ofgem Making a positive difference for energy consumers

DSO: Ofgem regulatory principles and priorities workshop

Louise van Rensburg
Edwin Tammas-Williams
Alex Walmsley
Freya Kerle

June 10th 2019

Time	Agenda Item
9:45	Workshop Registration & Coffee
10:00	Introduction
10:15	Detailed Day Overview
10:30	DSO functions and function providers Panel
11:00	DSO functions and function providers Workshop
12:15	DSO functions and function providers Feedback
13.00	Key Enablers Panel
13:45	Key Enablers Workshop
14:45	Key Enablers Feedback
15:00	Break
15:15	Future Insights Presentation
16:00	Workshop Wrap Up
16:15	End

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Introduction: Energy System Transition

How the DSO work fits into our wider energy system transition work

Frances Warburton

10 June 2019

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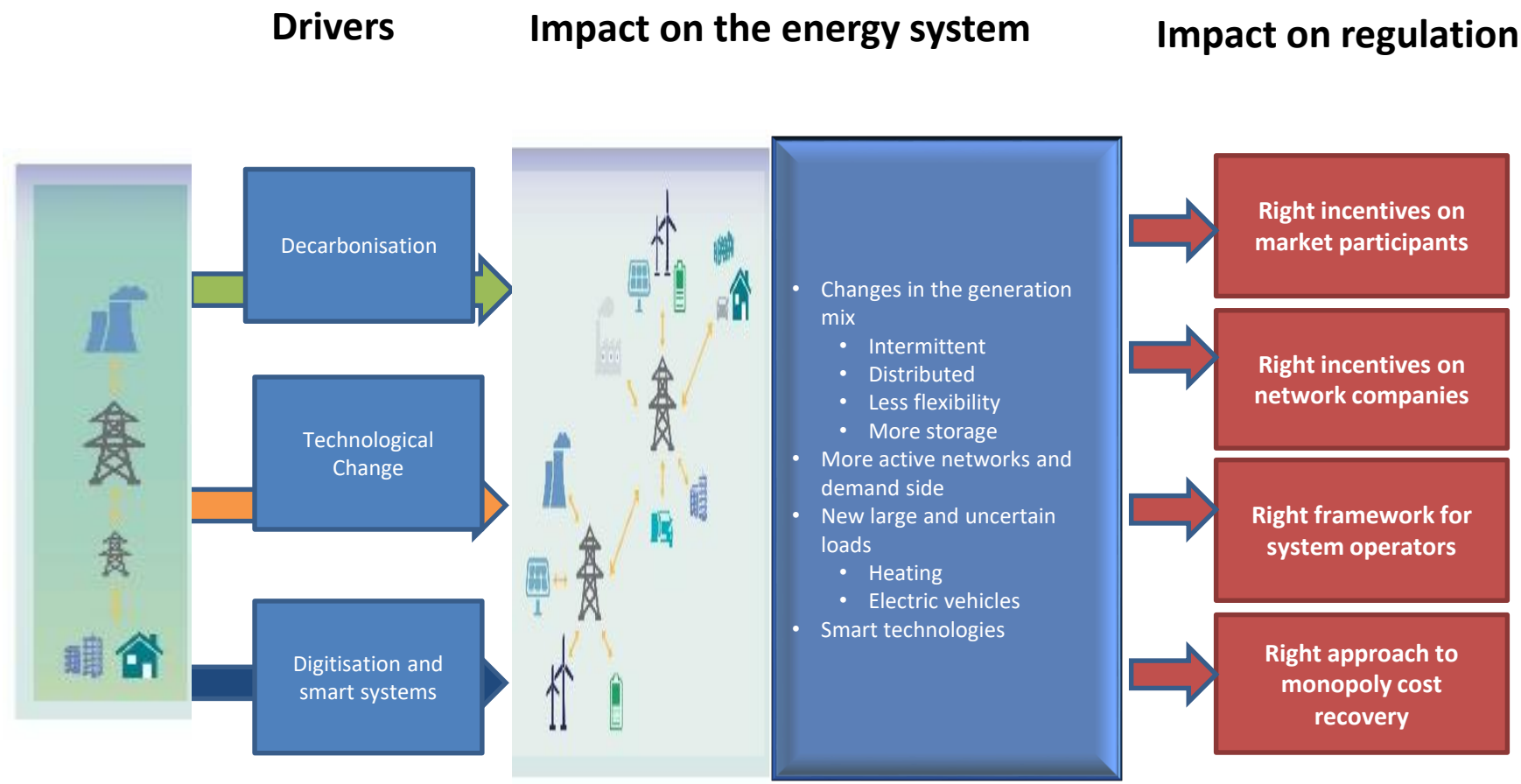
Changes in the system means changes in regulation



Facilitating change in future energy systems is an important part of our forward work programme

Our strategy for regulating the future energy system

Our aim is to ensure a regulatory framework that:

- **drives innovation,**
- **supports the transformation to a low carbon energy system, and**
- **delivers the sustainable, resilient, and affordable services that all consumers need.**

How our strategy translates into action

We will deliver our strategy by:

1. Making **best use of existing networks**
2. Minimising costs of **network expansion**
3. Facilitating effective **energy markets to deliver for consumers**
4. Achieving **whole system efficiencies** across energy sectors and vectors

In addition we will:

- Focus **innovation support** on the energy system transformation and increase alignment with other public sources of innovation funding
- Ensure **wholesale market arrangements adapt** to changing landscape
- Providing a **predictable regulatory regime** which supports efficient investment and allocates risks efficiently.
- Ensure **consumers are protected**, in particular those in vulnerable circumstances

Key elements of our work

Future Charging and Access (FCA) reforms

- Electricity Network Access and Forward-looking Charging reform ("**Access reform**")
  - Ofgem is leading a Significant Code Review (SCR) to develop improved access and forward-looking charging arrangements
  - In parallel, industry is undertaking a review of aspects of allocation of access rights, including improved queue management and the scope for trading;
- Targeted Charging Review (the "**TCR**")
  - Ofgem is leading an SCR to develop new residual charging arrangements and reform the arrangements which give rise to "embedded benefits"
  - in parallel, industry is bringing forward changes to ensure storage pays proportionate charges;
- Balancing Services Charges Task Force (the "**Balancing Services Taskforce**")
  - Industry is leading a review of balancing services charges in parallel with the Access reform and the TCR.

Distribution System Operation/Electricity System Operator reforms

- Clarify boundaries and mitigate conflicts
- Enable competitive markets
- Tender network reinforcement as neutral facilitators
- Embed whole systems coordination

RIIO price controls

- Efficiency incentives through totex
- Outputs, including flexibility / option value
- Innovation funding

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How we will deliver the critical components of system transition by 2023

Work area	Components of system transformation			
	Make best use of existing networks	Minimise costs of network expansion	Facilitate effective energy markets	Achieve whole system efficiencies (across vectors)
Future Charging & Access reforms				
Access reforms • Better definition of access rights • More cost-reflective forward-looking charges	★	★		
TCR • Reduce distortions from residual charges	★			
Balancing Services Task Force • Decide if BSUOS forward-looking or cost recovery				
ESO/DSO reforms				
Clarify boundaries & mitigate conflicts			★	★
Enable competitive markets	★	★	★	
Tender network reinforcement as neutral facilitators		★	★	
Embed whole systems coordination	★	★		★
RIIO • Efficiency incentives through totex • Outputs, incl flexibility/option value • Extending role of competition • Embed whole systems approach • Innovation funding	★	★		★

Today's focus: Distribution system operation

Distribution system operation

The decarbonisation, decentralisation and digitalisation of the energy system means new activities are enabled and required to deliver network and system needs:

- DNOs will need to evolve, embed new tools and responsibilities.
- At the same time third parties are increasingly able to deliver solutions to network and system needs.

There is a role for policy makers to create the right environment so that new functions are delivered efficiently and effectively.

At Distribution System Operation level, we want to:

1. Clarify boundaries and mitigate conflicts
2. Enable competitive markets

for today

3. Ensure network companies tender network reinforcement as neutral facilitators
4. Embed whole systems coordination

Objectives for today

- **Set out our thinking so far**
  - Describe our priority work areas
  - Present our early views
  - Outline how we will progress this work

- **Use your feedback to inform our policy development**
  - Understand your priorities
  - Test the robustness of our analysis to date
  - Gain perspectives from a diverse range of stakeholders

Summer publication

Overview of Day

Morning focus
Clarify boundaries and mitigate conflicts

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Afternoon focus
Enable competitive markets

Panel Sessions

1. Clarify boundaries and mitigate conflicts
DSO functions and function providers Speakers

- Steve Atkins, SSE
- Charles Wood, Energy UK
- David Middleton, Origami Energy

2. Enable competitive markets
Key Enablers Speakers

- Peter Bingham, Ofgem
- Keith Bell, University of Strathclyde
- Richard Dobson, ESC & EDTF
- Graham Ault, Smarter Grid Solutions
- Sotiris Georgiopoulos, UKPN

1. Clarify boundaries and manage conflicts

DSO functions and function providers *Panel session*

Chair

- Edwin Tammas-Williams, Senior Manager, Energy System Transition, Ofgem

Panel

- Steve Atkins, DSO Transition Manager, Scottish & Southern Electricity Networks
- Charles Wood, Policy Manager for New Energy Services & Heat, Energy UK
- David Middleton, Head of Commercial Innovation, Origami Energy

Distribution system operation as a set of functions

Effective Distribution System Operation is the delivery and coordination of a range of functions and activities. DNOs will embed some of these functionalities in order to facilitate efficient energy networks.

Long term planning	Operations, real-time processes and planning	Markets and settlement
Network planning	Switching, outage restoration and distribution maintenance	Aggregation of DERs
Forecasting demand and generation and DER	Monitor parts of the Dx system under active network management	Design of principles of system access and trading arrangements
Connection studies and operation procedures	Supply of grid-operational services using DER assets	Operation of flexibility trading platforms and associated tasks
Integrated T-D planning	Identify DERs, ancillary service rqts. and operation restrictions	
DER hosting capacity analysis	Data management and sharing	
Emergency response planning	Coordination between T-D interfaces	
Delivery of new investment	Supply of grid-operational services using DNO assets	
DER net local value analysis	Coordination of DER schedules	

Existing

Extended

New

- Functional analysis drawn from outputs for the ENA Open Networks Project, the Future Power Systems Architecture model, The Helm Cost of Energy Review; Academic literature; internal analyses
- Distribution system operation functions include variable depths of changes from existing operations.
- Functions vary in their integration to DNOs.

DSO functions and roles

- DNOs and other parties will need to evolve in delivering existing and new DSO functions
- In some cases, it's not clear who is best placed – DNO and third party could deliver
  - "Grey areas"
- Economies of scope with DNO core monopoly roles
- Risks of monopolising delivery, or otherwise distorting competition

Ofgem need to make decisions around

- **whether, and**
- **in what circumstances,**

should DNOs be able to provide these new functions

Examples where discussions have taken place

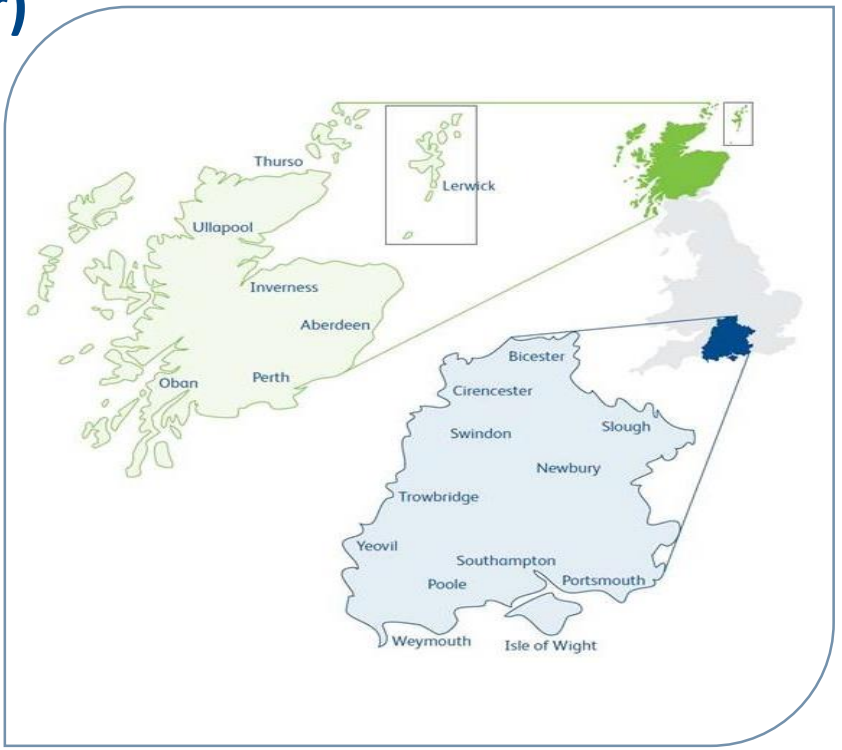
- Supply of grid-operational services using DNO assets
  - CLASS
- Supply of grid-operational services using DER assets
  - Modulating EV load control
  - Owning and operating storage
- Operation of flexibility trading platforms and associated tasks
- Aggregation of DERs

Steve Atkins (DSO Transition Manager)

Scottish and Southern Electricity Networks owns:

- two electricity distribution networks
- one electricity transmission network
- +100,000 substations
- +130,000 km of overhead lines and underground cables
- +100 submarine cable links

We serve 3.5 million customers across one third of the UK's landmass.



