How do we build a smart energy system centred around the needs of our customers?

Helen Priestley – Stakeholder Engagement Manager

15 May 2019

Our Stakeholder-Led Roundtables

- Today is an opportunity to hear from you, our stakeholders, as we discuss ‘complex issues’ we are thinking through
- We are hosting a series of 6 roundtables with a wide range of stakeholders from across our regions.
- We welcome your challenge, insight and guidance as today we discuss:
    1. What do customers (commercial and domestic) want to use our network for? Now and in the future?
    2. How accessible and usable is the current information we make available? How does this meet your current and future needs?
    3. What additional information do customers and market players want based on their changing needs? If there was a cost involved in providing the information, what would the priority order be and who should pay for this data?
- There are no right or wrong answers and we will actively encourage your contributions throughout the day.
- Your feedback and challenge helps shape the priorities of our annual business plan and our future planning.

Meet the team

Patrick Erwin, Policy and Markets Director

Jim Cardwell, Head of Policy Development

Mark Nicholson, Head of Smart Grid Implementation

Issy Middleton, Smart Metering Programme Manager

Andrew McKenna, Commercial Manager, Flexibility Services

Key Note Speaker: **Dinker Bhardwaj**, Head of Data Policy, Smart Energy, BEIS

Agenda	Lead
DSO: exploring the future	Jim Cardwell; Mark Nicholson
The Energy Data Taskforce	Dinker Bhardwaj, BEIS
Panel Q&A Sli.do Code: **#R502** Network Name: **Barbican Events** / Wifi Password: **BARBICAN1598**	Patrick Erwin; Jim Cardwell Mark Nicholson; Issy Middleton Dinker Bhardwaj
Roundtable Discussion 1: What do customers (commercial and domestic) want to use our network for? Now and in the future?	All
Break	
Roundtable Discussion 2: How accessible and usable is the current information we make available? How does this meet your current and future needs?	All
Roundtable Discussion 3: What additional information do customers and market players want based on their changing needs? If there was a cost involved in providing the information, what would the priority order be and who should pay for this data?	All
Summary and next steps	Jim Cardwell

House Keeping

No planned fire alarms

Mobiles to silent please

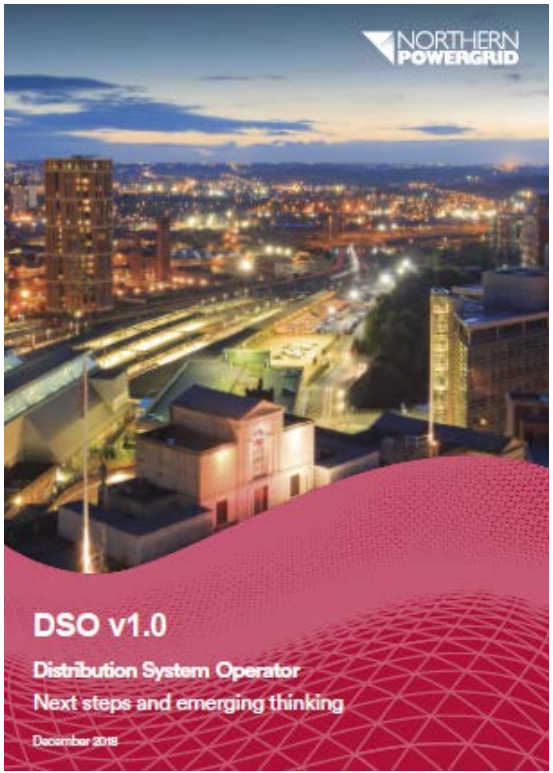
- We will have a break at 11am
- Please stay for lunch after the roundtable which will be served at 1pm

Smart energy systems roundtable

Jim Cardwell – Head of Policy Development
Mark Nicholson – Head of Smart Grid Implementation

