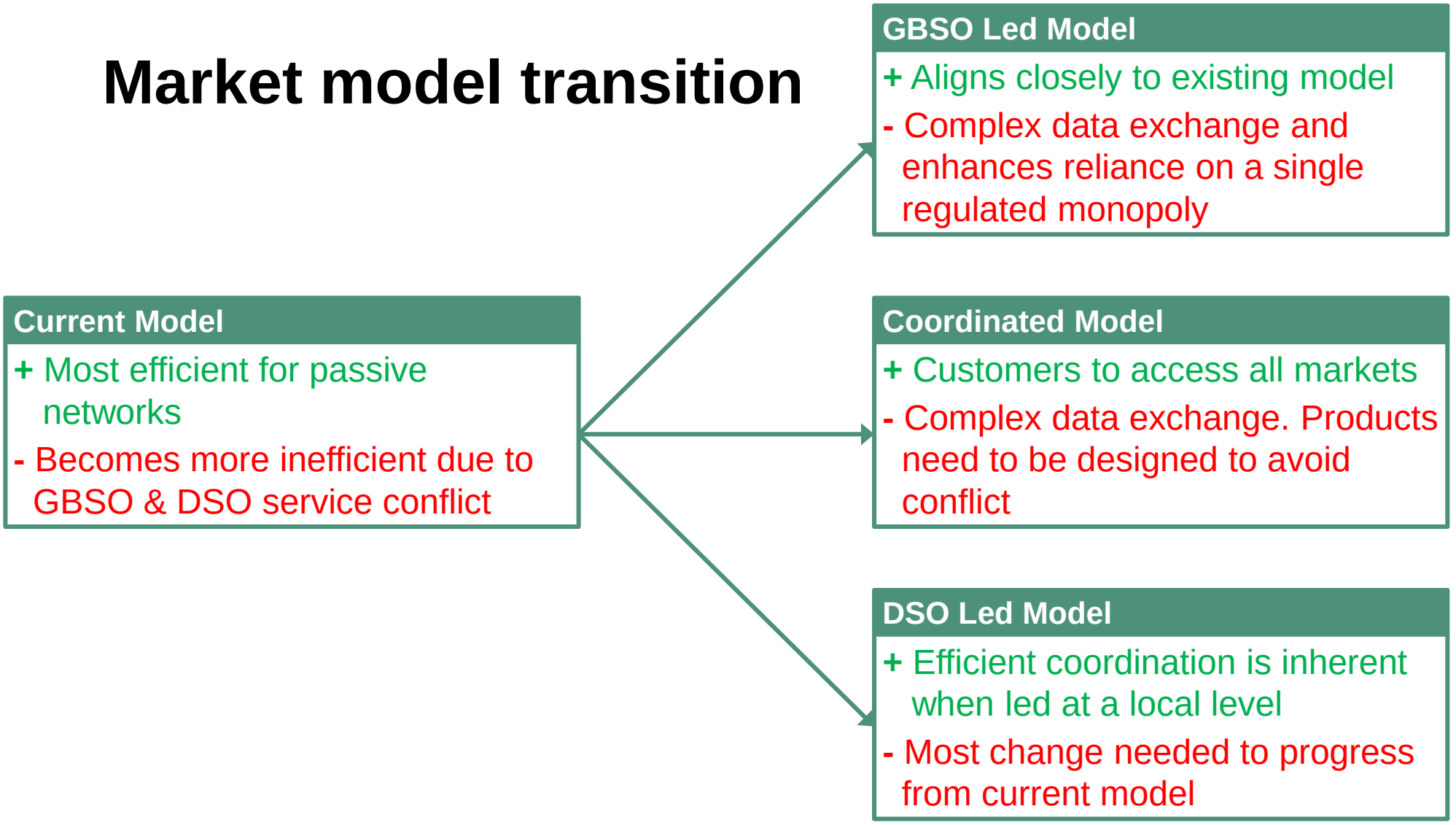
High level messages in responses to consultation

- Overall support for transition and that there is a lot to do
- Little consensus on priorities or market models
- Continuing open communication to all customer groups is key
- Cross sector and whole system (i.e. heat and transport) necessary
- Data, access to data and privacy become increasingly important
- Vulnerable customers must not be left behind
- Stakeholder want to see move from strategy to actions
- Flexible markets need to be simple to understand and participate in

