



<u>ENW : Shaping the future of your energy network</u>

Energy Policy Overview

Johnny Gowdy

1st December 2017 Manchester

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A changing energy system

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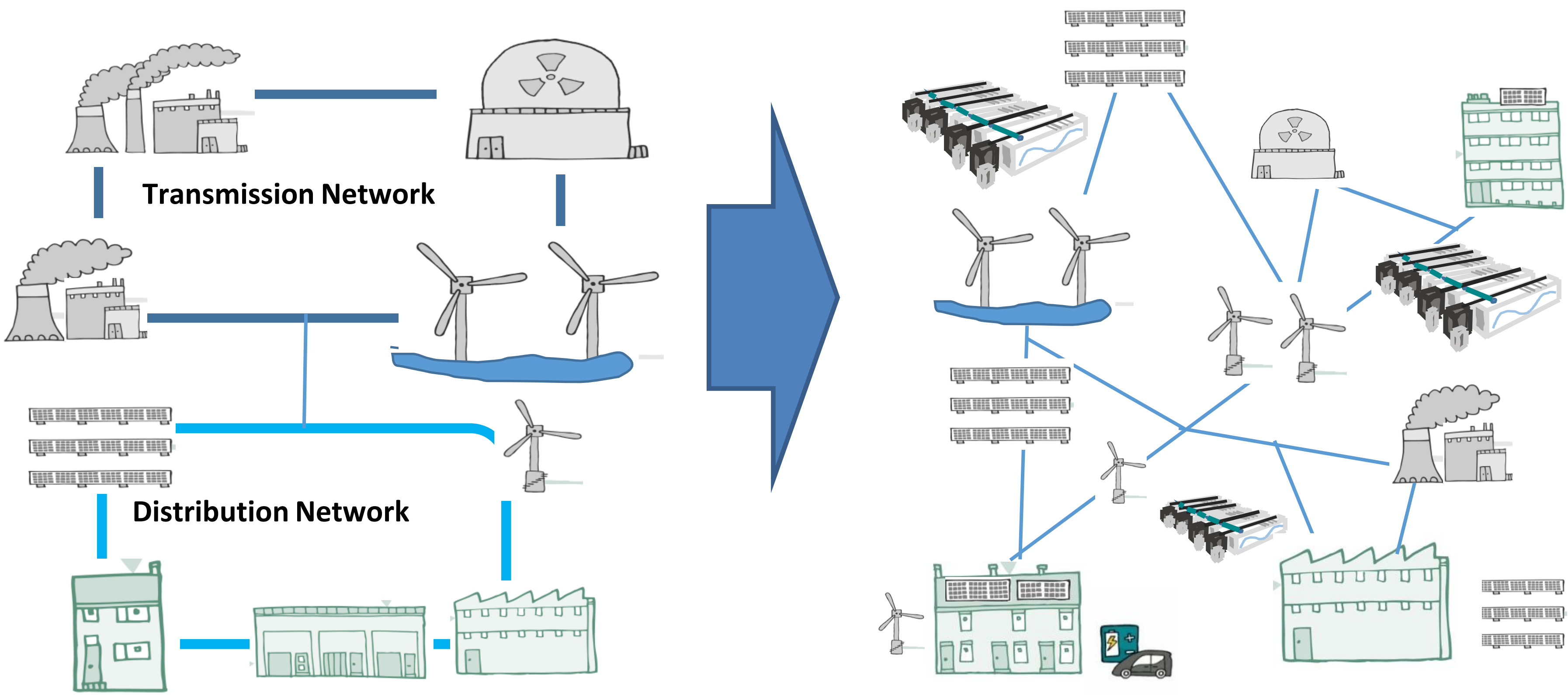
A centralised system | **More decentralised system**



> ***"...embedded generation has come to dominate the peak power flows on the distribution networks."***
>
> Nigel Turvey, Network Strategy & Innovation Manager,
> Western Power Distribution
> [DSO Strategy Launch Event 14/09/17]

