Smart Systems and Flexibility Forum

29 March 2022

How you can input into today's session

We will be using Microsoft Teams and XLeap to run the session – **please join both**!

BEIS / Ofgem presentations
You can ask clarification questions using the chat function on MS Teams – please try to refrain from wider discussions at this point, you'll get a chance to do so later!

Breakout discussions
We will use XLeap to facilitate a text-based discussion. We will direct you to the appropriate topic on XLeap during each session.

Verbal discussion
We will use MS Teams to facilitate a verbal discussion.

To help things run smoothly, please:

- **Remain muted on MS Teams**
- **Turn off your webcam**

If you want to say something – please use the text-based chat in Microsoft Teams

- **Technical queries & clarifications** – use the MS Teams chat function
- **Policy input** – use XLeap

Agenda

14:00	**Introduction and opening remarks (20 mins)**
	Chair's introduction from Natasha Smith, Ofgem (10 mins)
	Remarks from Teresa Camey, BEIS (5 mins)
14:20	**Delivery update (50 mins)**
14:20	BEIS and Ofgem update (10 mins)
14:30	Industry updates (30 mins)
15:00	Questions (10 mins)
15:10	**Break (5 mins)**
15:15	**Priorities for 2022/23 (55 mins)**
15:15	Presentation (15 mins)
15:30	Breakout 1 – XLeap platform and verbal discussion (40 mins)
16:10	**Break (5 mins)**
16:15	**Digitalisation and Decentralisation (35 mins)**
16:15	Presentation (15 mins)
16:30	Breakout 2 – XLeap platform (20 mins)
16:50	**Next steps and close**

Aims of today’s Smart Systems and Flexibility Forum

- Give you an update on our Smart Systems and Flexibility work to date
- Hear from industry representatives on how Smart Systems and Flexibility policies are progressing in different sectors
- Get your views on the most critical actions to take by the mid-2020s and the feasibility of delivering these given the changing context for delivering a smart and flexible energy system
- Discuss the next steps to creating a digital ecosystem and get your views on how we can drive forward work in this area

BEIS and Ofgem opening remarks

Delivery update

Smart Systems and Flexibility progress

Cross-cutting

I — BEIS announced £65m through Flexibility Innovation Programme to support innovative solutions to enable large-scale widespread electricity system flexibility. Ofgem awarded 40 early-stage 'discovery' projects under £450m Strategic Innovation Fund

Facilitating flexibility from consumers

1.1 — New 4-year **smart metering Targets framework** started on 1 January 2022

1.3 — Legislation mandating that all new private **EV chargepoints** must have smart functionality and meet minimum device-level requirements

1.5 — **Market Wide Half Hourly Settlement**: Decisions on implementation arrangements, designation of governance framework & multiple code modification

1.10 — Published 'Enabling the transition to **Electric Vehicles**: regulator's priorities for a green fair future' in September 2021

1.12 — Published response to 2019 call for evidence on **Electric Vehicles data transmission** in July 2021

Removing barriers to flexibility on the grid

2.1 — Updated Storage Co-location Generator Guidance published in November 2021

2.2 — Published call for evidence on potential reform of transmission network charging arrangements in October 2021

2.3 — £6.7m in funding awarded for **innovative longer duration energy storage projects** through LODES in February 2022

2.4 — Published call for evidence on **capacity market alignment** with net zero commitments

2.6 — **Business rates exemption** for sites mostly self-consuming energy generated onsite from renewable sources from April 2023

2.8 — Completion of the **Interconnector Policy Review** and third Cap and Floor investment round to open this summer alongside an MPI pilot scheme. Published consultation on **Offshore Transmission Network Review enduring regime and MPI**

Reforming markets to reward flexibility

3.2 — Bi-annual flexibility services procurement, with a core set of flexibility products across DNOs

3.4 — Launched consultation seeking views on proposals for future role, organisational design and implementation of **FSO**

