Strategic Network Investment Options
West Midlands
06 June 2019

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

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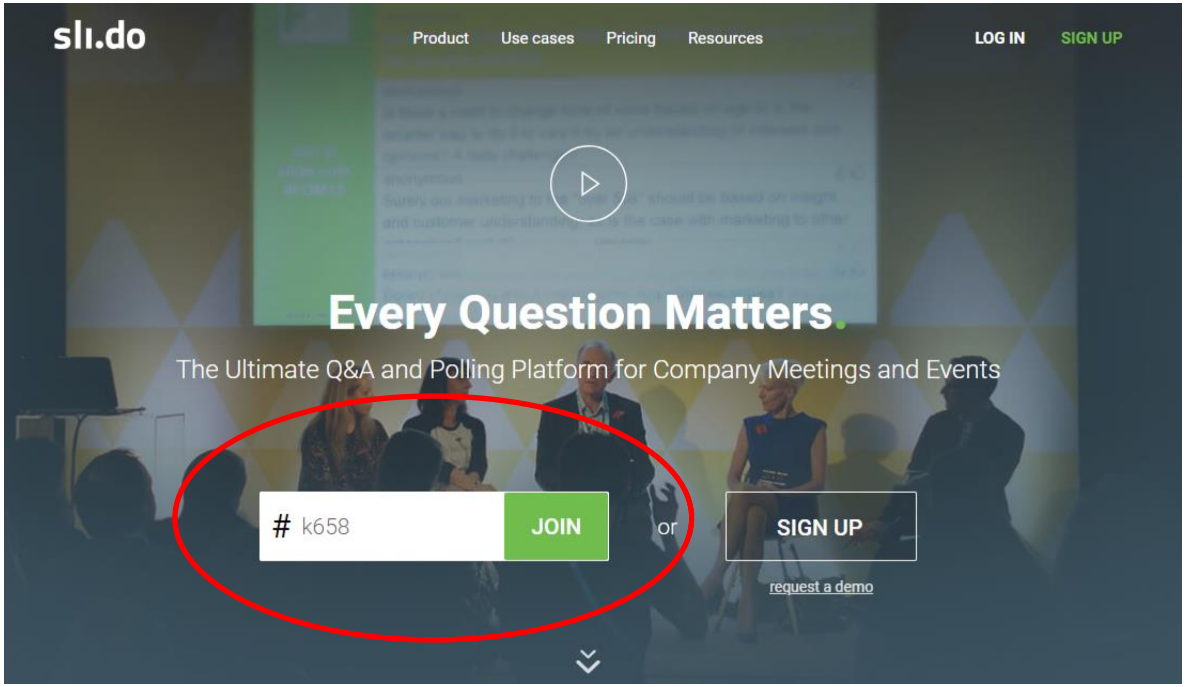

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AGENDA

10.00 **Arrival and registration**

10.30 **Introduction by the chair**

Ben Godfrey, Network Strategy Manager, Western Power Distribution

10.35 **Welcome and investment strategy overview**

Ben Godfrey, Network Strategy Manager, Western Power Distribution

10.50 **Regional energy ambition in the region**

Linda Forbes, chair, Energy Capital

11.05 **Discussion**

The West Midlands region from your perspective.
What are the priorities & key strategic focus areas the West Midlands?
What are the key local strengths and opportunities?

11.30 **Short break**

11.40 **Generation, demand and storage scenarios development**

Joel Venn, Head Analyst, Regen

12.00 **Roundtable sessions**

Each roundtable session will look at scenario outcomes in a more detail looking to understand and get feedback on specific regional conditions and differences.
Attendees join two of the sessions for 20 mins discussion around assumptions for 2032 scenarios:

1. Future energy scenarios
2. The future of electric vehicles
3. Change to DSO (WPD)

12.40 **Roundtable feedback, summary and close**

12.45 **Lunch and networking**

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WELCOME

WESTERN POWER DISTRIBUTION
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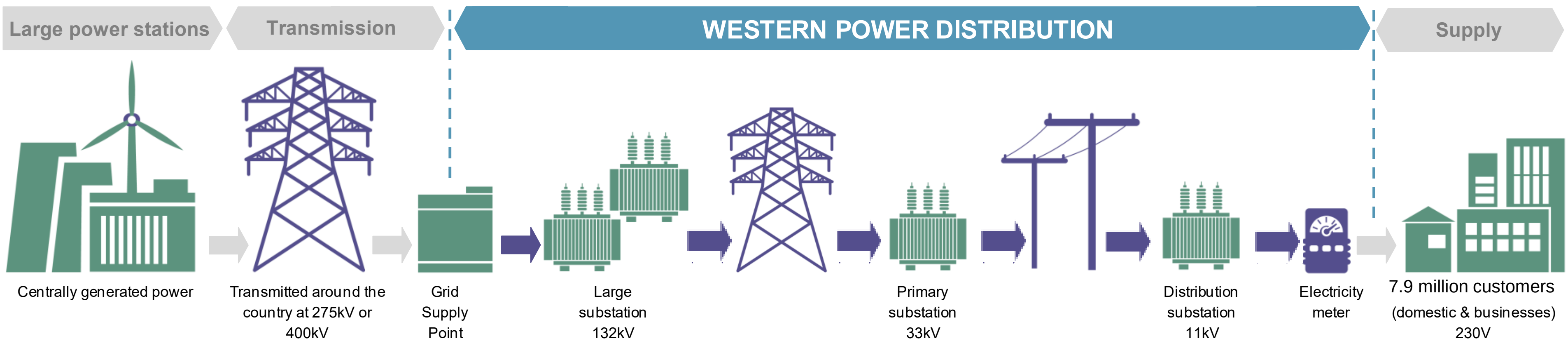
WHO WE ARE: WE ARE A DISTRIBUTION NETWORK OPERATOR (DNO)

- We operate the local electricity network, distributing power to 7.9 million homes & businesses



- Covering the East and West Midlands, South Wales and South West England

WESTERN POWER DISTRIBUTION
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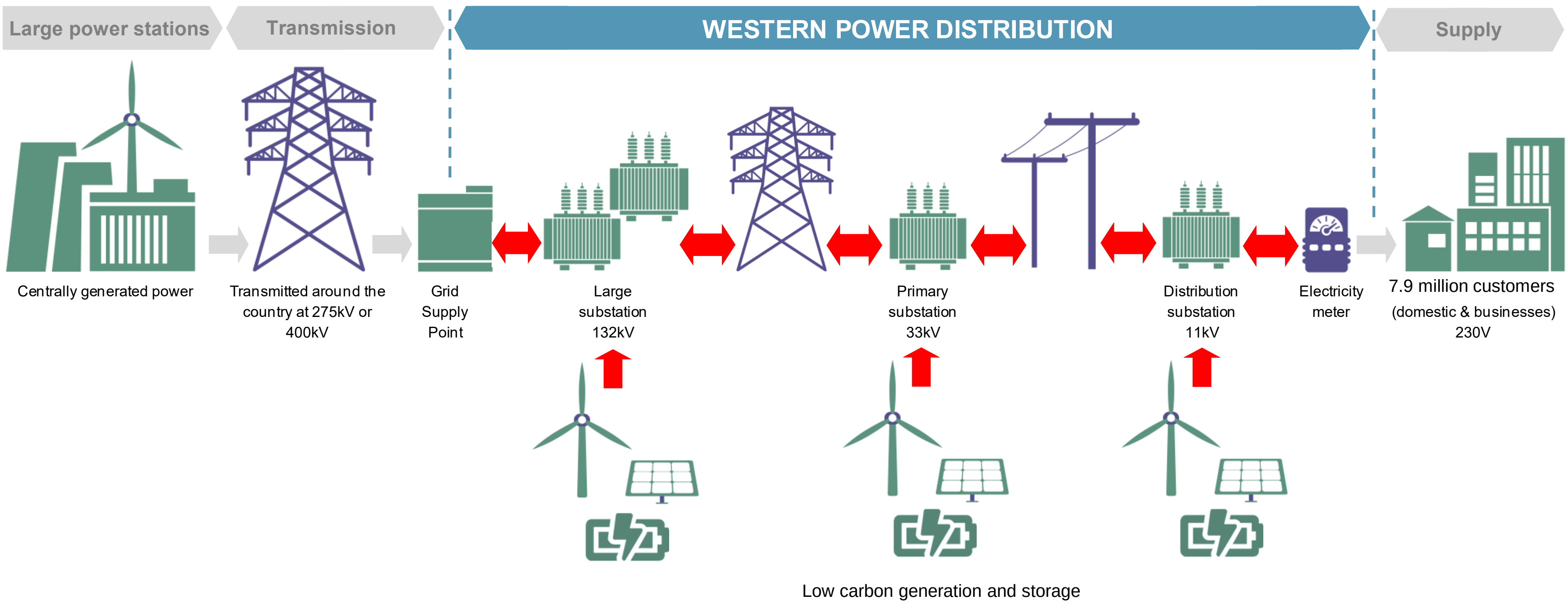
WHO WE ARE: BECOMING A DISTRIBUTION SYSTEM OPERATOR (DSO)

- We operate the local electricity network, distributing power to 7.9 million homes & businesses



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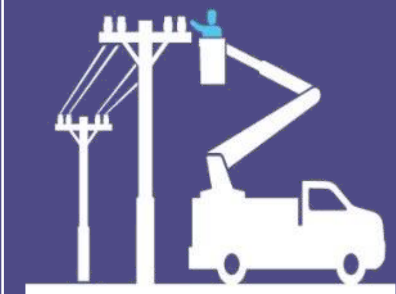
WHAT WE DO: AS A DISTRIBUTION NETWORK OPERATOR (DNO)

- Four traditional tasks:

Keep the lights on

by operating our network assets effectively



Maintain equipment

so that the network is in a condition to remain reliable

Fix the network

if equipment gets damaged or is faulty

Connect customers

by upgrading existing networks or building new ones

Safety

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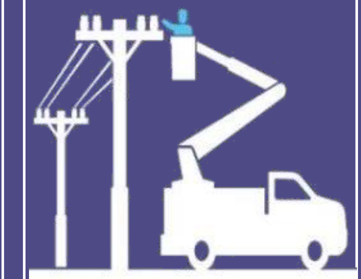
WHAT WE DO: BECOMING A DISTRIBUTION SYSTEM OPERATOR (DSO)

Keep the lights on

by operating our network assets effectively



Maintain equipment

so that the network is in a condition to remain reliable

Fix the network

if equipment gets damaged or is faulty

Connect customers

by upgrading existing networks or building new ones

Operating a smart system

Managing two-way power flows and flexibility services

Safety

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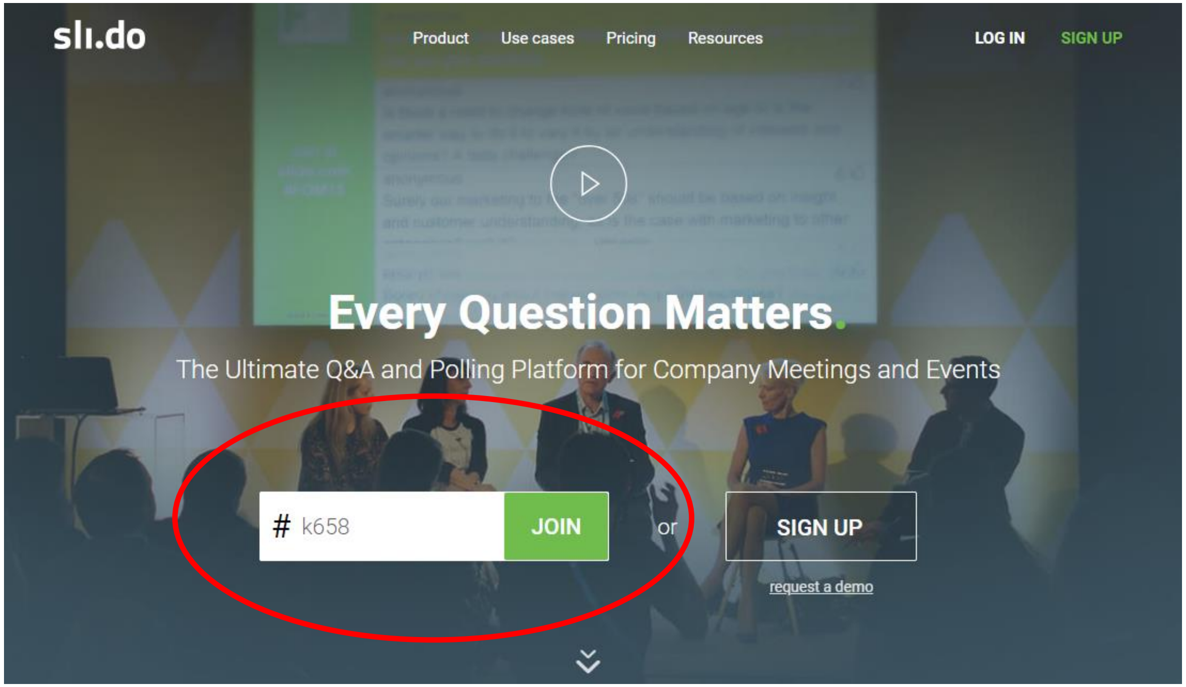

Strategic Investment Options
West Midlands
6th June 2019

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STRATEGIC NETWORK INVESTMENT

- Drivers for improved local planning
- Aims and approaches of investment planning work
- Timetable
- What else are we doing to help enable growth?

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NETWORK STRATEGY

WPD's Network Strategy team is responsible for a number of key outputs, contributing to the efficient and economic development of the network from five years out and beyond.

Our main focus topics are:

- Developing advanced modelling techniques to inform strategic studies.
- Alignment of our strategic studies with National Grid's FES work, enabling whole system working.
- Progression of a joint WPD/NGET Regional Development Plans.
- National work on developing whole system electricity outcomes through ENA's Open Networks project.
- Delivery of WPD's Distribution System Operability Framework documents.
- Development of WPD's strategy to enable transition to a DSO.
- Assessment of flexibility needs across the WPD region.
- Co-ordination of the responses to Government, regulator and external stakeholder consultations on DSO vision and strategy.

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THE NEED FOR DEVELOPING OPTIONS

- Uncertainty in the future path of demand & DG growth
- Variability and volatility in network flows increasing; usage patterns changing; new technologies
- 13.8GW Winter Peak; 17.4GW DG, 15% of Energy
- Significant changes in energy system operation: need for coordination if growth is to be achieved economically
- Ofgem wanting to understand the value to the wider customer base if they were to fund strategic reinforcement
- Need to understand whether there are 'no/low regret' investment options
- What does Brexit mean for renewables, LCTs and electrical self sufficiency?

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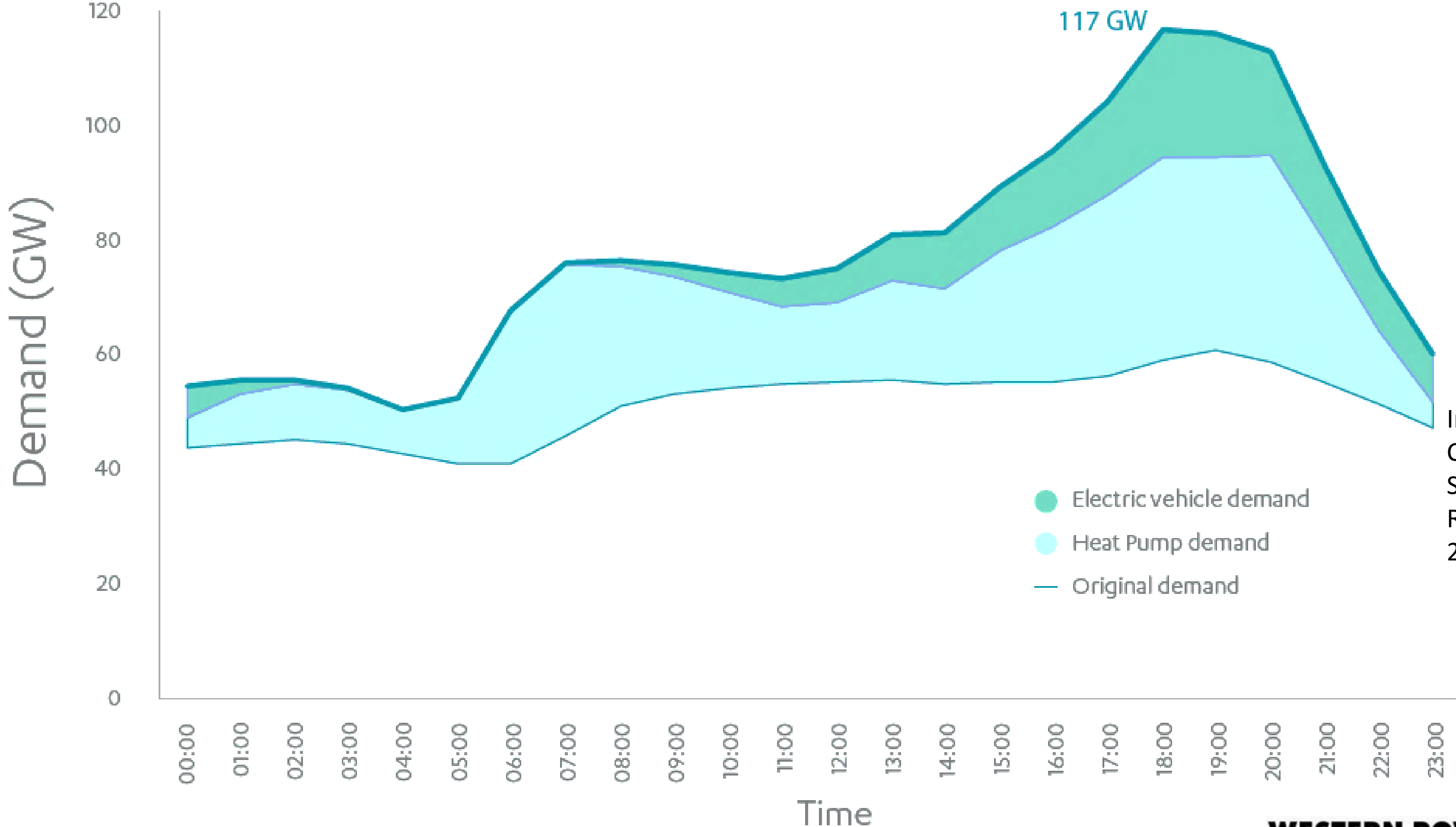
CHALLENGES OF PASSIVE NETWORKS

Possible future daily demand scenario with sub-optimal power system[10]