Market model transition



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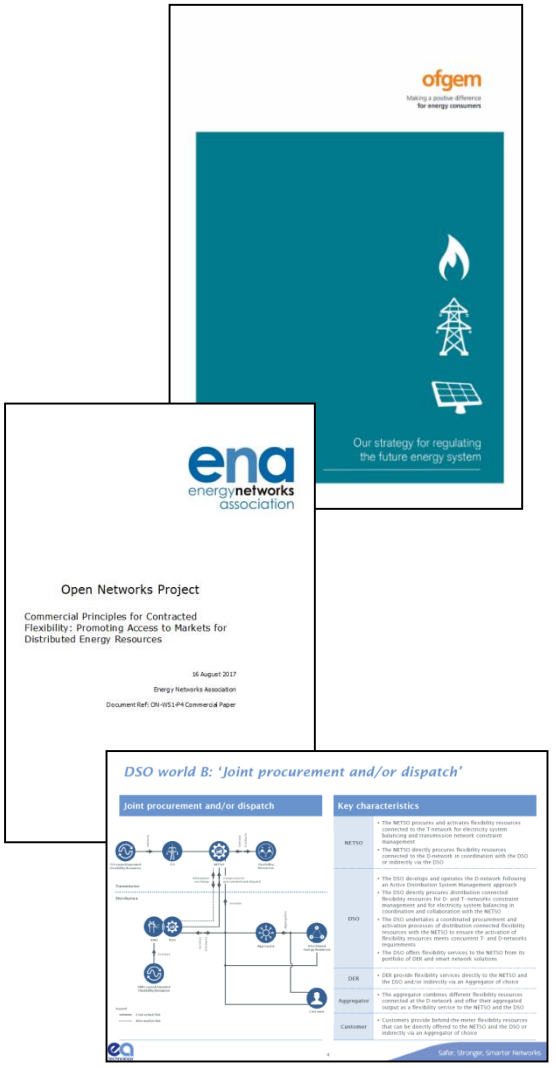
Market models

- These show the way flexibility is accessed by the SO and DSOs
- Very mixed views on market models
- Ofgem have published ‘Our strategy for regulating the future energy system’
- Ofgem’s direction appears to be towards a coordinated model but with strengthened locational and time of use price signals together with evolvement of network access rights to provide more efficient allocation of firm access rights
- ENA Open Networks project has consulted on market models and is producing models (SGAM) of the interfaces, data flow and systems required for different market models



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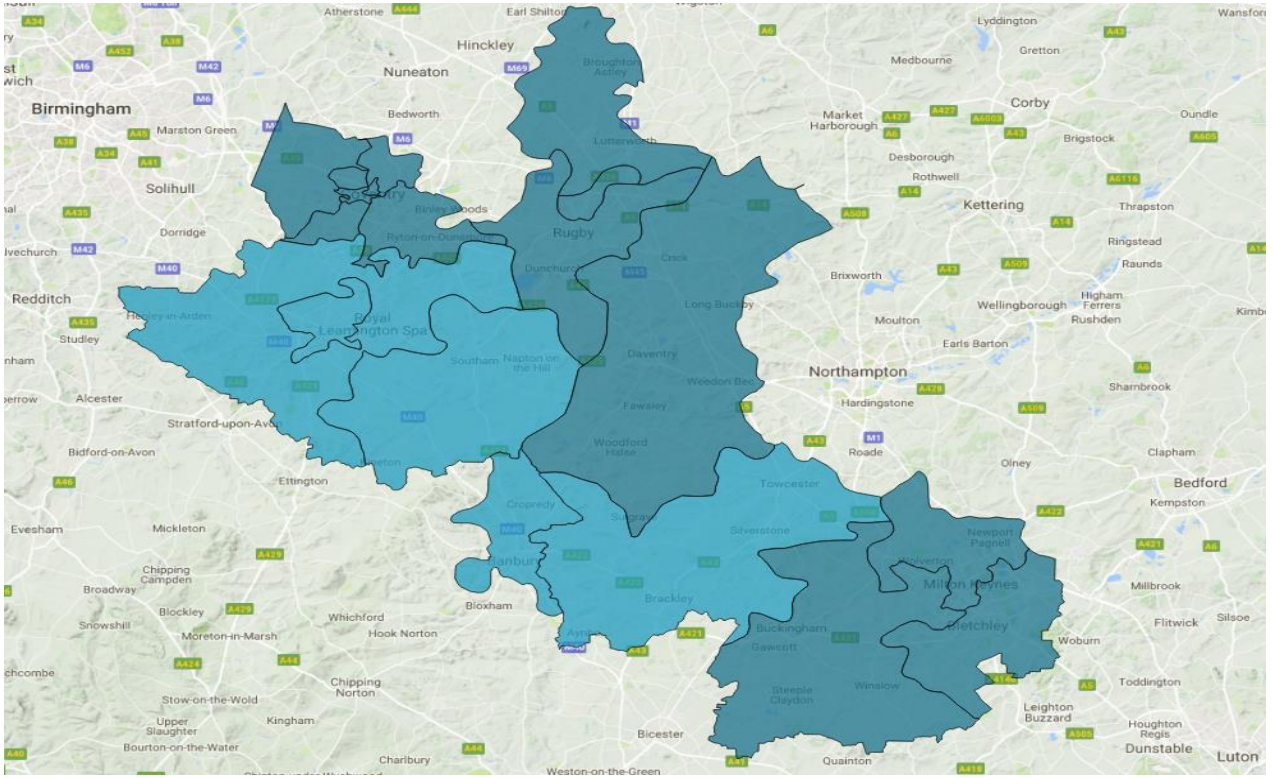
DSR – Project Entire

- In WPD's East Midlands licence area
- Along the M1-M40 corridor
- 14 Constraint Management Zones
- Marketed as Flexible Power



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What is Flexible Power?