3.5 — Confirmed **CfD auctions** will be held annually from March 2023

3.6 — Launch of ENA ON workstream to develop DNO carbon monitoring and reporting, in coordination with the ESO

3.7 — Launched **DUoS Significant Code Review** and asked ESO to lead **TNUoS taskforce**

Energy Digitalisation Strategy

3 — **Energy Digitalisation Taskforce published report** detailing recommendations to help deliver digitalisation within the energy sector in January 2022

Facilitating flexibility from consumers – Progress to date

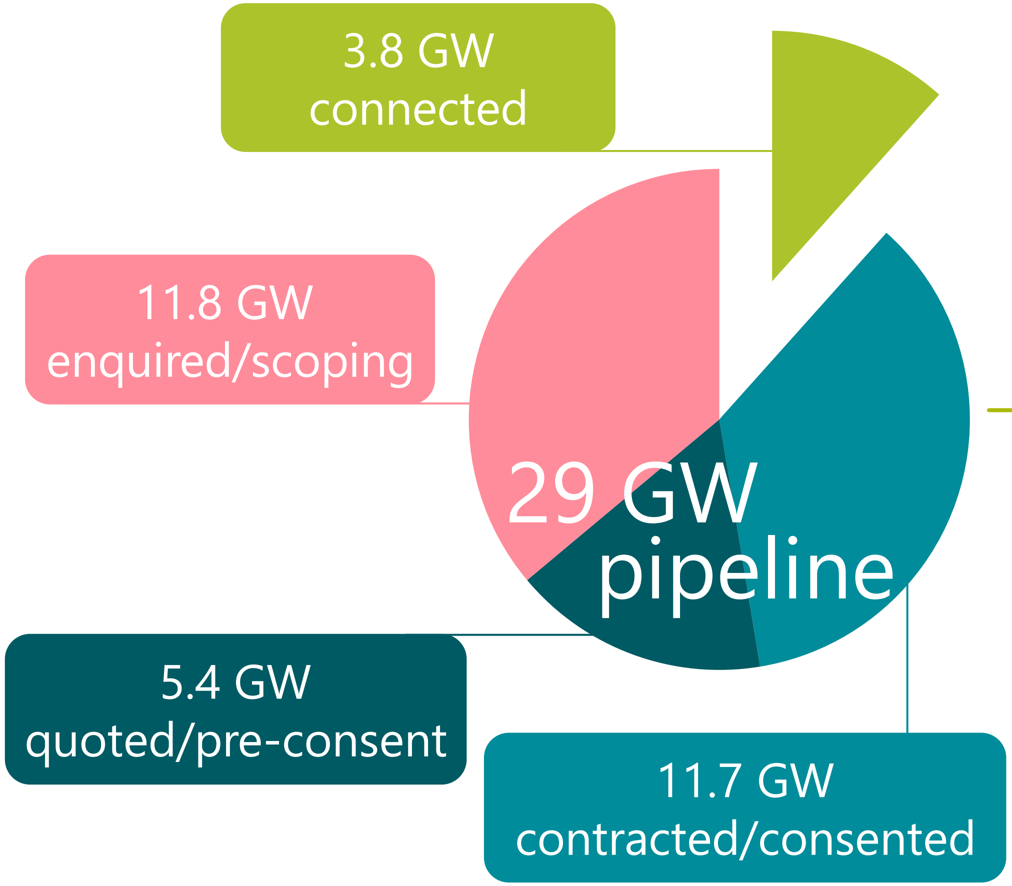
- Smart Energy Technology
- Flexibility providers
- Consumer protection and Engagement
- Smart buildings
- Smart Local Energy Systems

- BSI PAS, Smart EV charging
- HHS, defining roles
- DSR Risk Register
- SAP11
- HABS, Market reforms

Energy UK

Removing barriers to flexibility on the grid

UK storage pipeline 2022



THE ELECTRICITY STORAGE NETWORK

Average duration

93% Capacity Market entrants ≤ 2 hr duration

- 70% ≤ 1hr
- 7% ≥ 3 hr

Market growth (Dynamic Containment)