Infrastructure Commission Smart Power Report March 2016

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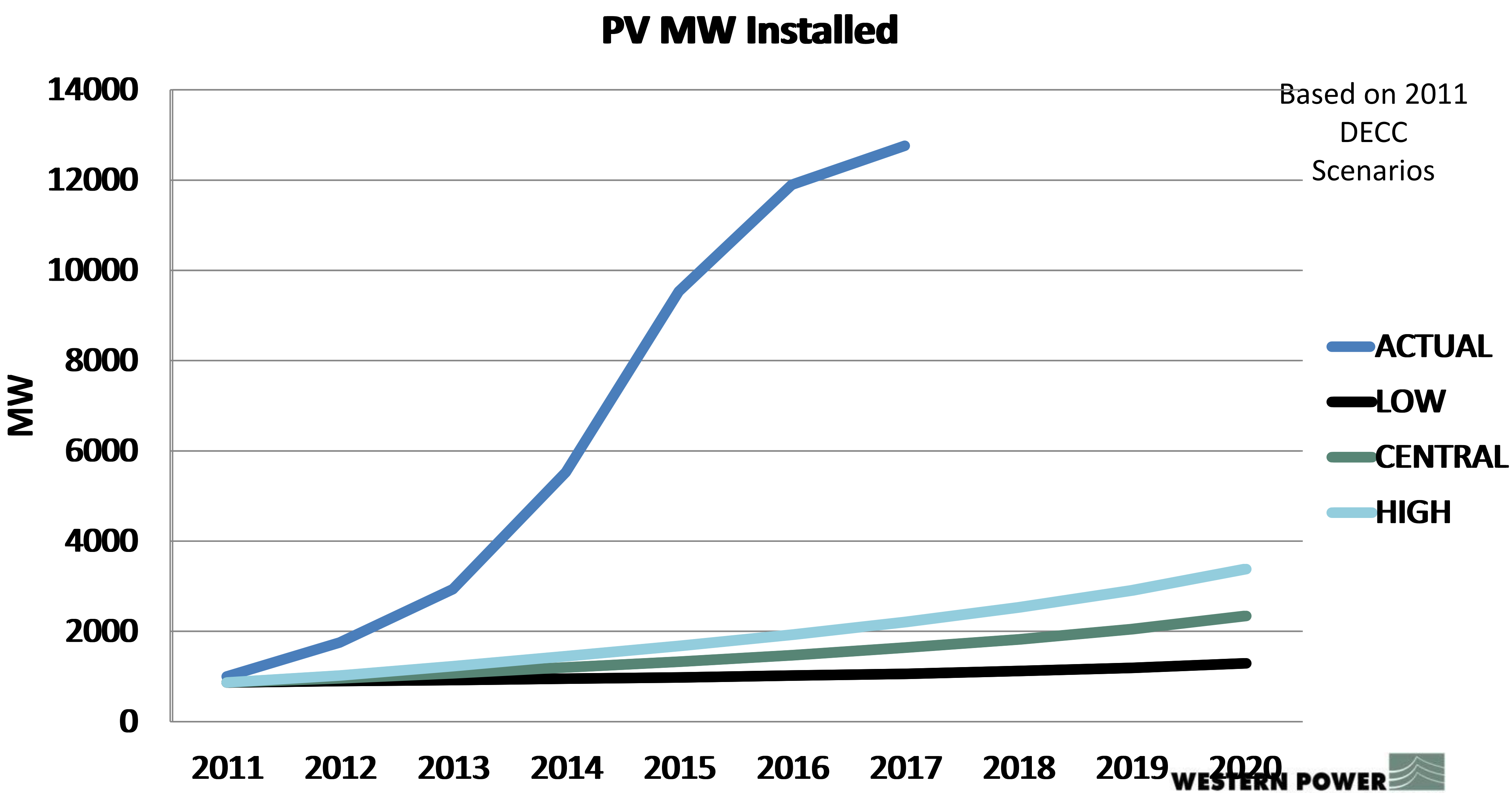
DER GROWTH IS HARD TO PREDICT



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CURRENT WEST MIDLANDS DG DATA

Generator type	Connected [MVA]	Accepted [MVA]	Offered [MVA]	Total [MVA]	*Enquired [MVA]*
Photovoltaic	648	414	297	1,359	197
Wind	55	-	-	55	1
Landfill Gas, Sewage Gas, Biogas and Waste Incineration	124	13	19	156	-
CHP	19	368	12	399	3
Biomass and Energy Crops	33	-	-	33	-
Hydro, Tidal and Wave Power	1	-	-	1	-
Storage	85	527	93	705	0
All Other Generation (inc Mixed)	796	399	122	1,317	19
Total	**1,761**	**1,721**	**543**	**4,025**	***220***

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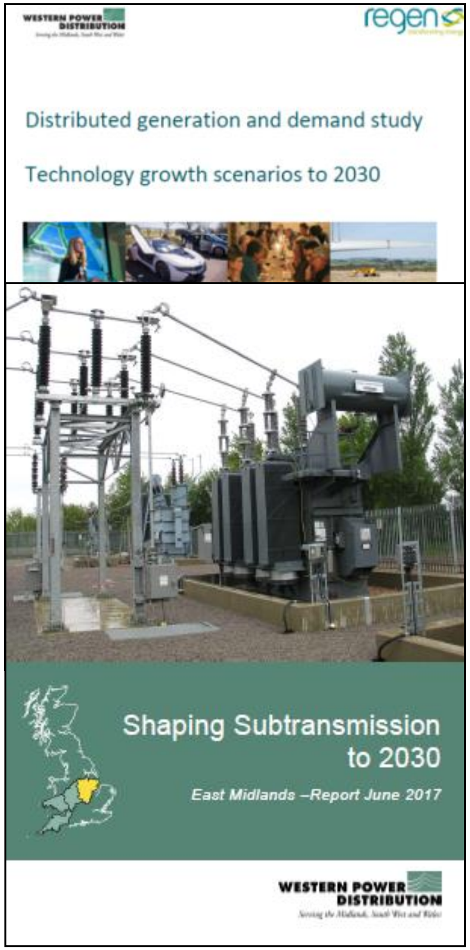
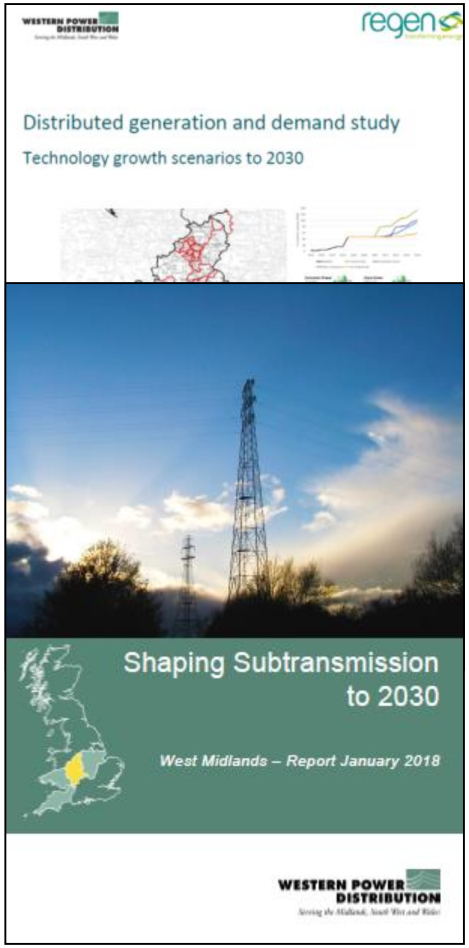
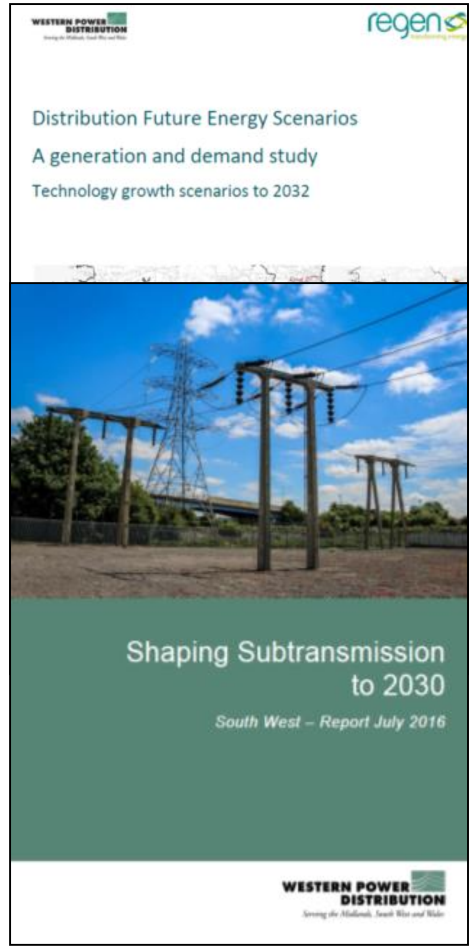
AIM OF THE STUDY

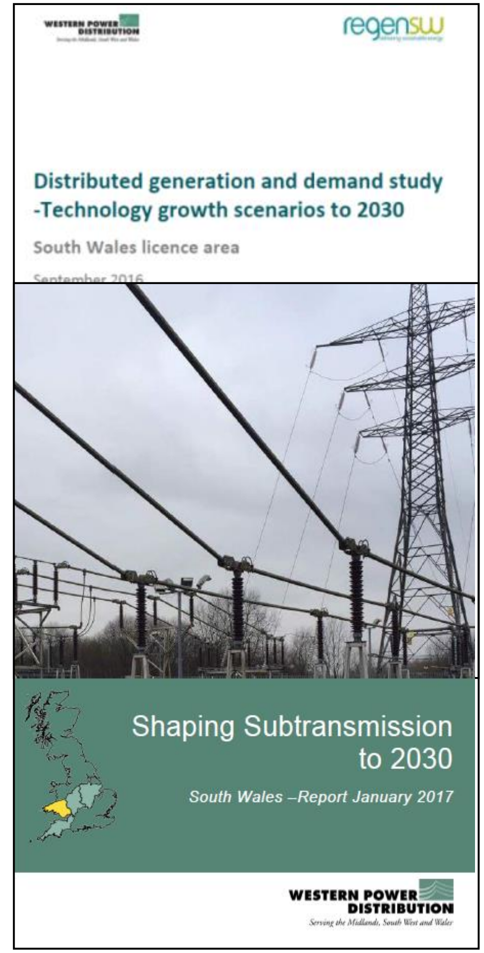
- Assessing the potential growth of customer demand and LCT uptake by type, general location and year
- Identifying thermal, voltage and fault level constraints that result
- Ensuring security of supply is maintained
- Assessing options for conventional reinforcement
- Providing recommendations for ‘low regret’ investment and identifying the cost and timescale of these
- Use this to understand the economic potential for demand side response and/or generation constraint to avoid reinforcement
- Begin to attach ‘Energy’ figures to future flexibility required

PREVIOUS OUTPUTS









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OUTPUTS OF THE STUDY

GSP	2020				2025			
Bishops Wood			CP	GG	NP	SP	CP	GG
Bushbury							CP	GG
Bustleholm							CP	GG
Cellarhead					NP	SP	CP	GG
Feckenham	NP	SP	CP	GG	NP	SP	CP	GG
Iron Acton								
Ironbridge and Shrewsbury			CP	GG			CP	GG
Kitwell							CP	GG
Lea Marston/Hams Hall			CP	GG	NP	SP	CP	GG
Nechells	NP	SP	CP	GG	NP	SP	CP	GG
Ocker Hill							CP	GG
Oldbury								
Penn						SP	CP	GG
Port Ham/Walham			CP	GG	NP	SP	CP	GG
Rugeley			CP	GG	NP	SP	CP	GG
Willenhall				GG		SP	CP	GG

CP	Consumer Power
NP	No Progression
GG	Gone Green
SP	Slow Progression

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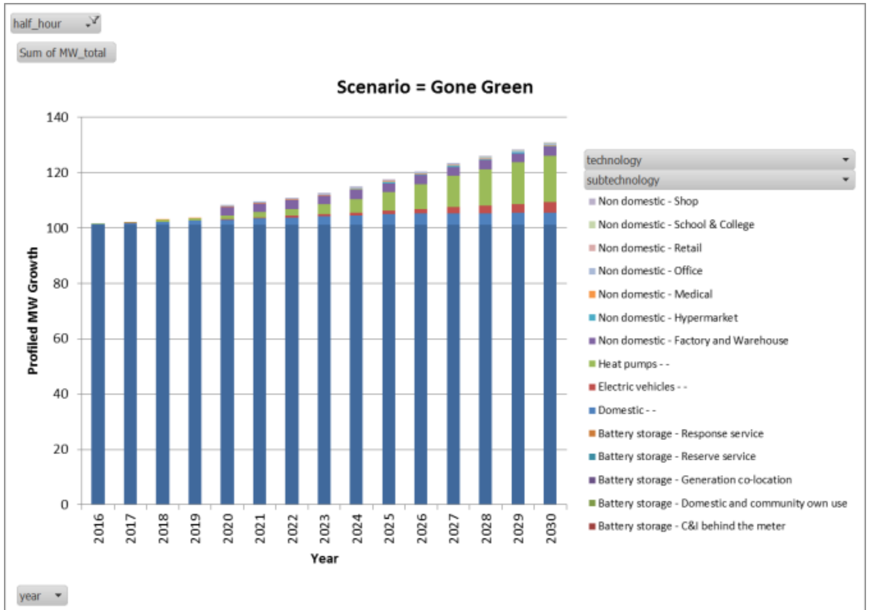
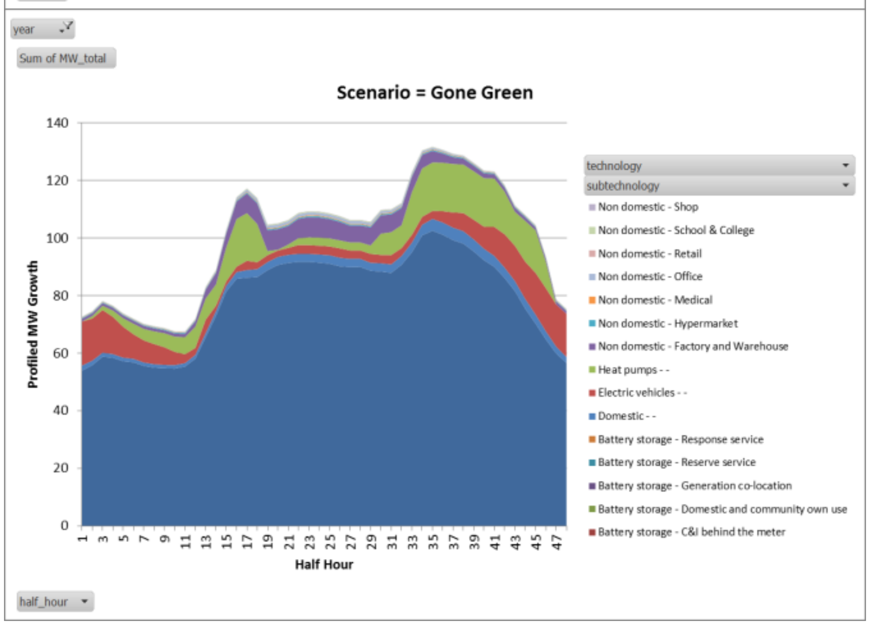
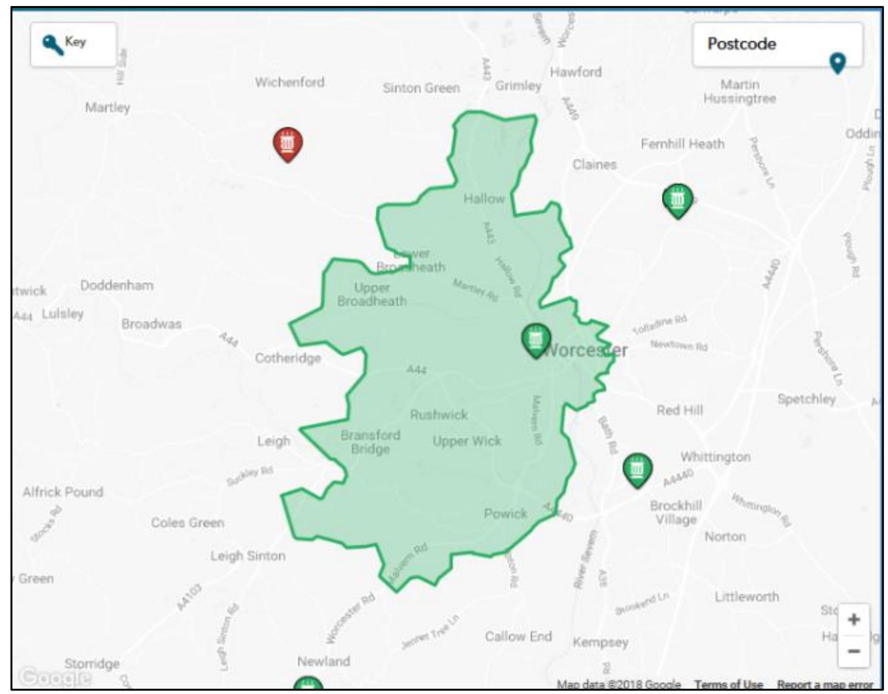
OUTPUTS OF THE STUDY





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



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TIMETABLE FOR STRATEGIC STUDIES

June 2019	Stakeholder workshop to get stakeholder input to approach and scenarios to be considered.
Q3 2019	Undertake network studies and identify solutions with costs
Q4 2019	Sensitivity work to analyse how much ‘headroom’ do the potential solutions give.
Q4 2019	Assess potential for demand response/generation to alleviate constraints
January 2020	Complete report and publish on our website
February 2020	Dissemination event by webinar – 27th February 2020

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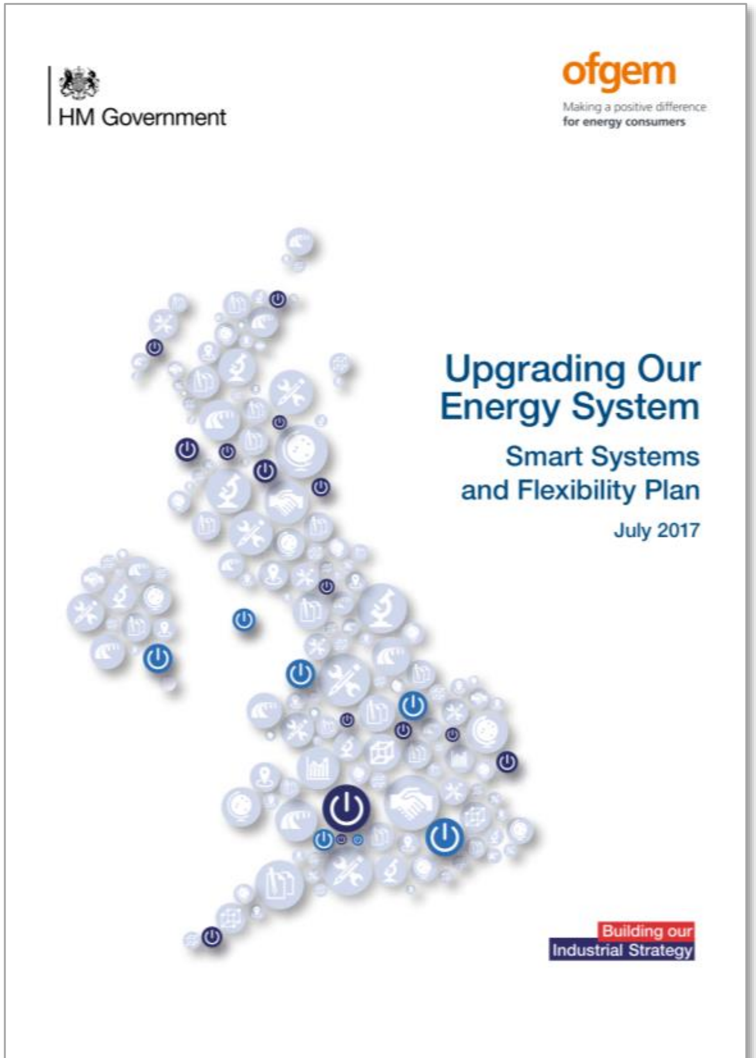
WHAT THIS MEANS FOR CUSTOMERS



ofgem

"If we take advantage of the opportunities, we can create new businesses and jobs, empower consumers and help people save up to £40bn off their energy bills in the coming decades"

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DSO TRANSITION

Distribution
Network
Operator

Passive networks managing maximum power flows

Distribution
System
Operator

Active networks managing real-time energy flows

Existing

- Develop and maintain an efficient, co-ordinated and economical system of electricity distribution
- Facilitate competition in electricity supply, electricity generation

New Roles

- Facilitate flexibility services
- Improve the resilience and security of the electricity system at a local level
- Facilitate neutral markets for more efficient whole system outcomes
- Drive competition and efficiency across all aspects of the system
- Promote innovation, flexibility and non-network solutions

WHAT THIS MEANS FOR CUSTOMERS

- WPD is becoming more active in its approach to network operation:
  - Active Network Management - rolling out across all network
  - Extending ANM to demand and storage customers
  - Transparency with our data

- Revenue streams for DSR/flexibility services – DSO requirements will be predictable and forecast in advance.
  - Revenue from demand ‘turn up’/’turn down’ services
  - Revenue from generation ‘turn up’/’turn down’ services
  - Revenue from storage energy shifting services
  - Revenue from demand shifting/influencing
  - Revenue from reactive power support

- Quicker, more efficient connections for customers willing to become active energy system participants

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WHAT THIS MEANS FOR CUSTOMERS

Some of our commitments to you...