- Part of Project Entire
- NIA funded Innovation Project by WPD
- Developing DSR services
  - Testing compatibility with complex marketplace
  - Effectiveness in dealing with different types of constraints
  - Creating new systems capability to operate DSR Programme
  - Procuring capacity within the CMZs (Constraint Management Zones)

What is being trialled?

- 3 new DSR services
- Each intended to deal with a different type of CMZ
  - Secure
  - Dynamic
  - Restore
- Local Flexibility resources
- Pre and Post Fault constraint resources

Summary of CMZ Services

	Secure	Dynamic	Restore
Advance Payment	Arming	Availability	None
Utilisation	Medium	High	Premium
Service declaration	Week Ahead	Week Ahead	Week Ahead
Accept / Reject	Week Ahead	Week Ahead	Automatic Accept
Dispatch Notice	Week Ahead	15 minutes	15 Minutes
Seasonal Requirement	All	Summer	All
Site Type	Half Hourly Metered	Half Hourly Metered	Half Hourly Metered
Generation	√	√	√
Load Reduction	√	√	√

Identifying future DSR requirements

- Data about the network and load flows is essential
- Signposting where services both are required and are likely to be required in future essential to help develop provision
- Looking at Flexible Power as a delivery route
- Potential future requirements being identified via two routes:
  - Regional Development Program with NGET – identifying whole system requirements for investment/flexibility in S West against a ‘gone green’ type scenario
  - Strategic Studies – first round has focused on identifying issues and potential reinforcement solutions – second round to look at the extent that flexibility could provide economic solutions

Workshop 3 – Discussion questions

- Do you agree with the findings of our consultation? Would you add anything?
- What is the best way to engage with different customer groups?
- How do we ensure that vulnerable and low income customers are not disadvantaged?

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Spotlight on Information Provision

Graham Halladay

Network Services Manager South West

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Topics for discussion

- Information currently available
- Network Capacity Map
- Proposals & your feedback

Information available

Network plans “WPD Data Portal”

- Online facility to download & access geographical mapping information

Long Term Development Statement

- 132kV and EHV network data (transformers, circuits, demands)