- ~500 MW / month procured through Dynamic Containment
- £116m in revenue over 18 months
  - averaging ~ £17/MWh

Removing barriers to flexibility on the grid

regen transforming energy

Barriers overcome

- **Planning:** changes to planning thresholds were a big boost, but planning guidance is still needed
- **Business rates:** relaxation of business rates for behind-the-meter welcome

Ongoing issues

- **Network charging:** long-running uncertainty over forward-looking charges hinders revenue projections
- **Markets for long duration storage:** innovation money will grow the industry, but a clear picture of markets that support long duration is needed
- **Fire safety:** no agreed industry structure around fire safety practices could cause insurance and reputational issues
- **Storage in legislation:** ongoing delays over definition of storage in legislation is causing industry to question whether storage is best defined as generation
- **Accessible markets:** ensuring the value of zero carbon assets is recognised in markets will be crucial for unlocking the value of zero carbon flexibility

Emerging barriers

- **Connections:** cost, availability and technical issues with connections are fast becoming a key barrier to deployment

THE ELECTRICITY STORAGE NETWORK

Current state of play for low carbon flexibility in markets

<table>
<tr><th></th><th>Small-scale DSR (e.g., EVs, HPs, batteries)</th><th>Medium I&C DSR (e.g., EVs, HVACs)</th><th>Large Industrial DSR</th><th>Coordinating procurement/dispatch</th></tr>
<tr><td>ESO Balancing Mechanism</td><td colspan="3">Somewhat progressing: Wider access removes hard barriers, but soft barriers (e.g. skip rate) remains</td><td></td></tr>
<tr><td>ESO Balancing Services (SSFP2 3.1)</td><td colspan="2">Somewhat progressing: U-turn back to GSP group important. However, still barriers (e.g., baselining, IT)</td><td>Shift to faster-acting services and removal of fast static response has significantly dampened market</td><td rowspan="2">Ongoing work through primacy rules work in the ENA</td></tr>
<tr><td>DSO Flexibility Markets (SSFP2 3.2)</td><td colspan="3">Somewhat progressing: Value of service is variable and can be very low for current services at EHV and HV. Ongoing work needed to the CEM and to expand procurement volumes (esp. down to LV).</td></tr>
<tr><td>CM & CfD (SSFP2 3.5)</td><td colspan="2">CfD: N/A
CM: Very difficult given admin is quite onerous. Current review not focused on improving the market for smaller assets.</td><td>Last T-1 auction cleared high which is positive. Likely new reqts (e.g., being a BMU) may reduce participation</td><td></td></tr>
<tr><td>Wholesale Market</td><td colspan="3">TBC: P415 likely to support participation as Wider Access did for BM</td><td></td></tr>
</table>

Industry perspective on “reforming markets to reward flexibility” chapter

Actions in the SSFP	Progress in 2021/22?	What’s needed now
ESO reforms under RIIO-2; incl. balancing services	Frequency products underway. Reserve products delayed. Original reqts would have blocked much smaller DSR.	Delivering reserve and response services. IT upgrades are critical.
All shareable data accessible by Sept 2021	ESO Data Portal useful but API not as good as the BMRS API. Still work in progress.	Ongoing devt.
Standardised DNO services by 2023; incl. how flex is valued	Work in ENA ongoing. Ambition on CEM has been disappointing.	Further development of CEM tool
Networks/ESO coordination and alignment (e.g., contract T&Cs)	Work in ENA ongoing; incl. on primacy rules. Work may take longer than envisaged given complexity.	Stronger evidence base and market approach
Ofgem review of DSO governance during 2022/23	[To be published shortly to industry]	[Pending publication]
Capacity Market and CfD changes	CM CfE was mixed for DSR, with some areas likely to create barriers for some DSR (e.g., CMU as BMU). Only minor changes to the CfD.	Stronger recognition of flex capacity growth to 2035 in CM. Broader market reform.
Carbon monitoring and reporting by 2023	Discussions ongoing – no firm proposals as yet	[Pending publication]
Exploring expanding the EU ETS	Nothing shared as yet with industry	[Pending publication]
Improving the flex signal within network costs	Access will have v ltd impact on flex. DUoS delayed. TNUoS impact unclear	Clearer view of the role of charging for flex
Review of policy costs allocation	Fairness and affordability work not yet published	[Pending publication]