80%
carbon emissions **reduction** by 2050

50 year
asset life on our network

Charging hubs
will be built in public car parks, supermarkets and taxi ranks

Domestic chargers will provide
150 mile
charge range

Super chargers at motorway services will provide full charge in
15 minutes

217,000
chargers will be built on our network by 2023

Our **'high'** prediction would see
3 million
vehicles in our area by 2023

Over
£58 million
is allocated for EV chargers in our current Business Plan period.

Consulted about EVs in **6**
stakeholder workshops
in February

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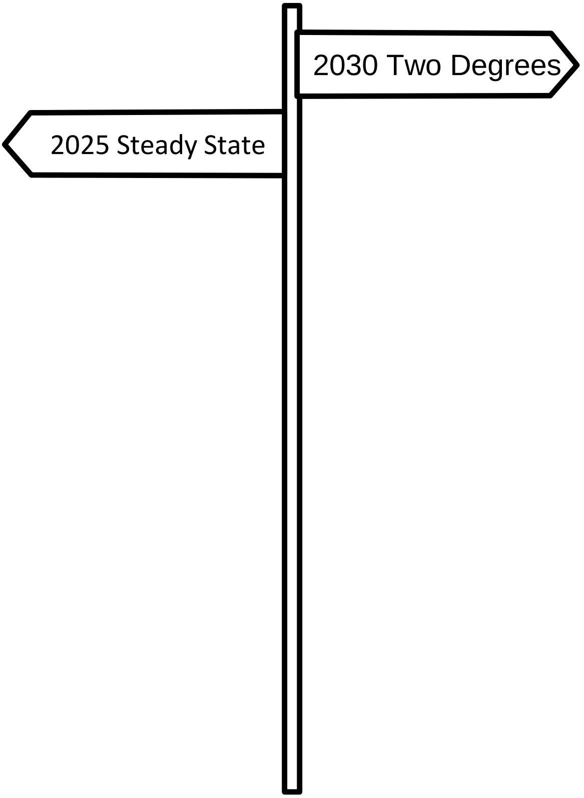
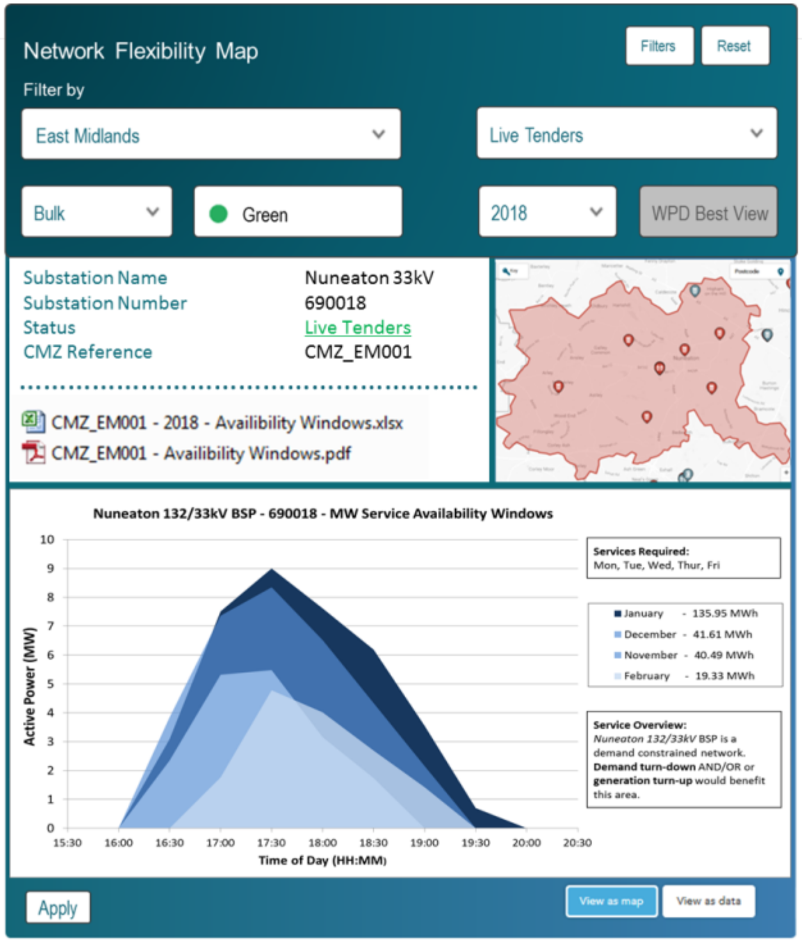
WHAT THIS MEANS FOR OUR CUSTOMERS

In February we will continue to signpost our DSO flexibility requirements for all licence areas. Our service products are designed to align with the ESO's Reserve products, increasing the potential value for DSR providers.





WPD's signposting information will direct flexibility providers to the different distribution system needs required under a range of scenarios and timings.

www.westernpower.co.uk/network-flexibility-map

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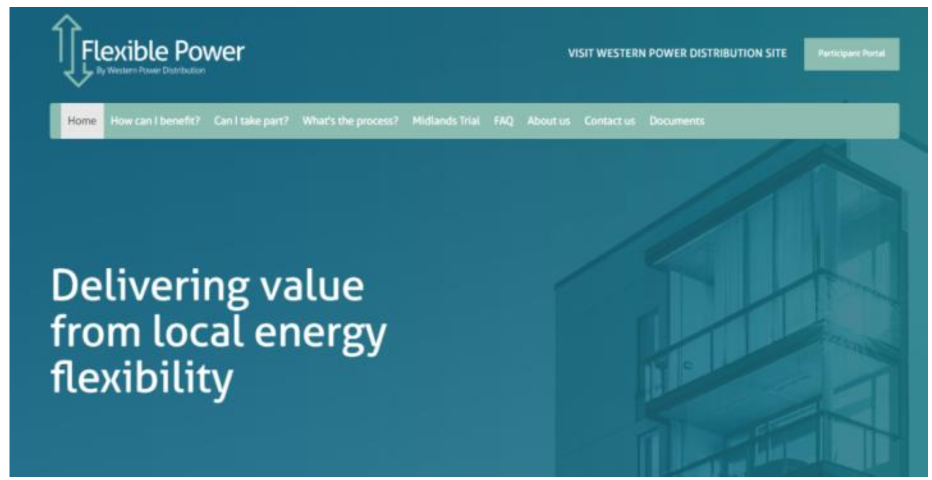
WHAT THIS MEANS FOR OUR CUSTOMERS

How we procure

- Through Flexible Power, a WPD customer-facing brand
- Full information on website: www.flexiblepower.co.uk
- Previous Expression of Interest documents and results
- API for interfacing with available for download
- Contractual frameworks published

Flexible Power
By Western Power Distribution



WHAT THIS MEANS FOR OUR CUSTOMERS

Timeline

Two Year Contracts

Expression of Interest	Procure	Build and Test	Operate
Early February 2019	Mid February to March 2019	April to May 2019	June 2019 to May 2021

We will follow a 6 monthly procurement cycle, bringing on new flexibility zones and ensuring we meet all our system needs

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WHAT THIS MEANS FOR OUR CUSTOMERS

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

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FURTHER COLLABORATION

All our reports, webinars and presentations are published online at:
http://www.westernpower.co.uk/netstrat

If you have any questions in relation to WPD's Network Strategy work, please contact WPD on the details below:

Email: wpdnetworkstrategy@westernpower.co.uk

By post:
Network Strategy Team
Western Power Distribution
Feeder Road
Bristol
BS2 0TB

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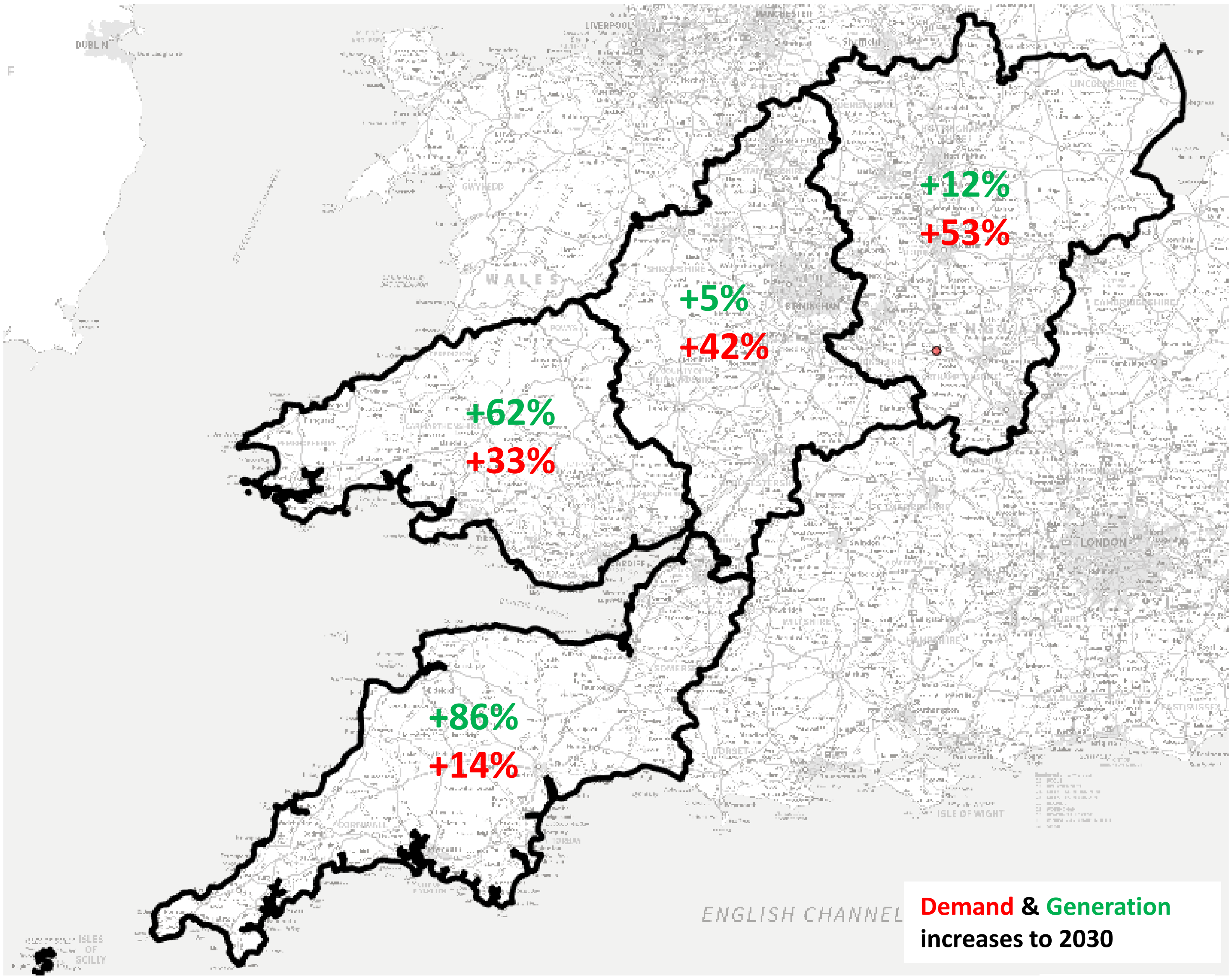
REGIONALLY SPECIFIC PLANNING



Our growth scenarios out to 2030 show that both demand and generation are expected to grow significantly in all regions.

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REGIONAL AMBITION

LINDA FORBES, PROGRAMME MANAGER, ENERGY CAPITAL

ENERGY CAPITAL

Regional ambition

Linda Forbes, Programme Manager

6 June 2019

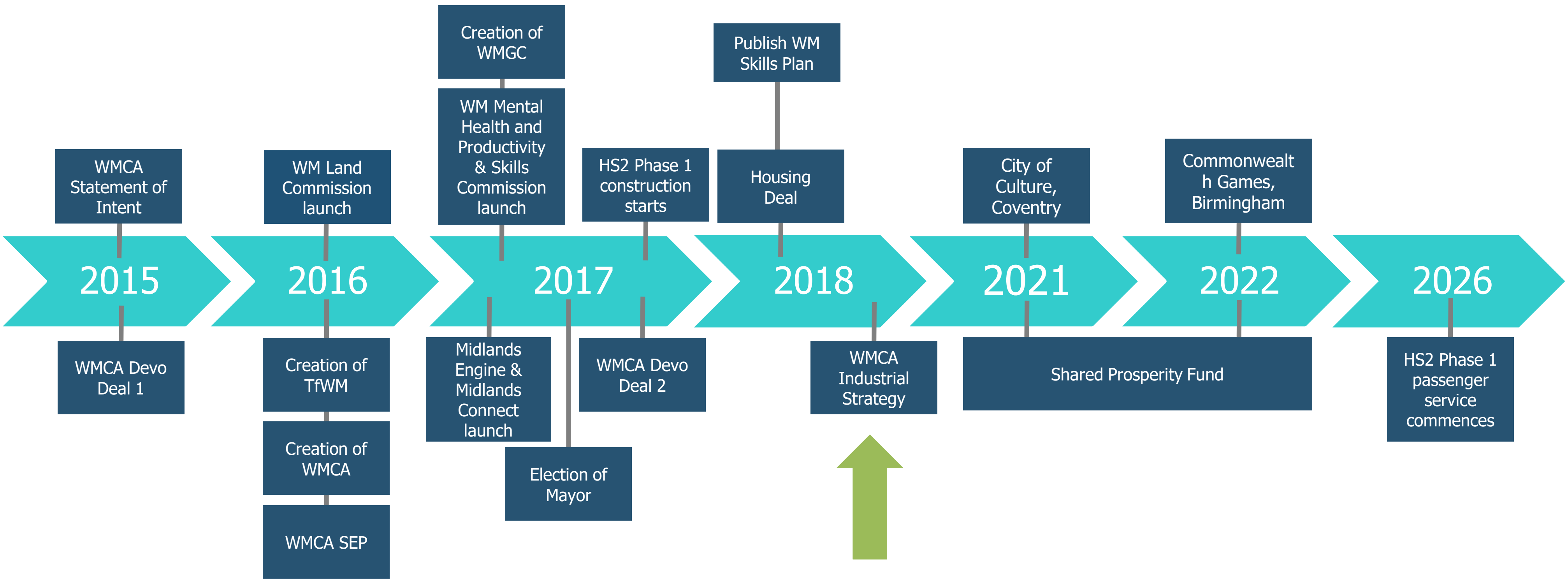
CWLEP Coventry & Warwickshire Local Enterprise Partnership

Greater Birmingham & Solihull Local Enterprise Partnership

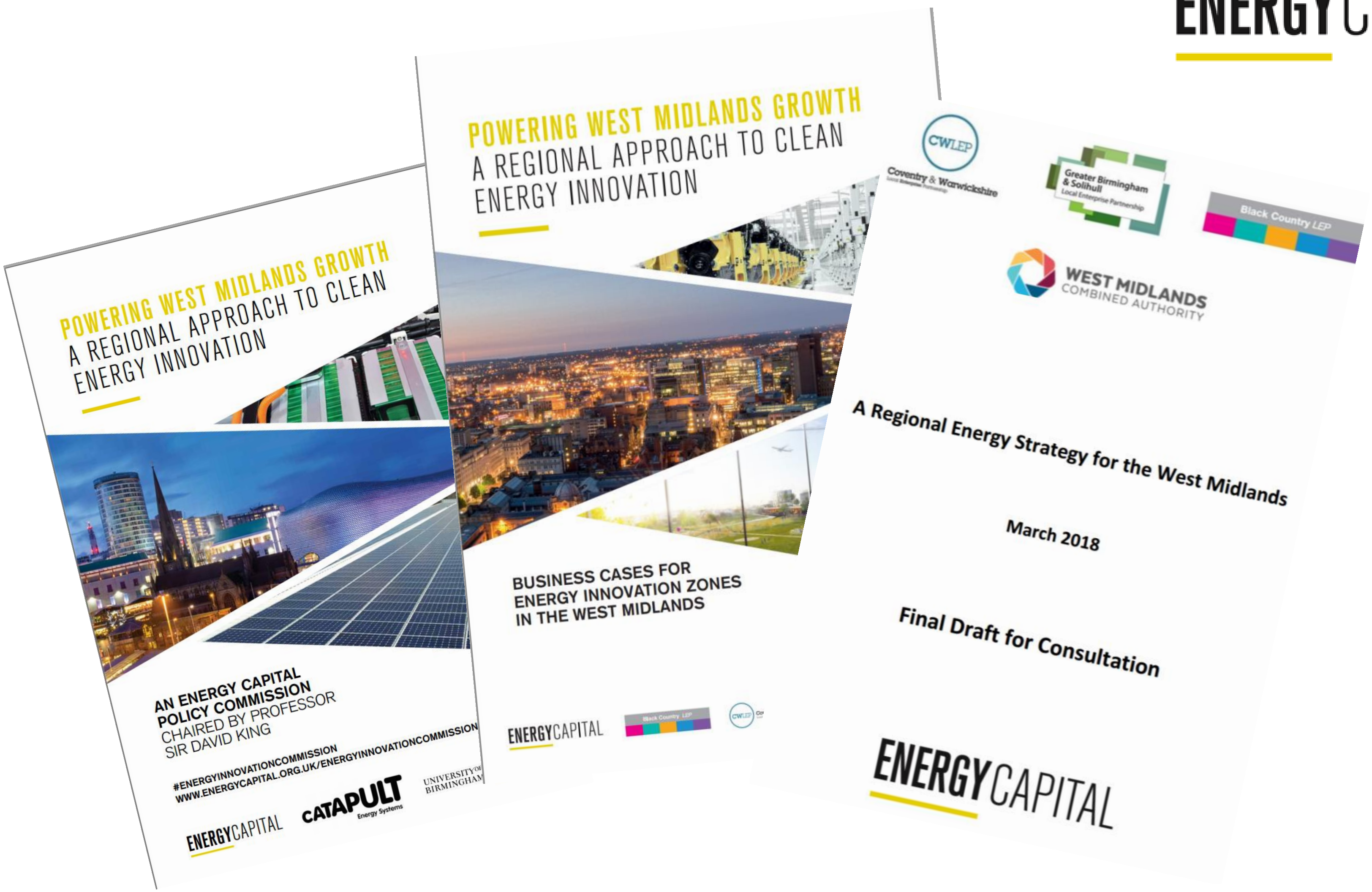
Black Country LEP

West Midlands Combined Authority

WMCA Delivery Journey



ENERGY CAPITAL



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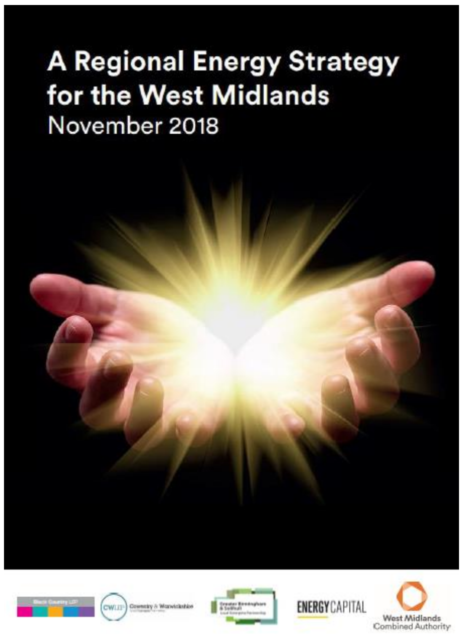
Greater Birmingham & Solihull Local Enterprise Partnership