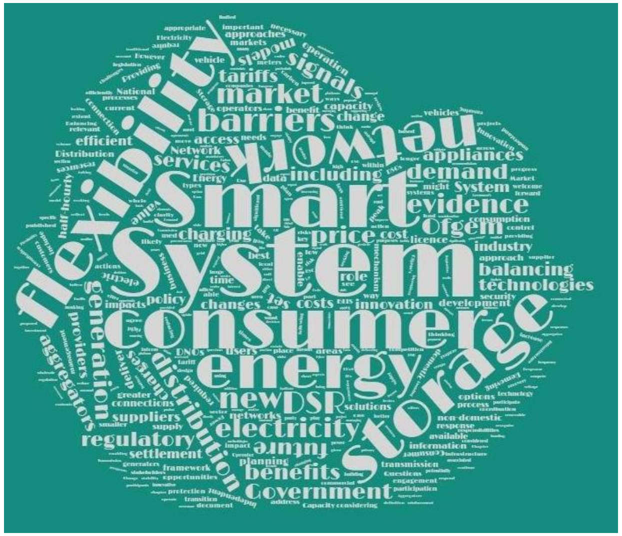
A radical shift

"The energy sector is undergoing a **fundamental, structural change**. We are **moving away from the linear 'one-way' flow** of electricity from large generators, through transmission and distribution networks, to passive consumers.

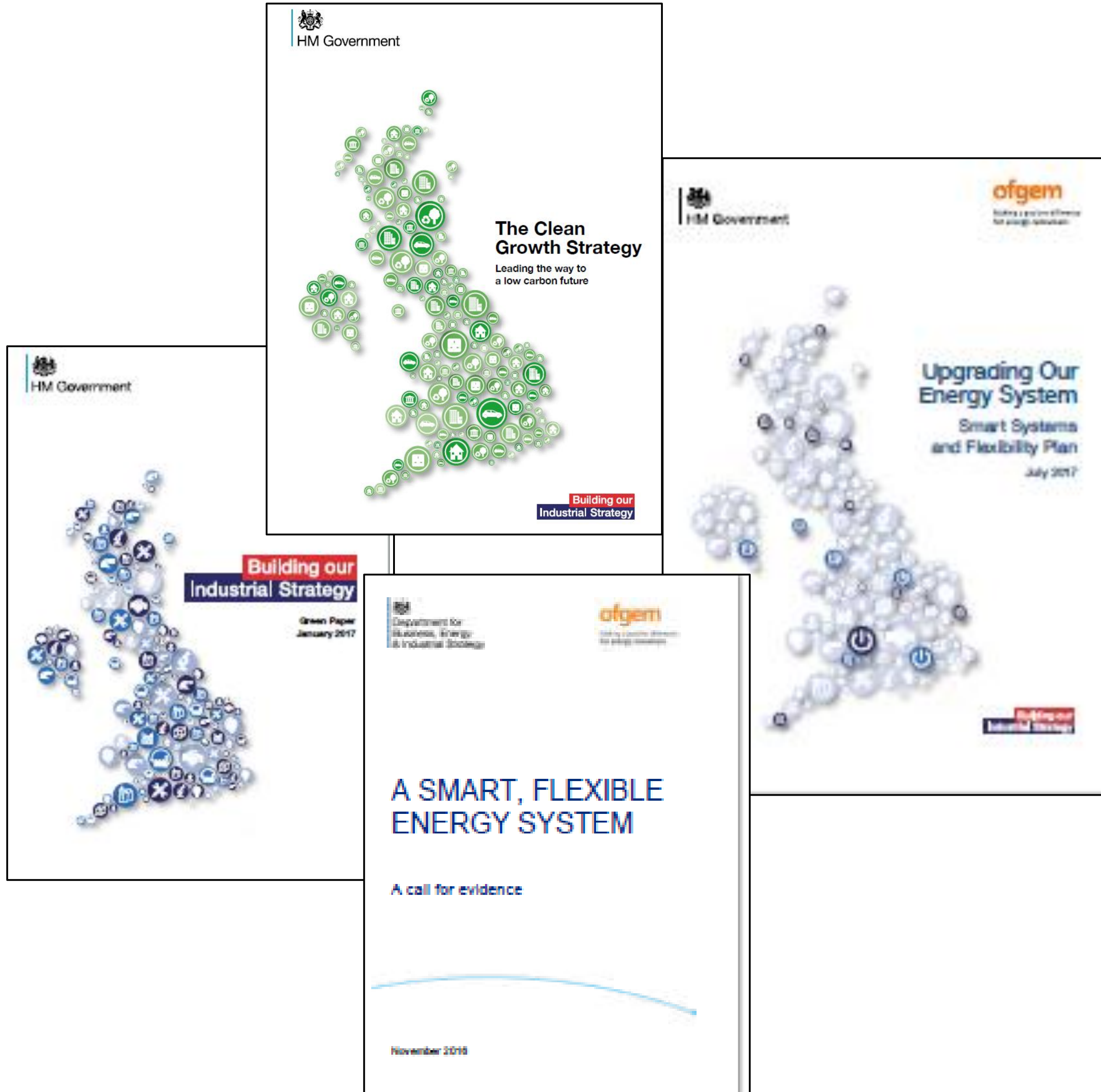
Instead we are now moving to a system where generation is **distributed and more variable**, where **consumers** can better monitor and manage their energy use, and where **new technologies and business models** are emerging."

