The transition from DNO to DSO – what could it mean for community and local energy?

#CEconf18

electricity north west

Bringing energy to your door

Transition to a Distribution System Operator – a collaborative approach

Cara Blockley,

Central services manager

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From DNO to DSO

Old Distribution Network Operator model

Low numbers of connections

Relatively easy to connect more demand

Limited customer engagement

Reactive management

Network sized to cope with peak

winter demand

Very little renewable generation

New Distribution System Operator model

Energy flows in multiple directions

Huge increase in number of renewable connections

Increasingly complex to manage supply and demand

Need to build relationships, and facilitate competition and innovation

Much higher use of electricity for electric vehicles and heat

Electricity distributors will need to play a more sophisticated role

Our guiding principles

Neutral, but not silent	Network automation	Collaboration	No regrets	Everyone's included	Affordable and efficient
We want to be a trusted source of information, helping to demystify the new, complex energy market, while remaining commercially neutral	We will provide sophisticated, automated network services that can meet the needs while keeping costs affordable	We will work with North West stakeholders and collaborate with them to develop local and regional solutions to deliver against devolved and national policy	We will work with stakeholders and customers to plan in a sensible, informed way which will facilitate the development of flexible markets in our region	We are committed to ensuring that the poorest in society are not disadvantaged by energy sector developments and have opportunities to secure benefits	We will continue to focus on value for money and on making efficient investment decisions

DSO transition

- Flexible connections
- Flexibility services
- ANM

Current

2019 – 2020

- Wider ANM rollout
- TSO-DSO interface
- Regional needs/heat maps

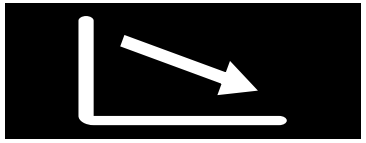
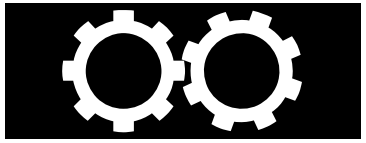
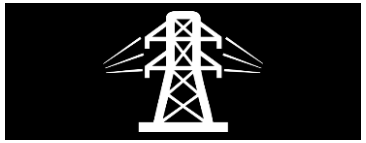
- DSO commercial operations are core business capability
- Active system management

2024 - 2030

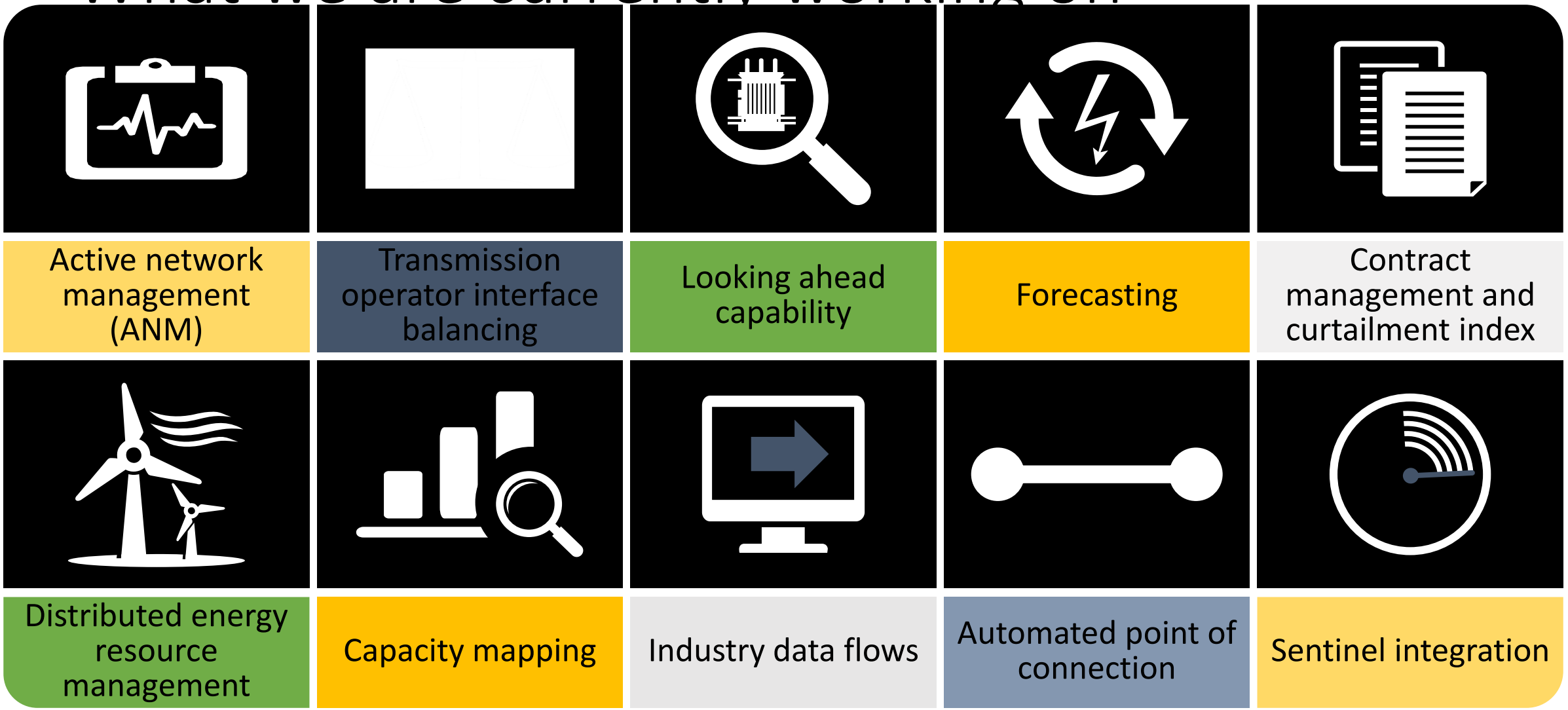
2020 - 2023

- Further investment in DSO
- Full ANM & DER services
- Network visibility/ online PoC