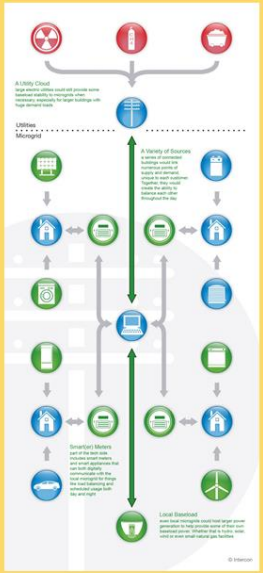
Scottish & Southern Electricity Networks

Project LEO/Transition

1. Distributed Energy

(sourcing energy)

2. Conflict Resolution



(optimised energy shifting)

Proactive Flexibility

3. Congestion Management

(avoiding reinforcement)

Scottish & Southern Electricity Networks

Introduction to Energy UK

Energy UK is the trade association for the GB energy industry with a membership of over 100 suppliers, generators, and stakeholders with a business interest in the production and supply of electricity and gas for domestic and business consumers. Our membership covers over 90% of both UK power generation and the energy supply market for UK homes.

New Energy Services & Heat is Energy UK's focus on emerging markets, including low carbon heat, low carbon transport, and a smart flexible energy system.

Charles Wood, Policy Manager - NESH
Charles.Wood@Energy-UK.org.uk

Energy UK
The voice of the energy industry

Energy UK positions

1. Neutral market facilitation

To ensure market confidence in the impartiality of NO and SO bodies, frameworks must be in place to ensure neutral market facilitation, including removal of conflicts of interest.

2. Competition driving value

Competition drives efficiencies and cost reductions for consumers, but market actors cannot compete effectively against paid-for assets.

3. Near-term investment confidence

A clear and codified direction of travel is needed for investment decisions to be made now and ensure that enough flexible capacity is online by 2025.

4. A clear role for network assets

As charging reforms and RIIO2 development continue, it is important to ensure that active network management and increasingly controllable network assets are given a codified system role.

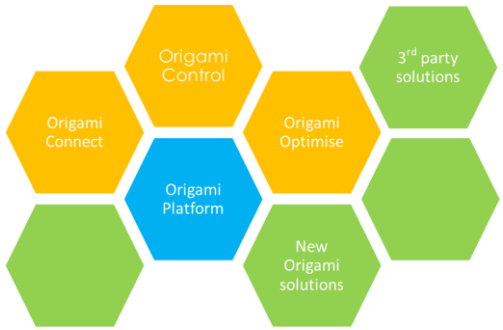
Energy UK

Technology to enhance the value capture for energy companies

Technology key to optimal value capture

- Need to capture optimal value from assets across all value opportunities
- Better decisions from real-time data & control
- Value will change over time, perhaps unpredictably
- Optimising many diverse assets across all service opportunities is complex

Solutions deployed on the Origami platform



Quality shareholders with evergreen capital

aggreko

octopus ventures

Cambridge Innovation Capital

Fred. Olsen

Technology deployed through partnerships

sse

smartestenergy

good energy

Gore Street Energy Storage Fund

David Middleton
Head of Commercial Innovation
0788 465 0816

Leveraging existing entities can accelerate the evolution of the DSO …

Platforms for Sourcing Flexibility	Flexibility Marketplace	Optimisation	Data Exchange Portal	Scheduling and Despatch	Security of Delivery	Billing & Settlement
piclo	epexspot	Origami POWER OVER ENERGY	AutoGrid	AutoGrid	ELECTRON	ELEXON
ebay	ICE	enbala	GridBeyond	GridBeyond	energy web FOUNDATION	utilidex
	TRAYPORT	UPSIDE	Origami POWER OVER ENERGY	Origami POWER OVER ENERGY	Origami POWER OVER ENERGY	
	piclo	AutoGrid		Schneider Electric		

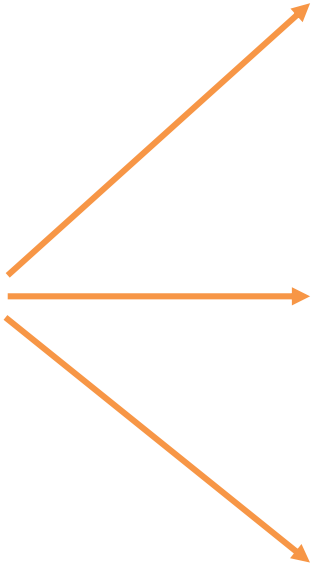
… but DSOs only secure flexibility for DNOs and are not otherwise a route to market for flexibility

1. Clarify boundaries and manage conflicts

DSO functions and function providers

Strategy & workshop

Our approach	Underpinning analysis
Scope and aims	Contestability and 'grey areas'
Framework approach	Common themes – risks, benefits
Implementation	Conditions, circumstances of DNO participation



Ofgem need to make decisions around whether, and in what circumstances, should DNOs be able to provide new functions

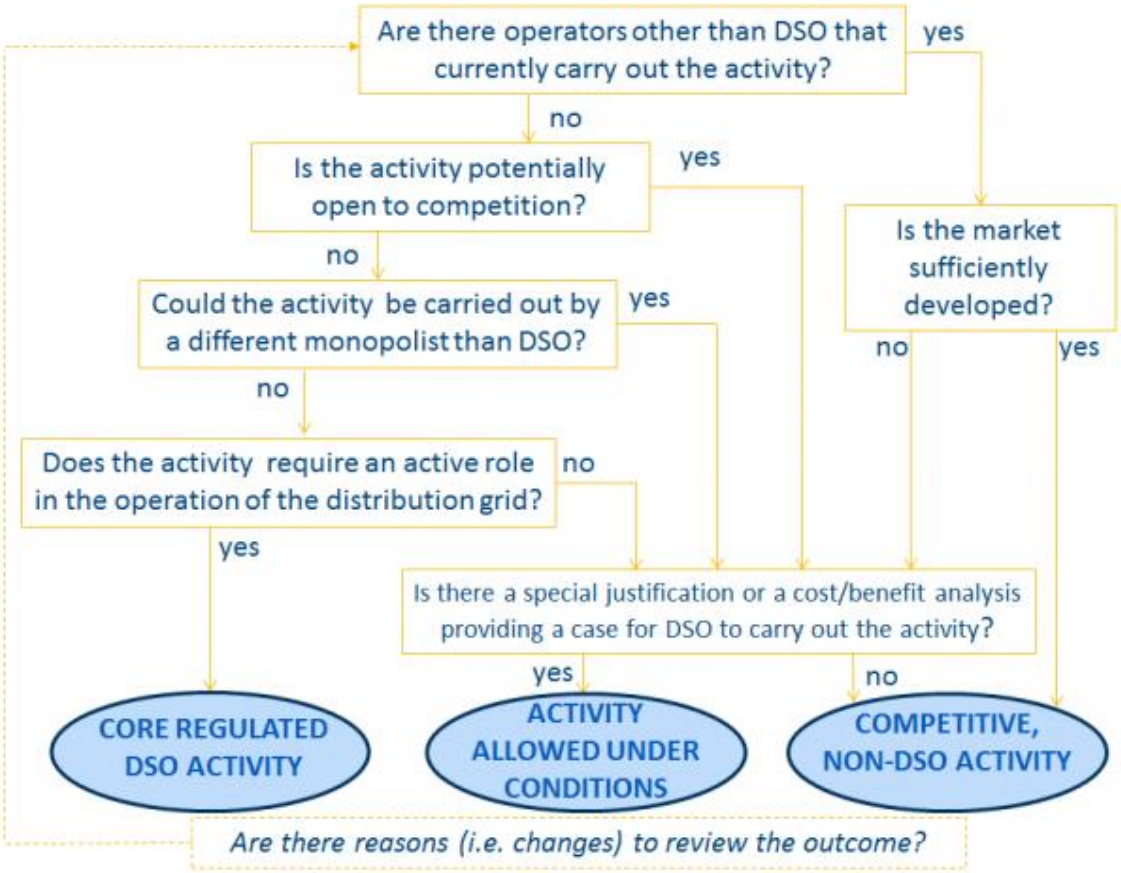
These decisions should:

a) Reflect **consumer interest**
b) Be consistent and **resilient**
c) Provide **confidence to DNOs and third parties** about their roles and the regulatory environment
d) Be made **efficiently**

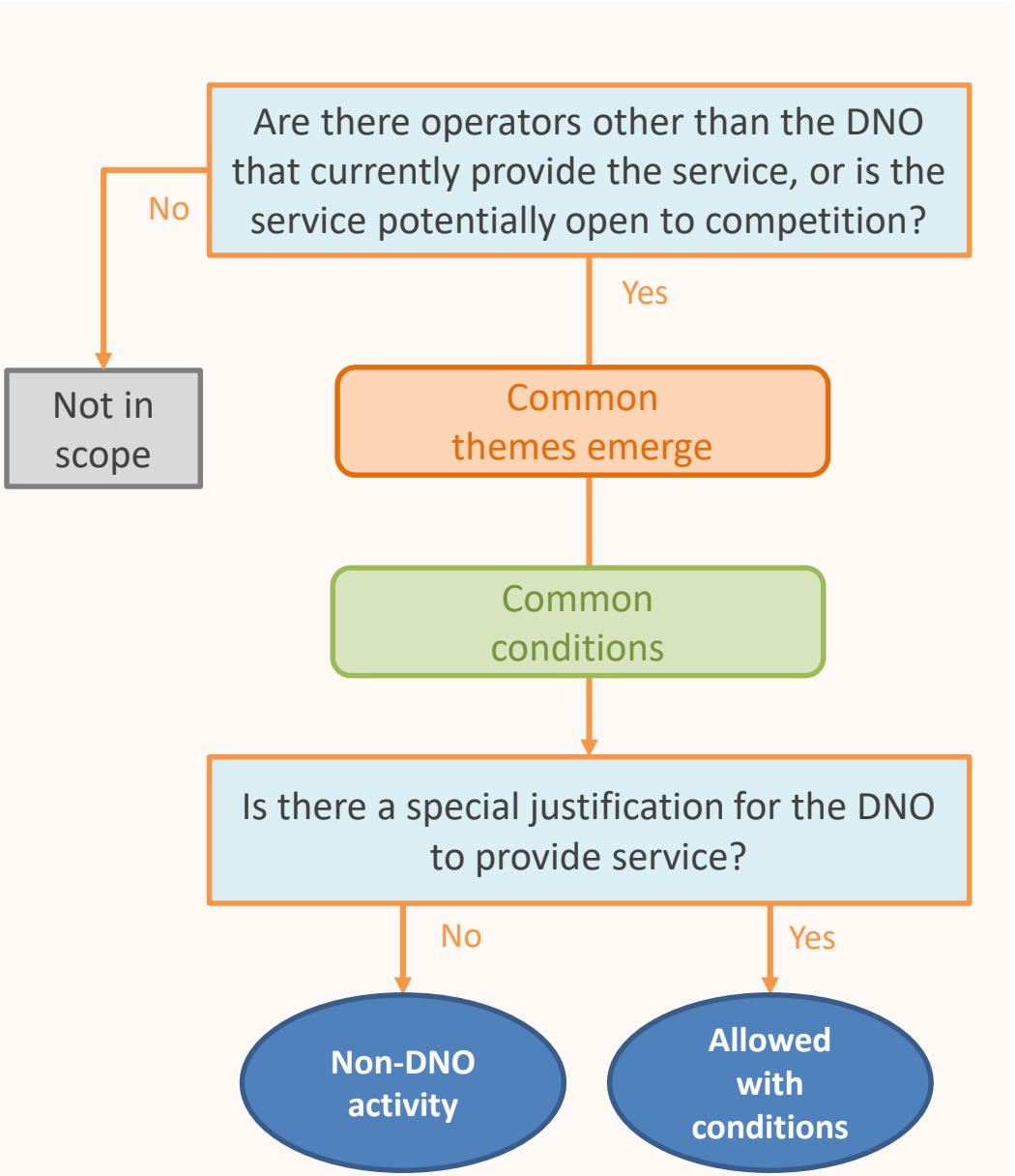
What is the objective of this work?
Delivering these objectives more effectively

What is not the objective of this work?
New stances and positions what good outcomes are.