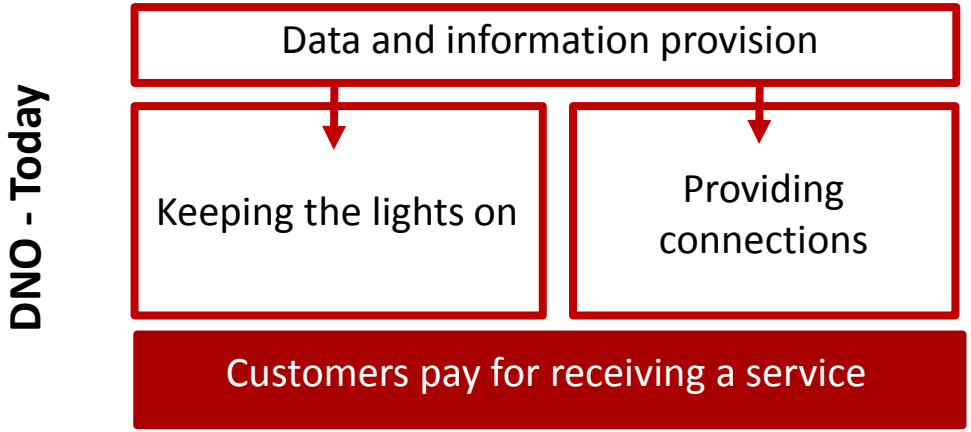
15 May 2019

Engagement on DSO transition – routine and ongoing



An evolving world

What DSO means for our customers



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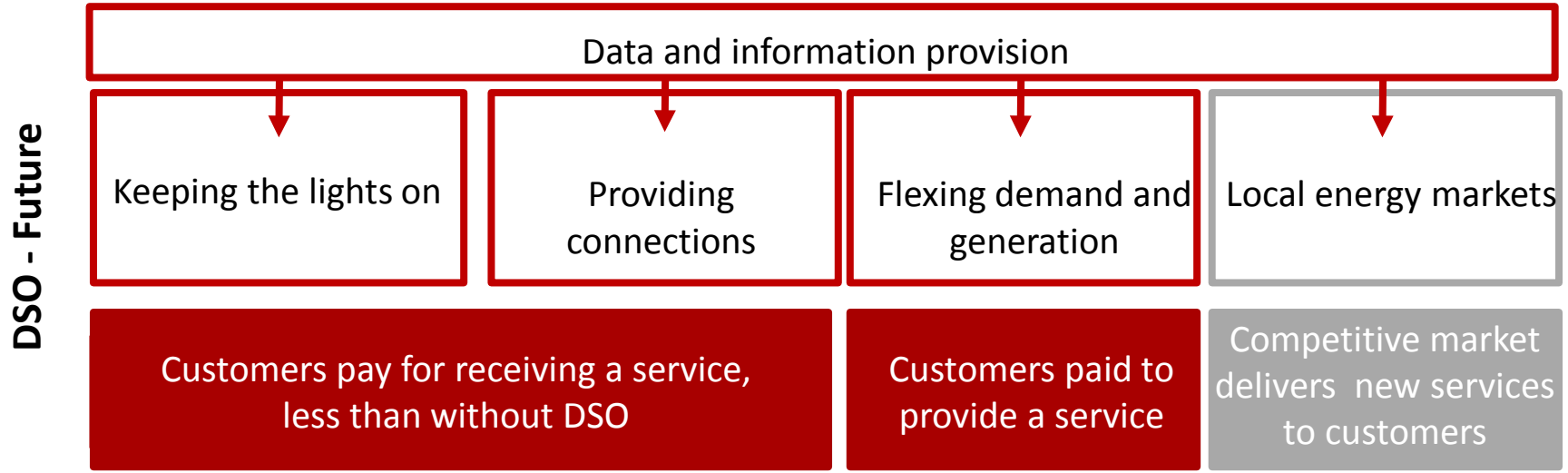