Black Country LEP

West Midlands Combined Authority

ENERGY CAPITAL

Clean Growth and Industrial Strategy - key priorities to be delivered



1. Power to designate Energy Innovation Zones and leverage global investment
2. Establish Regional Energy Infrastructure Commissioning Body
3. Pilot a new approach to tackling fuel poverty (ECO4)
4. Energy Systems Innovation Fund

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Greater Birmingham & Solihull Local Enterprise Partnership

Black Country LEP

West Midlands Combined Authority

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Energy as an economic enabler

- Cross-regional, national, and international
  - Building relationships
  - Promoting the West Midlands

- Investment sector
  - Social finance
  - Green banking

- Skills, training, and job opportunities
  - Private sector
  - Universities
  - internships

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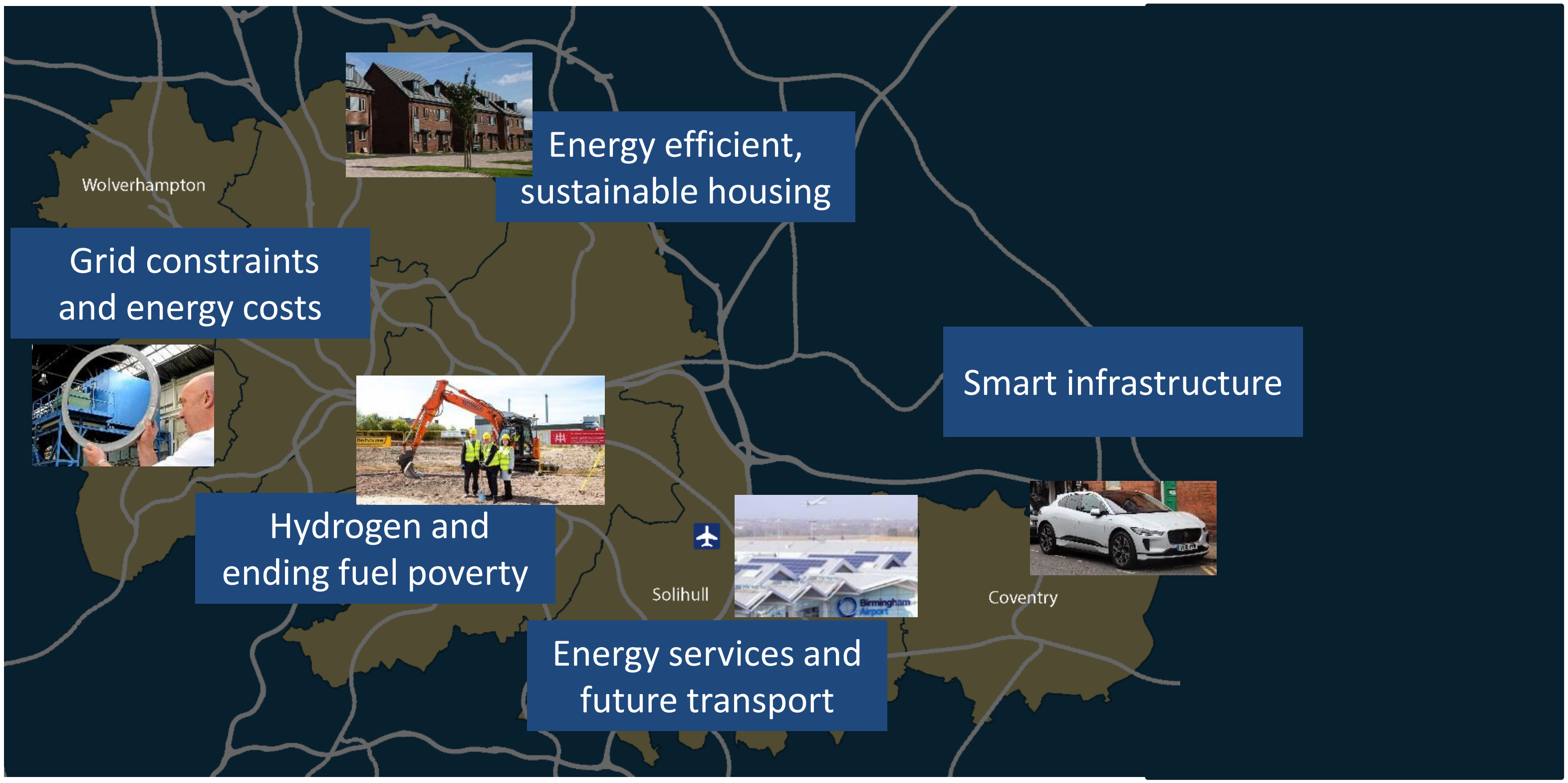
1. Energy Innovation Zones



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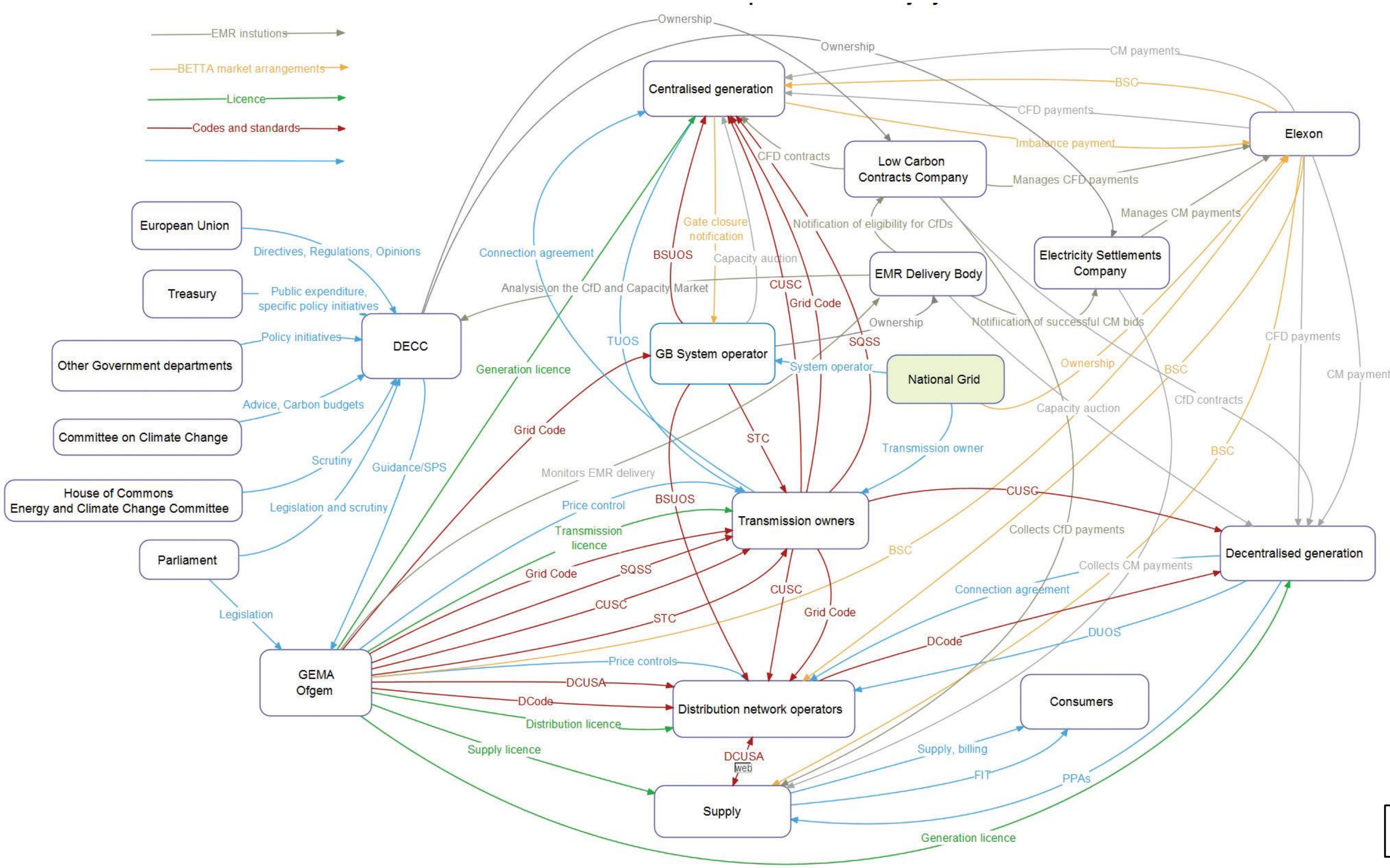

Source: iGov, Ofgem

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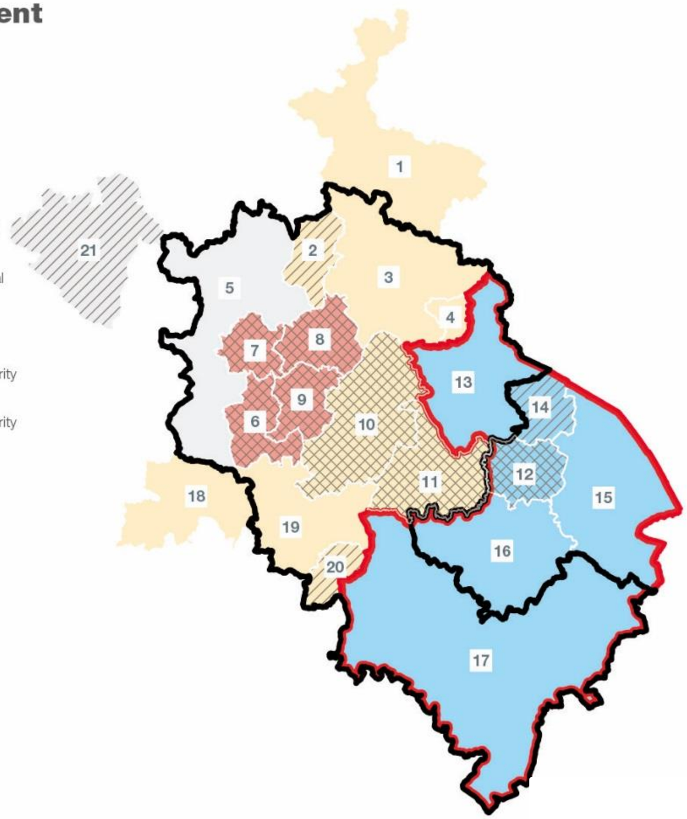
Planning and Economic Development in the West Midlands

Local Planning Authority

1 East Staffordshire
2 Cannock Chase
3 Lichfield
4 Tamworth
5 South Staffordshire
6 Dudley
7 Wolverhampton
8 Walsall
9 Sandwell
10 Birmingham
11 Solihull
12 Coventry
13 North Warwickshire
14 Nuneaton and Bedworth
15 Rugby
16 Warwick
17 Stratford-upon-Avon
18 Wyre Forest
19 Bromsgrove
20 Redditch
21 Telford and Wrekin

- Greater Birmingham and Black Country Housing Market Area
- Coventry and Warwickshire Housing Market Area
- Greater Birmingham and Solihull Local Enterprise Partnership
- Coventry and Warwickshire Local Enterprise Partnership
- Black Country Local Enterprise Partnership
- West Midlands Combined Authority – Constituent Authorities
- West Midlands Combined Authority – Non-constituent Authorities



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Greater Birmingham & Solihull Local Enterprise Partnership

Black Country LEP

West Midlands Combined Authority

Energy system transition

- Five pilot zones across the West Midlands with engaged teams attracting investment and demonstrating value
- Eliminate inhibitors of economic development and growth
- Flexible, locally-led mechanisms which make devolution real

Immediate asks of Government

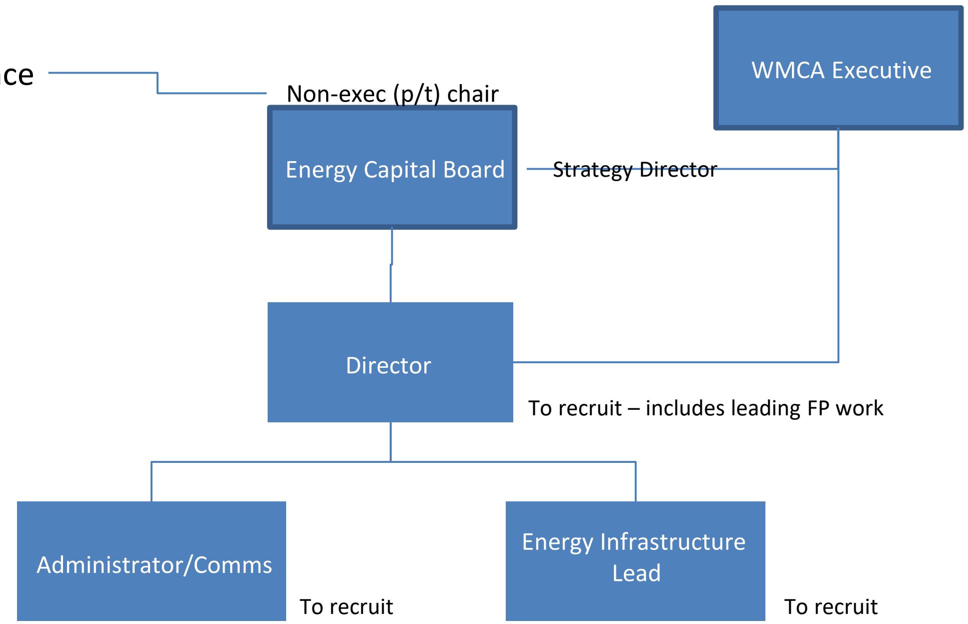
- £150k to agree model with Government and Ofgem
- £50M to seed and monitor pilots

What we will deliver

- National framework for the energy transition
- Self-funding mechanism
- £500M leveraged investment

2. Regional Energy Infrastructure Commissioning Body

WMCA (SED) Board and Governance



- 2019-20 transition structure
- step towards the vision
- funded by WMCA Investment Programme

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3. Fuel poverty pilot

- New approach to Energy Company Obligation (ECO) from 2023
  - Deliver fuel poverty, clean growth and industrial strategy objectives
  - Holistic and person-based approach to fuel poverty reduction
- Region-wide pilot
  - More effective enforcement and quality assurance
  - Best use of emerging sensor and communication technologies
- Create an evidence and experience base
  - More efficient than current scheme
  - Lower management and administration costs

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Black Country LEP

West Midlands Combined Authority

4. Energy Systems Innovation Funding

Consortia building to bid for and deliver projects

- Strength in Places Fund
- Industrial Strategy Challenge Fund
- Energy Networks Association
- Network Innovation Competition
- ERDF
- ?

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Immediate priorities and next steps

- Recruitment to deliver Investment Programme workstreams
- Continued development of project pipelines in all EIZs
- Infrastructure financing mechanisms (investment ahead of demand)
- Quick wins of traditional project development and innovation funding bids working with EIZ teams and partnerships
- Development of formal EIZ ‘blueprint’ and national rulebook commissioned and expected to be completed this year

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West Midlands Combined Authority

SCENARIOS OVERVIEW

REGEN

National Grid - Future Energy Scenarios 2018

4 scenarios: varying levels of **decarbonisation** and **decentralisation**

Technologies to be assessed

regen transforming energy

Supply

Distributed electricity generation technologies

- Solar PV (rooftop and ground-mounted)
- Onshore wind
- Hydropower
- Energy from waste (incineration and ACT)
- Anaerobic digestion
- Diesel and gas generation

Demand

Disruptive electricity demand technologies

- Electric vehicles
- Heat pumps (hybrid and single systems)
- Air conditioning - domestic
- New build developments (domestic)
- New build developments (non-domestic)

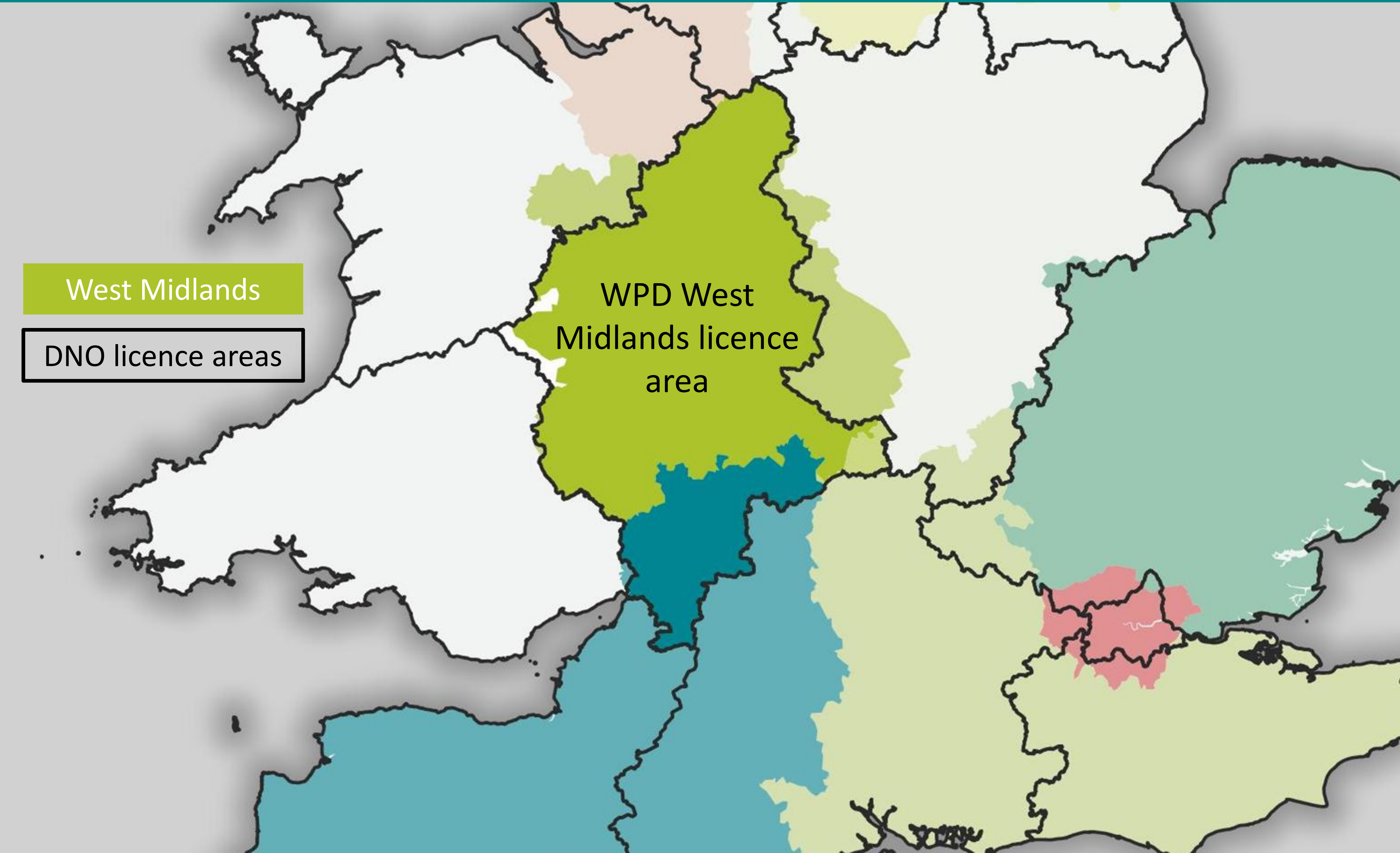
Storage

Electrical energy storage at distribution level

- Response services
- Reserve services
- Energy trader
- High energy user (behind the meter)
- Own use and community
- Co-location