A common framework approach



CEER (2019) New Services and DSO Involvement



Common understanding

We define contestability so that the user can determine *where* the conceptual framework applies

Where a market substitute does or could exist

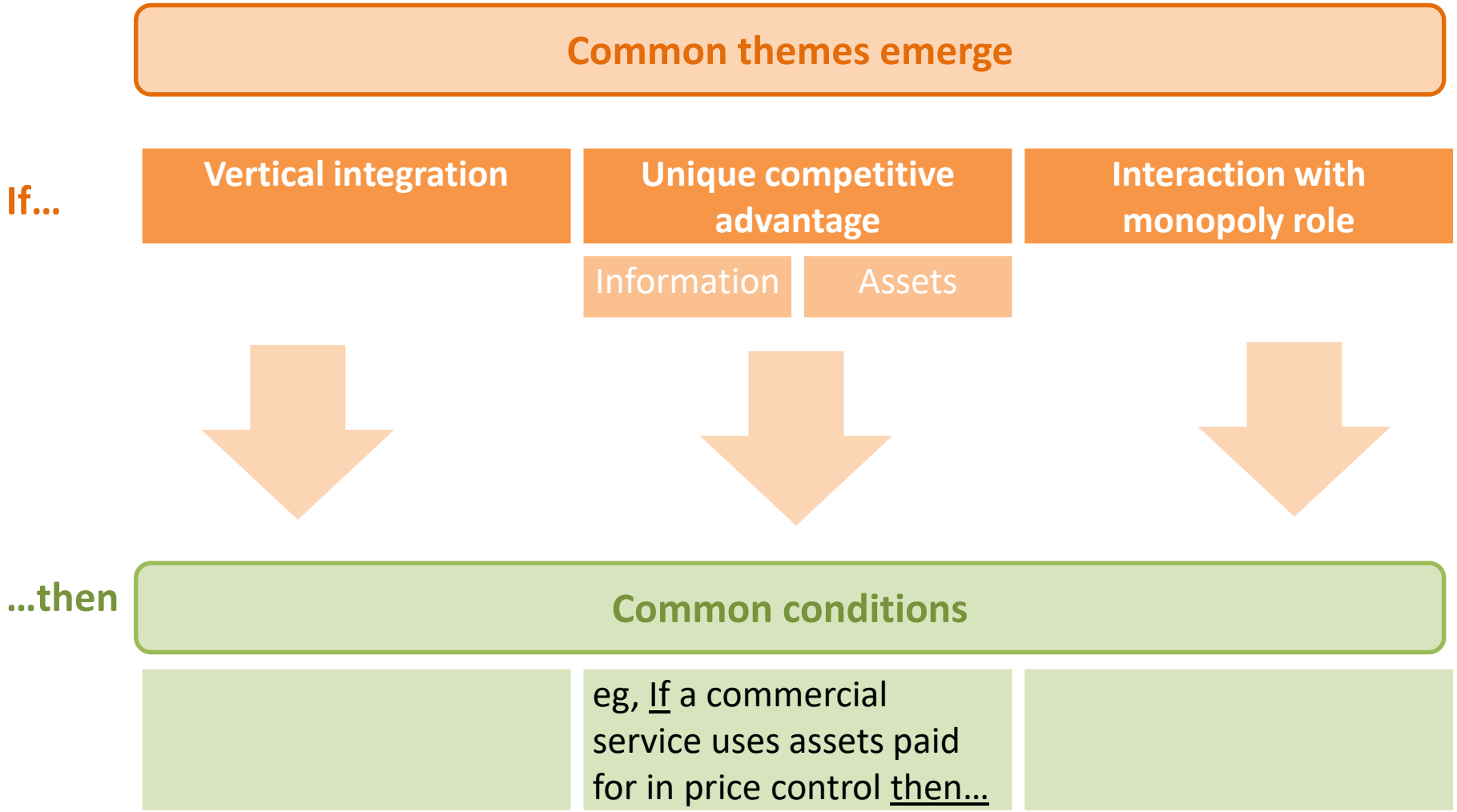
We identify common themes including the risks that justify *why* the conceptual framework applies

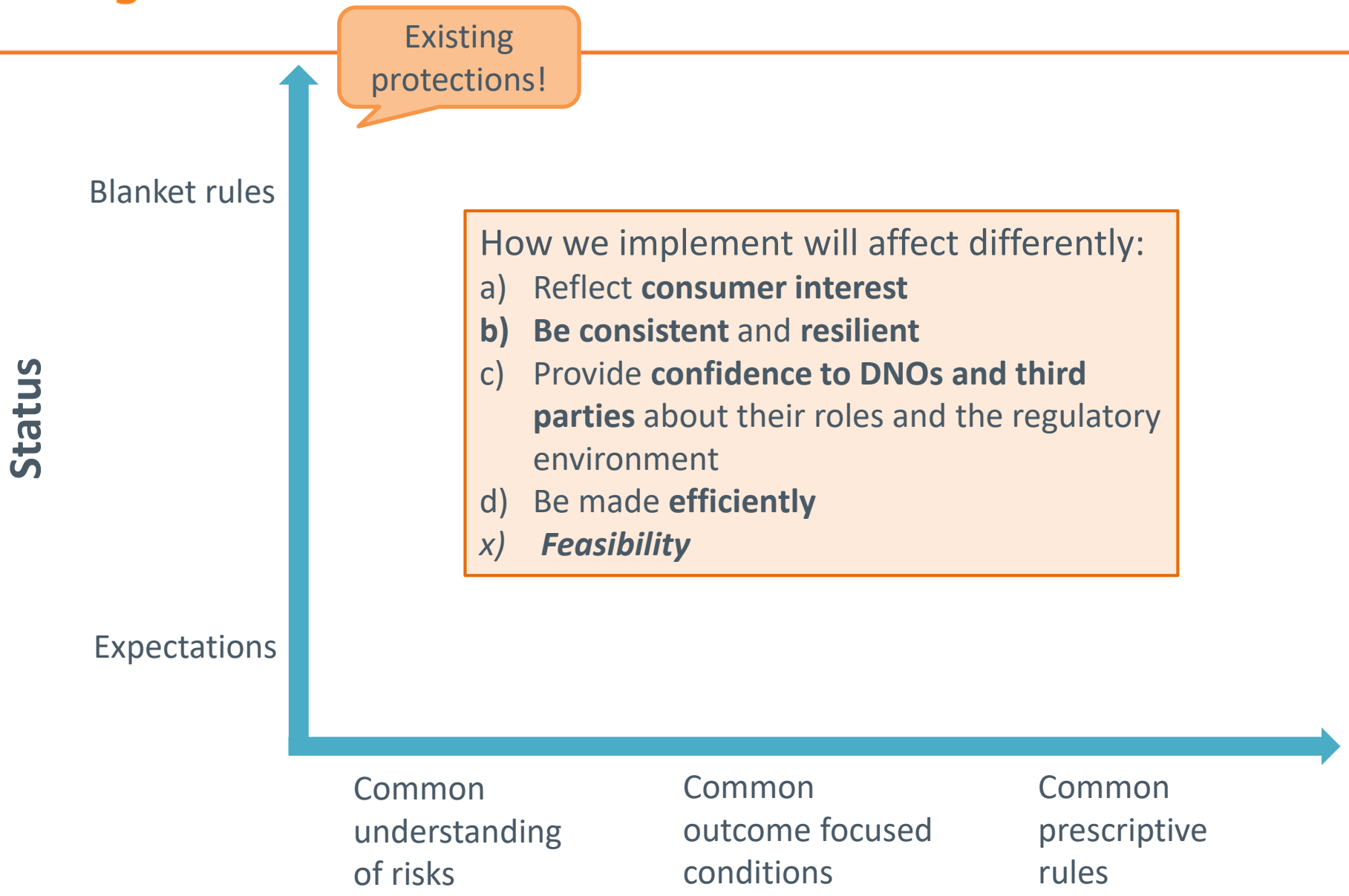
We consider common conditions, ie common circumstances or risk mitigations that address those themes

We describe what we would consider a special justification and highlight some relevant criteria

Common themes emerge

Vertical integration risks and benefits	Unique competitive advantage	Interaction with neutral monopoly role
Risk or perceived risk of non-neutral procurement Efficiency gains	Unique access to information Unique access to assets, resources	Where commercial functions may risk or be perceived to risk neutrality in monopoly functions


Common themes emerge
If…
Vertical integration
Unique competitive advantage
Information
Assets
Interaction with monopoly role
…then
Common conditions
eg, If a commercial service uses assets paid for in price control then…


Existing protections!
Blanket rules
Expectations
Status
How we implement will affect differently:
a) Reflect consumer interest
b) Be consistent and resilient
c) Provide confidence to DNOs and third parties about their roles and the regulatory environment
d) Be made efficiently
x) Feasibility
Common understanding of risks
Common outcome focused conditions
Common prescriptive rules
Common prescription

Use your workshop feedback

- Develop our analysis – themes, conditions, implementation

Wider engagement

- Summer DSO publication
- Continues policy development

Implementation

- Discrete decisions to be made (eg CLASS consulting early 2020)
- Consider appropriateness & feasibility of broader implementation options

Workshop split into two sessions with three questions

Our approach
20 minutes

Q1. Do you think a common framework is helpful? How would implementation options affect its helpfulness?

Output:

a) (Strongly)Agree/Disagree with common framework approach?

b) Outcome focused or prescriptive conditions?

c) Expectations or blanket rules?

Underpinning analysis
40 minutes

Q2. Have we identified the right common themes?

Table 1 and 2 start, then after 20 minutes move to Q3

Output:

a) What do you agree with?

b) What don't you agree with?

c) What have we missed?

Q3. What conditions do you think are appropriate?

Table 3 and 4 start, then after 20 minutes move to Q2

Output:

- *Draft conditions corresponding to common themes*

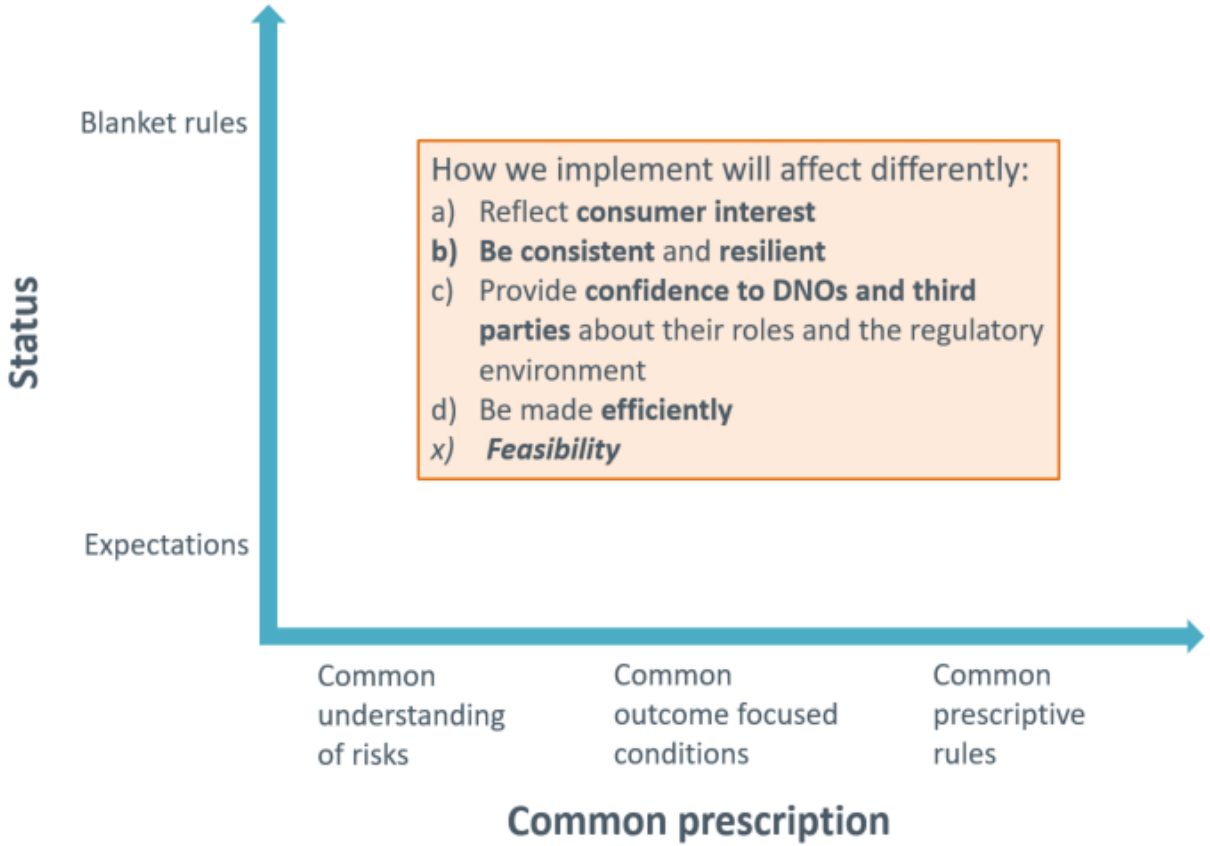
Q1. Do you think this framework is helpful? How would implementation options affect its helpfulness?