What we've already delivered

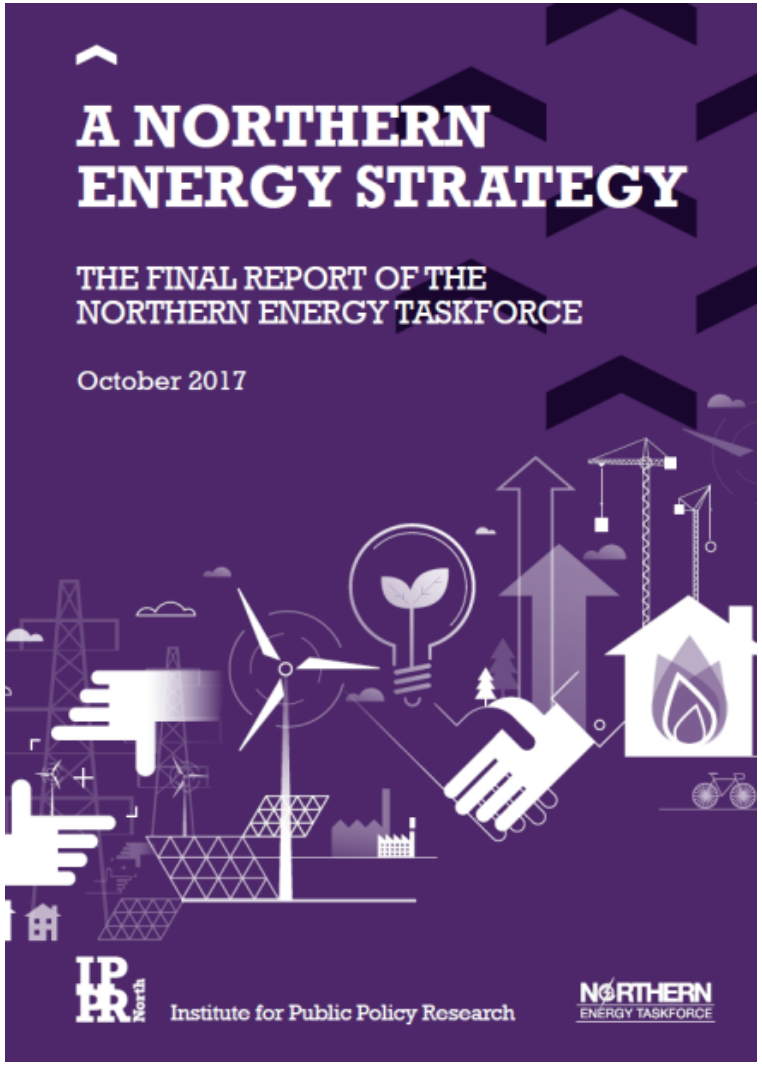
	Improved data quality and network connectivity	Cleansed network data – reliable network model is key foundation for DSO services
	Better use of network analysis tools	Better understanding of load flow and fault levels
	Implementing CLASS	Uses voltage to manage energy consumption and allow us to offer capacity services to the National Grid
	Flexible connections	Choice of connection type
	Control room data integration with customer service	New interface ensures that we're better able to manage impact of network events on customers
	Improved network automation	Automatic Restoration System has significantly improved customer impact of faults on high voltage network
	Enabled Respond	Active fault level management that avoids traditional network reinforcement
	Smart meter integration	Will give better visibility of the performance of the whole system and enhance the decision-making capacity of network operators.

What we are currently working on



Transition to DSO – community and local energy

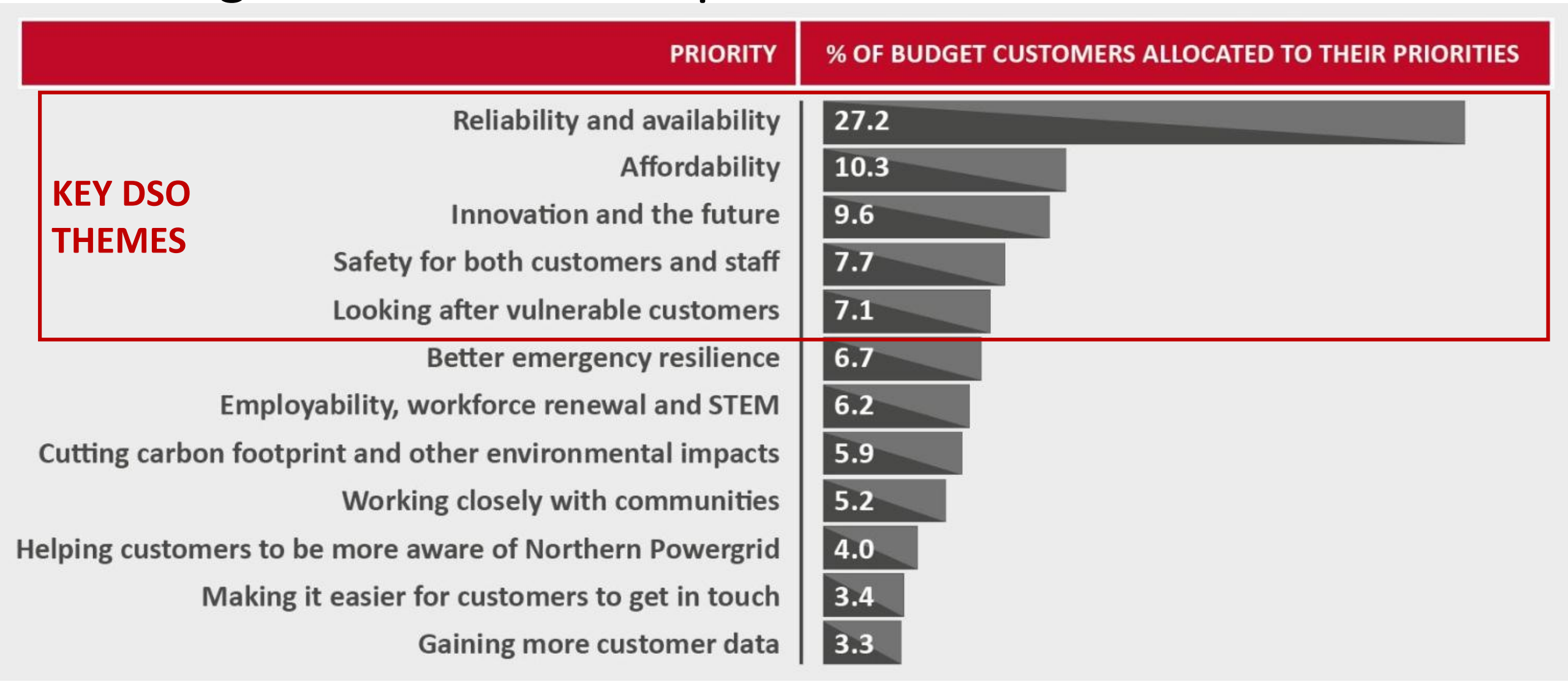
Delivering value for our stakeholders



‘Our vision for the north of England is that by 2050 we will be the leading low-carbon energy region in the UK, with an energy economy worth £15 billion per annum and 100,000 green jobs providing affordable, clean energy for people and businesses across the North.’