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Questions

Break

Back in 5 minutes

Priorities for 2022/23

SSFP Vision	Mid 2020s	Early 2030s
Facilitating flex from consumers	• Consumers of all sizes will be able to provide flexibility to the system • Mature market for flexibility from large consumers • EV drivers choose smart charging as standard	• Domestic consumers providing significant flexibility to the system through heating and EVs • Local systems optimised across power, heat and transport
Enablers	Smart energy products and services; Market-wide rollout of smart meters; Market-wide Half Hourly Settlement	Smart EV & V2G tech enablement; Cyber security
Removing barriers to flex on the grid	• Investors and developers have confidence to bring forward electricity storage at all scales and durations • Interconnection capacity continues to grow	• Electricity storage of all scales and durations deploying and operating optimally across the system • At least 18GW of interconnection capacity operating optimally
Enablers	Interconnection Regulatory framework; Storage Regulatory framework; Operability approaches	
Reforming markets to reward flex	• Flexible energy resources of all types and sizes can optimise network capacity throughout the system and provide services to enable security of supply and periods of zero carbon operation	• All flexible supply and demand energy resources respond dynamically to locational and time-of-use signals
Enablers	Participation in markets; Coordination across markets and operators; Accuracy of market & charging signals	Optimisation across markets; Markets closer to real time
Energy Digitalisation Strategy	• Significant step-up in the visibility of energy assets across the system • Energy system data usable and utilised	• System operators have visibility of all energy assets, making planning and operations more accurate and efficient • Innovators are providing new services, revolutionising how we interact with and conceive the energy system
Enablers	Data collection standards and frameworks; Presumed open data; Digital services for data	Digital energy system

Key

- Vision statements (arrows)
- Identified enablers (grey boxes)