Output:

a) (Strongly)Agree/Disagree with common framework approach?

b) Outcome focused or prescriptive conditions?

c) Expectations or blanket rules?



Q2. Have we identified the right common themes?

Output:

a) What do you agree with?

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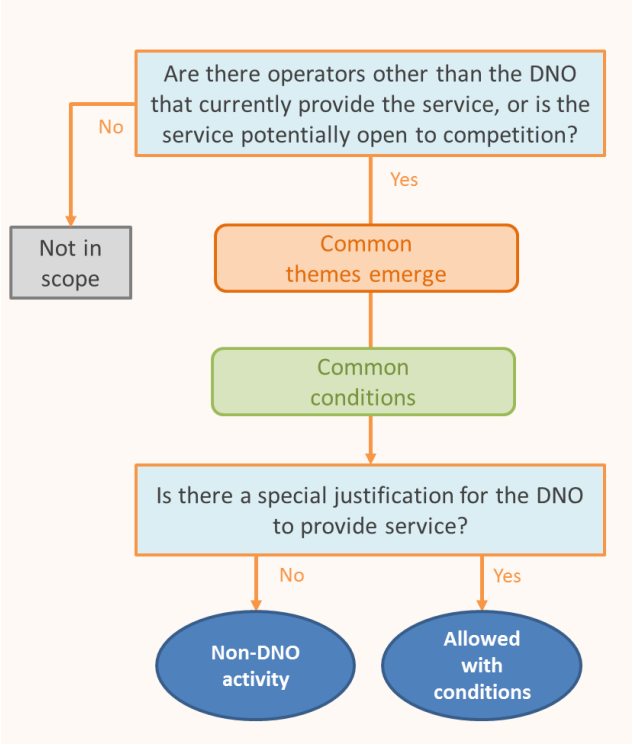
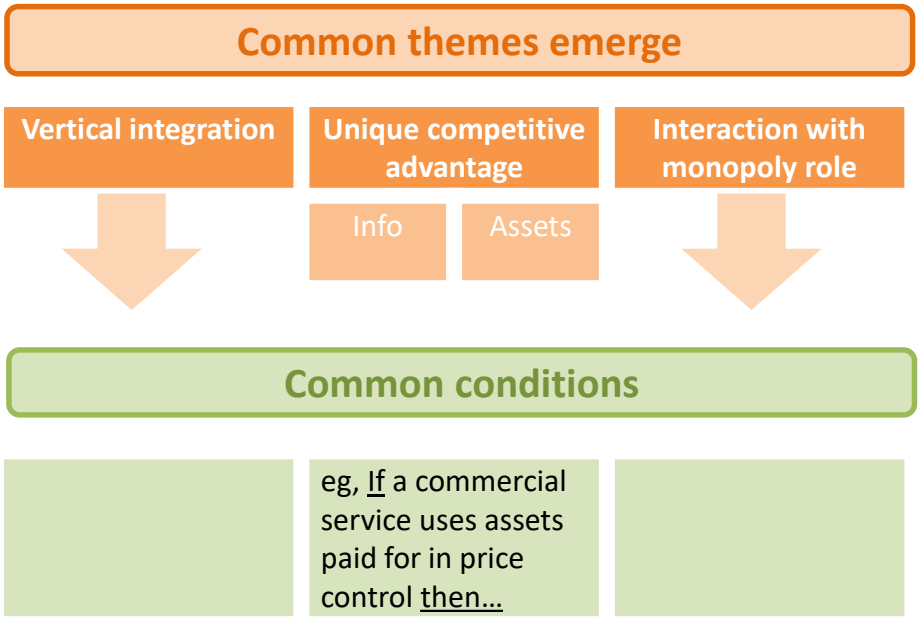


Q3. What conditions do you think are appropriate?

Output:

- ***Draft conditions corresponding to common themes***



2. Enabling competitive markets

Key enablers for DSO – panel session

Chair

- Alex Walmsley, Senior Manager, Energy System Transition, Ofgem

Panel

- Peter Bingham, Chief Engineers, Ofgem
- Keith Bell, Holder of the ScottishPower Chair in Smart Grids, University of Strathclyde
- Richard Dobson, Technical Collaboration Consultant, Energy Systems Catapult & Energy Data Taskforce
- Graham Ault, Executive VP and DER Operators General Manager, Smarter Grid Solutions
- Sotiris Georgiopoulos, Head of Smart Grid Development, UKPN & Chair ENA Open Networks Workstream 1A

"The hardware, software and all associated data and interoperability standards that are required to unlock DSO functionalities, support markets, and deliver consumer benefits through competition."

hardware

- Network monitoring
- Sensors (create & collect data)
- Comms infrastructure (To transport data)
- LCT interfaces (transports instructions to assets)

software

- Data repository (DNO architecture)
- Access portals (get info from networks)
- Data exchange
- Forecasting (across planning, ops, real-time timescales; resource availability; constraints)
- Planning tools (enhanced)

Associated data

Planning Data | **Asset Data** | **Ops Data** | **Real Time**

Associated interoperability standards

- CIM
- IEC61970
- IEC61850
- Cyber security – national infrastructure standards)
- Engineering standards review
- Vendor implementations

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2. Enabling competitive markets

Key enablers for DSO – panel session

Peter Bingham, Ofgem Chief Engineer

June 10th 2019

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Ofgem engineering view on Key Enablers for DSO

Organisational view and priorities

- Ofgem is there for the energy consumer, not for picking winners

- **Facilitating Network Access for Flexibility and Low Carbon Generation**
- **Optimising Network Capacity Usage through smart charging signals**
- **Investing in Smart Enabling Technology now to maximise network utilisation**
- **Promoting Competition for Capacity in Networks**
- **Developing Flexibility Markets and Platforms**
- **Big Data – Enabling Flexibility Platforms, Smart Technology and Behavioural Change**
- **Smart Engineering Standards for Traditional Network Investment**
- **Promoting Resilience (Black Start from DG)**
- **Local Energy (Enabling energy transactions of energy resources at a local level, community level and regional level)**

Key Enablers for DSO

Opening **siloed information** stores can release value, unlock **DSO functionalities**, support markets, and delivery consumer benefits through competition

Hardware and software improvements will facilitate transformation.

Data and information to enable DSO

DSO workshop:
Ofgem regulatory principles and priorities
Key enablers

Keith Bell

ScottishPower Professor of Smart Grids at the University of Strathclyde
and a co-Director of the *UK Energy Research Centre*

http://www.strath.ac.uk/staff/bellkeithprof/

http://www.ukerc.ac.uk/

The ENA's definition of a DSO

A Distribution System 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 in the support of whole system optimisation. A DSO enables customers to be both producers and consumers; enabling customer access to networks and markets, customer choice and great customer service

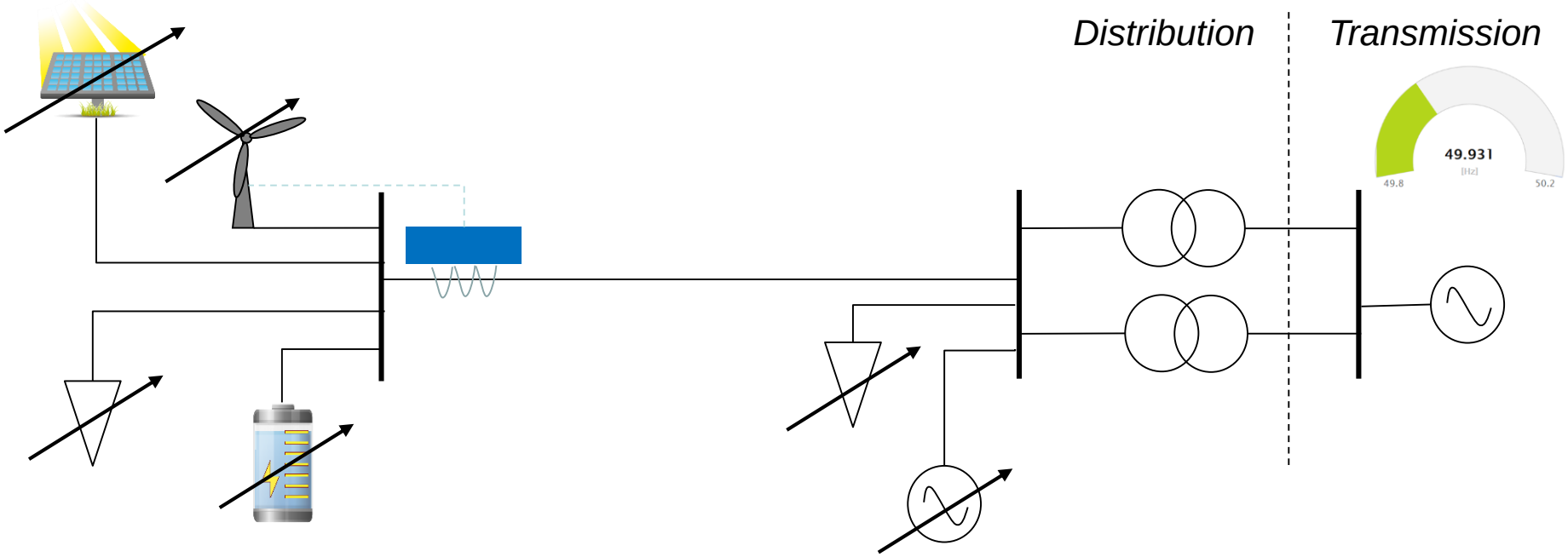
Shouldn't a DNO do this?

Doesn't a DNO do this?

What are we left with that's different?

Enabling active distribution and optimisation of the whole system

- How much of the distributed energy resource is flexible?
- How might it be encouraged to make itself available?
- For what purposes might it be flexed?
- What do you need to know in order to exercise flexibility in an optimal way?



Enabling active distribution and optimisation of the whole system

How much do we know about DER now?

How much do we need to know in future?

Need to answer these questions ASAP

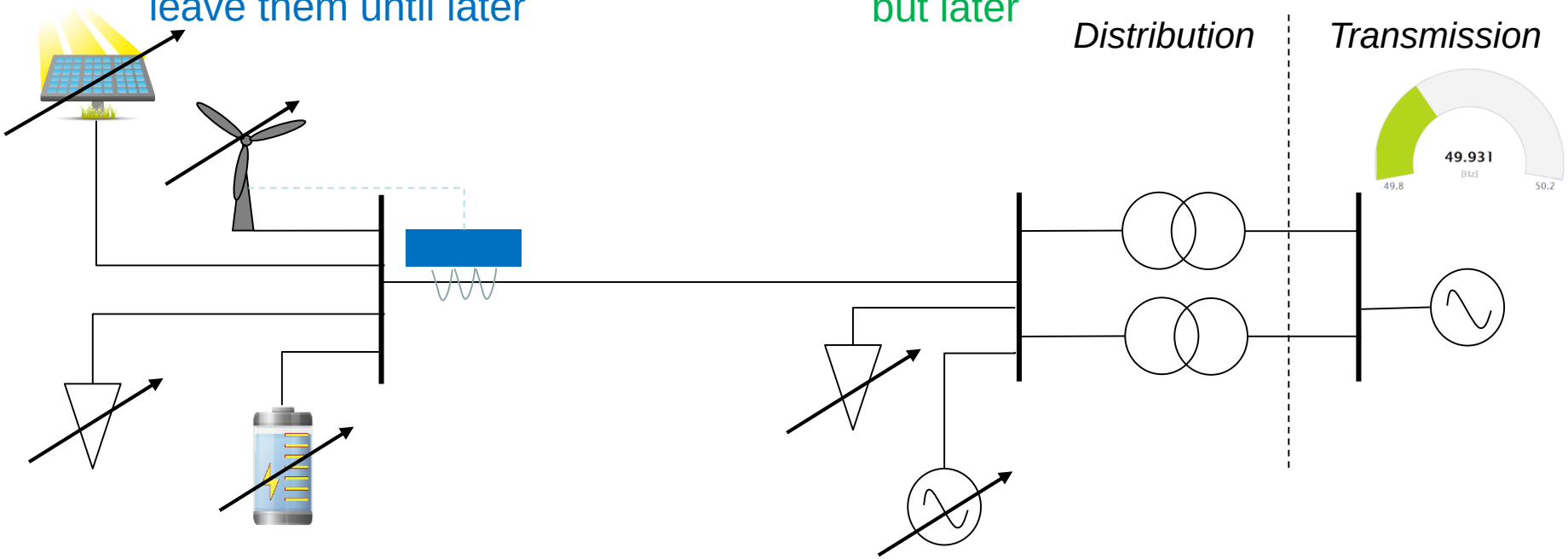
- Get codes in shape to enable answers

If ICT systems can't be adapted to different answers to the tiller question, leave them until later

Whose hands should be on the tiller?