Quote above from OFGEM Sept 2015 "Making the electricity system more flexible and delivering the benefits for consumers- position paper"

Policy Landscape



- Flexibility
- Access
- Charging
- Transparency
- Local energy markets



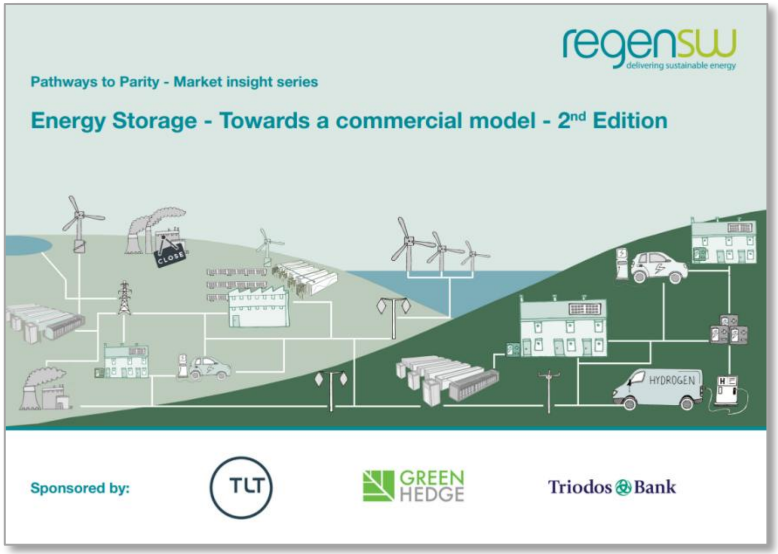
Policy, regulation and the market

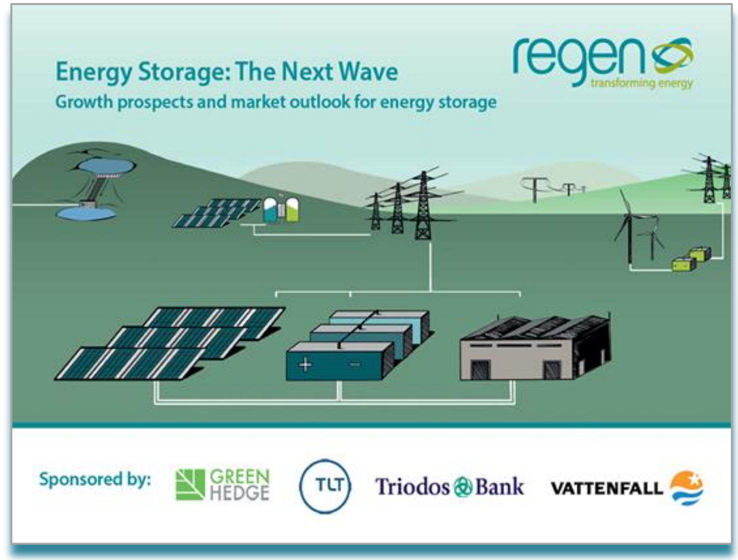
Libertarians
Unleash the power of the market
Level playing fields
De-regulation & simplification
Competition
Customer fo
Open up the
New busine
Harness inn

New interventionists
Recognise market failure
Long term investment
Take back control
Consumer focus - Price caps
Prevent natural monopolies
& local

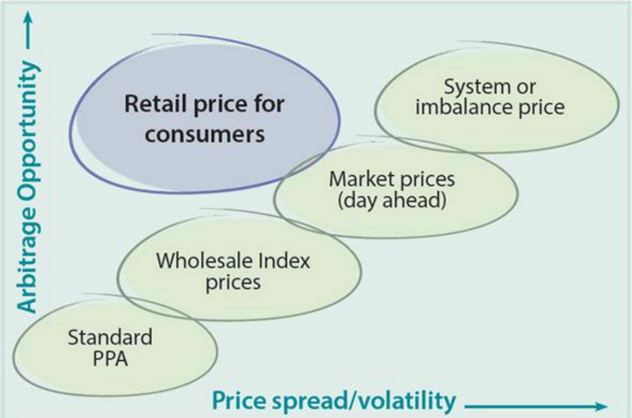
Making a positive difference
for energy consumers