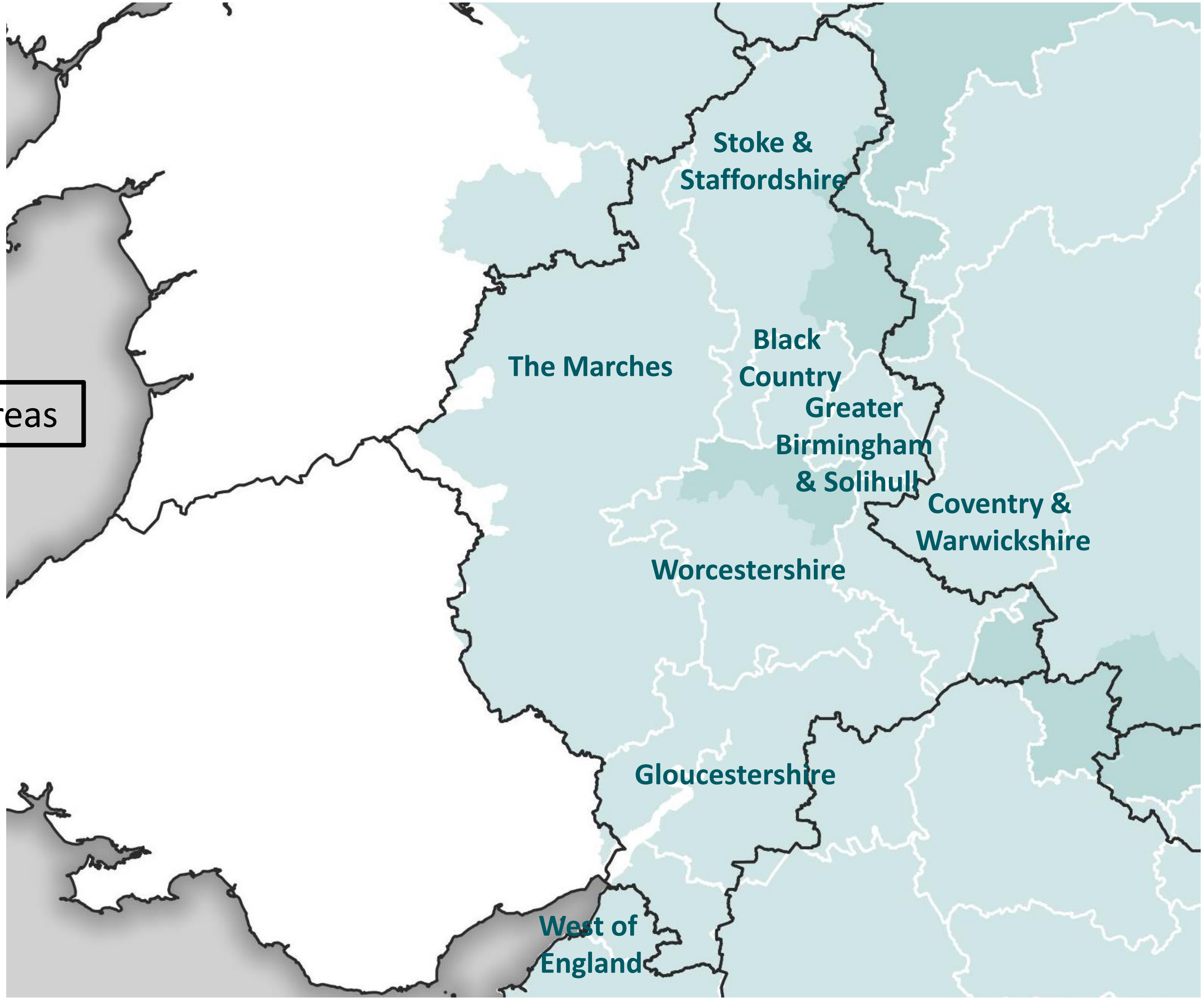
Geographical scope

Geographical scope



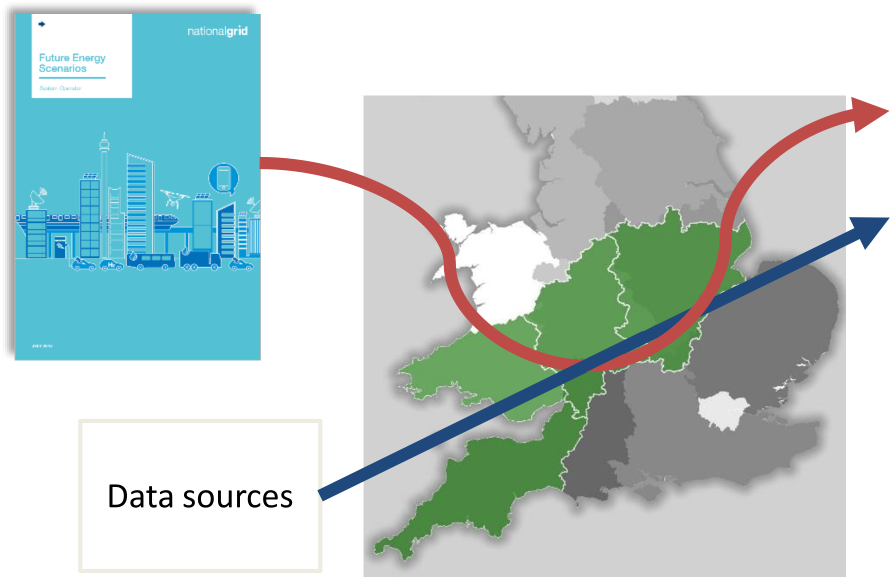
Geographical scope - LEPs

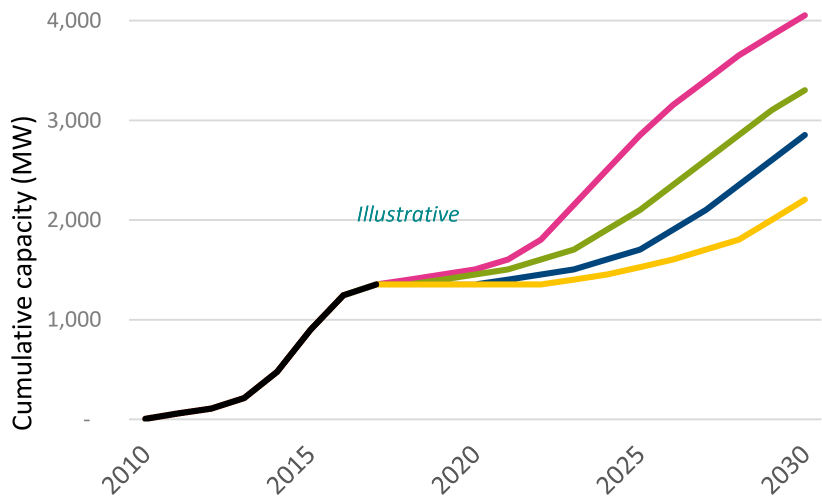
DNO licence areas



Methodology overview

A 'bottom-up', stakeholder-informed, set of future energy scenarios for the West Midlands licence area





2019

2032

Annual projections by:

Technology (20-25)

Scenario (4)

Electricity supply areas (200-300)

INITIAL REGIONAL ANALYSIS

REGEN

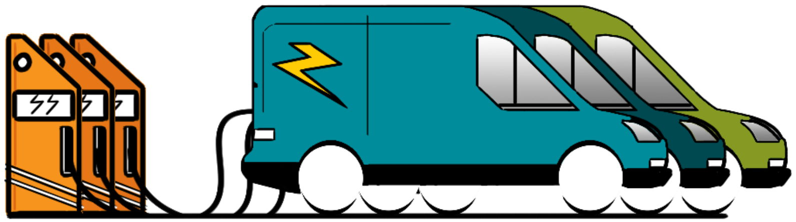
Electric vehicle analysis

West Midlands vehicle statistics

	Annual Mileage (million)	All Vehicles	Cars	LGVs	HGVs	Buses & Coaches
Baseline DfT 2018	29,388	3,655,760	3,030,659	456,949	51,729	13,379
Proportion of GB	9 %	10 %	10 %	12 %	10 %	8 %

West Midlands EV statistics

Electric Vehicles		All EVs	Cars	LGVs	HGVs	Buses & Coaches
Baseline DfT 2018		31,046	29,812	1,015	39	16
Proportion of GB EV's	Above average uptake	16 %	16 %	13 %	11 %	4 %



Baseline Data: DfT (Q4 2018)

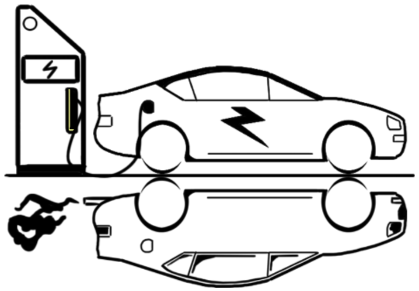
Electric vehicle projections

Range of vehicle types

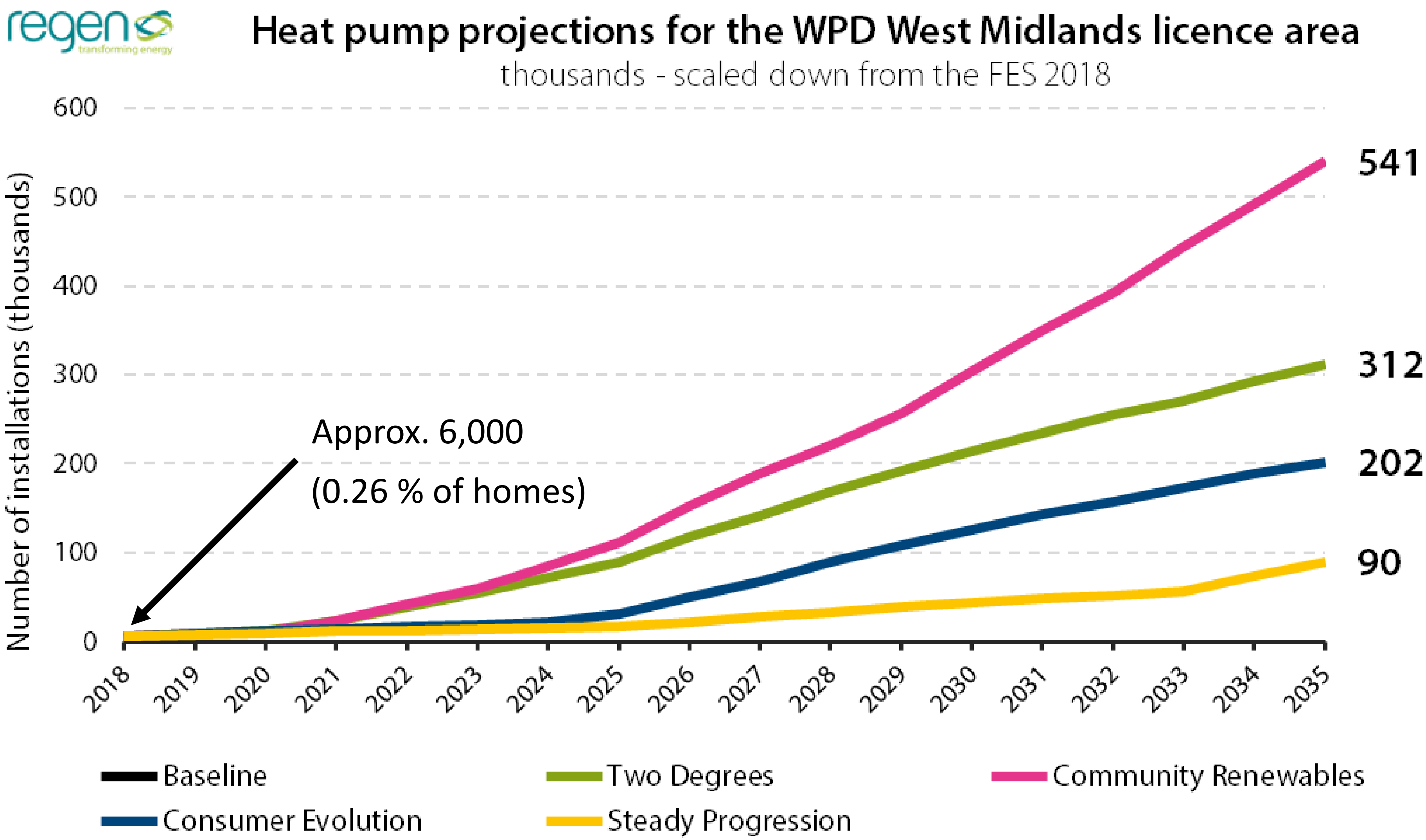
Cars	PEVs
	PHEVs
LGVs	PEVs
	PHEVs
HGVs	
Buses and coaches	
Motorcycles	

Battery electric car projections in the WPD West Midlands licence area

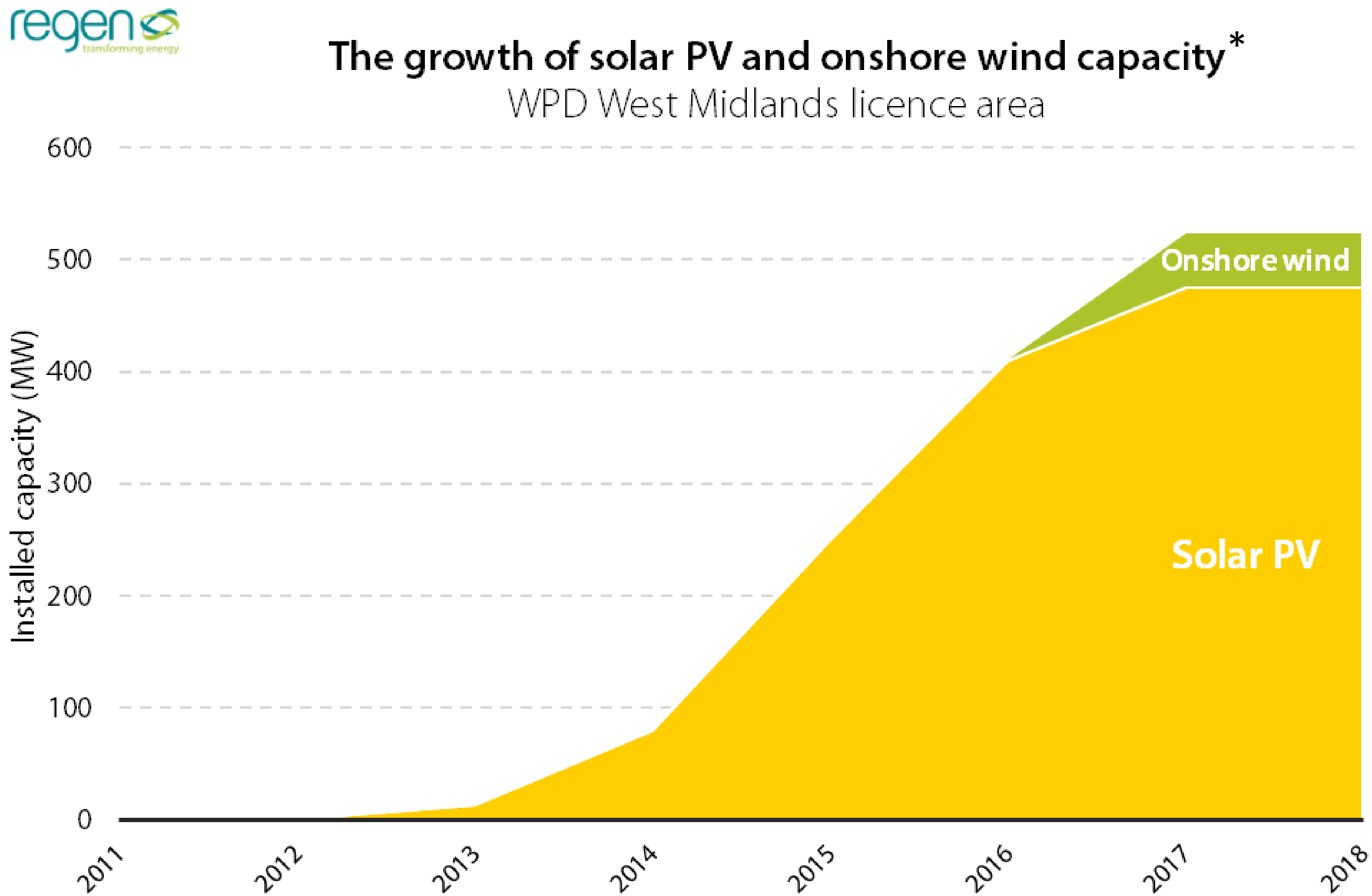
	Baseline	2032	Estimated percent of cars in 2032
Two Degrees	29,800	1,350,000	42%
Community Renewables	29,800	1,360,000	43%
Consumer Evolution	29,800	470,000	15%
Steady Progression	29,800	490,000	15%



Heat pump projections



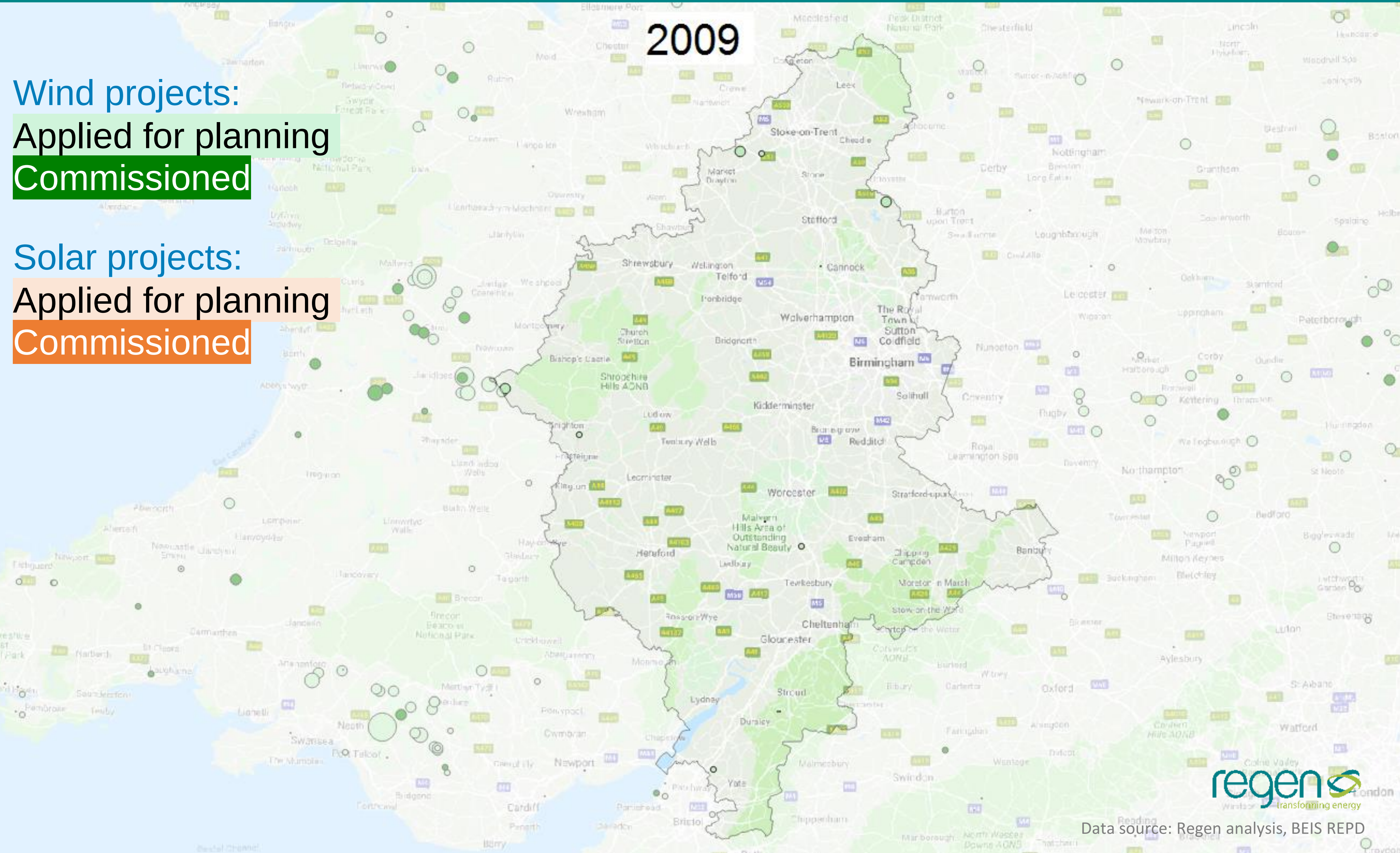
Largescale wind and solar analysis



* Projects above 1 MW

Data source: Regen analysis, BEIS REPD data

West Midlands licence area wind and solar projects



Data source: Regen analysis, BEIS REPD

Local authorities declaring a climate emergency

regen transforming energy

Bath and North East Somerset
Bedford Borough Council
Bradford Metropolitan District Council
Brighton Hove City Council
Bristol City Council
Calderdale
Cambridge City Council
Carlisle
Carmarthenshire
Cheltenham
Cheshire West and Chester
Cornwall County Council
Devon County Council
Dorset
Durham County Council
Forest of Dean District Council
Gwynedd County Council
Hastings Borough
Herefordshire
Hull
Isles of Scilly
Kirklees Metropolitan District Council
Lancashire