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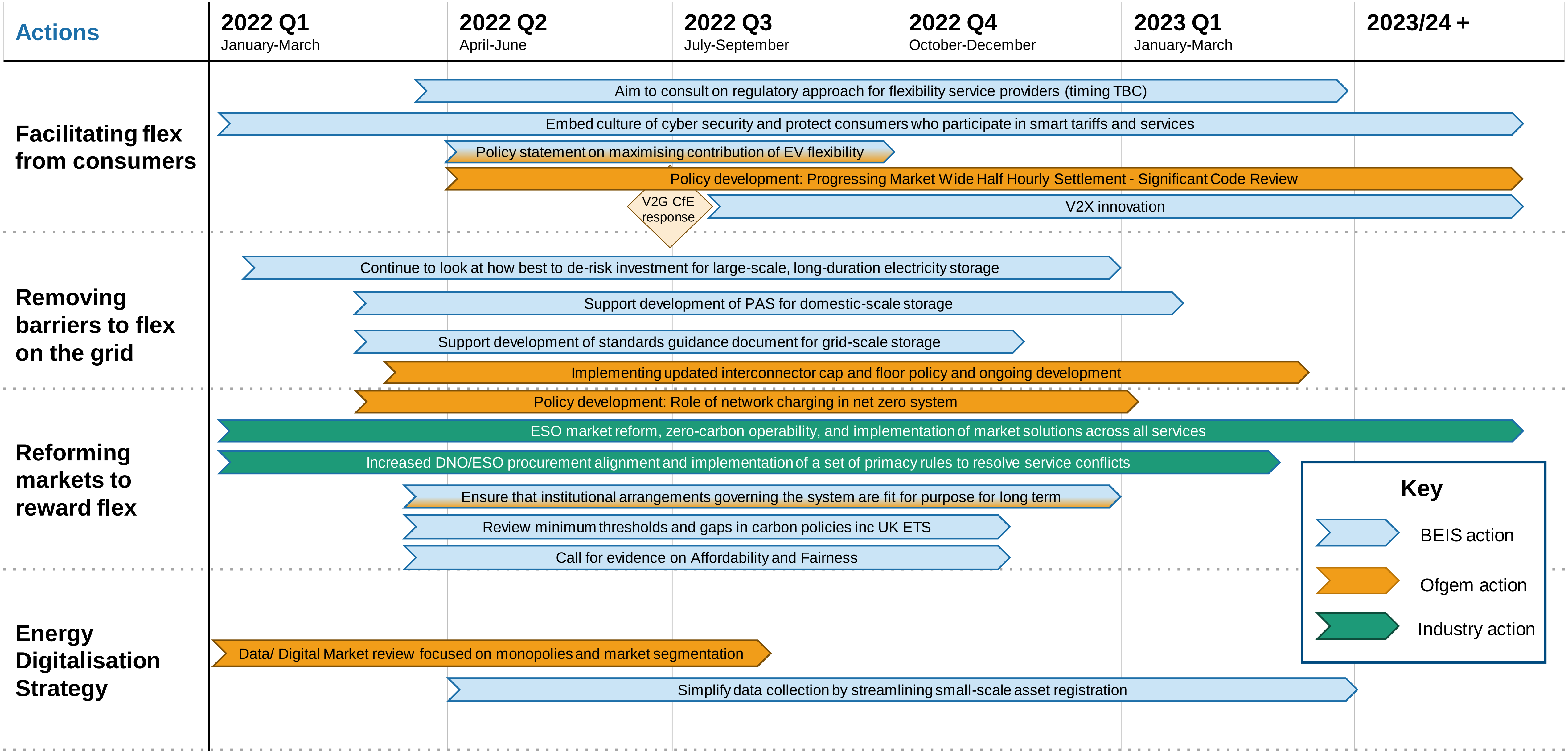
Making a positive difference for energy consumers

Department for Business, Energy & Industrial Strategy


Actions
2022 Q1
January-March
2022 Q2
April-June
2022 Q3
July-September
2022 Q4
October-December
2023 Q1
January-March
2023/24 +
Facilitating flex from consumers
Aim to consult on regulatory approach for flexibility service providers (timing TBC)
Embed culture of cyber security and protect consumers who participate in smart tariffs and services
Policy statement on maximising contribution of EV flexibility
Policy development: Progressing Market Wide Half Hourly Settlement - Significant Code Review
V2G CfE response
V2X innovation
Removing barriers to flex on the grid
Continue to look at how best to de-risk investment for large-scale, long-duration electricity storage
Support development of PAS for domestic-scale storage
Support development of standards guidance document for grid-scale storage
Implementing updated interconnector cap and floor policy and ongoing development
Policy development: Role of network charging in net zero system
Reforming markets to reward flex
ESO market reform, zero-carbon operability, and implementation of market solutions across all services
Increased DNO/ESO procurement alignment and implementation of a set of primacy rules to resolve service conflicts
Ensure that institutional arrangements governing the system are fit for purpose for long term
Review minimum thresholds and gaps in carbon policies inc UK ETS
Call for evidence on Affordability and Fairness
Energy Digitalisation Strategy
Data/ Digital Market review focused on monopolies and market segmentation
Simplify data collection by streamlining small-scale asset registration
Key
BEIS action
Ofgem action
Industry action

Evolving landscape since SSFP publication

Carbon Budget 6

Net Zero & H2 Strategy

COP26

Gas prices

Retail market

Energy independence

Strengthening the strategic direction

Volatility and cost pressures

Breakout 1

- In your view, which are the most critical actions in the Smart Systems and Flexibility Plan and Energy Digitalisation Strategy to take by the mid-2020s to deliver our vision for a smart and flexible system? (*Note: timeline on slide 17 does not include all actions in the SSFP).*

- What are your thoughts on the feasibility of delivering the actions amidst the evolving landscape?