Development of energy storage

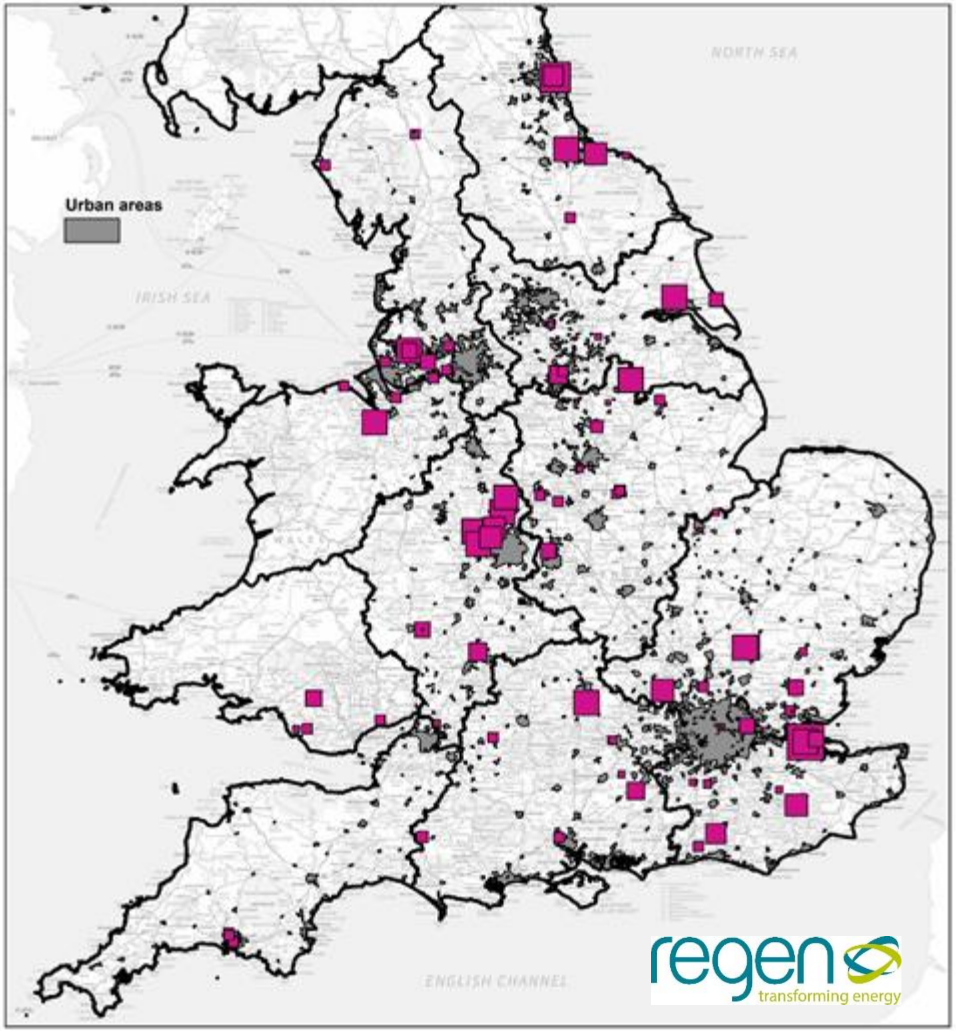


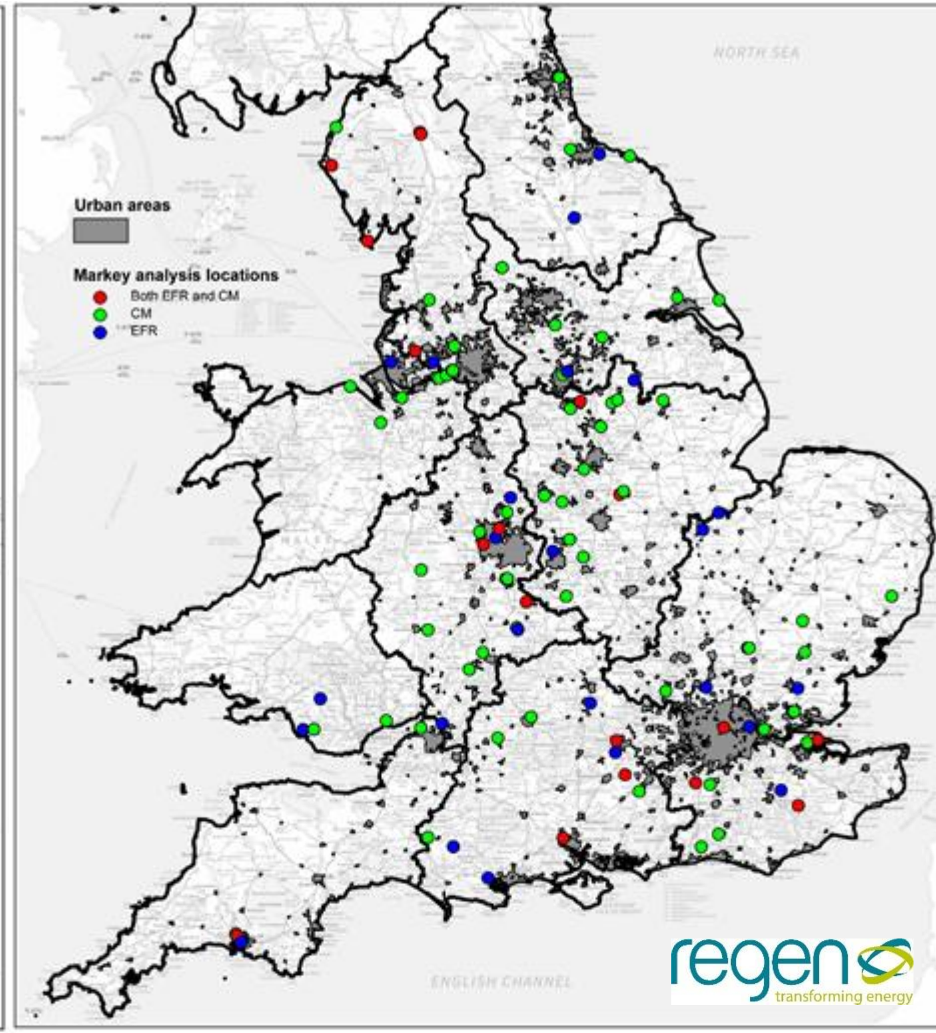


1) **Response service:** Providing high value frequency response services
2) **Reserve service:** Providing backup reserve services (STOR, Capacity Market)
3) **Commercial and industrial:** Located 'behind the meter' with high energy users, avoiding network charges and maximising onsite generation
4) **Generation co-location:** With variable generation to price/time shift or to peak shave generation to avoid grid curtailment
5) **Domestic and community:** Maximising own use of small generation (i.e. rooftop PV)
6) **Energy trader:** Aggregating storage to target price arbitrage or local supply models