- What do they need to know?
- Do they know why they need to know?
  - Not just about local thermal limits
  - Not just about system frequency

Sort out licences, incentives, etc. soon but later



Dr Richard Dobson

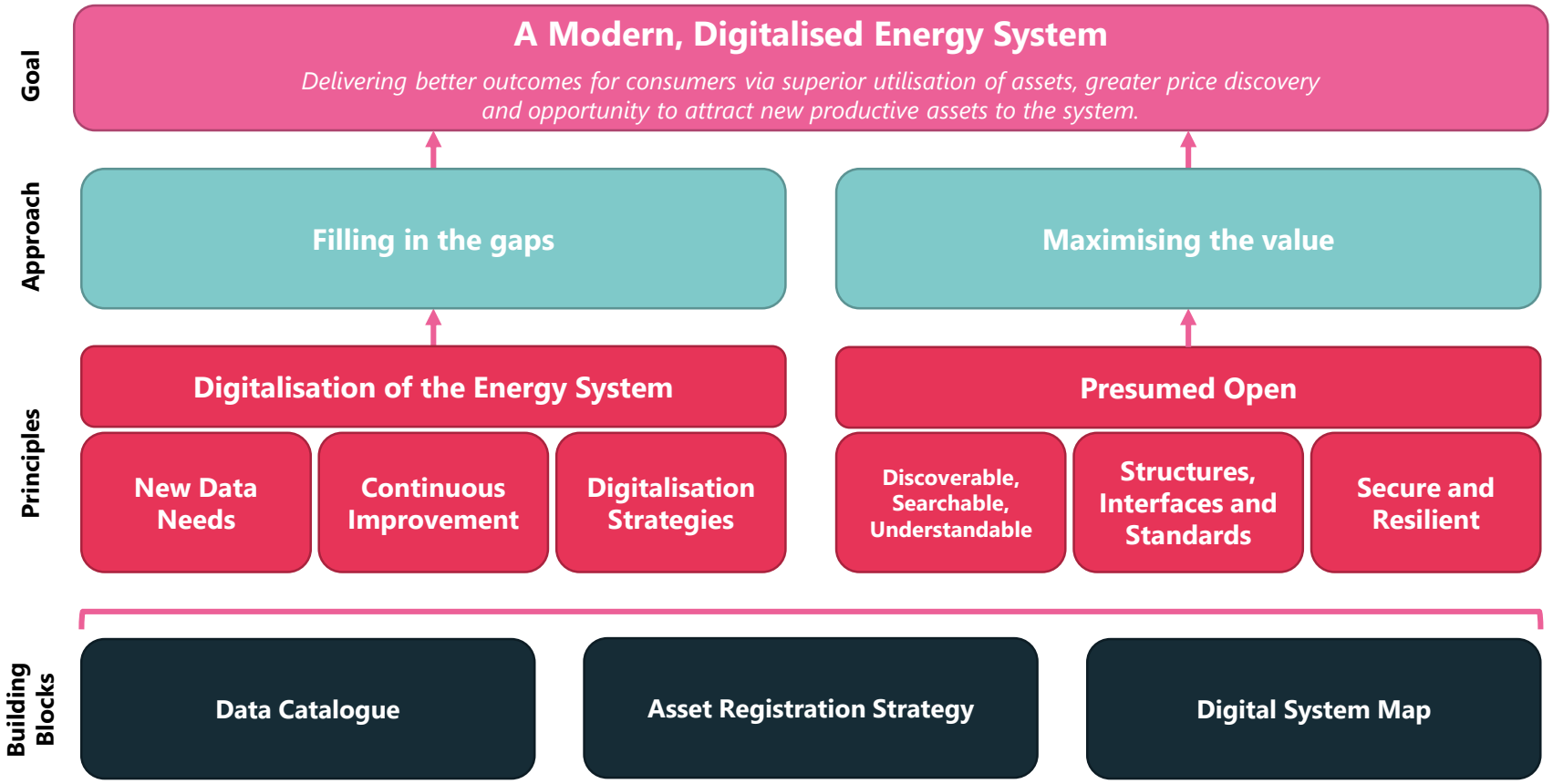
Technical Collaboration Consultant

Unleash innovation and open new markets to capture the clean growth opportunity

Digital and Data Systems

Exploring how digital technologies and data can be used in the future energy system to help inform and shape the strategies and balance the complex risks associated with data privacy, data protection and cyber security.

Energy Data Taskforce



Key Enablers for DSOs

Graham Ault, Co-Founder and Executive Director

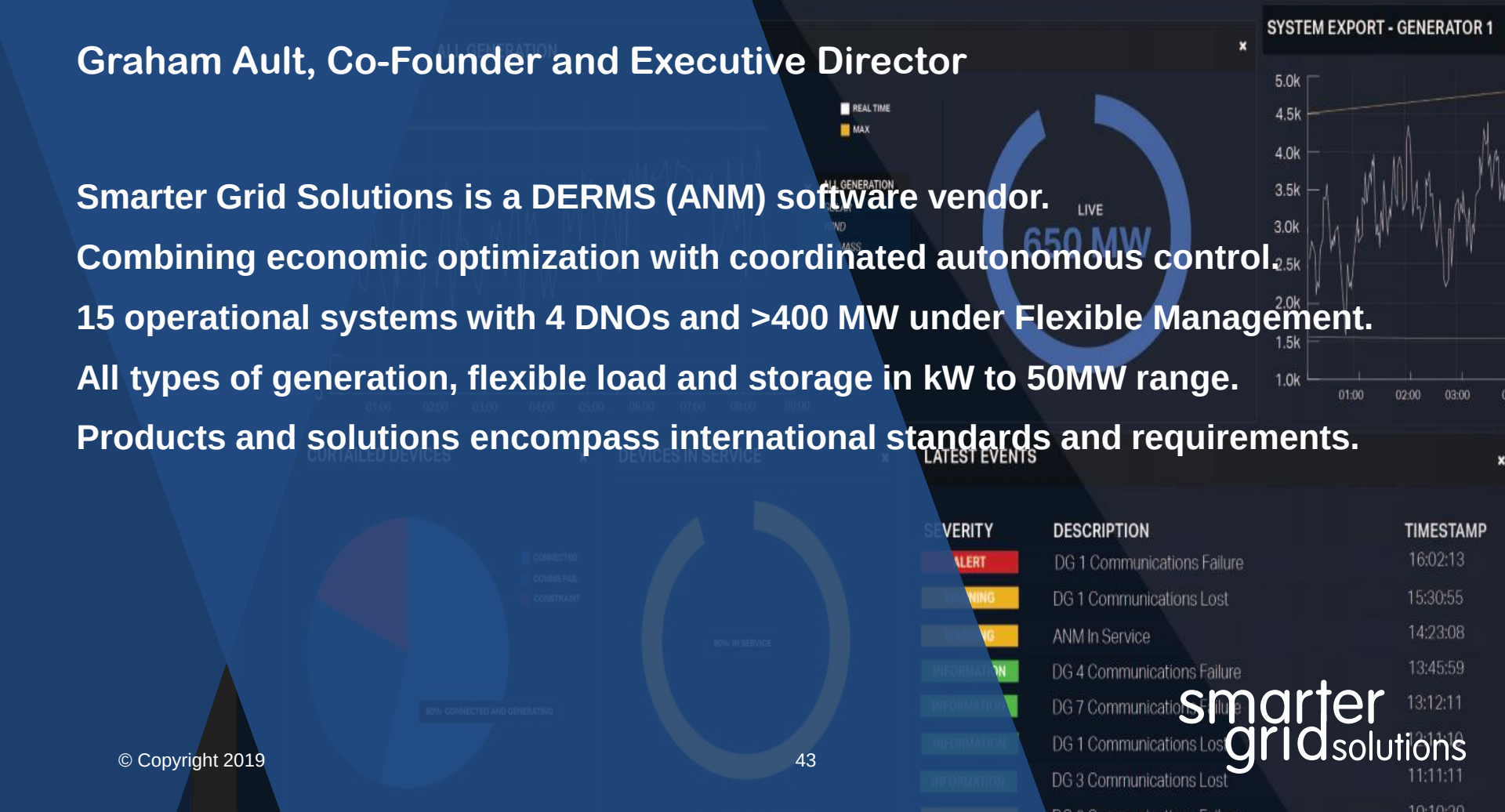
Smarter Grid Solutions is a DERMS (ANM) software vendor.

Combining economic optimization with coordinated autonomous control.

15 operational systems with 4 DNOs and >400 MW under Flexible Management.

All types of generation, flexible load and storage in kW to 50MW range.

Products and solutions encompass international standards and requirements.



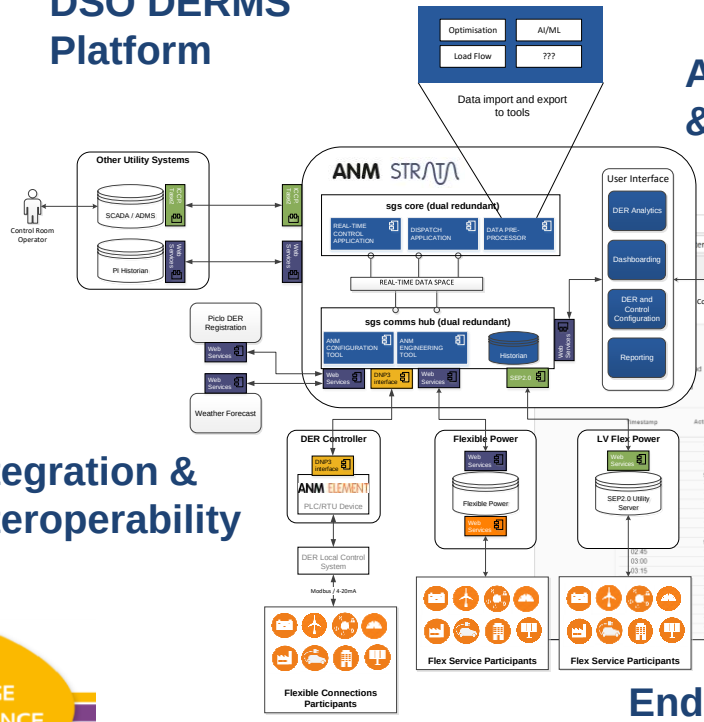
smarter grid solutions

Key Enablers for DSOs

openADR ALLIANCE

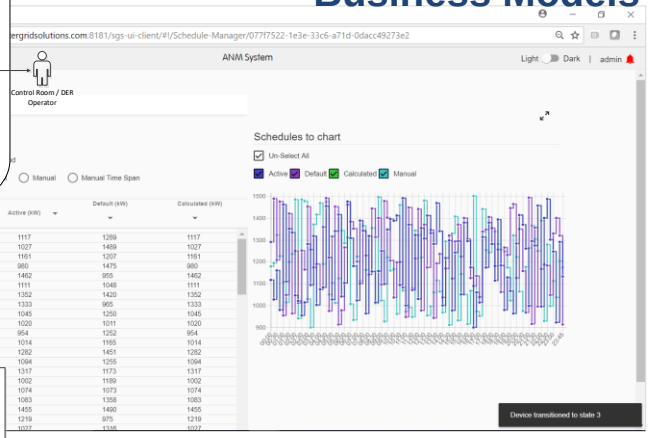
OPEN CHARGE ALLIANCE

DSO DERMS Platform



Advanced Algorithm & Applications

Business Models



Integration & Interoperability

Architecture based on Open Standards

End-to-end: Customer – DER – Field Device – Comms – Data – App – User

smarter grid solutions

The Voice of the Networks

Energy Networks Association

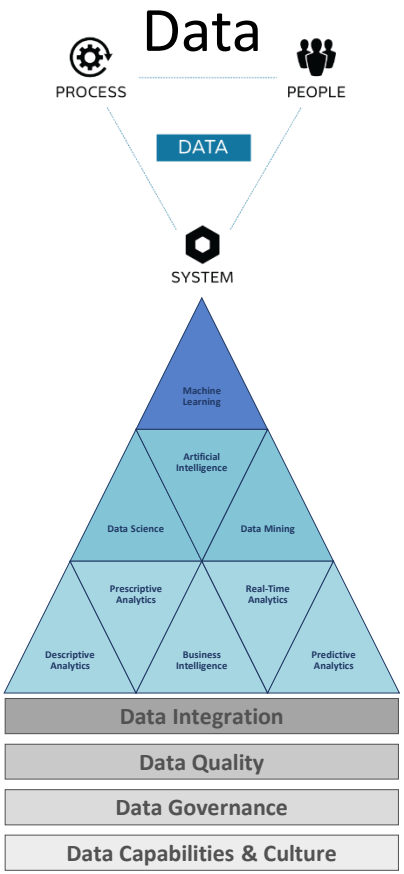
Open Networks Project
Key DSO Enablers

Sotiris Georgiopoulos
Head of Smart Grid Development
UK Power Networks

Key DSO enablers

Visibility

- Monitoring (targeted rollout at HV/LV)
- Integration of smart meter data & 3rd party data
- APIs and web interfaces for data sharing and exchanges with market parties
- Revamp & Standardisation of industry data exchanges (e.g LTDS, Week submissions, CIM)