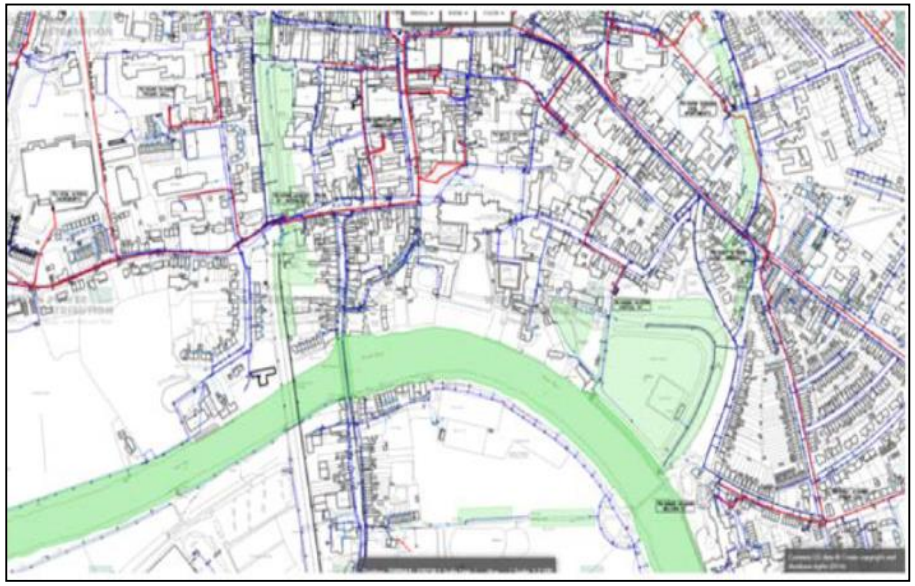

Table 3 - Load Information

							Forecast					
Gsp Group	Bsp	S/S or Busbar Name	Bus / Node	Base kV	Maximum Demand MVA 2015/1	Power Facto	Maximum Demand MVA 2016/1	Maximum Demand MVA 2017/1	Maximum Demand MVA 2018/1	Maximum Demand MVA 2019/2	Maximum Demand MVA 2020/2	Firm Capacity MVA
Alverdiscott 132 kV	BARNSTAPLE 33kV	AARONSONS 33kV	AARO3	33kV	6.44	0.99	6.44	6.44	6.44	6.44	6.44	8
Iron Acton 132 kV	LOCKLEAZE 33kV 'K' BAR	ABBEYWOOD 11kV 'J' BAR	ABBW5	11kV	3.70	0.99	4.03	4.79	5.17	5.17	5.21	7.5
Iron Acton 132 kV	BRADLEY STOKE 33kV	ABBEYWOOD 11kV 'K' BAR	ABBW5	11kV	3.48	0.98	3.42	3.38	3.36	3.36	3.40	7.5
Landulph 132 kV	PLYMOUTH 33kV	ADELAIDE ROAD 11kV	ADER5	11kV	10.96	0.99	10.77	10.63	10.57	10.58	10.69	18.2
Taunton 132 kV	BOWHAYS CROSS 33kV	ALCOMBE 11kV	ALCO5	11kV	15.02	0.96	14.76	14.57	14.49	14.49	14.66	22.86
Landulph 132 kV	ERNESETTLE 33kV	ALEXANDRA ROAD 11kV	ALER5	11kV	10.59	0.98	10.41	10.27	10.22	10.22	10.33	18.865
Landulph 132 kV	MILEHOUSE 33kV	ALMA ROAD 11kV	ALMR5	11kV	12.20	0.96	11.99	11.83	11.77	11.77	11.91	23
Iron Acton 132 kV	BRADLEY STOKE 33kV	ALMONDSBURY 11kV	ALMO5	11kV	14.03	0.98	13.79	13.75	13.68	13.68	13.84	22.86
Iron Acton 132 kV	BRADLEY STOKE 33kV	Alveston_Hammerley Midlands	AHMD3	33kV	14.42	0.98	14.17	13.98	13.91	13.91	14.07	16
Landulph 132 kV	PLYMOUTH 33kV	ARMADA STREET 11kV	ARMA5	11kV	14.23	0.99	13.99	13.80	13.73	13.73	13.89	19.5
Abham 132 kV	TOTNES 33kV	ASHBURTON 11kV	ASHB5	11kV	6.24	0.94	6.29	6.21	6.18	6.18	6.25	8
Seabank 132 kV	PORTISHEAD 33kV	ASHLANDS 11kV	ASHL5	11kV	6.71	1.00	6.59	6.51	6.47	6.47	6.55	14
Alverdiscott 132 kV	PYWORTHY 33kV	ASHWATER 11kV	ASHW5	11kV	1.39	0.99	1.36	1.35	1.34	1.34	1.35	7.623
Iron Acton 132 kV	SEABANK 33kV	ASTRA ZENECA 11KV	ASTZ5	11kV	4.16	0.92	4.16	4.16	4.16	4.16	4.16	23
Exeter 132 kV	EXETER CITY 33kV	ATHELSTAN ROAD 11kV	ATHL5	11kV	15.74	0.98	17.21	18.38	18.78	18.79	18.96	20.29
Seabank 132 kV	AVONMOUTH 33kV	AVONMOUTH 11kV 'J' & 'K' BAR	AVOH5K	11kV	21.71	0.99	22.41	22.61	22.74	22.75	22.98	46
Seabank 132 kV	Avonmouth 33 kV	AVONMOUTH 33kV	AVON3	33kV	80.08	0.99	79.82	79.57	79.64	79.90	80.71	114.32
Seabank 132 kV	AVONMOUTH 33kV	AVONMOUTH DOCKS 'J' 6.6kV	AVMO7J	6.6kV	6.64	0.99	6.64	6.64	6.64	6.64	6.65	22.86
Seabank 132 kV	AVONMOUTH 33kV	AVONMOUTH DOCKS 'K' 6.6kV	AVMO7K	6.6kV	4.86	0.99	4.78	4.71	4.69	4.69	4.74	22.86
Bridgwater 132 kV	CHURCHILL 33kV	AXBRIDGE 11kV	AXBR5	11kV	7.36	0.99	7.23	7.13	7.10	7.10	7.18	14
Axminster 132 kV	WOODCOTE 33kV BAR	AXMINSTER 11kV	AXMN5	11kV	6.92	0.96	7.39	7.30	7.26	7.27	7.34	22.86
Alverdiscott 132 kV	Barnstaple 33 kV	BARNSTAPLE 33KV	BAST3	33kV	55.24	0.99	54.69	54.73	54.48	54.49	55.03	68.59
Alverdiscott 132 kV	EAST YELLAND 33kV	BARNSTAPLE QUAY 11kV	BARQ5	11kV	14.15	0.99	14.25	14.06	13.99	14.00	14.15	18.2
Abham 132 kV	TORQUAY 33kV	BARTON 11kV	BART5	11kV	12.61	0.98	12.39	12.23	12.17	12.17	12.31	22.86
Melksham 132 kV	Bath 33 kV	BATH (DOLEMEADS) 33kV	BATH3	33kV	84.26	0.99	85.88	86.55	87.29	88.08	88.92	114.32
Bridgwater 132 kV	BRIDGWATER 33kV 'J' BAR	BATH ROAD 11kV 'J' BAR	BATR5J	11kV	14.64	0.96	14.39	14.19	14.12	14.12	14.28	22.86
Bridgwater 132 kV	BRIDGWATER 33kV 'J' BAR	BATH ROAD 11kV 'K' BAR	BATR5K	11kV	17.31	0.96	17.01	16.79	16.70	16.70	16.89	22.86