Recent storage projects bidding into EFR and Capacity Market 2016

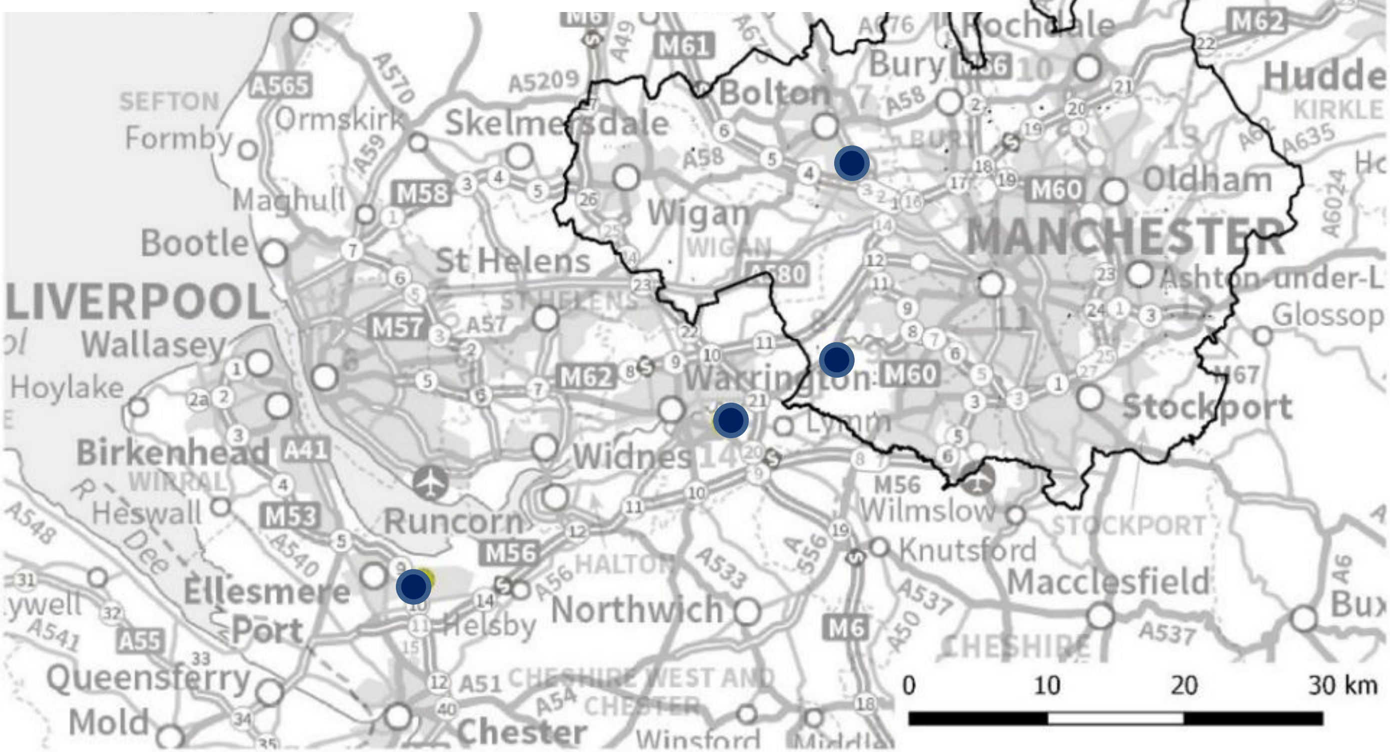




Manchester area energy storage

Table 4: List of large energy storage developments in the study area

Location	Technology	Capacity	Capacity Market contract length	Land classification	Proximity to substation
Oil sites Rd, Ellesmere Port	Lithium-ion	9.629 MW	15 years	Industrial	c. 6 km
Thelwall Lane, Warrington	Lithium-ion	9.629 MW	15 years	Industrial	c. 16 km
Manchester Rd, Carrington	Lithium-ion	9.629 MW	15 years	Industrial	c. 2.5 km
Emlyn Street, Farnworth	Lithium-ion	9.629 MW	15 years	Industrial	c. 6 km



Winning storage projects in the Enhanced Frequency Response and Capacity Market auctions in the Manchester area

Greater Manchester

Winning storage projects

Changing policy impacts e.g. for storage

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Policy & Regulatory Development	When	Potential Impact
'Minded to decision' to remove embedded benefits/Triad credits for embedded generators	March 2017	**Negative**
Removal of 'double charging' for storage, treating storage, for the purposes of network charges, as purely generation asset class	March 2017	**Positive**
Ofgem launch of Targeted Charging Review and Charging Futures Forum	May / Aug 2017	**Positive**
Launch of Smart Systems and Flexibility Plan	July 2017	**Positive**
Consultation around the de-rating of storage within the Capacity Market	July 2017	**Negative**
Reduction of distribution use of system (DUoS) 'red band' charges	April 2018	**Negative**
Ofgem decision around RO accreditation for three 5MW solar farms retrofitting co-located storage	September 2017	**Positive**
HMRC confirms 5% tax rate for solar and storage installed together	September 2017	**Positive**

Elective half-hourly settlement for domestic and small commercial	June 2017	**Positive**
Government announcement around ending petrol/diesel vehicle sales >2040, increasing the momentum for EV rollout	August 2017	**Positive**
Brexit	Ongoing	**Unknown**