Future services: our guiding principles

1. Led by our customers' needs

2. Promotes sustainability by being efficient, fair and inclusive, and better for the environment

3. Requires a right-sized regulated business supporting competitive markets for flexibility

4. Changes to duties that optimise the system as the volume of distributed energy resources increases

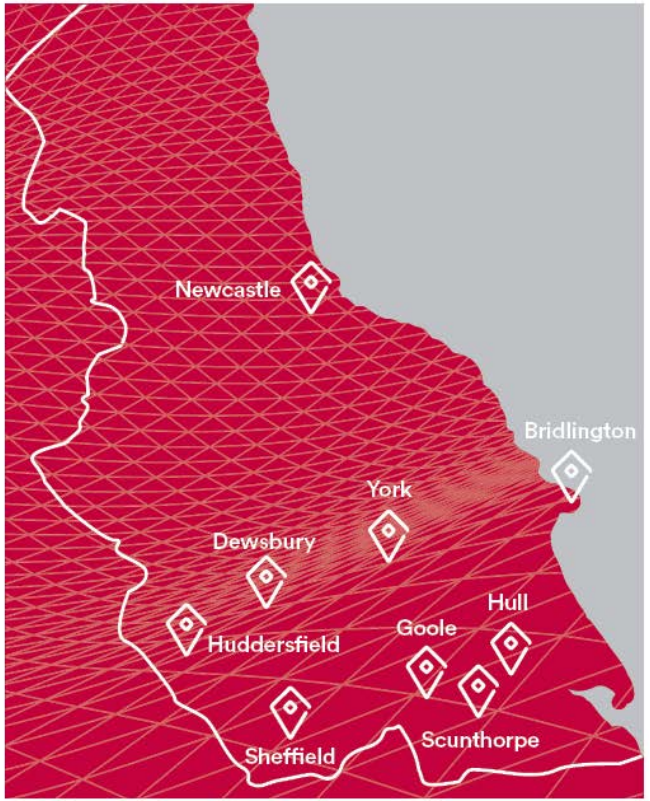
84%

of delegates agreed with our draft guiding principles, but some consensus emerged on the need to add some proposition around impartiality and transparency

Takeaway from January 2019 DSO event

Innovation: customer, data and technology

Implementing first phase of customer flexibility



2019-2023
Capacity required for flexibility
up to 14 sites, 16MW

2023-30
Capacity required for
up to *ca.* 40MW

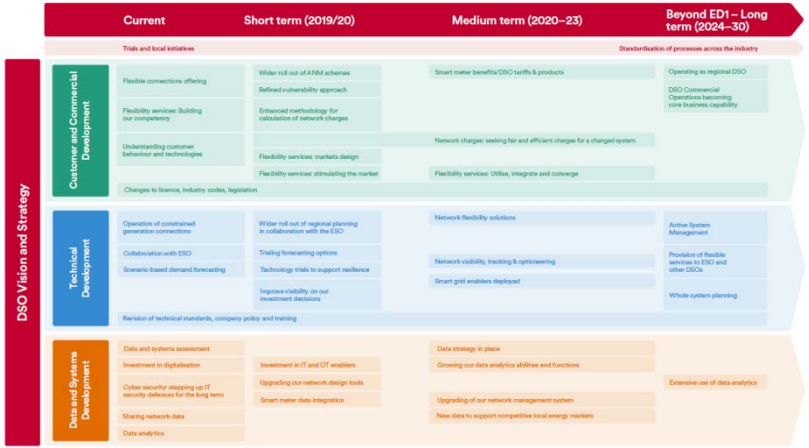
SMARTGRID TIMELINE

	Primary (town) networks	Local (street) networks
1960s	✓ Locally managed circuit breakers	✓ Dumb, 'fit and forget' passive assets
1970s	✓ Post-fault circuit re-closing	
1980s	✓ Remote operation of circuit breakers ✓ Monitoring one-way power flow ✓ Low bandwidth communications	
1990s	✓ Equipment rationalisation driven by electronics	✓ Temporary LV fault management devices
2000s	✓ Remote reconfiguration post-fault	✓ Low bandwidth HV remote control
2015 - 2023 (ED1)	**✓ Self-healing networks** **✓ Real-time capacity management** **✓ Two-way power flow monitoring** **✓ Advanced substation control devices** **✓ Wideband flexible communications (IP-based)**	**✓ Time of use demand data** **✓ Remote monitoring of LV circuit power flow** **✓ Automated control of voltage** **✓ Fault prediction and smart "fuses"** **✓ Wideband communications** **✓ Harvesting network data from existing HV devices**