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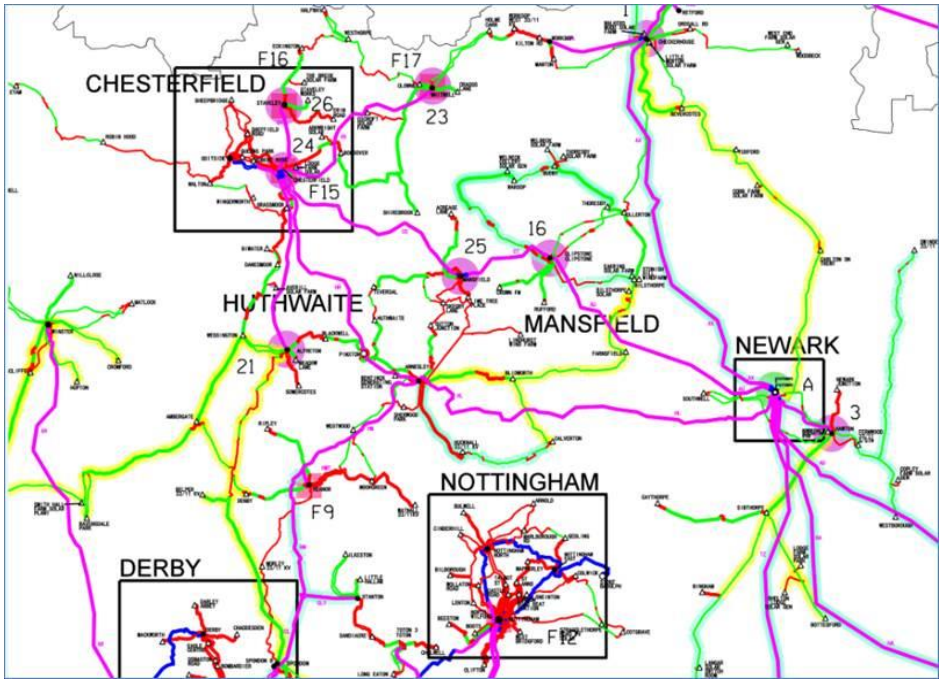
Information available

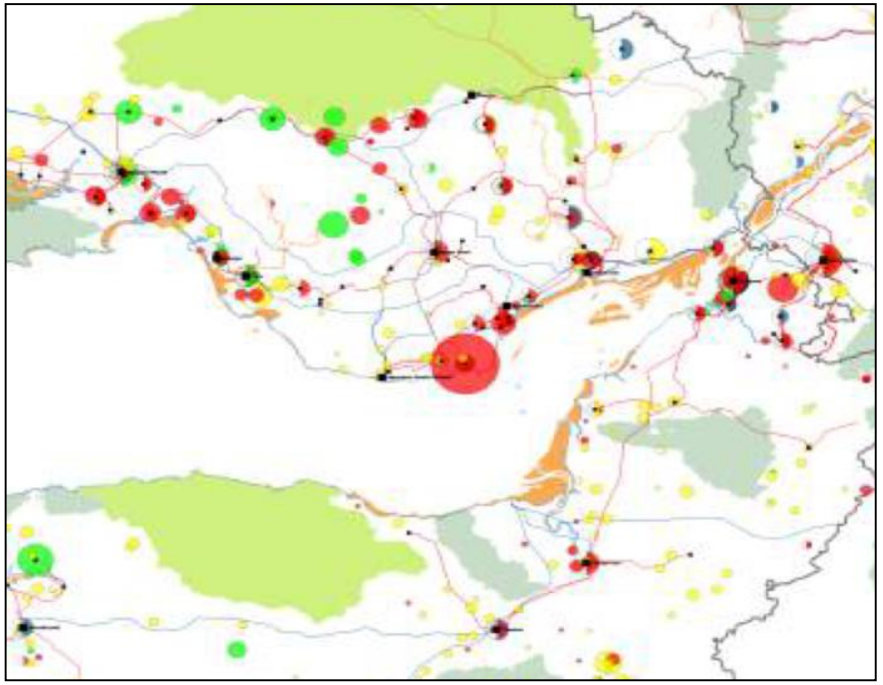
Constraint Map

- 132kV and EHV (thermal and voltage constraints)