- In your view, does the evolving landscape drive any change in ambition or reprioritisation of our work programme?

Break

Back in 5 minutes

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Ofgem: Digitalisation & Decentralisation

Doug Cook

March 22

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- Introductions
- Digital Energy Ecosystem
- Opportunities & Outcomes
- Where to start?
- What next?

Digitalisation & Decentralisation: a renewed, specific focus

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Doug Cook
Deputy Director
Digitalisation and Decentralisation

Energy System Data Regulation

To anticipate data-driven vulnerabilities, risks to consumers and provide appropriate governance mechanisms.

Energy Systems Data Architecture

To identify digital and data barriers to improve coordination, new services and innovative products.

Decentralised Flexibility

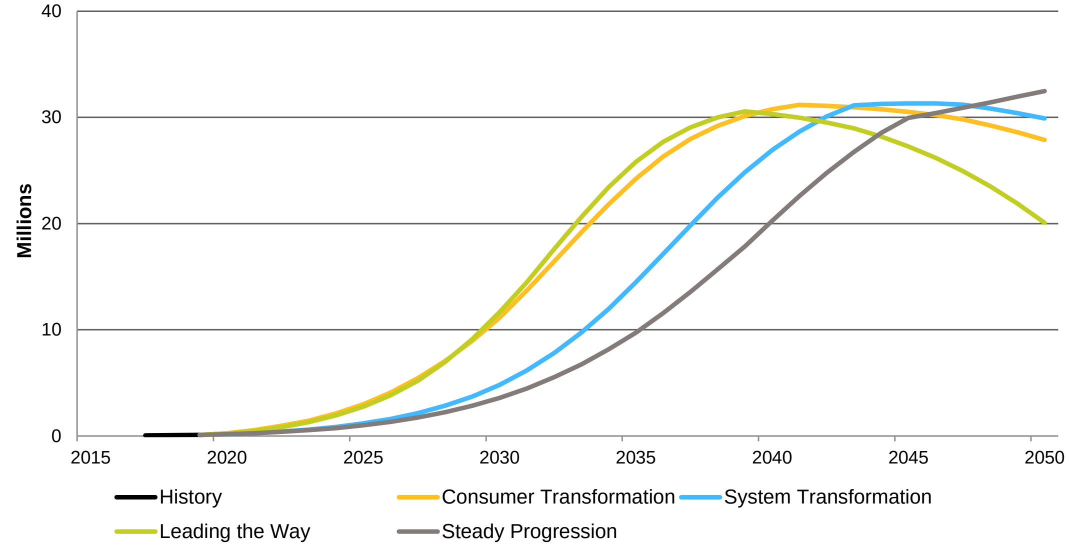
To increase participation of residential (<100kW) low carbon devices in energy markets.

Distribution Flex Markets & Enablers

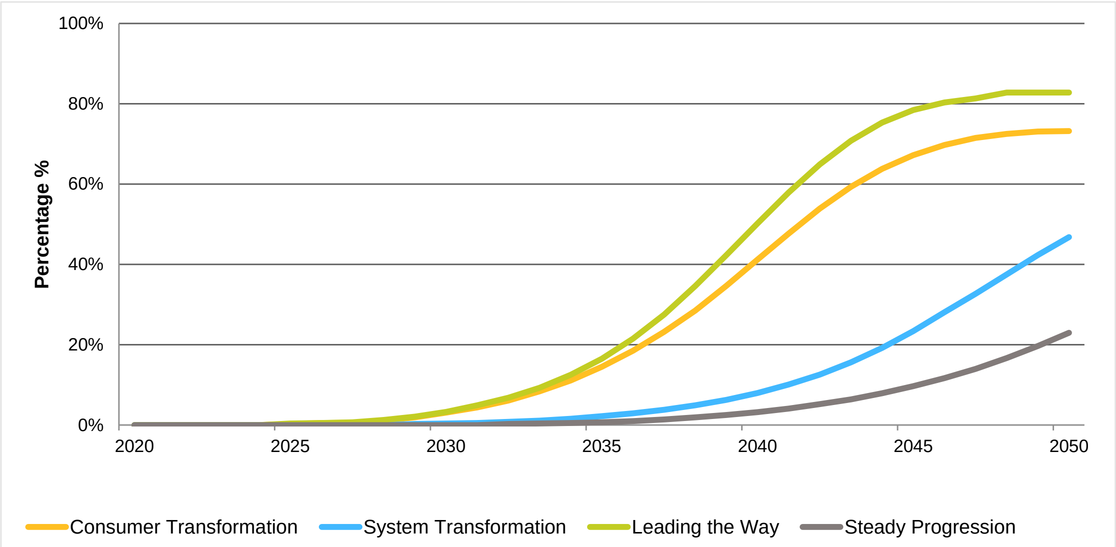
To develop the market structures and data flows required across all future markets to allow increased participation from distributed energy resources.