Lancaster City Council

Leeds City Council
Leicester City Council
Lewes D.C.
Greater London Authority
London Borough of Haringey
London Borough of Greenwich
London Borough of Hackney
London Borough of Lambeth
London Borough of Lewisham
London Borough of Newham
London Borough of Southwark
London Borough of Tower Hamlets
Maidstone
Manchester City Council
Medway
Mendip District Council
Milton Keynes
Newcastle
North Somerset Council
Norwich
Nottingham City Council
Oxford City Council
Oxfordshire County Council

Plymouth

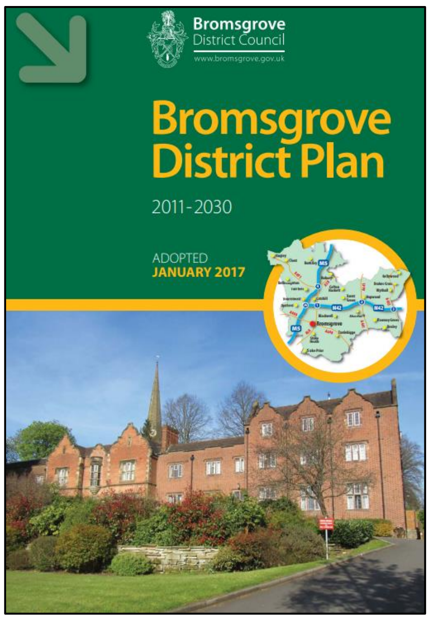
Portsmouth
Powys County Council
Preston
Reading Borough Council
Redcar and Cleveland Borough Council
Reigate and Banstead B.C.
Richmond
Rushcliffe
Scarborough Borough Council
Sheffield City Council
Shropshire
Somerset
Somerset West and Taunton
South Cambridgeshire
South Lakeland District Council
Suffolk
Sunderland City Council
Stroud District Council
Teignbridge District Council
Trafford Council
Vale of White Horse
Wiltshire County Council
Wirral
Wyre Forest
City of York

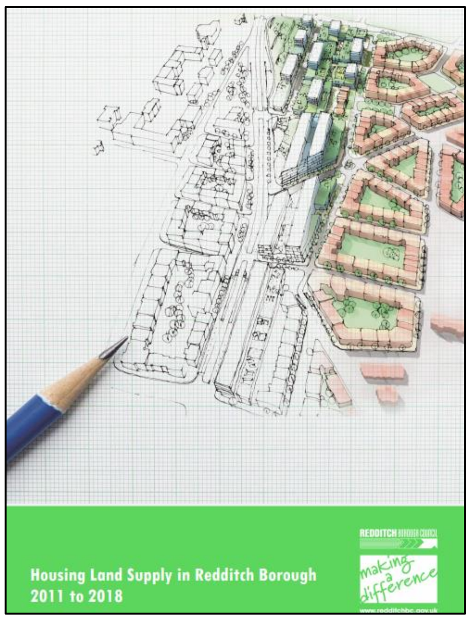
NEW DEVELOPMENT STUDY

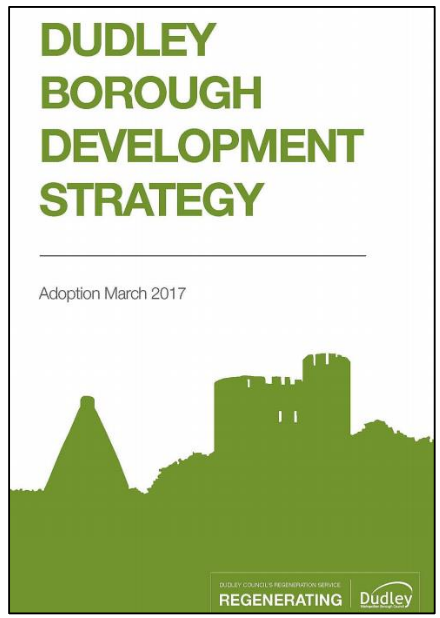
REGEN

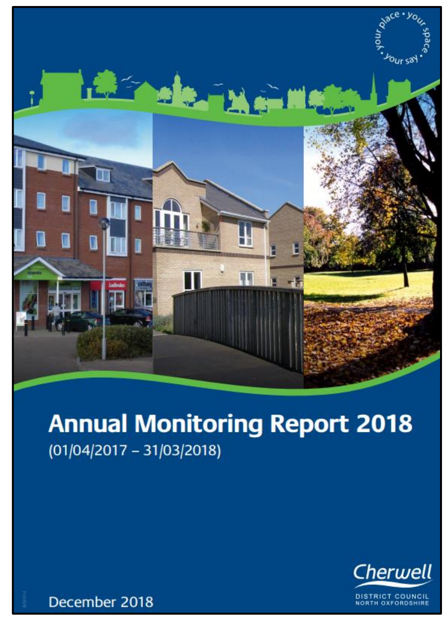
Data – Local Development Plans

- Local plans and core strategies
- Annual monitoring reports
- Employment and housing land availability assessments
- Housing trajectories
- Infrastructure development plans









New developments study methodology

Analysis of both domestic and new commercial developments

* Domestic sites with five dwellings or over

Identify latest version of local plan and supporting documents (SHLAAs, ELA etc.) → Gather detail on sites* (number of homes, hectares and locations) → Identify build out rate and phasing (using plans and historic growth) → Assign development to ESAs (using locational data) → Local authorities contacted to review and sign off information → Assumptions applied to produce high and low growth scenarios

Final dataset

Planned 2018/19	Planned 2019/20	Planned 2020/21	Planned 2021/22	Planned 2022/23	Planned 2023/24	Planned 2024/25	Planned 2025/26	Planned 2026/27	Planned 2027/28	Planned 2028/29	Planned 2029/30	Planned 2030/31	Planned 2031/32	Planned 2032/33	Planned 2033/34
417	417	417	417	417	417	417	417	417	417	417	417	417			
102	102	102	204	255	255	255	511	511	613	664	562	357	255	204	153
100	100	100	200	251	251	251	501	501	601	652	551	351	251	200	150
87	87	87	174	218	218	218	435	435	522	566	479	305	218	174	131
310	310	310	310	310	310	310	310	310	0	0	0	0	0	0	
120	160	220	220	220	200	220	220	220	220	220	220	105	100	0	0
186	186	186	186	186	186	186	186	186	186	186	186	186	56		
		50	200	200	200	200	200	200	200	200	200	200	200	200	200
125	250	250	250	250	250	250	250	250	325	0					
48	48	48	96	121	121	121	241	241	289	313	265	169	121	96	72
154	154	154	154	154	154	154	154	154	154	154	154	154	72		
150	150	150	150	150	150	150	150	150	150	126	76	76	0	0	0
													0	0	
													0	0	
													120		
													150	200	150
													100	100	
													75	75	
													100	100	
													150	150	121
													239		

Development name	Local authority	ESA	Allocation type	Number of homes in projection period (2018-20:	Development plan stag	Source document	Stage of planning	Start of plan perio	End of plan perio	Plan per	Notes/ Scale Factors	E	N	Published, submitted or adopted date	Redevelopment?
Windfall allowance	Shropshire		Unallocated (windfall)	1750	Draft	5 year plan	Pre-pl:	2006	2026	20	Windfall approx proportional by ar			2016	
Long Marston Airfield (Phase 2)	Stratford-on-Avon		Strategic site	1700	Draft	Housing Sites Register	In plar	2011	2031	20				2016	
Windfall	Sandwell			1680		SHLAA/HELAA								2017	
Land at Lawley, the Rock	Telford and Wrekin			1610		5-yr Land Supply								2018	
Langley SUE, west of A38, Sutton Walmley & Minworth	Birmingham		General allocation	1550		SHLAA/HELAA					6-10+ years			2018	Greenfield
North Brockworth	Gloucester		Strategic	1500		Provided by LA								2019	
Leominster, Southern expansion	Herefordshire			1500		5-Year land supply								2018	
Lea Castle East –A451	Wyre Forest			1500		HELAA					entire plan period			2018	Greenfield /
Colethrop Farm (Hunt's Grove)	Stroud			1386		5-yr Land Supply								2018	
Land West Of Stonehouse Nastend Lane	Stroud			1350		5-yr Land Supply								2018	
Windfall	Stroud		Unallocated (windfall)	1339		5-yr Land Supply								2018	
Perryfields Road, Bromsgrove	Bromsgrove		Strategic	1300	Adopte	Local plan								2017	
North West Cheltenham (previously known as Land to the north west of	Cheltenham		Strategic	1300		SHLAA/HELAA	Outline permission				0-20 years			2018	Greenfield
Innsworth	Gloucester		Strategic	1300		Provided by LA								2019	
South of Salt Way - East	Cherwell			1299		AMR	Planning permission granted							2018	
Former Birmingham City University Campus	Birmingham		Not allocated, commitme	1275		SHLAA/HELAA					Other Opportunity in BDP Growth			2018	Brownfield
Wholesale markets , Barford St, Bordesley & Highgate	Birmingham		General allocation	1195		SHLAA/HELAA					10+ years			2018	Brownfield
windfall	Forest of Dean		Unallocated (windfall)	1165		Other								2018	
IPL Site, Ladywood	Birmingham		General allocation	1150		SHLAA/HELAA	Outline permission				0-10+ years (parabolic)			2018	Brownfield
Land at Leckhampton	Tewkesbury		Not allocated, commitme	1125		SALA					0-15 yrs			2018	
South Churchdown	Gloucester		Strategic	1100		Provided by LA								2019	
Land between, Castle Farm Way and A5, Priorslee, Telford	Telford and Wrekin			1100		5-yr Land Supply								2018	
Monaco House, Bristol Street, Edgbaston, Birmingham, B5 7AS, Bordesley & Hig	Birmingham		General allocation	1000		SHLAA/HELAA	In planning				6-10 years			2018	Brownfield
Hereford, Three Elms	Herefordshire			1000		5-Year land supply								2018	
Hereford, Lower Bullingham	Herefordshire			1000		5-Year land supply								2018	
Arden Triangle	Solihull			1000		SHLAA					1-12 yrs			2016	Green belt
Land North West Of Balsall Common	Solihull			1000		SHLAA					1-12 yrs			2016	Green belt
Land at, Berryhill	Stoke-on-Trent			1000		SHLAA					Developable			2017	Mix
Lea Castle North, Axborough Lane	Wyre Forest			1000		HELAA					entire plan period			2018	Greenfield /
Twigworth	Gloucester		Strategic	995		Provided by LA								2019	
windfall	Staffordshire Moorlands		Unallocated (windfall)	988		Housing trajectory								2018	
Windfall	Cheltenham		Unallocated (windfall)	952		SHLAA/HELAA								2018	
Land off B'ham New Road / Sedgley Road West (Former Bean Road Factory Esta	Dudley		General allocation	925	Adopte	Local plan					2016-26			2017	

High and low growth scenarios

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Data check: contact all local authorities in licence area to confirm figures

Apply scenario growth factors to data

Scenario 1
High economic growth

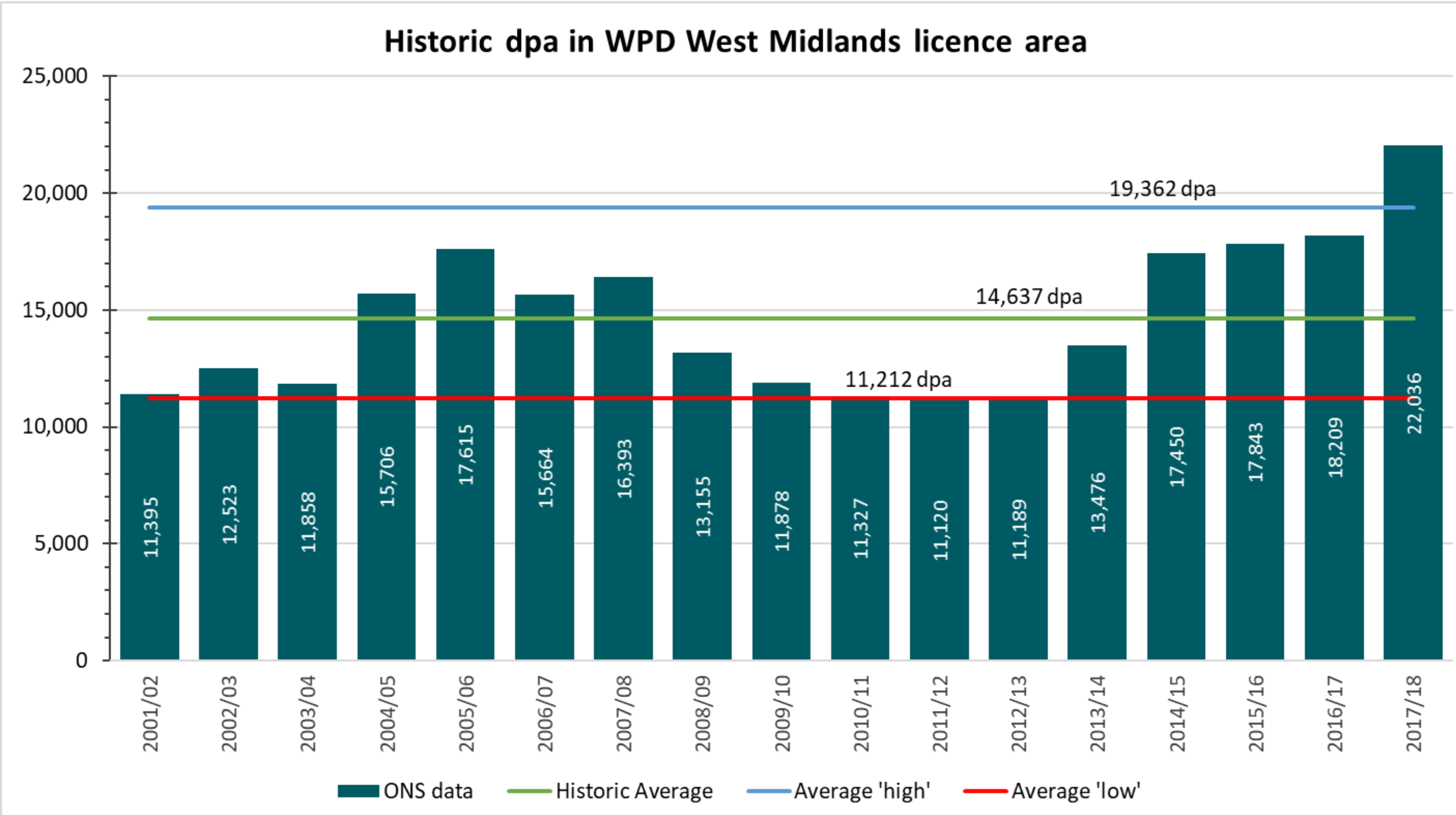
- Domestic build rates adjusted to delay proportion (between 10-25%) to future years.
- 100% of strategic sites are built out and 64% of non-strategic sites.
- Commercial developments are delayed 10-35% for high growth

Scenario 2
Low economic growth

- Build rates adjusted to delay a small proportion (between 25-40%) to future years.
- 100% of strategic sites are built out and 64% of non-strategic sites.
- Commercial developments are delayed 20-55% for low growth.