Northern Energy Taskforce

Listening to our customers' priorities



DSO brings a new service

TODAY

Keeping the lights on

Hooking people up

Customers pay us

FUTURE

Local balancing

We pay customers

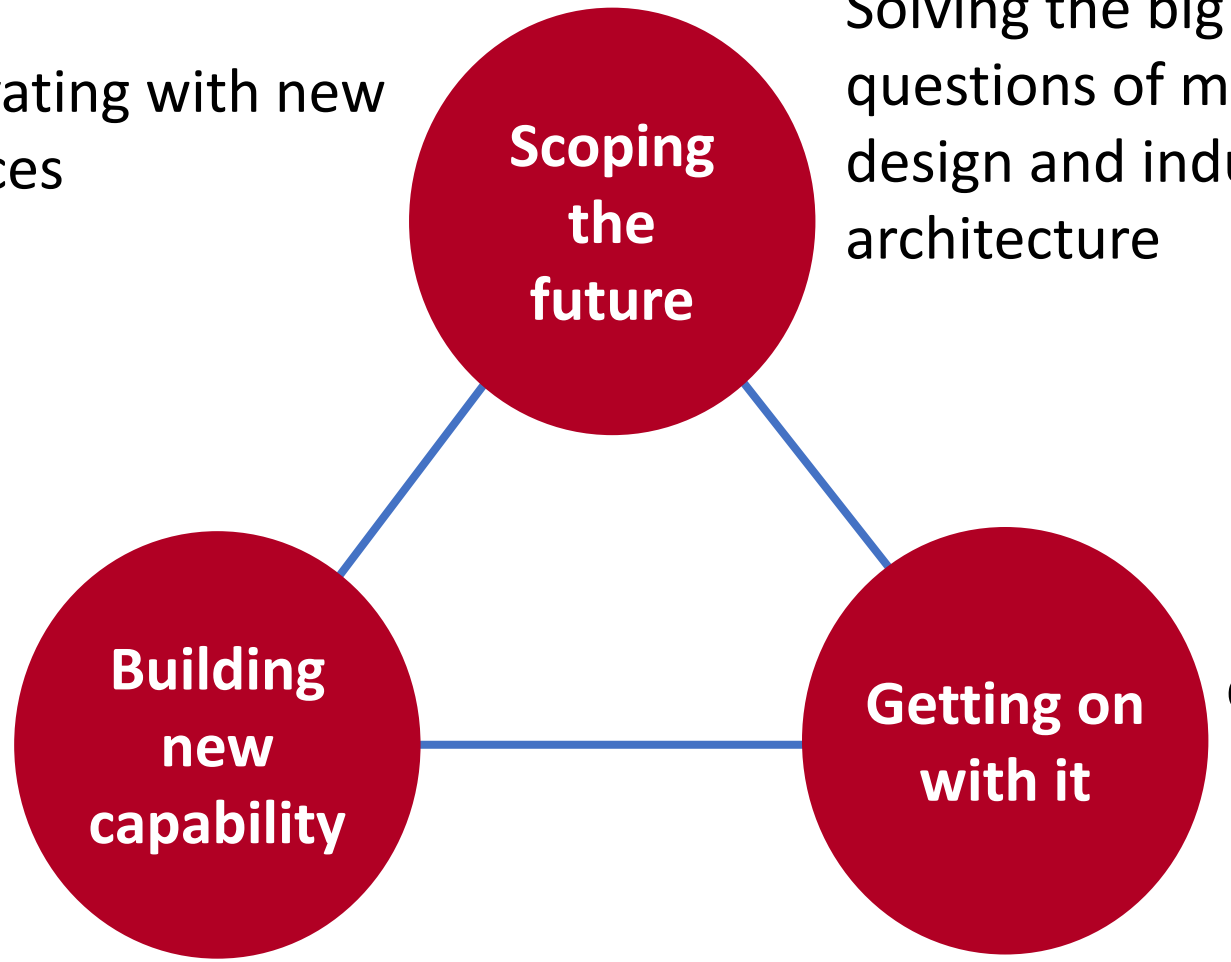
‘Fit and forget’