Systems

- Suitable telecoms
- Forecasting
- Power flow optimisation
- Dispatch capability e.g. flexibility services

2. Enabling competitive markets

Key enablers for DSO

Strategy

Distribution system operation as a set of functions

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Connection studies and operation procedures	Supply of grid-operational services using DER assets	Operation of flexibility trading platforms and associated tasks
Integrated T-D planning	Identify DERs, ancillary service rqts. and operation restrictions	
DER hosting capacity analysis	Data management and sharing	
Emergency response planning	Coordination between T-D interfaces	
Delivery of new investment	Supply of grid-operational services using DNO assets	
DER net local value analysis	Coordination of DER schedules	

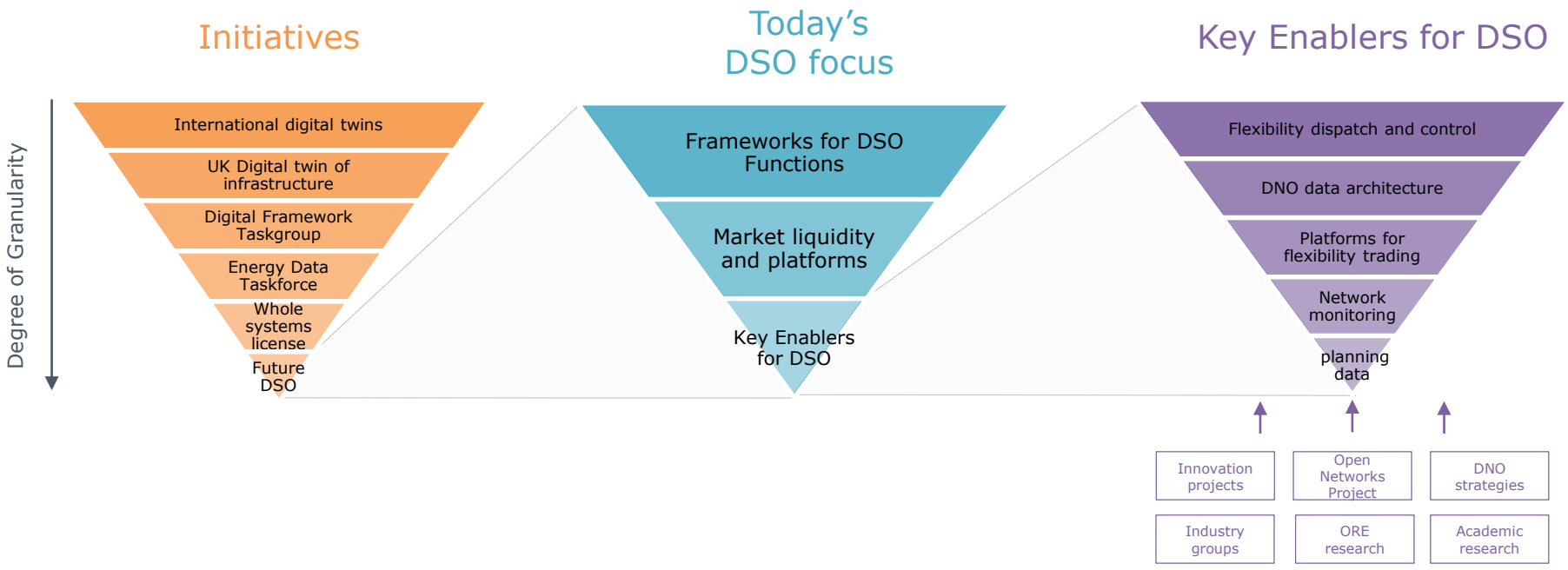
Existing

Extended

New

- Functional analysis drawn from outputs for the ENA Open Networks Project, the Future Power Systems Architecture model, The Helm Cost of Energy Review; Academic literature; internal analyses
- Distribution system operation functions include variable depths of changes from existing operations.
- Functions vary in their integration to DNOs.

Nesting Key Enablers for DSO in wider policy



"The hardware, software and all associated data and interoperability standards that are required to unlock DSO functionalities, support markets, and deliver consumer benefits through competition."

Key enablers for DSO are aligned and consistent with actions across industries and policy areas

Ofgem has a clear remit to encourage the development of key enablers for DSO, and to ensure the equitable and suitable delivery of DSO in the **interests of the energy consumer.**

Data inclusions

DSO improvement	Consider market, network & non-network solutions		Operate a market	Distinct geographical constraint management
Data Type	**Planning Data**	**Asset Data**	**Ops & market Data**	**Real Time**
Data examples	Data to share • Maximum demand index • 132kV, 33kV Load flow models • Locational headroom data (electrical engineering parameters MVA flows) • Reinforcement planning data • Connection queues • Fault level data (constraints) • Single line drawings **NEW** data to share • D-FES • Load forecasting tools • Direct Hosting capacity – usable – what can you connect)	Data to share • GIS data • Network topology (static) Data unlikely to share • Health index • Criticality index • Probability of failure • Condition assessment data • EoL estimates	Data to share • Network outage • Network config • Working network topology • Resource availability under SCADA (gen, demand, resources contracted for operations) • Constraints and conflicts • Dispatch & control • Week 24 data	Data to share to **needs** • Power flows and capacity • Network resource requirements **NB** specific use cases only (ANM curtailment)
Associated License Condition or codes of conduct	**Proposed "Whole Systems" Data Conditions, Principles & Stakeholder Needs**			
	SLC 25 LTDS	**SLC 51 NAIM**	**Not Defined**	**Not Defined**
Sharing Mechanism	**LTDS FOS Sharing (Excel)**	**Not Defined But Data Exists (CBA)**	**Not Defined**	**Not Defined**

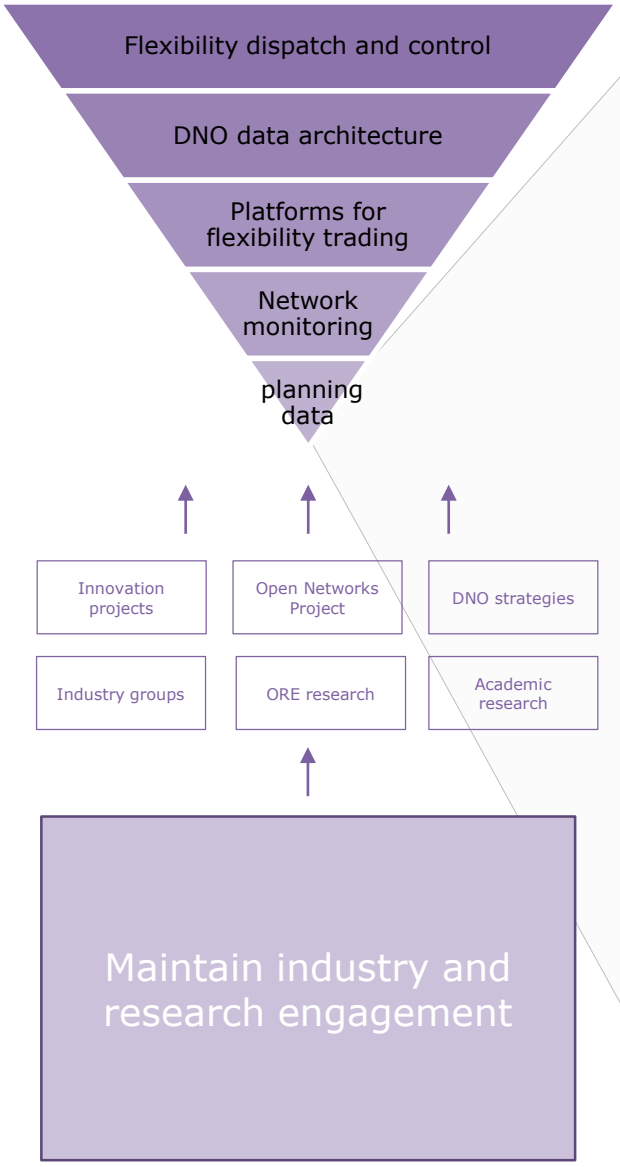
As more silos are broken down we may need a mechanism for data coordination, assurance and security
We may need a framework to empower DNOs to publish relevant data

2. Enabling competitive markets

Key enablers for DSO

Implementation

Programme of works



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License Condition	SLC 25 LTDS
Sharing Mechanism	LTDS FOS Sharing (Excel)

- Consultation on key enablers for DSO
- LTDS review Q3 2019
  - Data format
  - Smart Tools for DSO
  - Network needs information
- Inclusion of above parameters
- Review of applicable parties
- Working groups for development
- Price control preparation

Coordination with industry

Harnessing Open Networks and network operator learnings and products outputs:

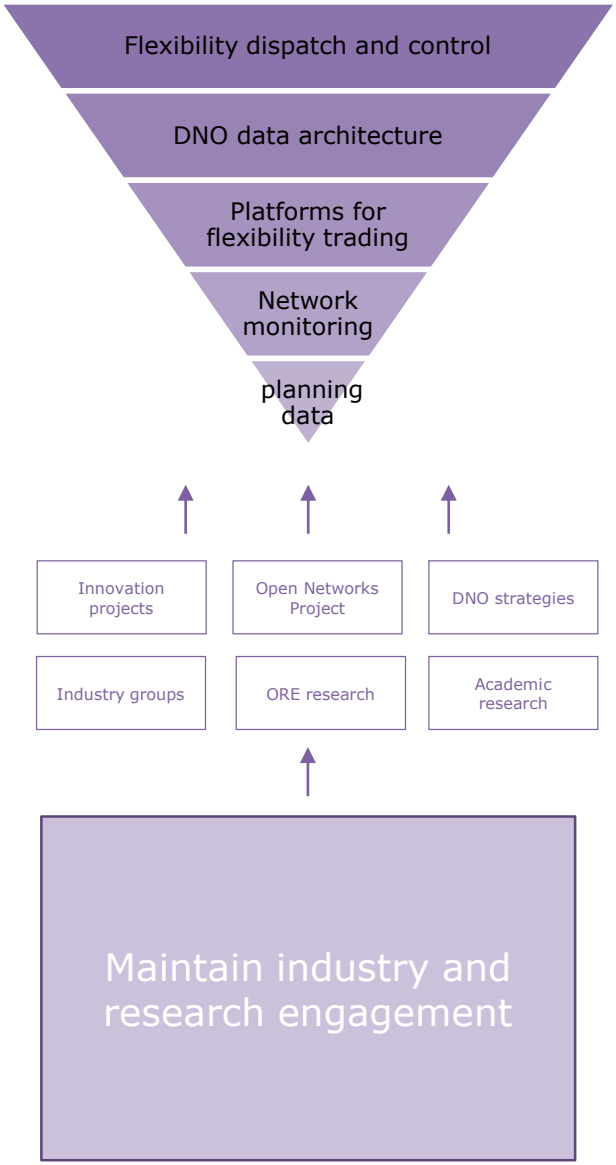
- Flex lifecycle
- Key enablers for DSO
- System wide resource register
- Whole system FES
- Real-time data exchange & priority actions
- Conflicts of interest and unintended consequences
- Data exchange in planning timescales
- TSO/DSO & DER data requirements
- WS4 on whole systems: centralised info and dynamic LTDS

WS1B P4 CIM recommendation

DNO/ESO learnings:

KASM
WPD CIM NIA
D-FES

Ongoing programme of works



Flexibility dispatch and control

- Protect the consumers and participants in flexibility markets
- Delimit conflicts of interest
- Maintain policy optionality

DNO data architecture

- Encourage holistic data standards
- Work with industry on ensuring accurate and accessible data

Platforms for flexibility trading

- Delimit platform task breakdown, merit order and competencies to undertake tasks

Network monitoring

- Review innovation project learning and integrations to DNO BaU
- Undertake cost-benefit analysis of network visibility to inform RIIO-ED2 costs and volumes

Strategy

Key Enablers definition and Ofgem approach

- Do you agree with the definition including hardware, software and data?

Priority Key Enablers

- What are the most important key enablers?
- Which data grouping is the most appropriate to focus on post planning data? [Be specific and realistic]
- What is near-term vs long-term?

Interoperability as a strategic goal

- Is interoperability key to DSO? Why/why not?

Implementation

Programme of works and LTDS

- Do you agree with the implementation approach from Ofgem?
- Which changes are industry best placed to carry forwards?

Operational data for DSO

- How should this be shared?

What would you do with key enablers in place?

- What activities cannot be undertaken now that require key enablers?