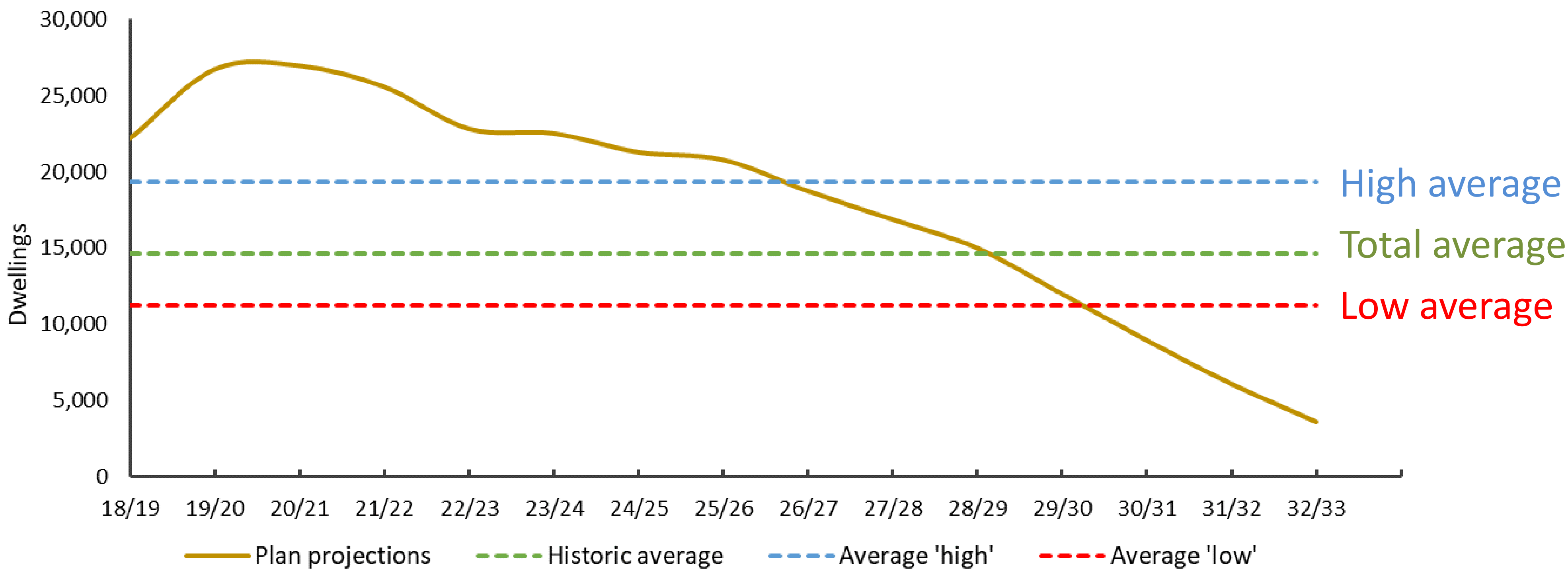
Historic dwellings per annum

High average: 26,495   Total average: 21,798   Low average: 18,510



Domestic projections through to 2032

- Draft projections to be used for network analysis
- Existing plans higher than historic averages in near term
- Apply growth models to improve housing projections



Top 20 sites - housing

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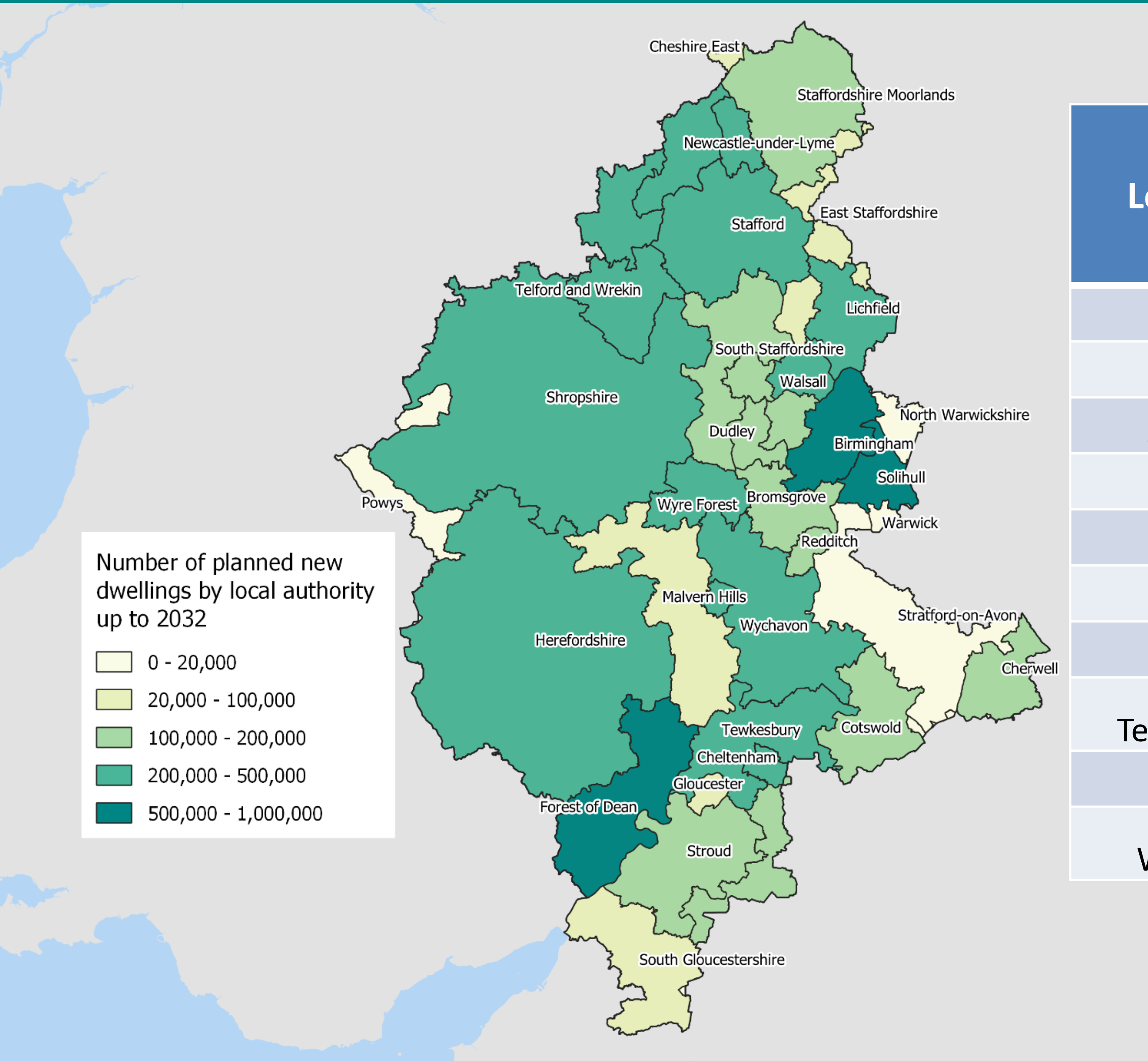
Development name	Local authority	ESA	Number of homes in projection period (2018-2032)	Source document	Easting	Northing	Published, submitted or adopted date	Redevelopment?
Northern SDL (Stafford)	Stafford		2,665	Local Plan			2014	
Broomhall/Norton Barracks Community Urban Extension	Worcester		2,474	Local Plan			2016	
Redditch Cross Boundary Development Foxlydiate	Bromsgrove		2,450	Local plan			2017	
Land at North Yate - Heron (PK12/1913/O)	South Gloucestershire		2,450	AMR			2016	
Temple Laugherne extension	Worcester		2,074	Local Plan			2016	
Western SDL (Stafford)	Stafford		1,778	Local Plan			2014	
Long Marston Airfield (Phase 2)	Stratford-on-Avon		1,700	Site Allocations			2016	
Land at Lawley, the Rock	Telford and Wrekin		1,610	5-Year Land Supply			2018	
Langley SUE, west of A38, Sutton Walmley & Minworth	Birmingham		1,550	SHLAA/HELAA			2018	Greenfield
North Brockworth	Gloucester		1,500	Provided by LA			2019	
Leominster, Southern expansion	Herefordshire		1,500	5-Year Land Supply			2018	
Lea Castle East –A451	Wyre Forest		1,500	HELAA			2018	Greenfield / Green belt
Colethrop Farm (Hunt's Grove)	Stroud		1,386	5-Year Land Supply			2018	
Land West Of Stonehouse Nastend Lane	Stroud		1,350	5-Year Land Supply			2018	
Perryfields Road, Bromsgrove	Bromsgrove		1,300	Local plan			2017	
North West Cheltenham (previously known as Land to the north west of Cheltenham within Cheltenham), Swindon Village	Cheltenham		1,300	SHLAA/HELAA			2018	Greenfield
Innsworth	Gloucester		1,300	Provided by LA			2019	
South of Salt Way - East	Cherwell		1,299	AMR			2018	
Former Birmingham City University Campus	Birmingham		1,275	SHLAA/HELAA			2018	Brownfield
Wholesale markets , Barford St, Bordesley & Highgate	Birmingham		1,195	SHLAA/HELAA			2018	Brownfield

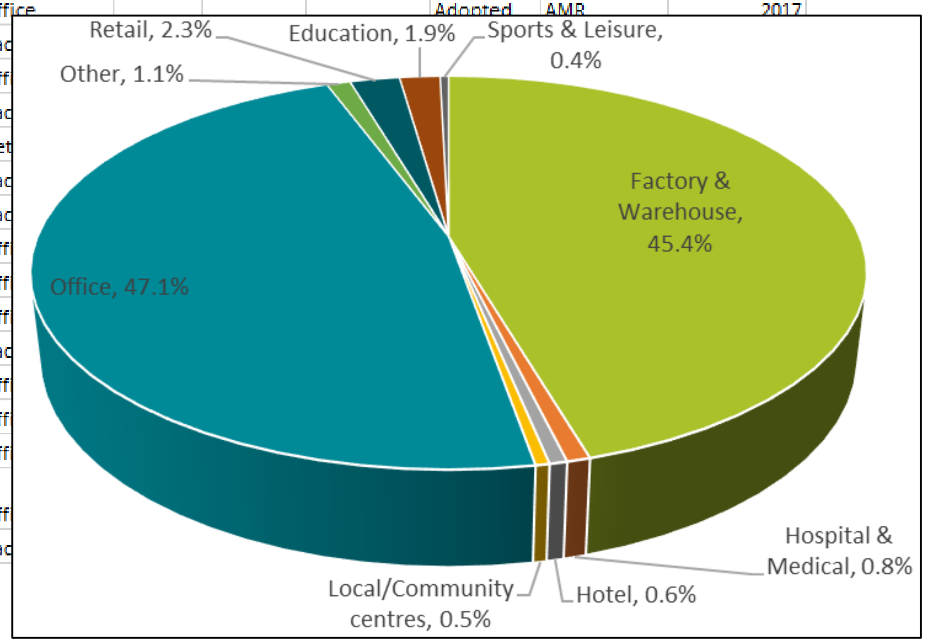
New builds – domestic



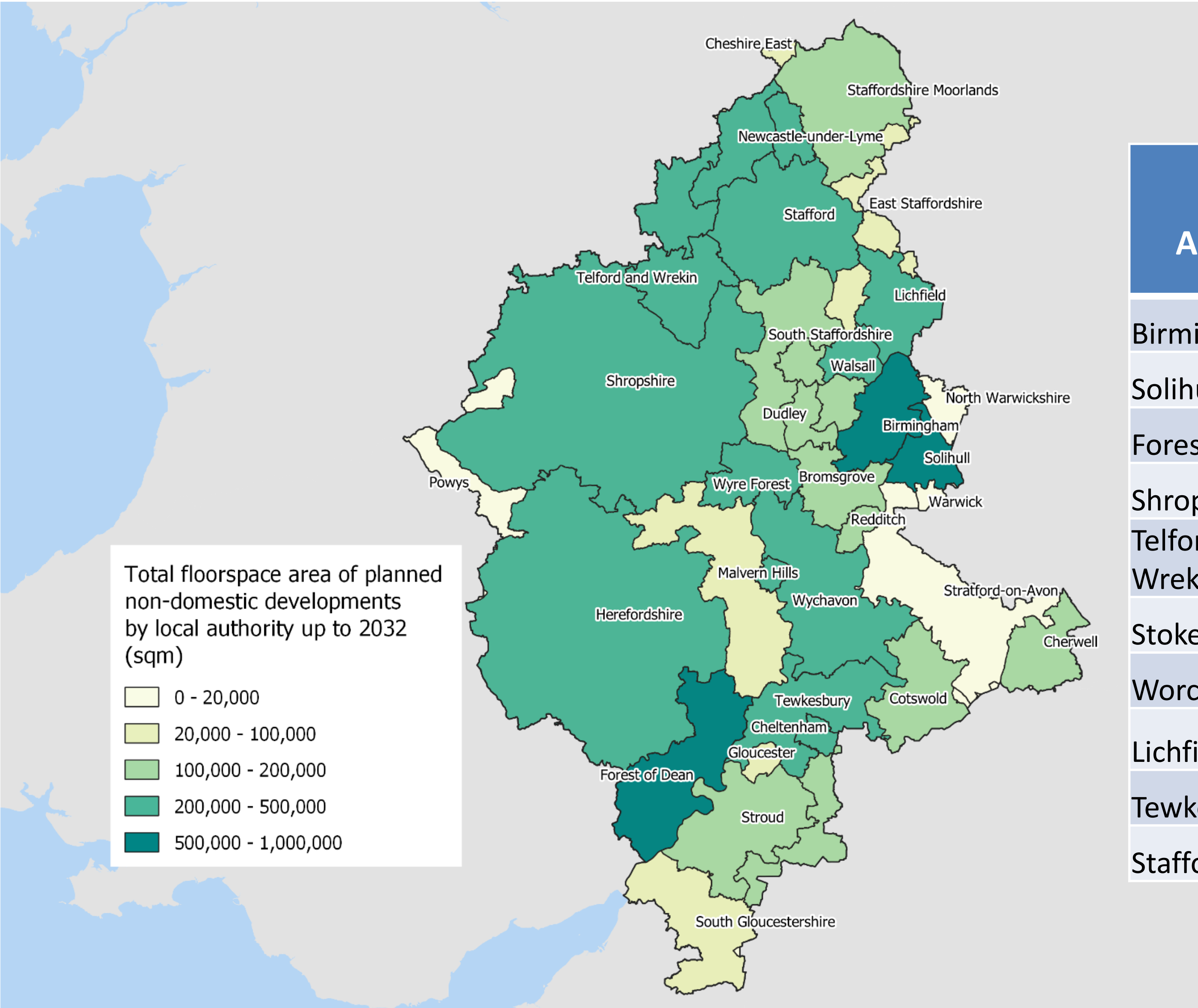
Local Authority	Total number of homes to 2032
Birmingham	53,136
Solihull	20,158
Stoke-on-Trent	15,812
Herefordshire	15,801
Sandwell	14,832
Shropshire	11,676
Gloucester	9,713
Telford and Wrekin	9,677
Worcester	8,377
Wolverhampton	8,165

Top 30 sites – non-domestic

Development name	Local authority	ESA	Total site area m²	Total floorspace m²	Estimated (Y)	Category	Easting	Northing	Greenfield/ brownfield?	Local plan stage	Source document	Published, submitted or adopted date
PEDDIMORE WISHAW LANE	Birmingham		710000	**239,865**		Factory and Warehouse					SHLAA/HELAA	2018
Berkswell Quarry, Meriden	Solihull		450000	**152,027**	Y	Factory and Warehouse			Green belt		SHLAA/HELAA	2016
Berkswell Quarry, Meriden	Solihull		450000	**147,541**		Office			Green belt		SHLAA/HELAA	2016
'Forest Vale, Cinderford - Cinderford Employment Area'	Forest of Dean		378000	**127,703**	Y	Factory and Warehouse					Local plan	2018
'Forest Vale, Cinderford - Cinderford Employment Area'	Forest of Dean		378000	**123,934**		Office					Local plan	2018
Box Tree Farm Craft Centre, Knowleowle	Solihull		343850	**116,166**	Y	Factory and Warehouse			Green belt		SHLAA/HELAA	2016
Box Tree Farm Craft Centre, Knowleowle	Solihull		343850	**112,738**		Office			Green belt		SHLAA/HELAA	2016
THE AXIS, 10 HOLLIDAY STREET, B1 1TF	Birmingham			**98,364**		Office					LA Provided	2019
Boxtrees Site 2, Dickens Heath	Solihull		256350	**86,605**	Y	Factory and Warehouse			Green belt		SHLAA/HELAA	2016
Boxtrees Site 2, Dickens Heath	Solihull		256350	**84,049**		Office			Green belt		SHLAA/HELAA	2016
CURZON PARK, FORMER PARCELFORCE CURZON STREET, B4 7XG	Birmingham			**72,464**		Office					LA Provided	2019
i54 South Staffordshire, Land west of i54	South Staffordshire		200000	**67,568**	Y	Factory and Warehouse					Other	2018
Shrewsbury	Shropshire		198000	**66,892**		Factory and Warehouse				Adopted	AMR	2017
i54 South Staffordshire, Land west of i54	South Staffordshire		200000	**65,574**		Office					Other	2018
Shrewsbury	Shropshire		198000	**64,918**		Office				Adopted	AMR	2017
Chatterley Valley (west of mainline), Chatterley	Newcastle-under-Lyme		187650	**63,395**		Fac						
Chatterley Valley (west of mainline), Chatterley	Newcastle-under-Lyme		187650	**61,525**	Y	Off						
Northern SDL (Stafford)	Stafford		180000	**60,811**		Fac						
Shrewsbury Riverside shopping	Shropshire		260000	**60,185**		Ret						
Naird Lane, Nedge Hill, T54	Telford and Wrekin		177850	**60,084**	Y	Fac						
Blythe Vale	Staffordshire Moorlan		175000	**59,122**	Y	Fac						
Northern SDL (Stafford)	Stafford		180000	**59,016**	Y	Off						
Naird Lane, Nedge Hill, T54	Telford and Wrekin		177850	**58,311**		Off						
Land at Hagley Road, B16 8LB	Birmingham			**57,500**		Off						
Vale Industrial Park, Evesham	Wychavon		170000	**57,432**		Fac						
Blythe Vale	Staffordshire Moorlan		175000	**57,377**		Off						
Vale Industrial Park, Evesham	Wychavon		170000	**55,738**		Off						
Keele Science Park Phase 3, University of Keele	Newcastle-under-Lyme		145000	**47,541**		Off						
SNOW HILL SITE3 SNOW HILL QUEENSWAY AND ST CHADS CIRCUS, B4 2BJ	Birmingham			**46,684**		Off						
Market Drayton	Shropshire		136000	**45,946**		Fac						



New builds – non-domestic



Local Authority	Total non-domestic floorspace (sqm) to 2032
Birmingham	1,308,501
Solihull	1,046,424
Forest of Dean	721,626
Shropshire	492,422
Telford and Wrekin	489,795
Stoke-on-Trent	428,949
Worcester	402,631
Lichfield	355,749
Tewkesbury	305,619
Stafford	293,811

STORAGE

REGEN

UK storage deployment

DNO	Connection Status	No. Sites	Estimated Capacity (MW)
Western Power Distribution — Serving the Midlands, South West and Wales	Accepted	68	1,129
	Connected	37	99
UK Power Networks — Delivering your electricity	Accepted	48	1,412
	Connected	10	178
Northern Powergrid	Accepted	24	583
	Connected	6	55
Scottish & Southern Electricity Networks	Accepted	58	1,522
	Connected	6	55

5.1 GW accepted or connected*

341 MW

of connected storage (55 sites) now operating on the UK distribution network

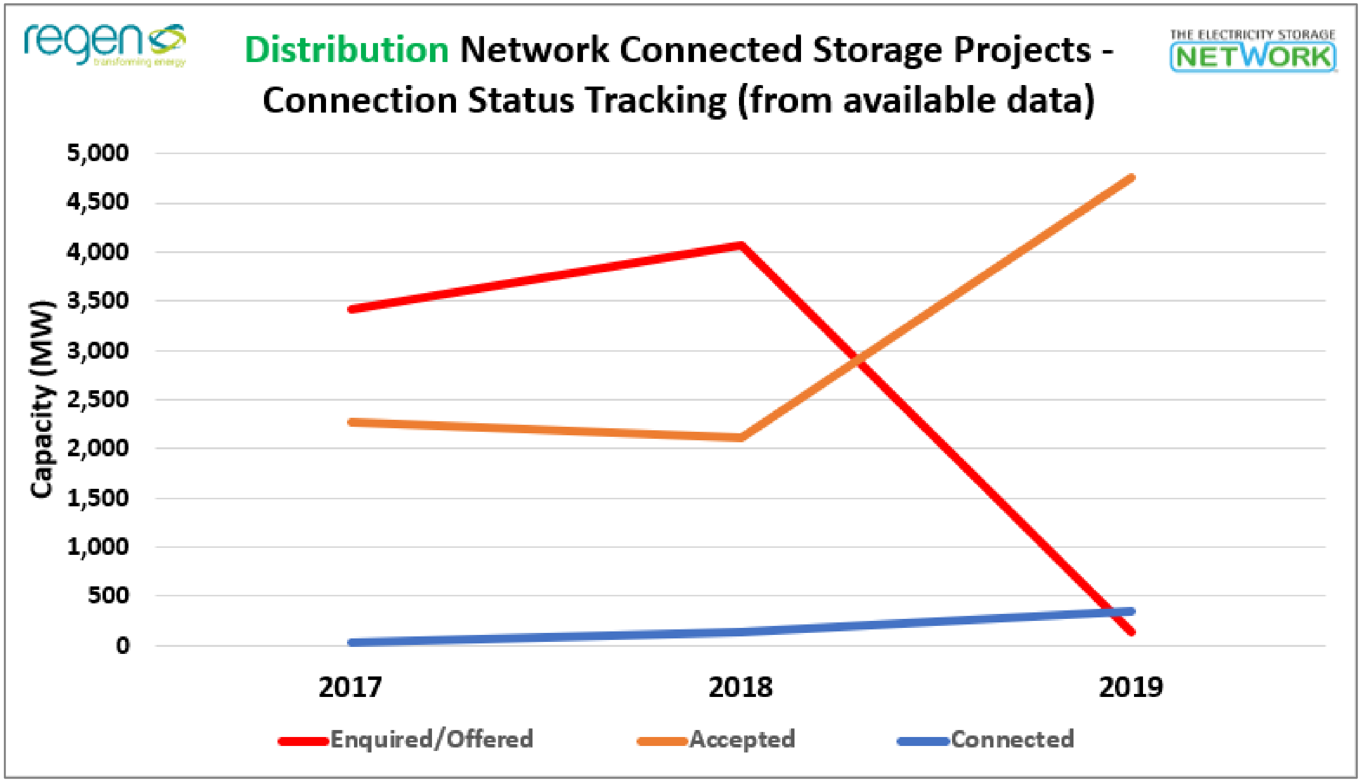
*** From available data for 9 of the 14 DNO licenced network areas**