Active customers and network

DSO – Developing our thinking

Innovating with new services

Solving the big open questions of market design and industry architecture

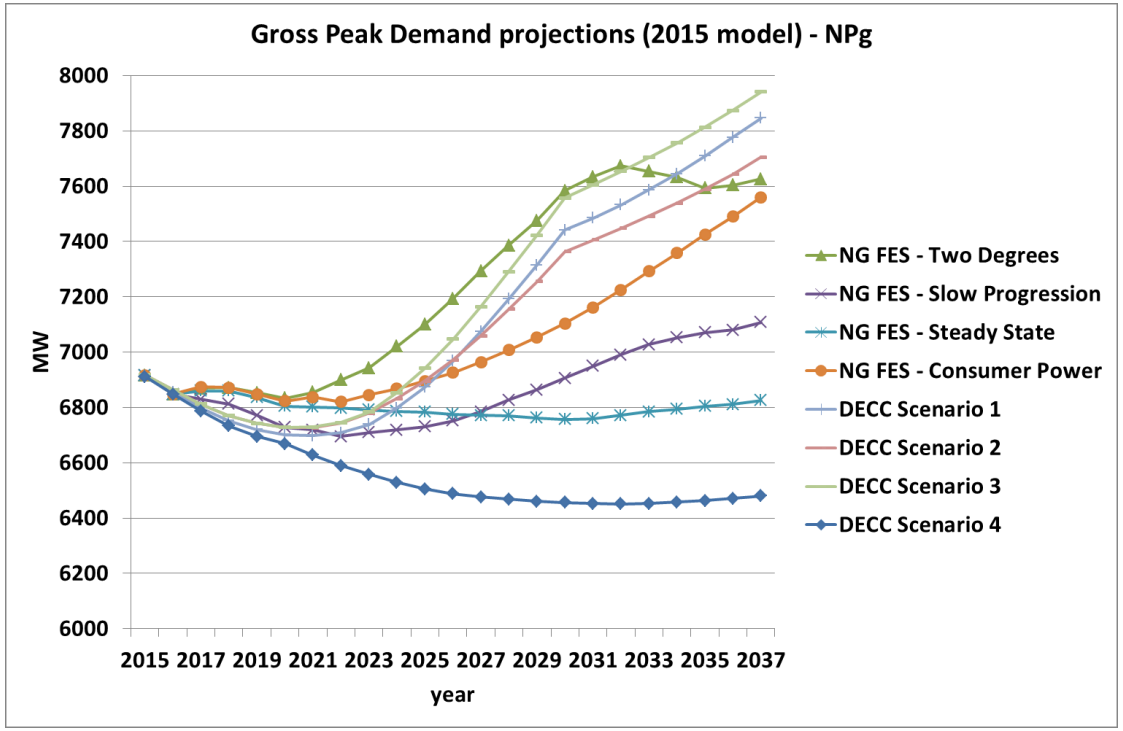


Providing new infrastructure and processes

Low regrets steps to demonstrate and learn

Societal changes: vehicles as a source of value for the energy system

Collaboration between motor manufacturers, vehicle users and energy companies



Vehicle-to-grid technology trials informing future network scenarios

Scoping the future: community energy solar and storage

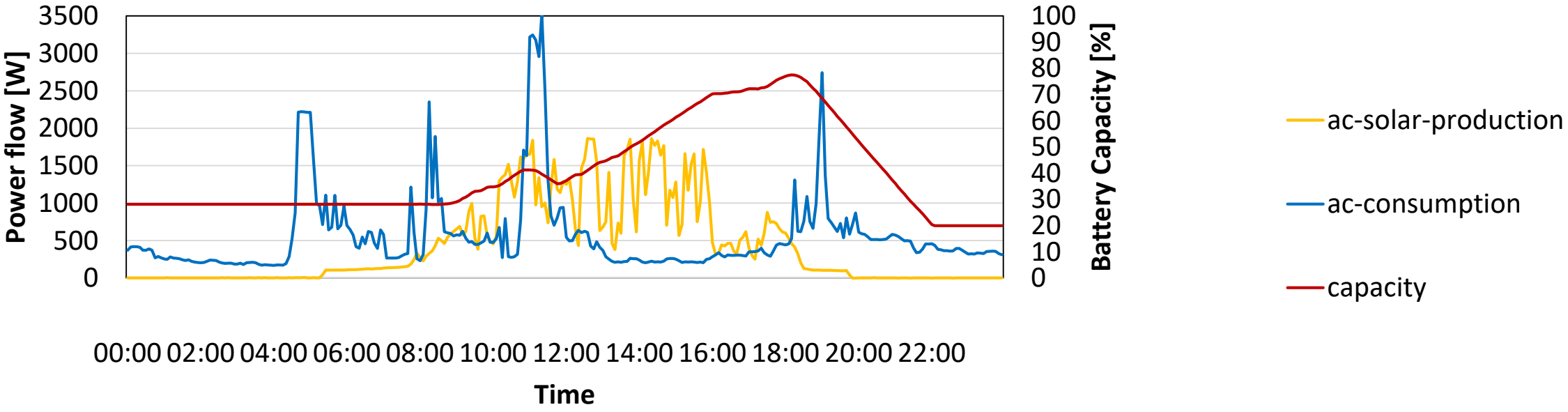
- Batteries installed in 40 council owned homes in Oxspring village outside Barnsley
- Aims to reduce customer electricity bills
- Using batteries to manage peak solar output
- Reduce reinforcement works – cost and disruption
- 2030: 70-80% of rooftop PV installed with storage
- Ensuring that everyone benefits from the transition to a smarter more flexible energy system