The largest coordinated change to our network assets since the 1970s

Asset area	Asset investment	Spend(£)
Voltage control and monitoring	• Replacement of 1,356 transformer automatic voltage control relays • Installation of control equipment at 47 HV voltage regulators • Functionality for ANM & DSO services for improved visibility & alternative settings	£34m
Primary substation RTUs	• Upgrade or replacement of 850 RTUs • Platform for local substation control & IP capable	£17.6m
Telecoms (secondary)	• Replacement of existing UHF radio system, operating over 9,500 sites • Providing communications for grid edge control & monitoring	£13.8m
Telecoms (primary)	• IP based network replacement providing more bandwidth and resilience across 850 sites	£9.9m
Control and OT systems	• Rollout of standard ANM systems, first one at Driffield in 2019 with forecast of two per year after that • New databases for monitoring data and platform for data analytics	£4.3m
Distribution monitoring	• Harvesting of data from 2,000 pole mounted reclosers • Retrofitting of LV board monitors to 1,300 GM distribution subs	£3.2m
		£83m

Our emerging thinking: potential pathways to 2030



- ***Customer and commercial development*** – developing deep and liquid flexibility markets through co-ordinated actions with customers and the sector

- ***Technical development*** – cost effective deployment of well-targeted and well-timed investment smart grids

- ***Data and systems development*** – embracing the opportunities to revolutionise our service delivery

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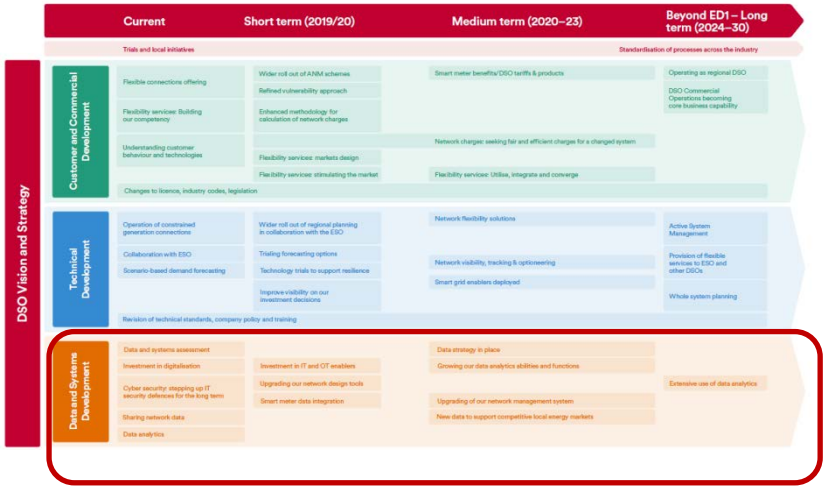

- ***Customer and commercial development*** – developing deep and liquid flexibility markets through co-ordinated actions with customers and the sector
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- ***Data and systems development*** – embracing the opportunities to revolutionise our service delivery

Current data and information sources

Name	Description	Update
Check before you dig	Diagram of our assets (electricity cables) in specific locations to assist civil works and keep workers safe	n/a
Power cuts	Map and tabular view of planned and unplanned power cuts by postcode	Near real time
Generation availability	Map and tabular view of the network capability to connect large-scale developments to major substations	Monthly
Demand availability	Map and tabular view of the network capability to connect large-scale developments to major substations	Monthly
Long term development statements	A detailed view of our system capability to assist existing and future users	Yearly
Future investment in the network	Map and tabular view of the investment that we are planning by postcode	Twice a year
Contracted Capacity Register	Tabular view of large scale generators which are connected to our network or are yet to be connected (i.e. accepted connection offer)	Monthly
Customer flexibility requirements	A list of sites where we want to assess the availability of customer flexibility with a view to contract it	Yearly