We must get serious about industry digitalisation (to enable 'useful' decentralisation)

Battery Electric Cars on the Road (NGESO FES)



Smart Appliance Uptake (NGESO FES)



The future energy ecosystem must incorporate:

- millions of smart consumer devices
- thousands more distributed energy resources
- new organisations virtual lead parties etc.
- trusted third parties offering data driven services direct to consumers and to energy market participants

These assets and orgs will need to be integrated, optimised, and co-ordinated across markets and networks.

<u>This system must be digital.</u>

So, what will a digital energy ecosystem do?

A future digital energy ecosystem, including suppliers, customers, networks, operators, new applications, third-party data service providers must:

- Reduce risks through **visibility,** ensuring collection and publication of data about what is happening: LV visibility, markets, decentralised assets, etc.
- Increase **participation through clear treatment of risks** (leading to trust), while minimising negative or harmful practices for consumers
- Increase **data exchange through standards**, ensuring standards are coordinated, secure and easy to understand and apply
- Change the industry's **culture,** to make sure digitalisation is valued and understood

What outcomes will a digital ecosystem deliver?

A digital energy ecosystem will facilitate dramatically improved outcomes:

- **Consumers:** more choice and control over devices and data. Able to permission data, access new services and ensure 'optimised' devices earn them money
- **Digitalised Networks** ensuring more efficient, reliable, resilient, planning and operation
- **Distributed Energy Resources:** integrated and 'optimised' in fully digitalised marketplaces to reduce friction, leveraging digital infrastructure to deliver new products and services faster
- **Innovation**: leveraging data and access frameworks to introduce new services more quickly & at lower cost
- **Markets**: fundamentally linked, ensuring trust of new actors at scale thanks to digital infrastructure, increasing supply of flexibility and better matching vRE
- **Genuine 'evidence based' policymaking and regulation** via the provision of high quality and timely data

What problems do we need to solve?