Gen Community EnergiseBarnsley

BERNESLAI HOMES

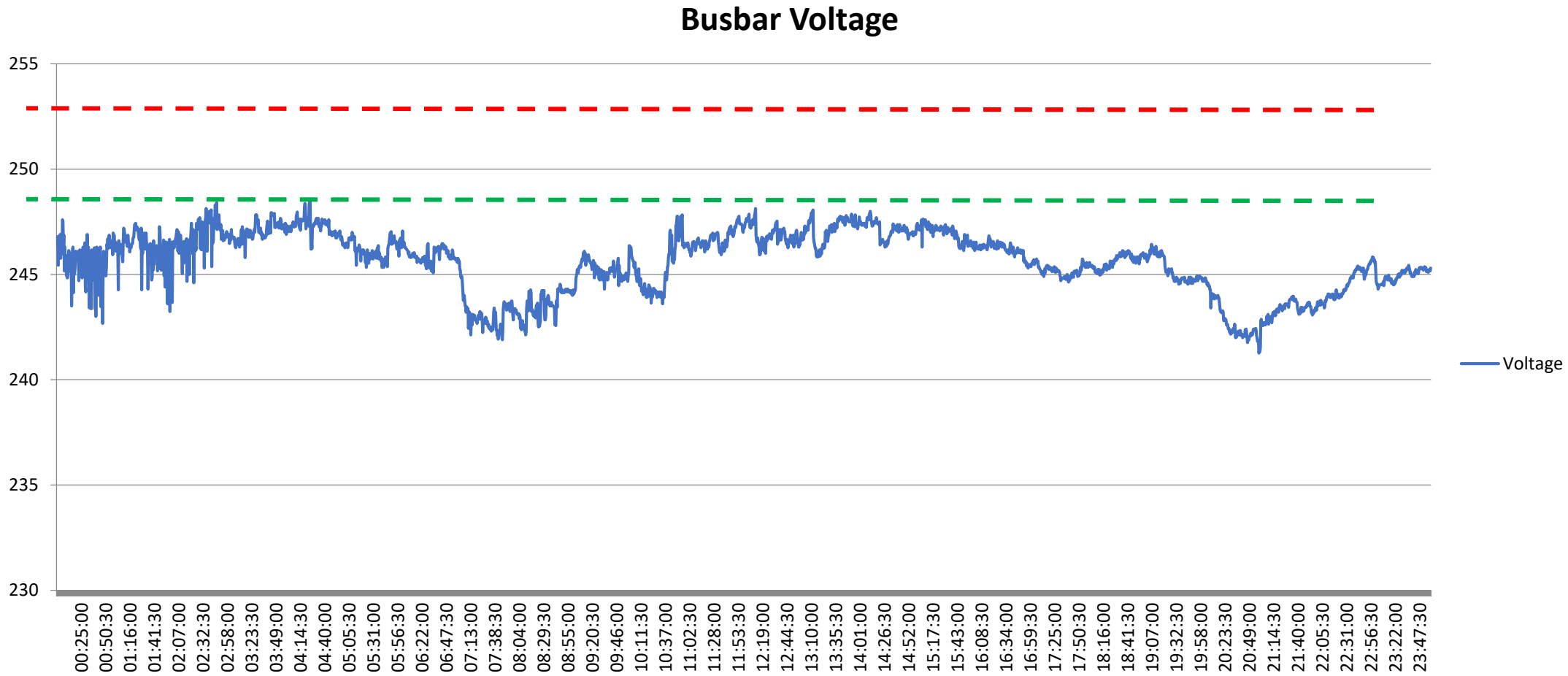
moixa

Customer activity one day in August…

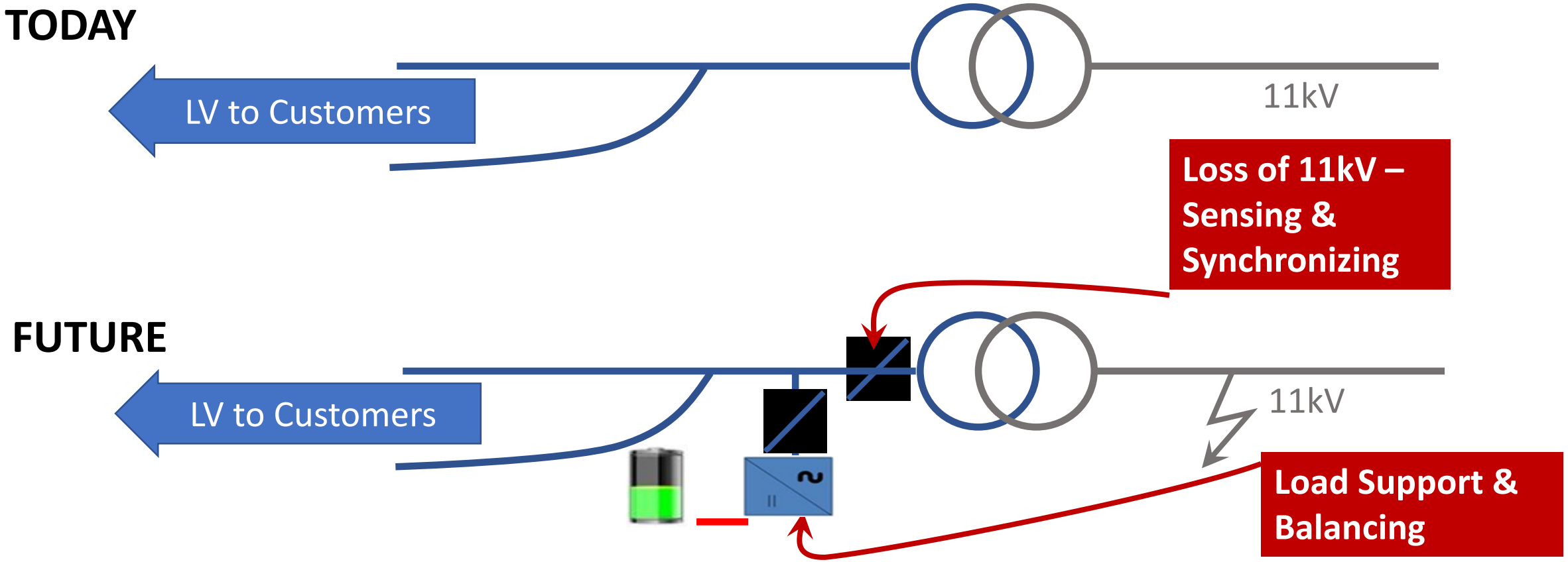


- Strong consumption and a low battery capacity in the morning
- Charging battery through day and supplying house evening load

…with voltage at the substation within limits

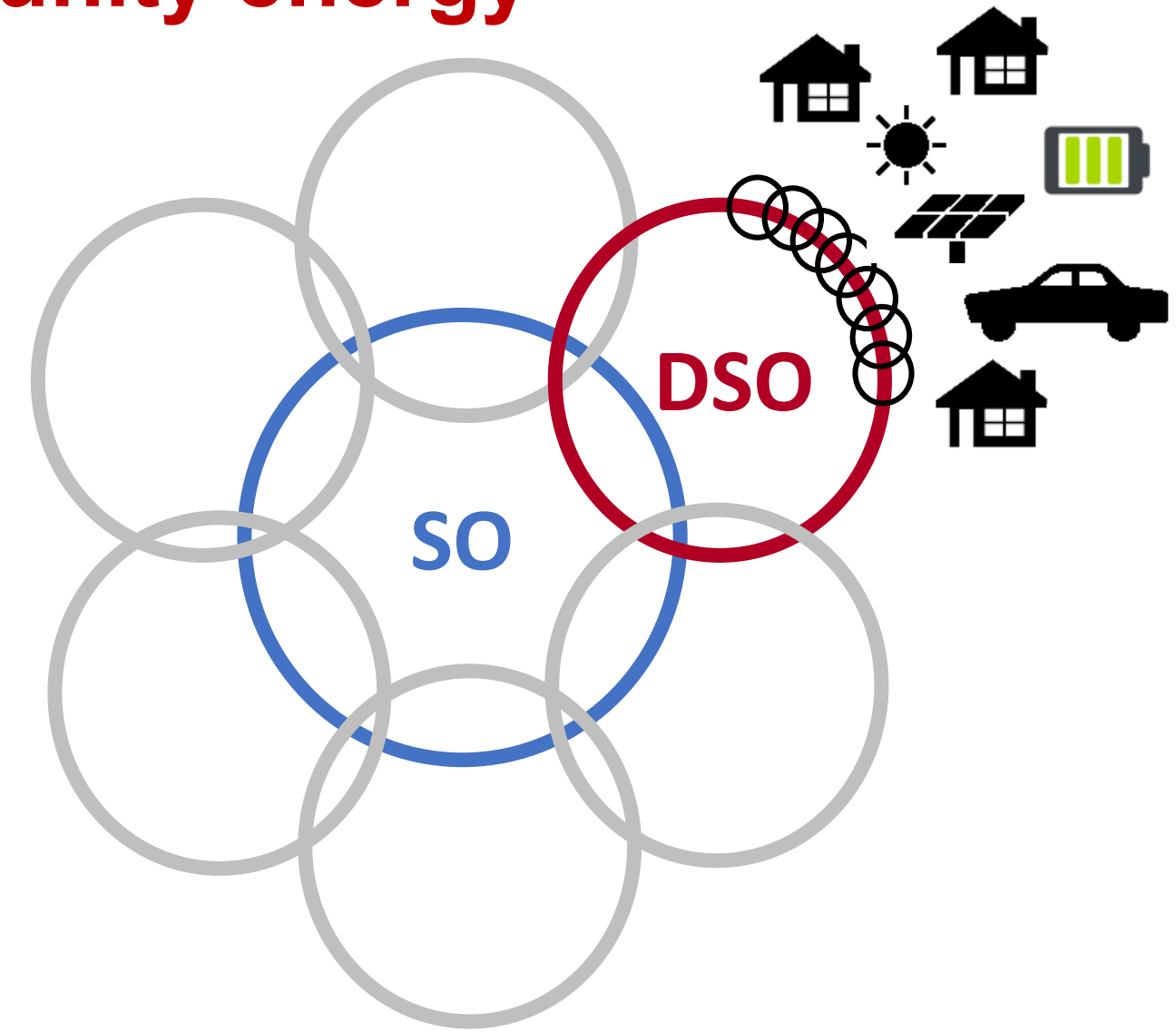


Scoping the future: using microgrids to boost resilience



Opportunities for community energy

- Facilitate our customers' transition to a low carbon future at lowest cost
- Enable new local markets for peer-to-peer local trading
- Provide more value for customers by contracting for local grid balancing flexibility services
- Provide the physical trading platform for other parties in the energy market
- Keep the network stable and power supplies reliable