Changing world for the distribution network operator

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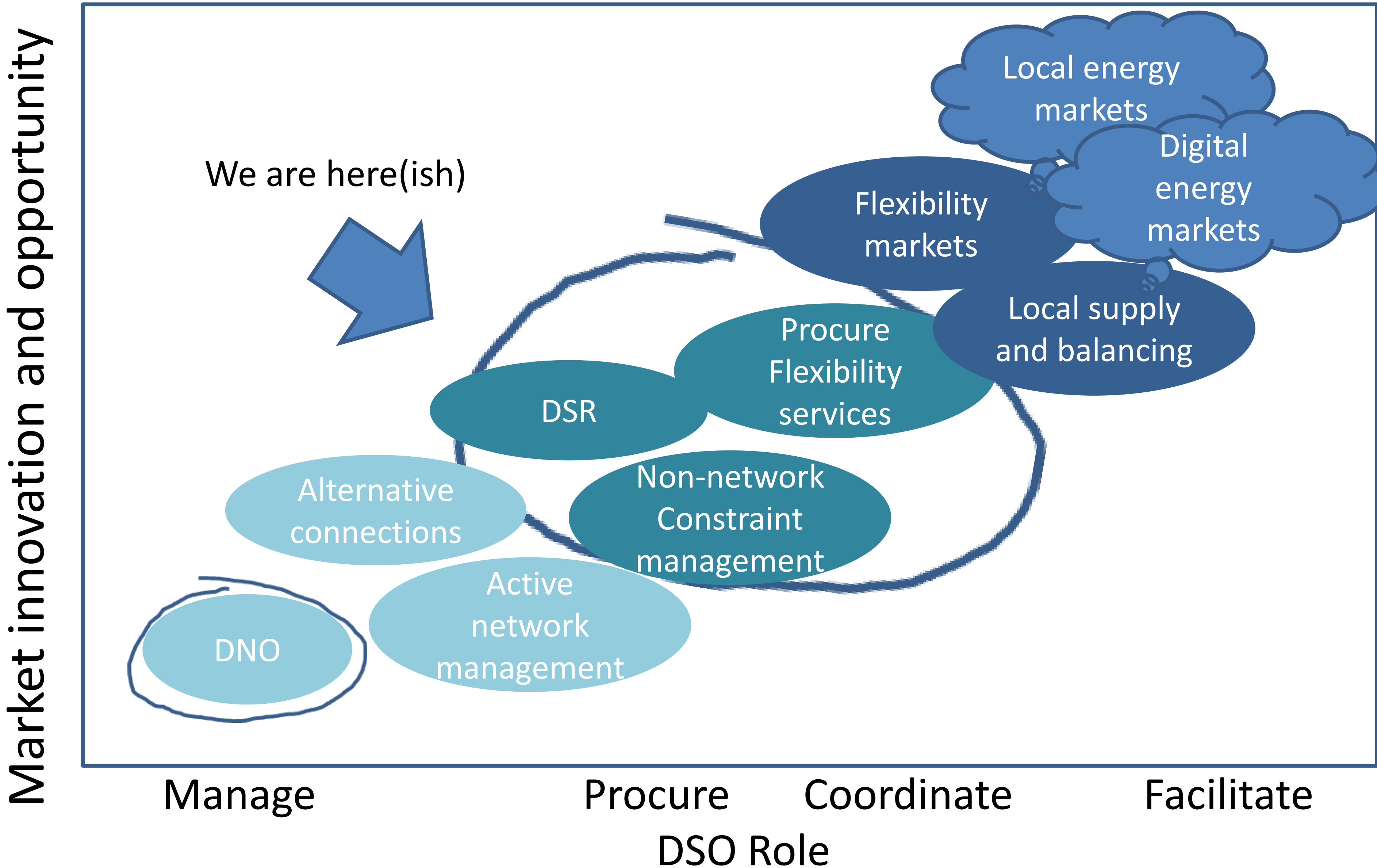
Old DNO World Centralised energy system	New DSO World Decentralised energy system
Single directional flows Low number of new generation connections “Relatively” easy to model demand diversity	Multi-directional flows Massive increase in generation connections Increasingly difficult to manage supply/demand balances
Limited customer engagement Reactive management Asset efficiency and cost management Least regret investment strategy	Continuous customer engagement Proactive management Focus on system efficiency Alternative investment strategies
Network sized and managed to provide capacity to meet peak winter demand “keep the lights on”	Network managed to produce optimal economic outcome and: • Facilitate competition, innovation and new flexibility services • Deliver resilience and security • Support new local energy markets?