WPD storage connection data

	Enquired		Offered		Accepted		Connected	
WPD Supply Area	Number of Sites	Capacity (MVA)	Number of Sites	Capacity (MVA)	Number of Sites	Capacity (MVA)	Number of Sites	Capacity (MVA)
West Midlands	2	0	4	93	27	468	11	44
East Midlands	0	0	12	28	25	497	12	35
South Wales	1	0.1	1	0.0	3	21	5	0.1
South West	3	11	3	0.8	13	144	9	20
TOTAL	6	11	20	122	68	1,129	37	99

Updated month May-19

Application trends

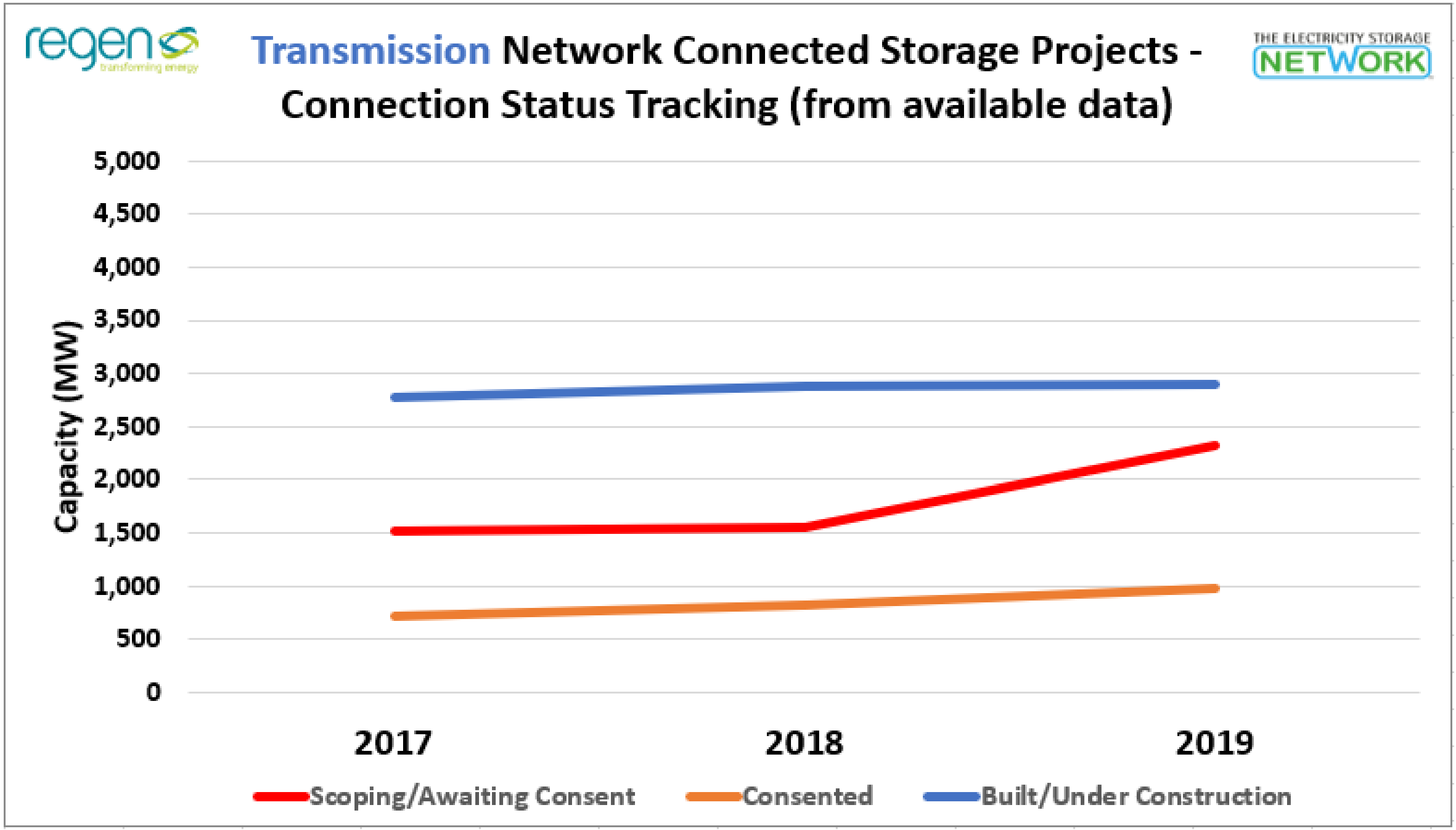


High level of connection interest

Only moderate amount going through to development

Steep decline in enquiries (connection design charges?)

New builds – non-domestic



BREAK

Roundtable sessions

1. **Future energy scenarios** – regional scenario trends for generation and demand in the West Midlands
2. **The future of electric vehicles** – projections and growth of EVs and smart transport in the West Midlands
3. **Change to DSO**– Distribution System Operator and what it means for customers.

- c. 20 min discussions
- 2 out of 3 sessions
- Short feedback at the end

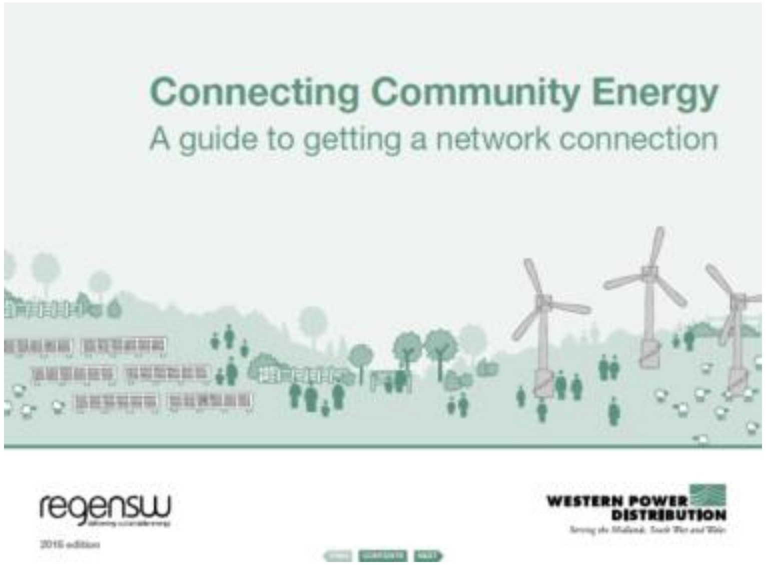
Possible discussion points:

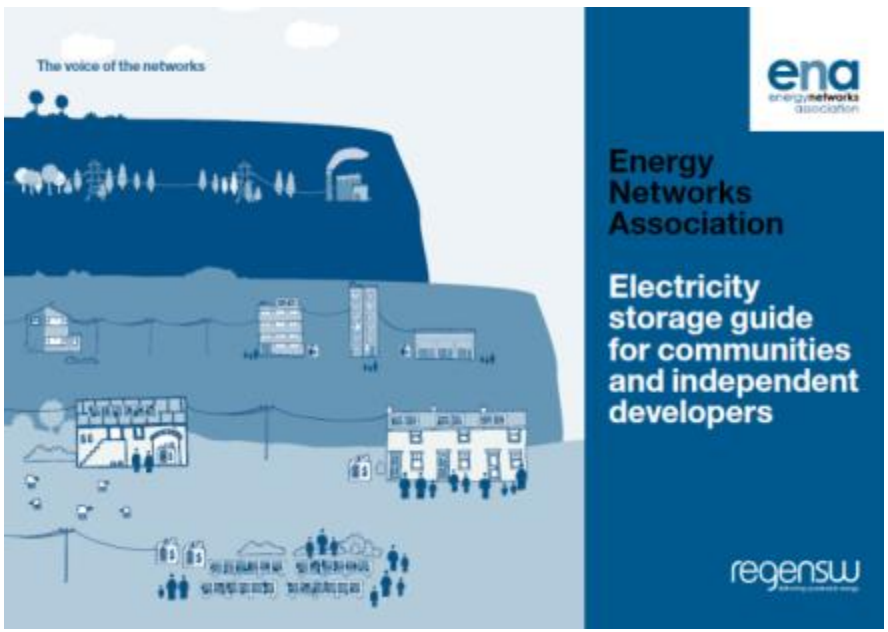
- What are the key local strengths and opportunities in the West Midlands?
- What are the key sector weaknesses and barriers?
- How are the commercial and industrial sectors in the West Midlands adapting to energy challenges?

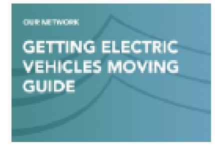
FEEDBACK

regen
transforming energy

IMPROVING DATA PROVISION







Getting Electric Vehicles Moving Guide

This guide will provide you with all you need to know about installing on-street charge points.

Find out more

Electric Vehicle Charging & DNO Engagement

This guide will provide you with information specifically tailored to local authority customers delivering public charging points.

Find out more

EV Strategy Report

This document sets out our goals and ambitions to help make your transition to an electric vehicle as easy as possible.

Find out more

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

IMPROVING DATA PROVISION

Providing Greater Network Visibility

- WPD Web Map – linesearchbeforeyoudig.co.uk
- EHV Constraints Map
- Estimated Capacity Tool
- Connection Surgeries
- Flexibility Surgeries

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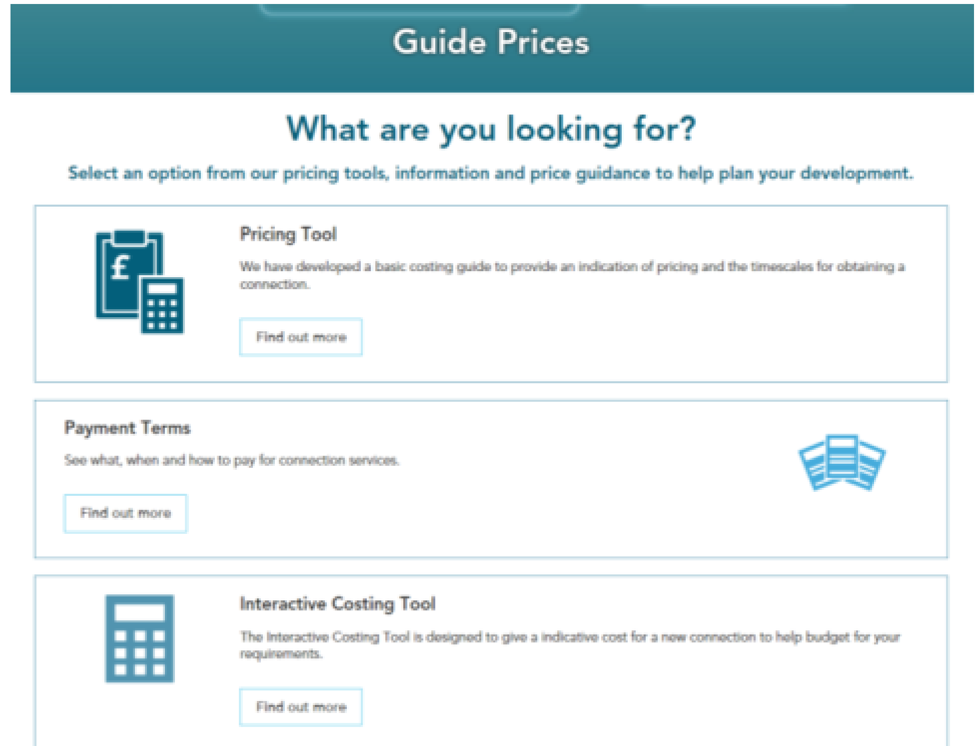
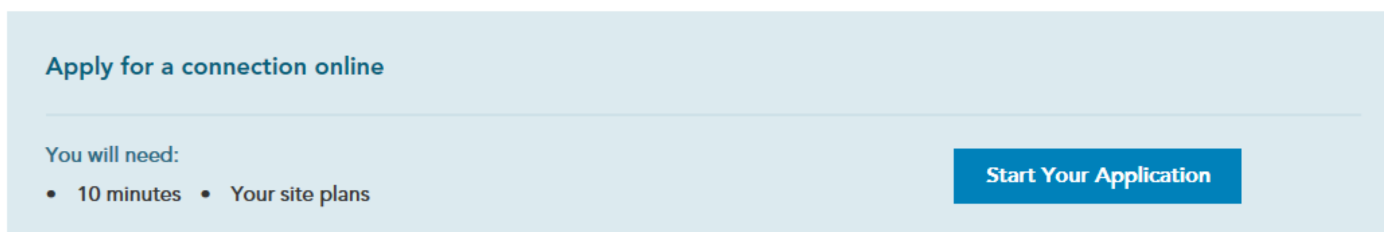
IMPROVING DATA PROVISION



Providing Greater Network Visibility

- LTDS
- Network Capacity map
- Network Flexibility map
- Costing tool
- Apply online



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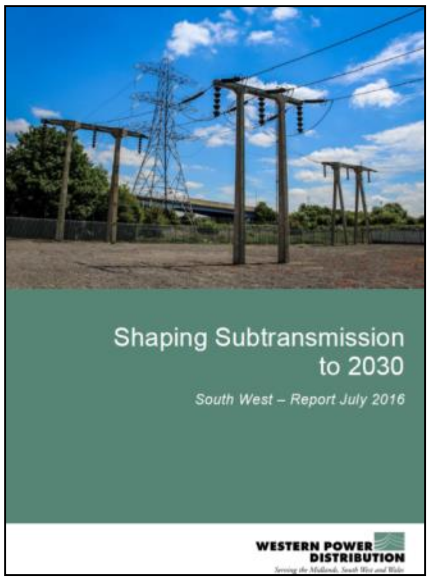
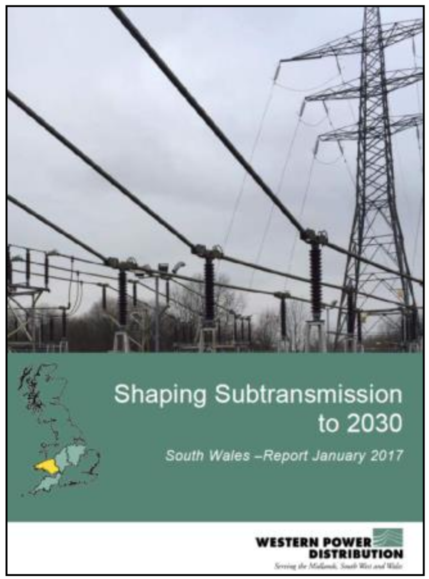
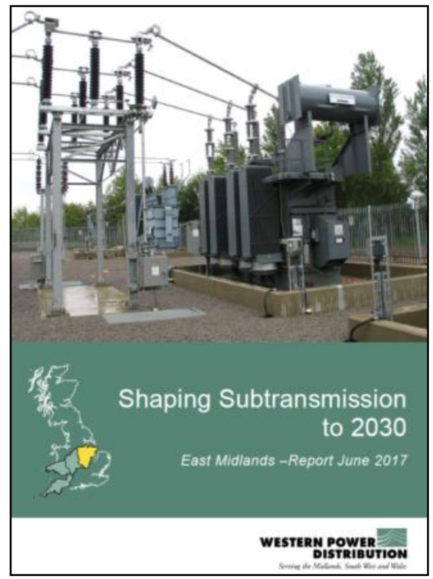
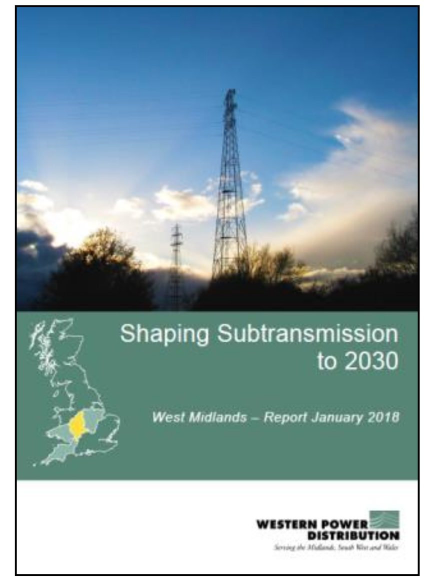
IMPROVING DATA PROVISION

Every 6 months we publish a strategic investment study report on one of our four licence areas.









Webinars available to view online

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FURTHER COLLABORATION

All our reports, webinars and presentations are published online at:
http://www.westernpower.co.uk/netstrat

If you have any questions in relation to WPD's Network Strategy work, please contact WPD on the details below:

Email: wpdnetworkstrategy@westernpower.co.uk

By post:
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Western Power Distribution
Feeder Road
Bristol
BS2 0TB

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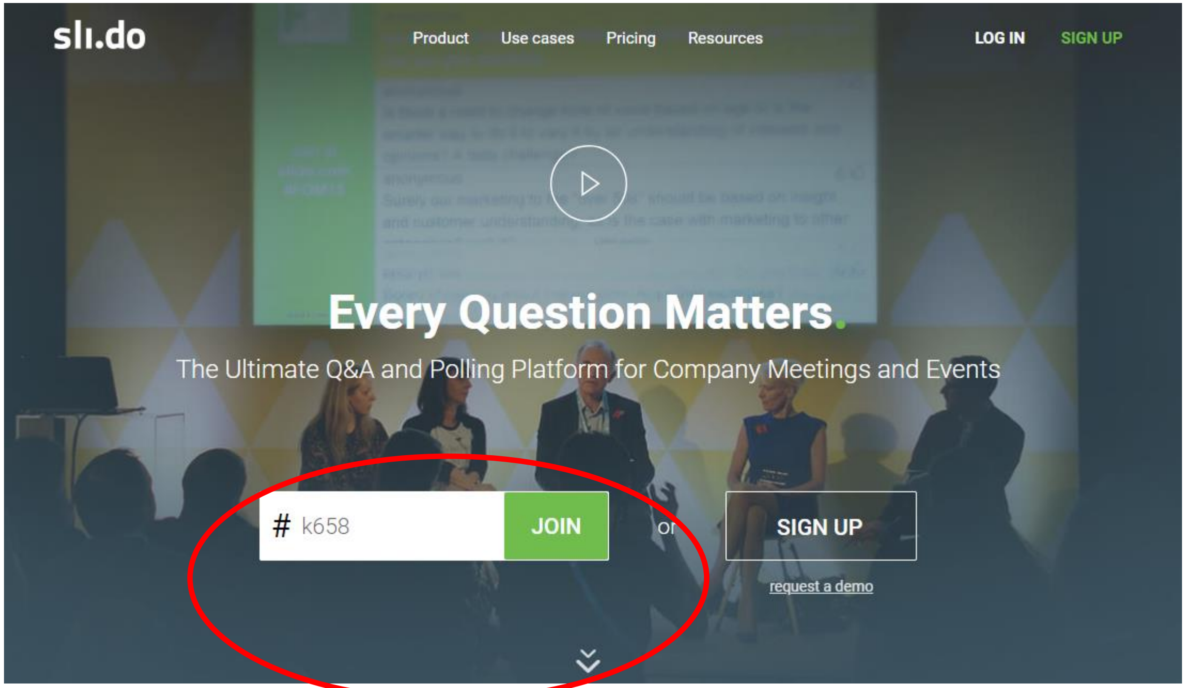
How did we do?

Tell us on www.sli.do. Enter code #WPD



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