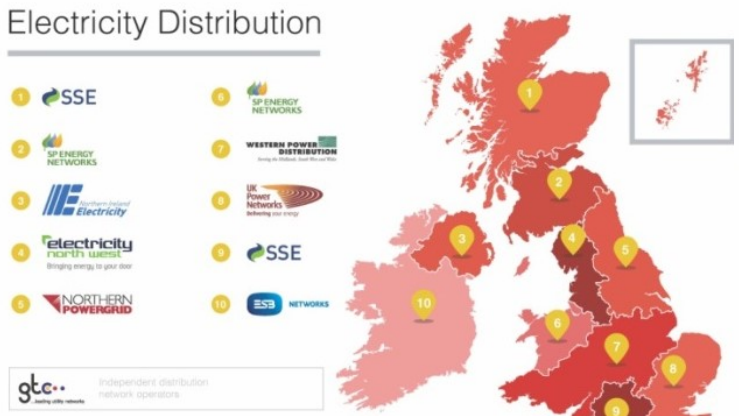
Community Energy Conference 2018:

Introduction to the Open Networks Project and the DSO Transition

Jim Cardwell, Head of Trading and Innovation, Northern Powergrid

Introduction to ENA

- 29 million electricity customers
- 21.5 million gas customers



- 180,000 miles of gas network
- 519,304 miles of electricity network

Open Networks – Delivering a Smart Grid

ENA's Open Networks Project is a major energy industry initiative that will transform the way that both local Distribution Networks and national Transmission Networks will operate and work for customers. This is being driven by the 3D's; digitisation, decentralisation and decarbonisation

The Open Networks Project will help customers connect and realise value; as well as reducing cost for consumers through more cost effective planning

ofgem
Making a positive difference for energy consumers

HM Government

The Open Networks Project is a key initiative to deliver Government policy set out in the Ofgem and BEIS Smart Systems and Flexibility Plan, the Government's Industrial Strategy and the Clean Growth Plan.

Short Animation that can be found at: https://www.youtube.com/watch?v=8GxeWsppmBI

Definition of a DSO

A Distribution Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DER).

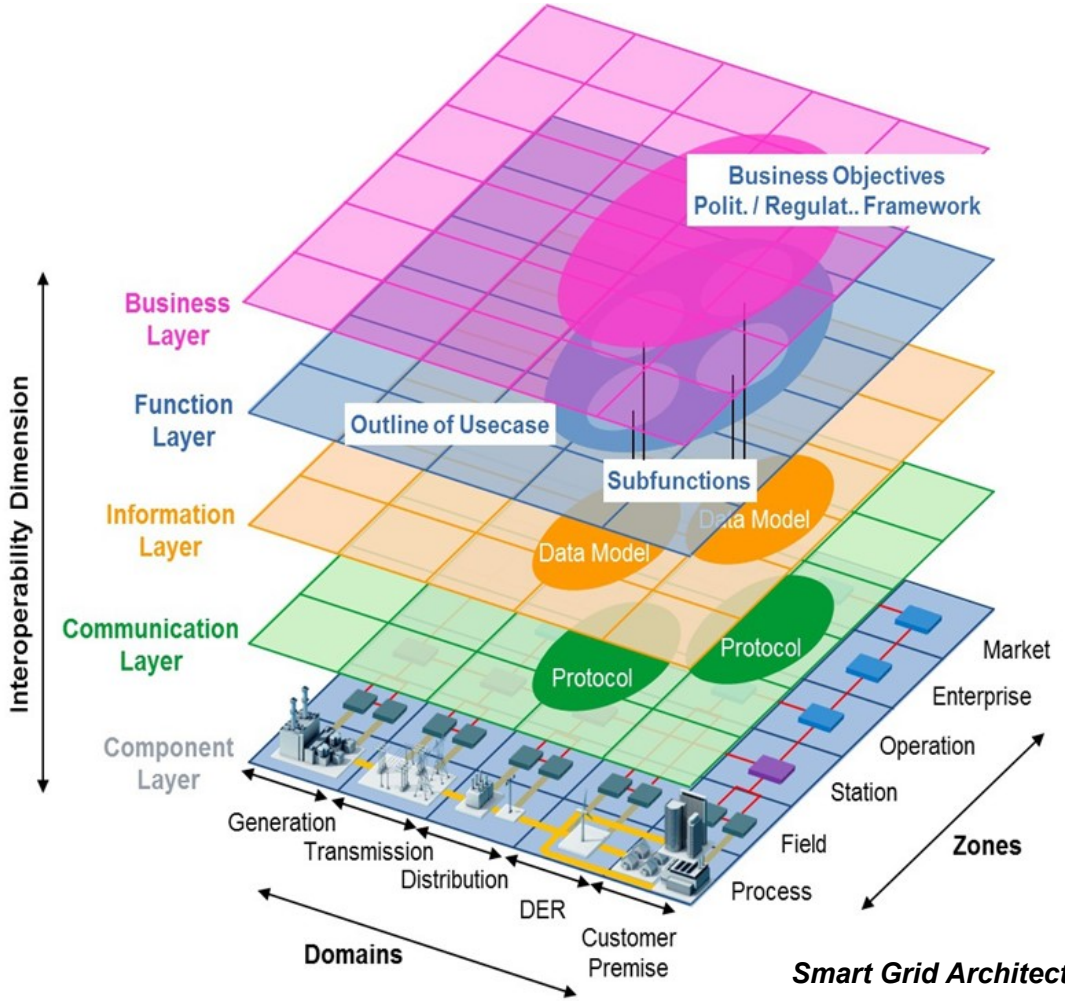
*As a **neutral facilitator** of an open and accessible market, it will enable competitive access to markets and the optimal use of DER on distribution networks to deliver security, sustainability and affordability with the support of whole system optimisation.*

A DSO enable customers to be both producers and consume enabling customer access, customer choice and great customer service.

What does the DSO look like?

In 2018, modelling potential DSO future worlds and impact assessment to feed Ofgem and BEIS policy direction:

- *DSO co-ordinates*
- *National system operator co-ordinates*
- *Joint Procurement*
- *Price Signal driven*
- *Flexibility Co-ordinators*



Smart Grid Architecture Model (SGAM)

Stakeholder Input is Critical

Thus far, we have undertaken with the Advisory Group:

4
Advisory Group Meetings

3
Advisory Group Modelling Workshops

40
With over 40 different stakeholder attendees at these sessions

To the wider stakeholder community, we have:

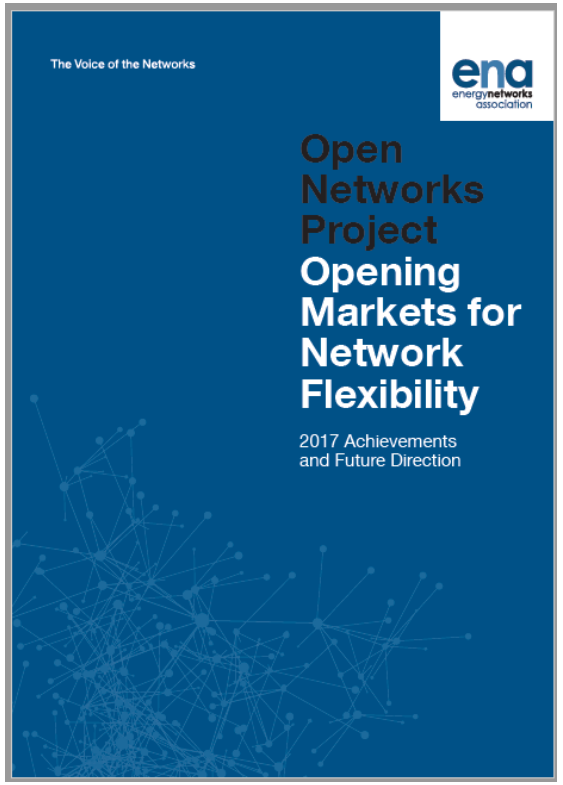
Published a newsletter to 100s of stakeholder contacts.

Published our material on ENA website updates.

Conducted a stakeholder webinar with 45 attendees followed by 30 responses to commercial principle consultation.

How to get involved?

- Join our mailing list!
  - opennetworks@energynetworks.org
- All outputs and consultations posted online:
  - www.energynetworks.org/electricity/futures/open-networks-project/open-networks-project-overview/
- 2017 End of Year Report can be found here:
  - http://www.energynetworks.org/electricity/futures/open-networks-project/eoy-report-2017.html
- We welcome your feedback and input



The energy system is going through a fundamental change

Old world

New world

The distributed energy world in 2030 – a view…

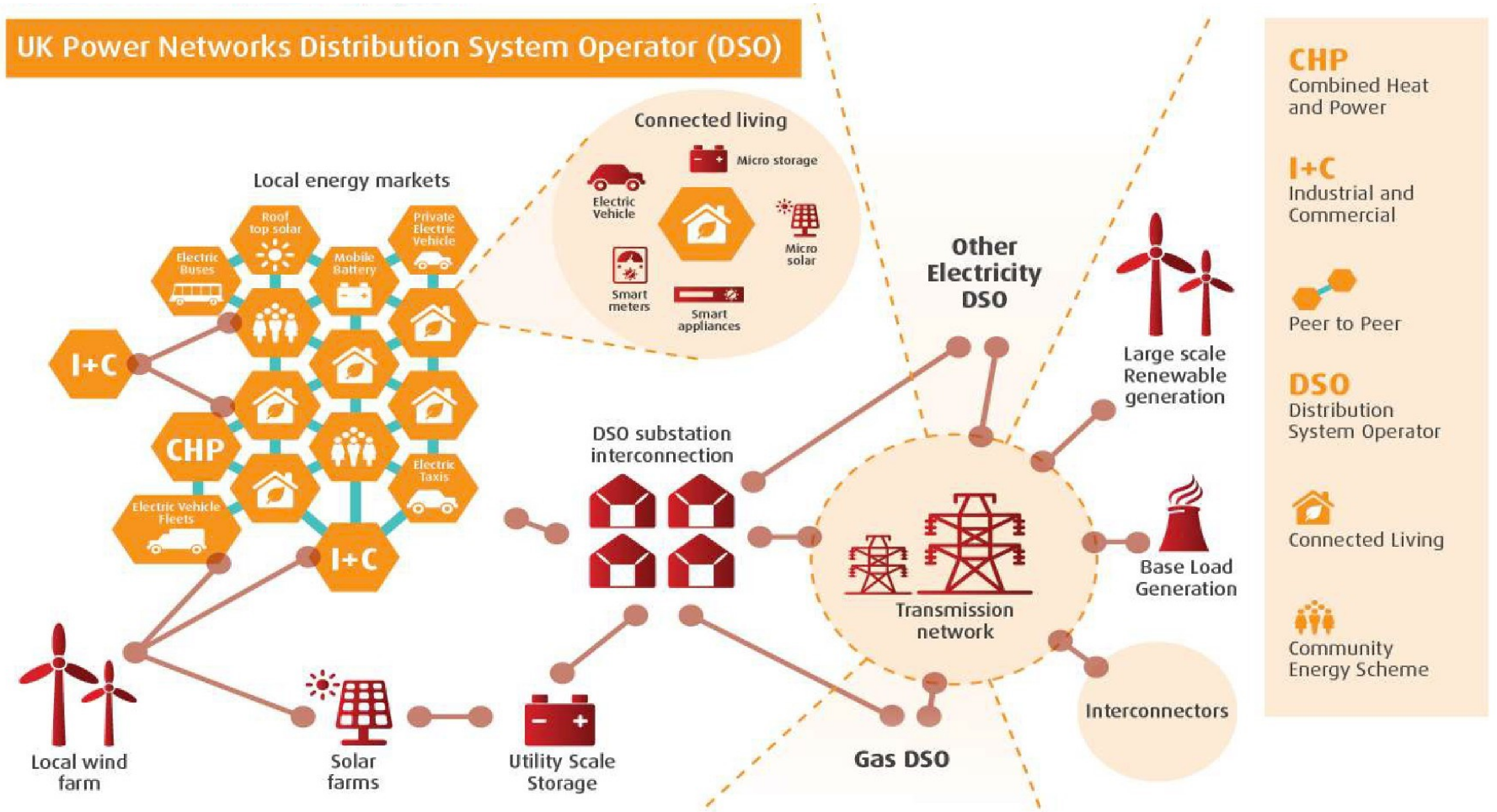
Distribution networks acting as a facilitator for a wide range of energy resources and market models