Large Generator Connection Map

- High-level map showing location of large generation sites





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Information available

Statement of Works

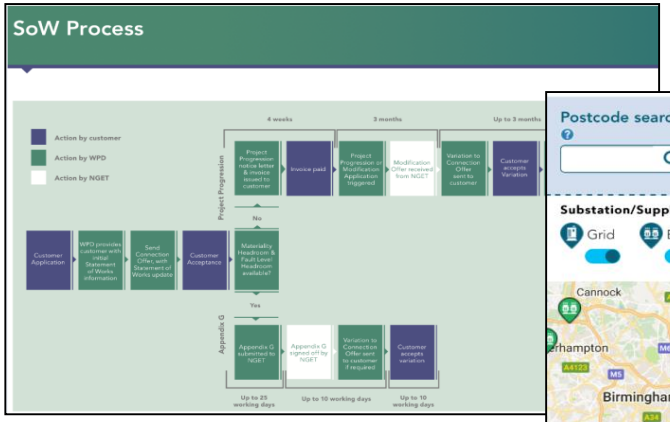
- SoW updates, ‘Appendix G’ summaries, guidance document

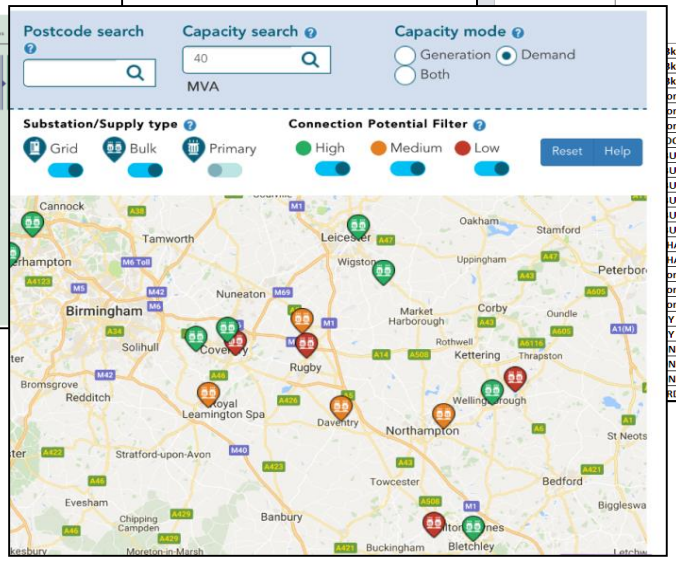
Generation Capacity Register

- MW of connected, accepted, offered generation by s/s & technology

Network Capacity Map

- Indication of network capability headroom, traffic light status





B	C	D	E	F	G	H	I	J	K	L	M
BSP	Primary	Generator Technology	Voltage	Latest Connected Export Capacity [kVA]	Change in Connected Export Capacity [kVA]	Latest Accepted-not-yet-Connected Export Capacity [kVA]	Change in Accepted-not-yet-Connected Export Capacity [kVA]	Latest Offered-not-yet-Accepted Export Capacity [kVA]	Change in Offered-not-yet-Accepted Export Capacity [kVA]	Latest Enquired-not-yet-Offered Export Capacity [kVA]	Change in Enquired-not-yet-Offered Export Capacity [kVA]
	kV connection	Photovoltaic	33kV	9,000	-	-	-	-	-	-	-
	kV connection	Photovoltaic	33kV	4,400	-	-	-	-	-	-	-
	kV connection	Photovoltaic	33kV	5,000	-	-	-	-	-	-	-
	or 66kV connection	Other Generation	33kV or 66kV	-	-	20,000	20,000	-	-	-	-
	or 66kV connection	Other Generation	33kV or 66kV	-	-	-	-	-	- 20,000	-	-
	or 66kV connection	Storage (Battery)	33kV or 66kV	-	-	15,000	-	-	-	-	-
	DON 33 11kV S STN	Photovoltaic	Aggregate of HV & LV	340	-	-	-	-	-	-	-
	URY 33 11kV S STN	Biomass & Energy Crops (n	Aggregate of HV & LV	-	-	185	-	-	-	-	-