Facilitated table discussions and reporting: 25 minutes on strategy and implementation each; use table prompts, report table findings (15 minute wrap up)

Ofgem's Future Insights Series

Flexibility Platforms in electricity markets

Distribution system operation as a set of functions

Effective Distribution System Operation is the delivery and coordination of a range of functions and activities. DNOs will embed some of these functionalities in order to facilitate efficient energy networks.

Long term planning	Operations, real-time processes and planning	Markets and settlement
Network planning	Switching, outage restoration and distribution maintenance	Aggregation of DERs
Forecasting demand and generation and DER	Monitor parts of the Dx system under active network management	Design of principles of system access and trading arrangements
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- Functions vary in their integration to DNOs.

Future Insights series - Ofgem has developed a view of the future for flexibility trading platforms.

- outlines the finding
- presents an opportunity for open discussion

Content:

- What is a flexibility platform?
- The future of flexibility platforms
- Regulatory issues -how could Ofgem respond?
- Standards and harmonisation

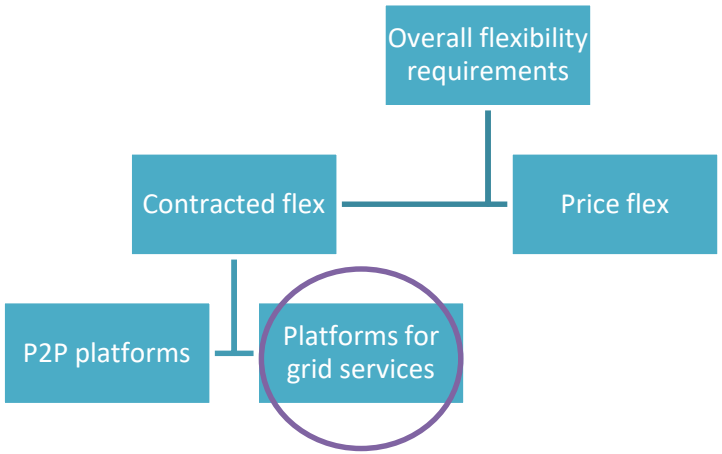
- **Methodology**

Literature review

Stakeholder engagement

Policy discussions

"A flexibility platform is an IT platform where the coordination, trading, dispatch and support services for flexibility markets take place."



Tasks of a flexibility platform

Platforms are made up of a number of tasks or functions

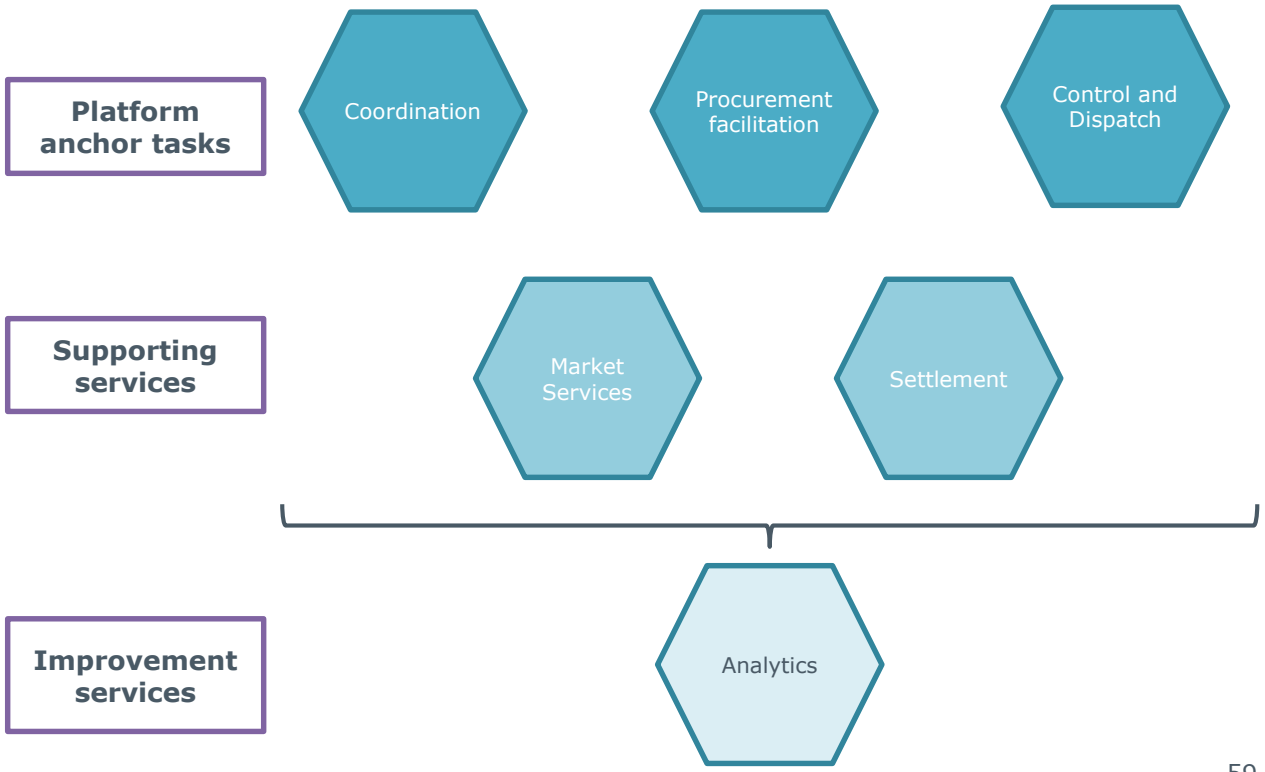
task	overview
Coordination	Alignment with external platforms, markets and actors
Flexibility Procurement	Match flex provider and procurers
Dispatch and Control	Dispatch flex asset and maintain system integrity
Platform Transaction Settlement	Verification and payment services
Platform Market services	Additional services (credit, qualification)
Platform Analytics and Feedback	Network assessment, review and improvement

Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Tasks fit a tier level.

We anticipate that numerous parties will fulfil different roles

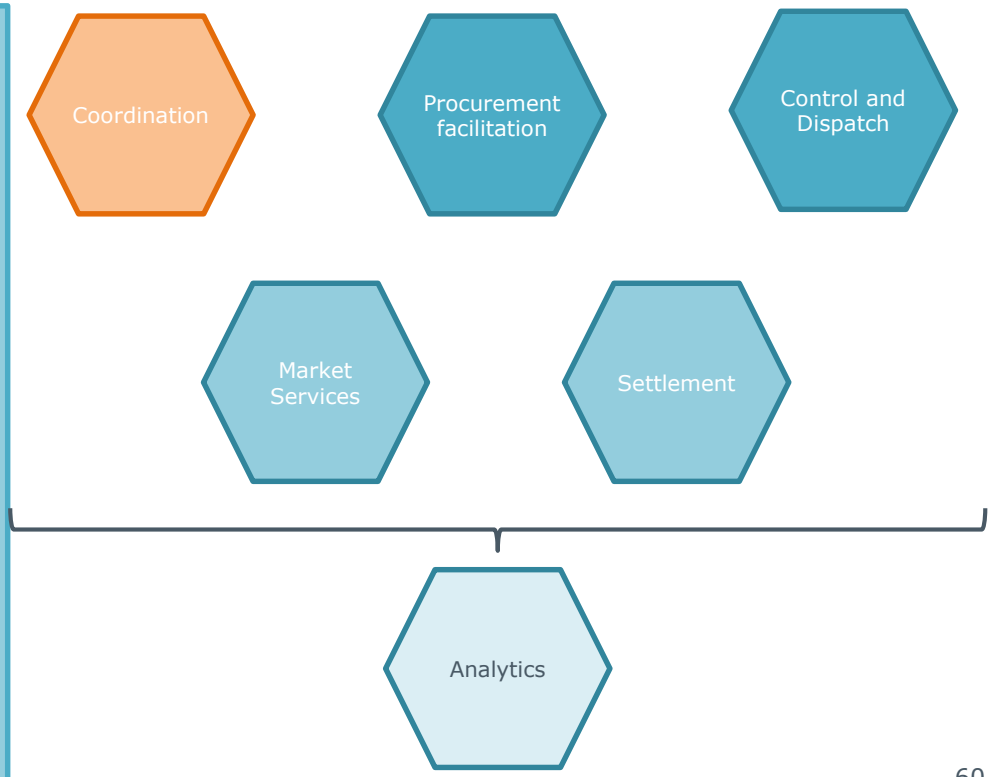


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Coordination

- Recognition that multiple platforms are likely to develop within and across geographies
- Coordination between flexibility procuring and selling parties
- Shared standards or potential to trend toward a monopolistic role

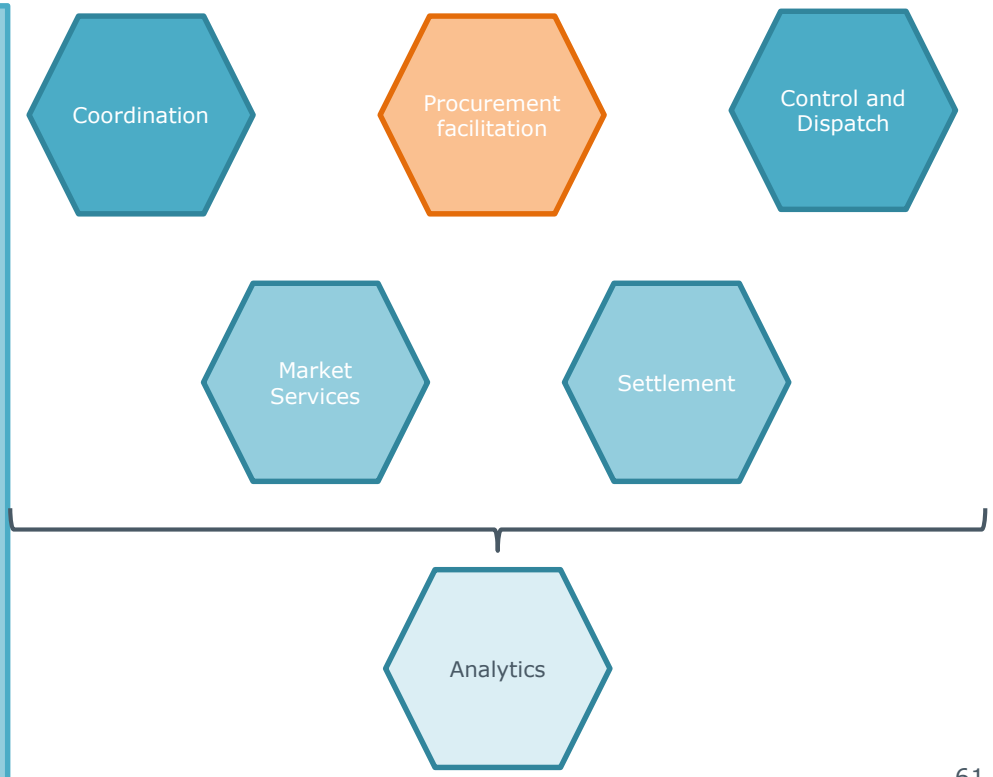


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Procurement facilitation

- The task of 'shop-window' and 'match-making' buyers and sellers of flexibility.
- Currently being taken up by GB innovative businesses.
- Provides a for flexibility services.

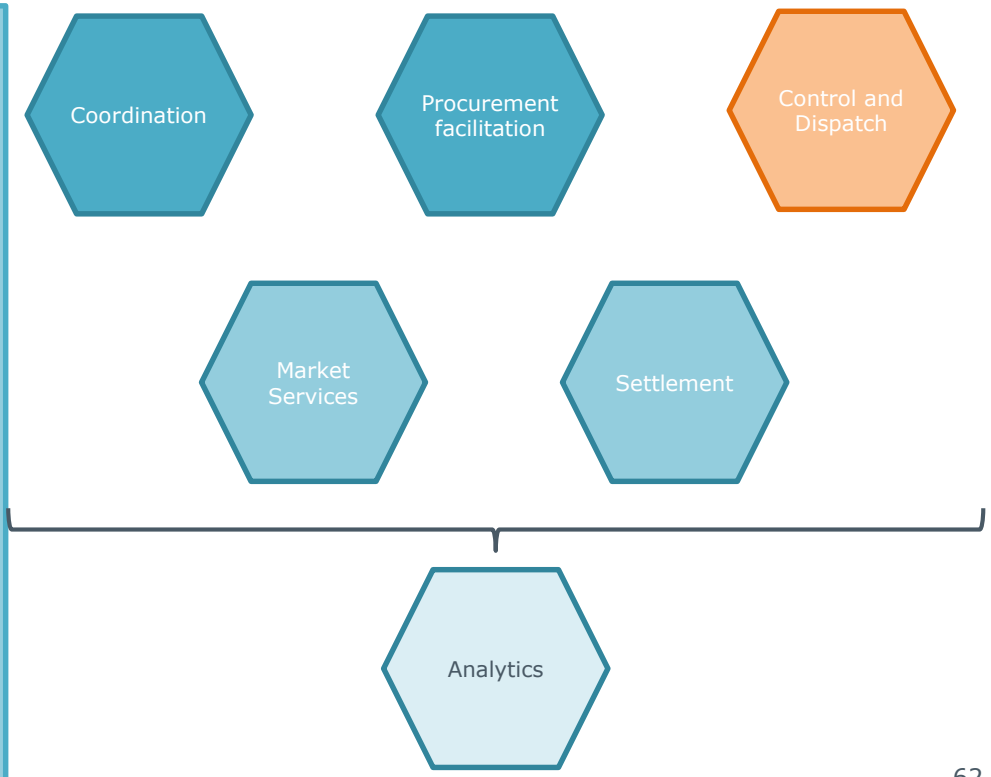


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Control and Dispatch

- Highly technical task of managing assets connected to the energy network.
- Grid safety analysis role.
- Requires network data.
- Existing tools and SCADA systems may integrate in task.
- DNO or alternative parties may be able to undertake this role in the future.