The UKPN world in 2030

~13 GW of solar

~4 GW of storage

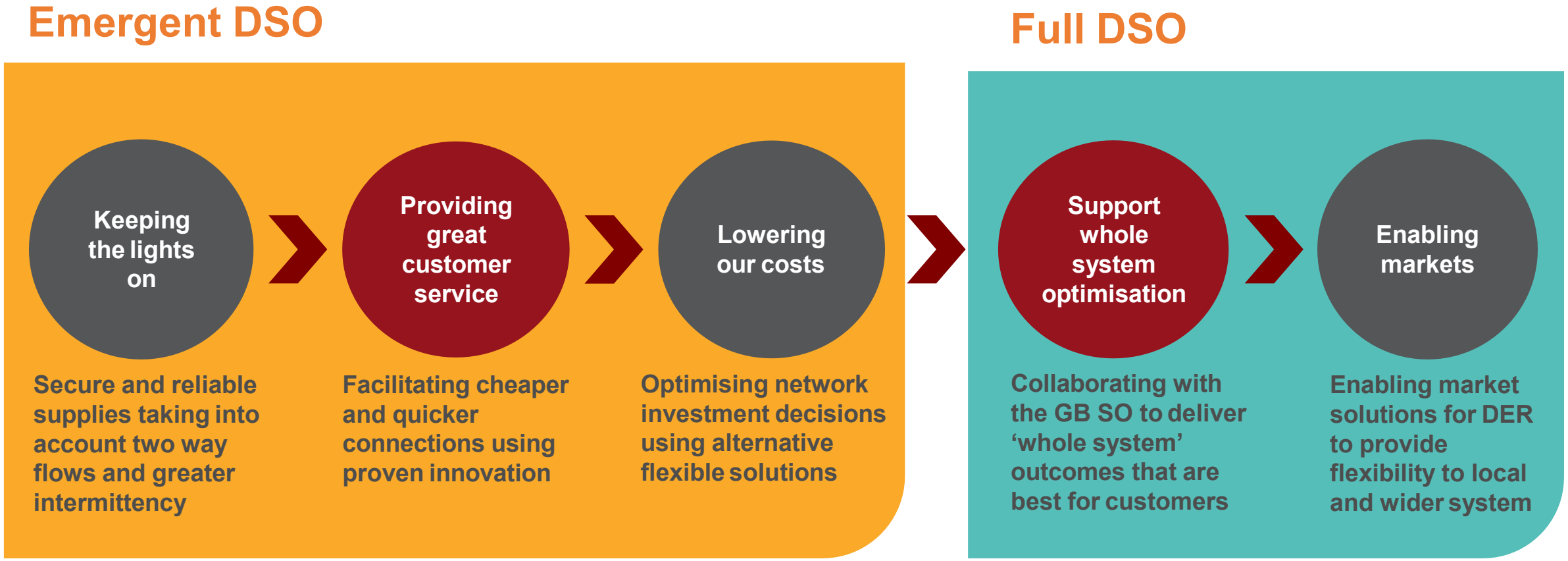
~1.2-1.9m Electric Vehicles



Enabled by:

- Smart meters
- Distributed Generation
- Storage
- Micro Grids
- Community Energy and peer-to-peer
- Electric Vehicles
- Smart appliances
- Market and regulatory reform
- Demand flexibility

Transitioning to a Distribution System Operator

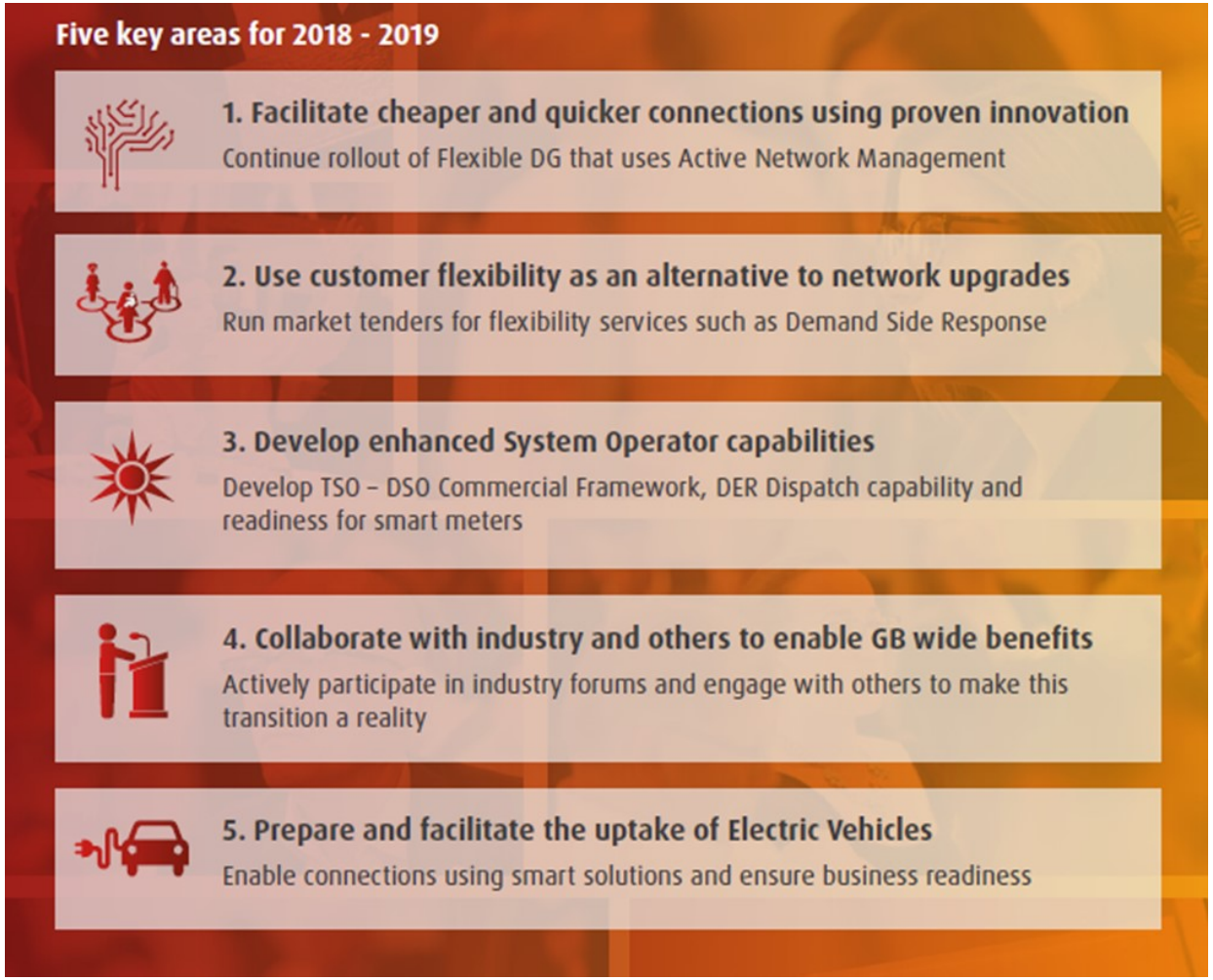


Customers shaping our transition to DSO

- Accelerate the roll out of Active Network Management
- Continue to run flexibility tenders for Distributed Energy Resource (DER)
- Support local energy growth
- Consider potential new areas of vulnerability
- Educate and inform different customer groups
- Improve network visibility and monitoring
- Clarify the DSO's roles and responsibilities
- Strengthen the collaboration between different energy sectors

Visit FutureSmart.ukpowernetworks.co.uk

Our Distribution System Operator Strategy



Delivering 'a smart grid for all'

FutureSmart

Facilitating your ‘A Day in the life’ Stories

Energy Sector Employee

Community Energy Manager

Domestic Prosumer

Commercial Operator

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Delivering your electricity

Community and Local Energy have an have an important role in facilitating a smarter, cleaner energy system

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