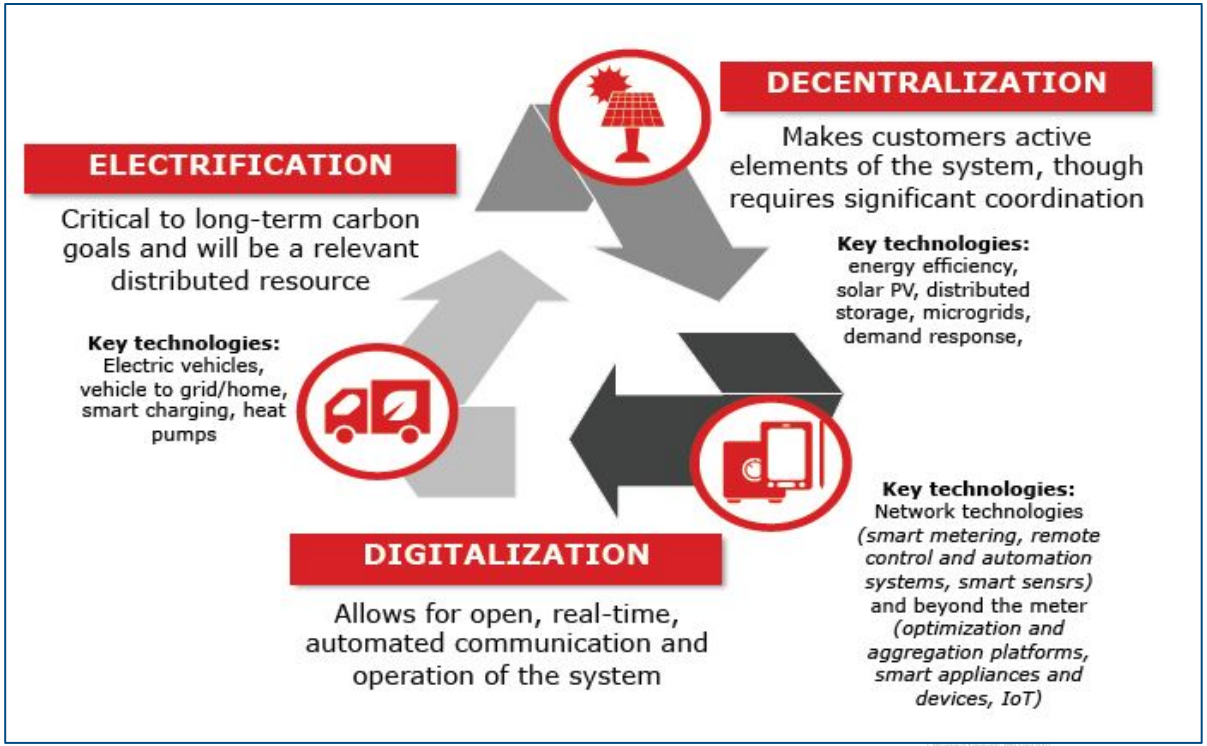
Energy Data Taskforce Project Update

Dinker Bhardwaj
Head of Data Policy, Smart Energy
Dinker.Bhardwaj@beis.gov.uk

Focus today

- Why is data important in energy context?
- What is the energy data taskforce?
- What are the likely recommendations?
- What difference can it make for consumers?

Future system: Data intensive



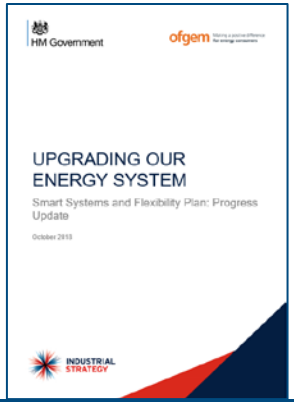
Source: World Economic Forum

EDTF: **Context**

Oct18- Smart Systems and Flexibility Plan Update

- Data is **intrinsic to transition** to a smart system.
- Currently, there is a **lack of transparency** and **barriers to access** to certain data-sets which can **limit competition** for energy services and **restrict innovation**
- **Opportunities exist for optimisation** and allowing innovators to realise where they can **add value to the system**

So,
"BEIS and Ofgem (and Innovate UK)… launched EDTF that will look across the energy sector, identify gaps where data can be used more efficiently and make clear, actionable recommendations."



EDTF: **Scope**

Remit: Focusing on Energy "System" data rather than "consumer" data with the overarching ambition of opening up

Purpose: The Taskforce aims to deliver more open access to the UK energy system data to facilitate the energy transition and deliver on the Digitalisation Agenda.