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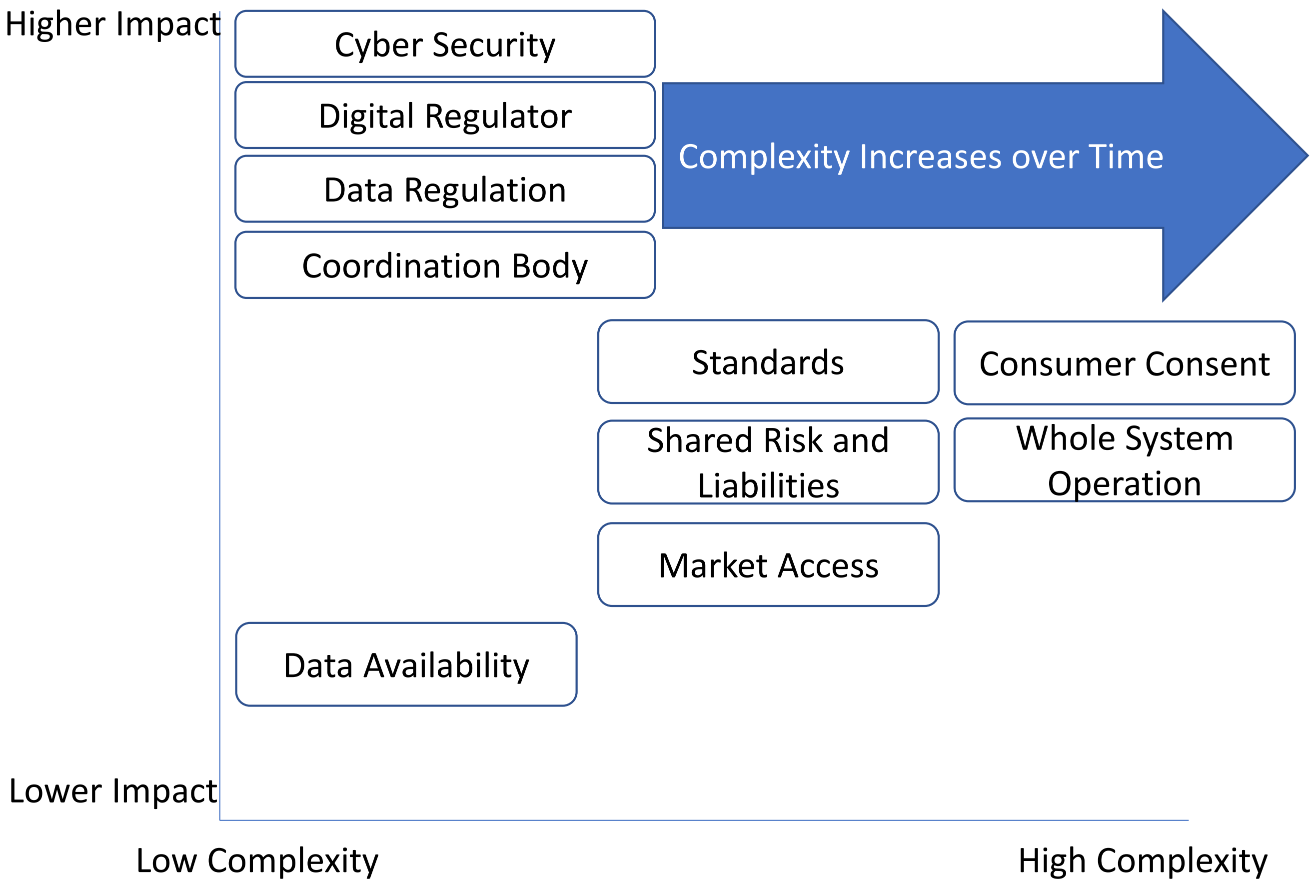

Ofgem can't and shouldn't do everything.

Furthermore, the scope and scale of the change in the energy sector is such that we cannot tackle all the problem areas at once.

Solving these problems will be a collaboration across Government, industry and the supply chain.

What Next?

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Spring 22

- **Digital Energy Ecosystem Discussion Paper**
- A discussion paper on the future digital energy ecosystem providing an overview of the changes required and the challenges involved
- A view on roles and responsibilities, priority problems and short term actions
- This will incorporate our initial response to EDiT and our enduring priorities i.e. Data Best Practice

Spring-Summer 22

- **Stakeholder Workshops**
- Engagement with the stakeholder community, to examine stakeholder priorities, highlight what we may have missed, or if there are any alternative perspectives we should consider etc.

Winter 22/23

- **Digital Energy Ecosystem White Paper**
- Roles and responsibilities associated with the regulation of the digital eco system
- Priority problems for Ofgem, Government and Regulators to solve
- Overlaps and Coordination with Industry Indicatives

Breakout 2

- In your view, what sector(s) do you think energy could learn the most from? Please explain how and why you think this in your response.
- What are your views on a government-led or industry-led dialogue to achieve a faster common ontology and taxonomy?
- Are there opportunities to accelerate industry dialogue around Code changes pertaining to digitalisation that we should be considering?

Next steps and close