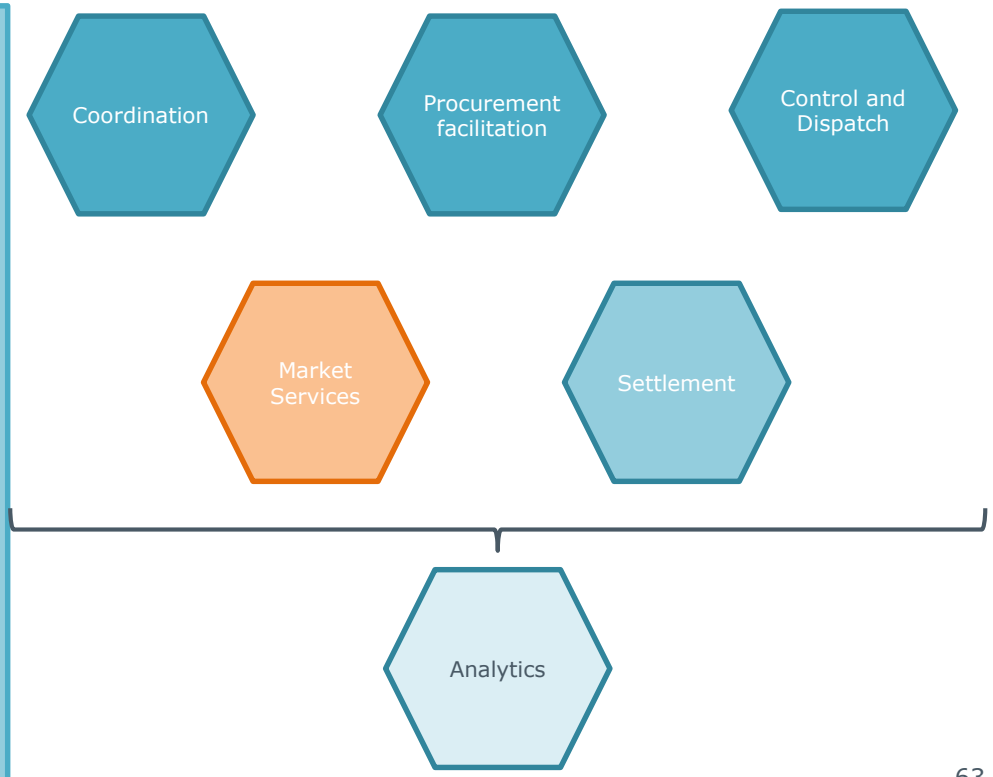


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Market services

- Services support flexibility trading
  - credit checking
  - Pre-qualification
- Could be undertaken by specialists from other sectors.

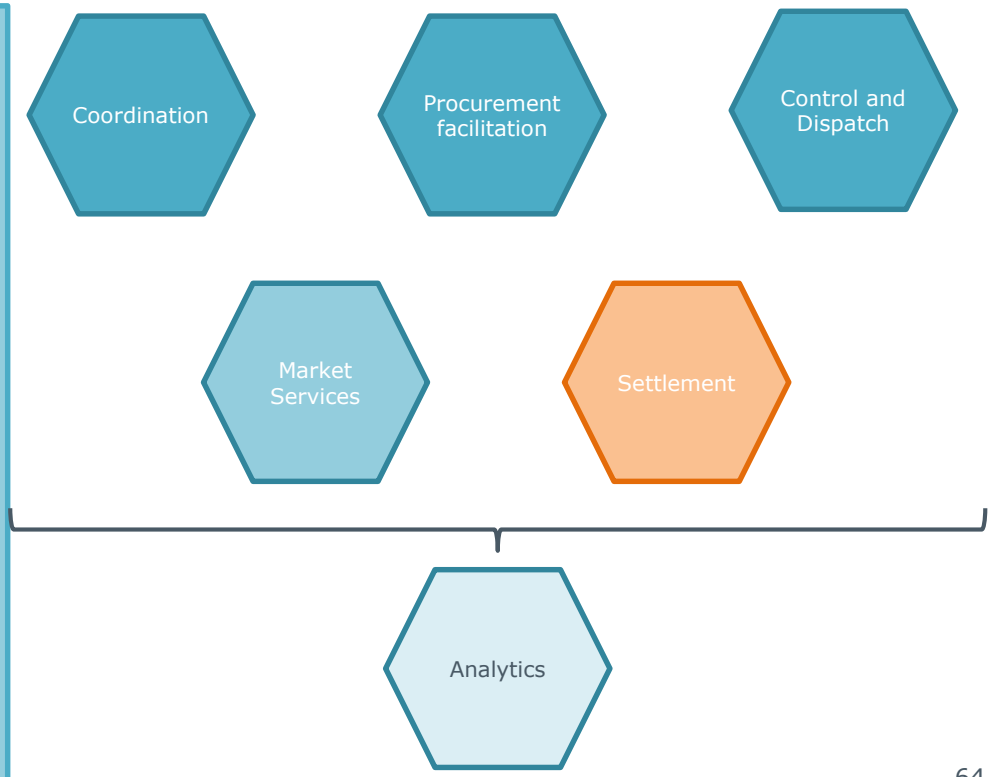


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Settlement

- Services support flexibility trading and balance settlement.
- Could be undertaken by specialists from other sectors.

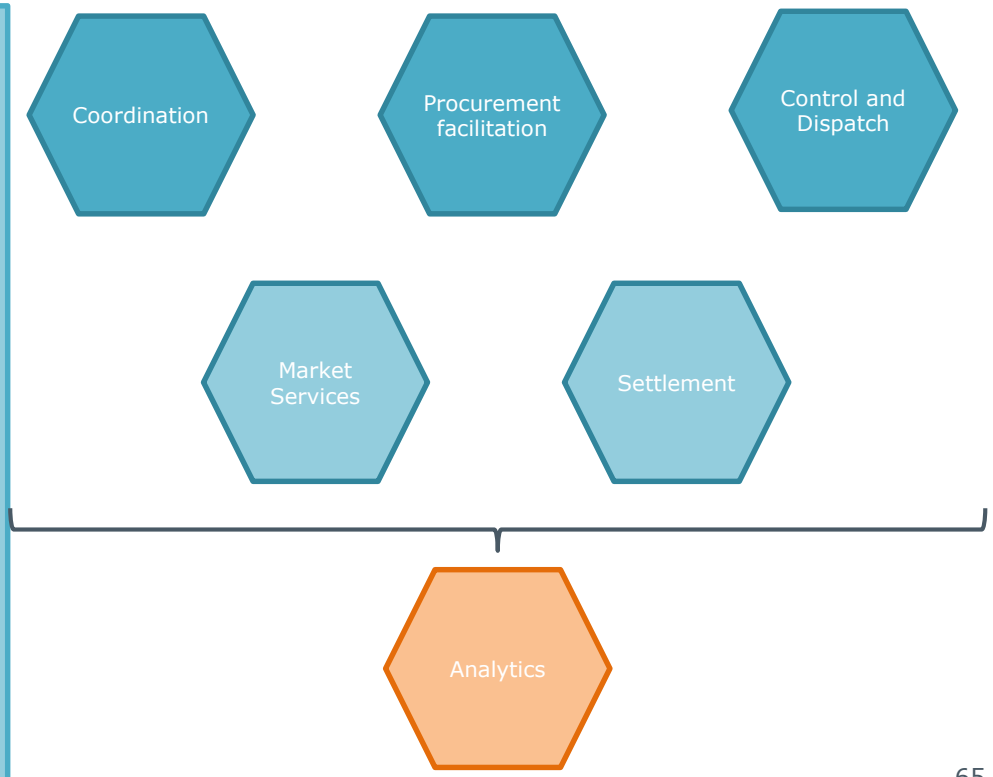


Tasks are not created equal

The breakdown is needed for a fully functioning flexibility trading environment

Analytics

- Improve the functioning of all platform tasks.
- Data:
  - Inputs and analysis
  - Data privacy



ofgem Making a positive difference for energy consumers

Spectrum of Flexibility Platforms

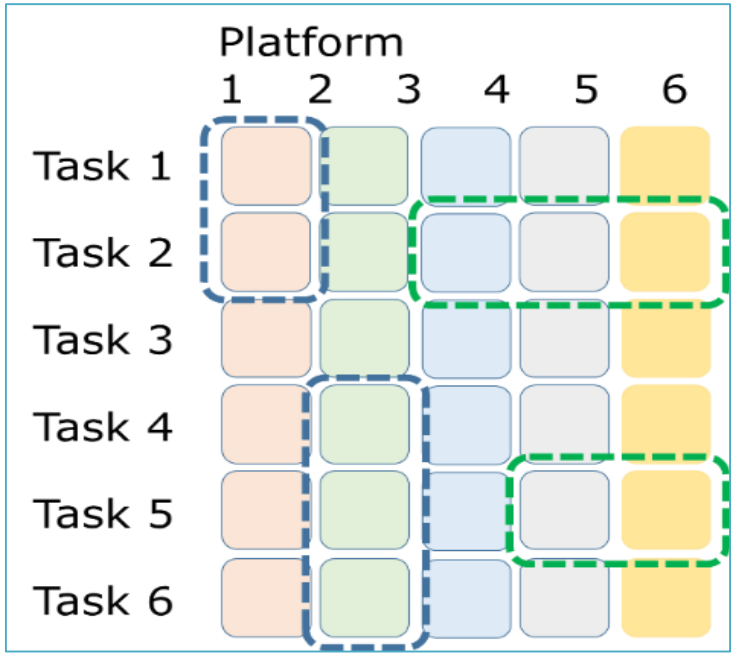
Model	Uncoordinated	Coordinated	Super-platform	Single Market
Features	Current GB situation	Numerous platforms across geographies	Single platform hosting multiple differentiated markets	Single UK market
	Multiple independent platforms	Platforms align with principles and interoperable standards	Single process of joining or prequalification	Single process of joining or prequalification
	Limited cooperation or interoperability	Providers or purchasers easily operate across platforms	GB wide monopoly – regulation required	Assets and participants automatically allocated locational tags
Platforms	Many	Many	Single	Single
Markets	Many	Many	Many	Single
Common standards	No	Yes	Yes	Yes
Governance	Independent	Negotiated	Centralised	Centralised

	Coordination	Procurement	Dispatch and Notification	Settlement	Market services	Analytics and Feedback
Coordination						
Procurement						
Dispatch and Notification						
Settlement						
Market services						
Analytics and Feedback						

Overlap and coordination between tasks may hold synergies

- availability of information
- sequential processes
- key inputs from another task

Vertical integration
Horizontal integration



Standards and harmonisation across platforms to:
- improve the commercial environment
- ensure consumer protections

Interoperability for: data sharing across platforms

- keep barriers to entry low
- Drive innovation
- Remedy market imbalance and tipping point

Interoperability for: Asset and product characteristics

- Reduce search and transaction costs
- Standardised products or filter assets based on procurer needs

Interoperability for: procurement process

- Format & content of flexibility bids and offers
- Single format for transactions can lower barriers to entry

Flexibility Platforms in a **non-regulated space**

Risks to consumers:

- a lack of coordination among the stakeholders causing **duplication**, **efficiency losses**, and **consumer costs**.
- a lack of an independent arbiter or code of conduct leading to poorer **consumer protection** outcomes.

Ensure **protect consumers** from the potential effects of:

- development of **undue market power**
- partiality in dealing with own assets
- non-competitive use of **network knowledge**
- Restricted **innovation benefits** to consumers due to illiquid market offerings for flex platforms

Conclusions

i. Cross-industry development to drive common standards and methods thereby reducing barriers to entry and lowering costs.

ii. Develop data sharing protocols to allow access to network data.

iii. Monopoly power is a risk for flexibility platforms, whether delivered by the DNO or others.

iv. A shared vocabulary around flexibility market services, platforms and related issues, harnessing existing initiatives.

v. Define and communicate the socialised and community benefits flexibility can deliver.

ofgem Making a positive difference for energy consumers

Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.

www.ofgem.gov.uk