Its **Outcomes** aim to:

- **Optimise System Management:**
  - Effective system optimisation
  - Clarity of roles & responsibilities across multi-actors
- **Optimise Procurement and Reducing Costs**
  - Appropriate procurement of assets meeting real needs
  - Better price discovery
  - Enhancing Demand side Markets
- **Improve Policy and Regulatory Oversight**
  - Symmetry of information and knowledge
  - More accurate understanding of system needs and infrastructure requirements
- **Enable New Markets and Actors**
  - Accelerating new markets
  - Opening up to new actors

Outputs: The Taskforce will deliver the following to BEIS / Ofgem

- Establish overarching principles to guide government, regulators and industry
- Develop an open method of sharing data
- Propose a set of data license requirements to drive a richer data environment

- Identify and make recommendations on "how" to unlock System Opportunities
  - **Data Visibility:** The development of an Energy Sector Data Index
  - **Infrastructure Visibility :** What and where are energy assets
  - **Operational Improvements:** Data informing better decision making
  - **Market Development:** Transparent markets delivering better price discovery around time, location and performance
  - **Regulatory Visibility:** Providing clear and useful data to the regulator to address consumer, market and system risk

EDTF: **Policy Principles**

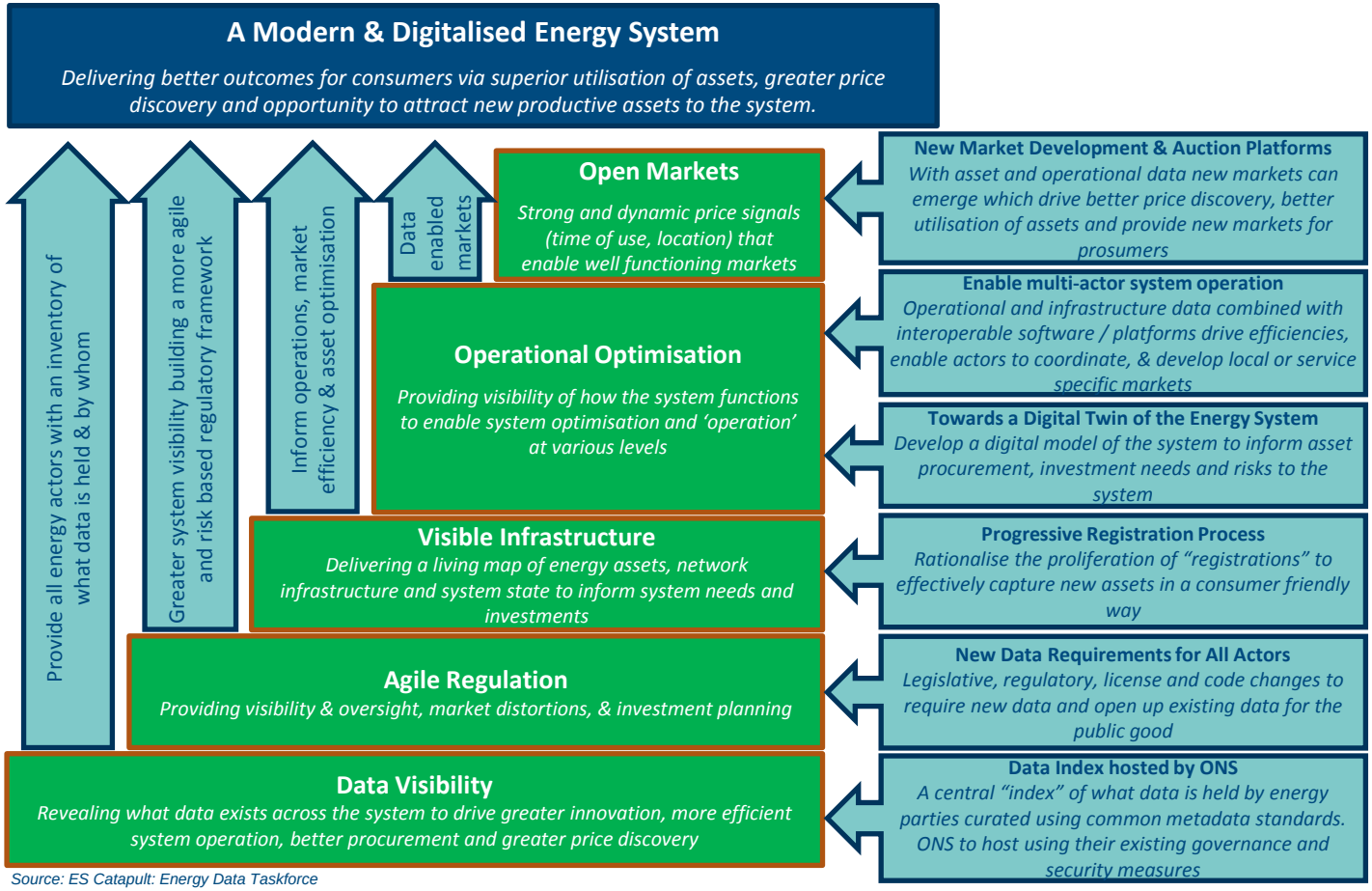
Presumed Open

Energy system data should be presumed Open / Shared to create more value for the system and consumers, and should guide all existing and future policies and regulatory measures.

Data is integral to Infrastructure	**Discoverable, Searchable, Understandable**	**Common Structures and Interfaces**	**Secure and Resilient**
Requiring physical infrastructure to be evidenced through data on asset & operational behaviour	Revealing the "hidden" value in data that today is opaque, incomprehensible and inconsistent	Employing common structures & interfaces to enable data to be aggregated and utilised more effectively	Deploying best practice to ensure openness without compromising security while building in greater resilience