Depth and speed of change



DSO strategies being developed

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Scottish & Southern Electricity Networks

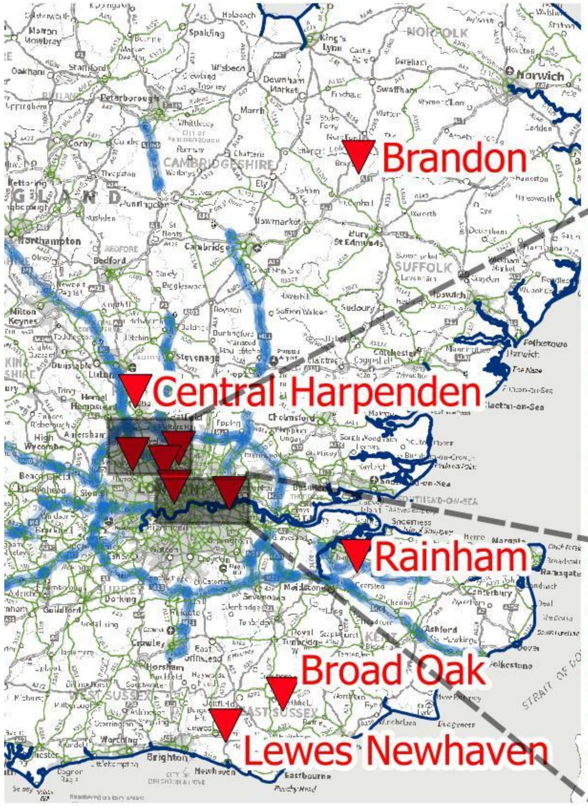
Constraint Managed Zone procurement process

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

Flexible Power
By Western Power Distribution

UK Power Networks

- Expression Of Interest for c.35MW of flexible capacity at 10 substations (11kV)
- 500kW minimum bid size (aggregation is permitted)
- Two to five hours rough duration range
- Open for services to commence from Jan 2018 and/or winter 2018/19



Locations with a potential need for flexibility identified by UK Power Networks

Creating new market opportunities

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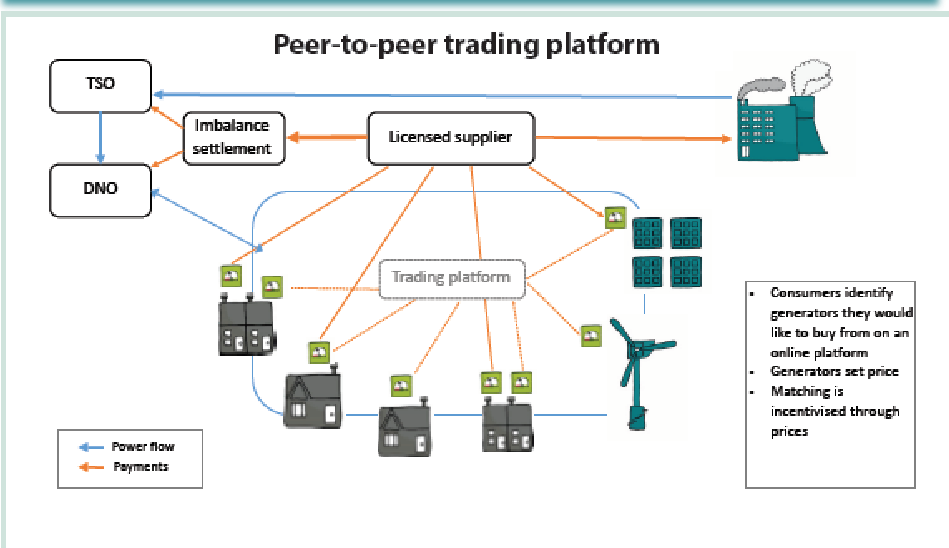
Northern Powergrid to create 'virtual' local energy market

NORTHERN POWERGRID

"Northern Powergrid, is to plough £1.9 million into the creation of a smart energy grid across its network, allowing its eight million customers to trade power and services using their home solar, battery systems and electric vehicles (EVs)."

"Northern Powergrid says its Customer-Led Distribution System project is the first to take a holistic view of how to maximise the benefits of a future smart energy system, identifying how to accommodate large volumes of new technologies, such as local generation, at least cost while at the same time enabling customers to earn income by selling energy or services to balance the network."

Evolving local supply options



- Energy clubs
- Local generation tariffs
- Peer-to-peer trading
- Microgrids
- Local energy markets
- Local ESCO

Some key policy questions and unknowns

Speed and extent to which new markets for flexibility services will appear

Where in the system will flexibility services be provided?

Dynamic market solutions (enabled by new technology and business models) versus direct procurement

Will future network charging and access drive flexibility services and local energy markets or risk killing innovation

How will locational and time of use signals work?

Risk of defining top down roles rather than thinking about new market dynamics

Interface between the SO (National Grid) and DSO's will work together

Role of aggregators and other intermediaries, future for energy supply companies.

Data and information - quality, digital revolution, ownership and **security**

Behavioural changes - people





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delivering sustainable energy