	URY 33 11kV S STN	Landfill Gas, Sewage Gas,	Aggregate of HV & LV	1,200	-	-	-	-	-	-	-
	URY 33 11kV S STN	Mini CHP (<1MW)	Aggregate of HV & LV	50	-	80	-	-	-	-	-
	URY 33 11kV S STN	Onshore Wind	Aggregate of HV & LV	5	-	-	-	-	-	-	-
	URY 33 11kV S STN	Other Generation	Aggregate of HV & LV	4	-	-	-	-	-	-	-
	URY 33 11kV S STN	Photovoltaic	Aggregate of HV & LV	476	-	2,300	-	-	-	14	6
	HAM 33 11kV S STN	Other Generation	Aggregate of HV & LV	-	-	-	-	3,000	3,000	-	- 3,000
	HAM 33 11kV S STN	Photovoltaic	Aggregate of HV & LV	500	-	500	-	-	-	-	- 20
	or 66kV connection	Other Generation	33kV or 66kV	-	-	20,000	20,000	-	-	-	-
	or 66kV connection	Other Generation	33kV or 66kV	-	-	-	-	-	- 20,000	-	-
	or 66kV connection	Storage (Battery)	33kV or 66kV	-	-	-	-	-	-	20,000	20,000
	Y ROAD 33 11kV S STN	Mini CHP (<1MW)	Aggregate of HV & LV	250	-	-	-	-	-	-	-
	Y ROAD 33 11kV S STN	Photovoltaic	Aggregate of HV & LV	7,604	-	1,000	-	15	-	250	250
	N HILLS 33 11kV S STN	Micro CHP (Domestic)	Aggregate of HV & LV	1	-	-	-	-	-	-	-
	N HILLS 33 11kV S STN	Mini CHP (<1MW)	Aggregate of HV & LV	-	-	-	-	50	-	-	-
	N HILLS 33 11kV S STN	Photovoltaic	Aggregate of HV & LV	485	3	-	-	-	-	-	-
	RDON 33 11kV S STN	Mixed	Aggregate of HV & LV	-	-	-	-	8	-	-	-

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Information provision

- Why do we provide it?
  - Allows initial self assessment
  - Benefit to developer & WPD
  - Clear and transparent

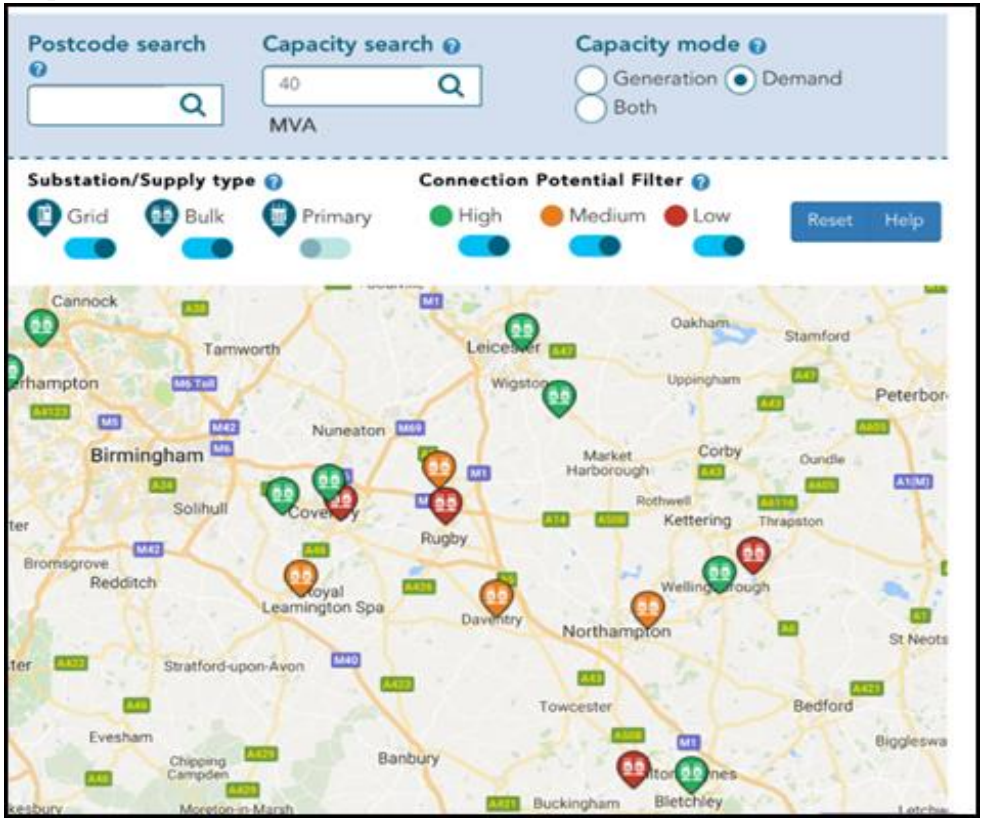
- Requirements?
  - Reliable
  - Up to date
  - Useful