Recommending: Policy, Regulation, Architecture, Governance, Standards, Access, Risks

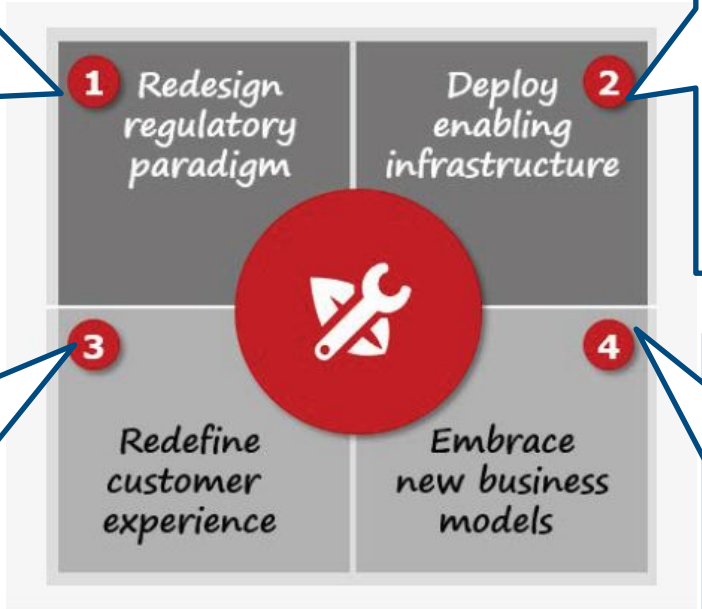
Source: ES Catapult: Energy Data



Source: ES Catapult: Energy Data Taskforce

Why do it?

- Efficient DERs markets (e.g. efficient locational price signals)
- Modernising System Planning (e.g. data sharing between all system participants)



- Data as infrastructure
- Open, interoperable standards (e.g. common metadata standards)

- Improve customer experience by combining multiple services (e.g. single point of engagement for prosumers)

- Cross-vector integration enabled by a culture of open data sharing (e.g. Open Banking, XaaS)

Source: World Economic Forum

Next Steps

- **Taskforce recommendation report**
- **Policy development**
- **Delivery**
  - **BEIS/Ofgem**
    - Legislative changes necessary to do this or alternative routes, engaging with other reviews, as appropriate; e.g. Significant Code Review
  - **Data Products**
    - Other items within the recommendations will require further work to bottom out details (Data Index, Digital Model, Asset Registration Platform)

Feedback

Energy Data Taskforce
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Panel Q&A

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Roundtables

NORTHERN POWERGRID

Roundtable 1

What do customers (commercial and domestic) want to use our network for? Now and in the future?

Break

Roundtables

NORTHERN POWERGRID

Roundtable 2

How accessible and usable is the current information we make available?

How does this meet your current and future needs?

Roundtable 3

What additional information do customers and market players want based on their changing needs?

If there was a cost involved in providing the information, what would the priority order be and who should pay for this data?

Summary and next steps

Forthcoming Events

Annual Stakeholder Summit

Friday 29th November at Cloth Hall Court, Leeds

Thank you