- WPD want to be leading the way

Network Capacity Map

Stakeholder Feedback – ‘more information please’

- Introduced Network Capacity Map
  - Based on LTDS information
  - Map based navigation
  - Traffic light system of capacity
  - Filters included
- Further Information
  - Reinforcement Information
  - Description & Cost
  - Demand & Generation
- Future Information
  - Constraint information
  - Data Download
  - Daily Load Profile



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Network Capacity Map

- New Data Items Identified (Generation released Sept, Demand released Q1 2018)
  - Available capacity (traffic light)
  - Thermal constraints
  - Fault level constraints
  - Alternative offers availability
  - Point of Connection (PoC) costs
  - Reinforcement costs
  - Upstream reinforcement
  - Connection time scales
  - Planned reinforcement

Network Capacity Map

Further Information

Substation Information

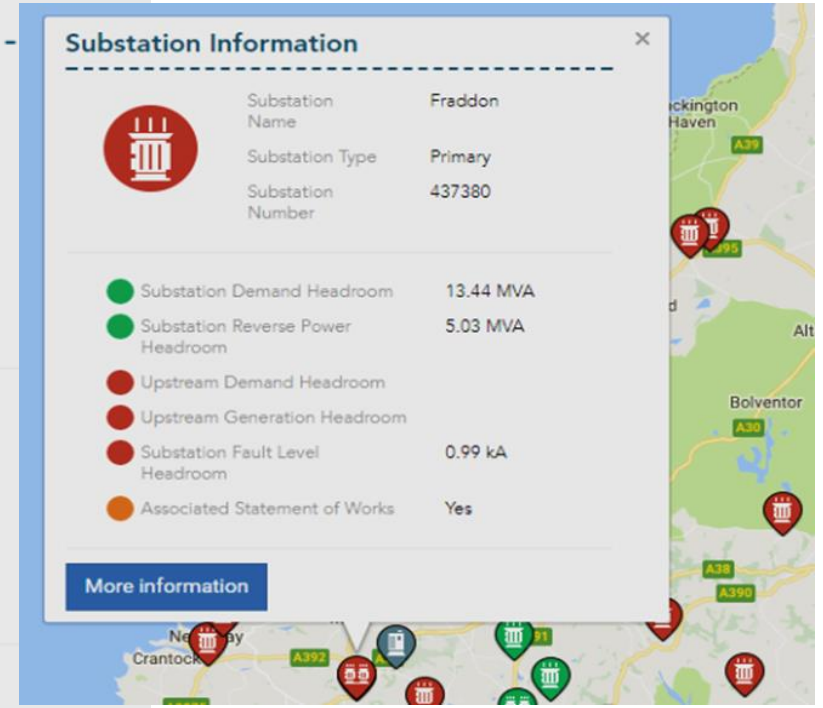
Substation Name:	Fraddon
Substation Type:	Primary
Substation Number:	437380
HV Voltage Level:	33 kV
LV Voltage Level:	11 kV

Demand

Substation Firm Capacity:	22.86 MVA
Substation Peak Demand:	9.42 MVA
Substation Demand Headroom:	13.44 MVA
Upstream Demand Headroom	

Generation

Substation Reverse Power Capability:	17.25 MVA
Connected Generation:	12.05 MVA
Accepted not yet connected:	
Offered not yet accepted:	0.17 MVA
Substation Reverse Power Headroom:	5.03 MVA
Substation Reverse Power Limitation:	Transformer
Upstream Generation Headroom	
Upstream Network Limitation:	Alverdiscott SGTs; K-route capacity; Fraddon GTs
Planned Reinforcement:	K-route uprating; Fraddon BSP



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Workshop 4 – Discussion questions

- Were you aware of the information WPD already publishes and have you used it?
  - Is the information easy to access?
  - How could access be improved?
- Are there any areas where you would like more information?
  - Capacity & Constraint Information?
  - Network Data?
  - Consumption data e.g. daily Load Profile?
  - Anything else required for Storage sites?
- What additional functionality would you like to see on the Network Capacity Map?
- Is there anything that other network companies are doing in this area that you would like WPD to replicate?

Afternoon surgeries

A choice of four sessions:

Table 1: Consents and Legals (Bruce Pollard)

Table 2: Competition in Connection (Paul Jewell)

Table 3: Storage (Tim Hughes/Faithful Chanda)

Table 4: Strategic Network Investment (Ben Godfrey)

Information for Stakeholders

Thank you for attending

- Slides and feedback will be posted on the website www.westernpower.co.uk

- We would appreciate feedback on any of the areas discussed today. Please contact:

Alison Sleightholm, Regulation and Government Affairs Manager

✉ email: asleightholm@westernpower.co.uk

☎ phone: 0117 933 2175

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LUNCH

Please remember to sign up for afternoon surgeries

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