# Smart Systems Forum

9 September 2020

# How you can input into today's session

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

**Part 1 – 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!

**Part 2 – Breakout discussions**
We will use MeetingSphere to facilitate a text-based discussion. We will direct you to the appropriate topic on MeetingSphere during each session.

**Part 3 – Plenary Session**
We will use MS Teams to facilitate a verbal discussion on our overarching programme. This session will be recorded through MS teams.

**Part 4 – After the event**
MeetingSphere will remain open for the next 3 weeks for you to provide feedback on the questions asked today.

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 MeetingSphere

If you want your comment to be considered after today's workshop, use MeetingSphere!

# Agenda

14:00 **Introduction, opening remarks and brief Q&A**
- How the day will be run - Imogen Brown (BEIS)
- Chair introduction from Frances Warburton (Ofgem) and Teresa Camey (BEIS)

14:30 **Smart Systems and Flexibility Plan: Latest updates** Matt Aldridge (BEIS)

14:35 **Next phase of Smart Systems and Flexibility** Will Broad (BEIS)

14:40 Markets for Flexibility, Monitoring and Data & Digitalisation

15:10 Breakout 1 - MeetingSphere

15:35 **Break (10 mins)**

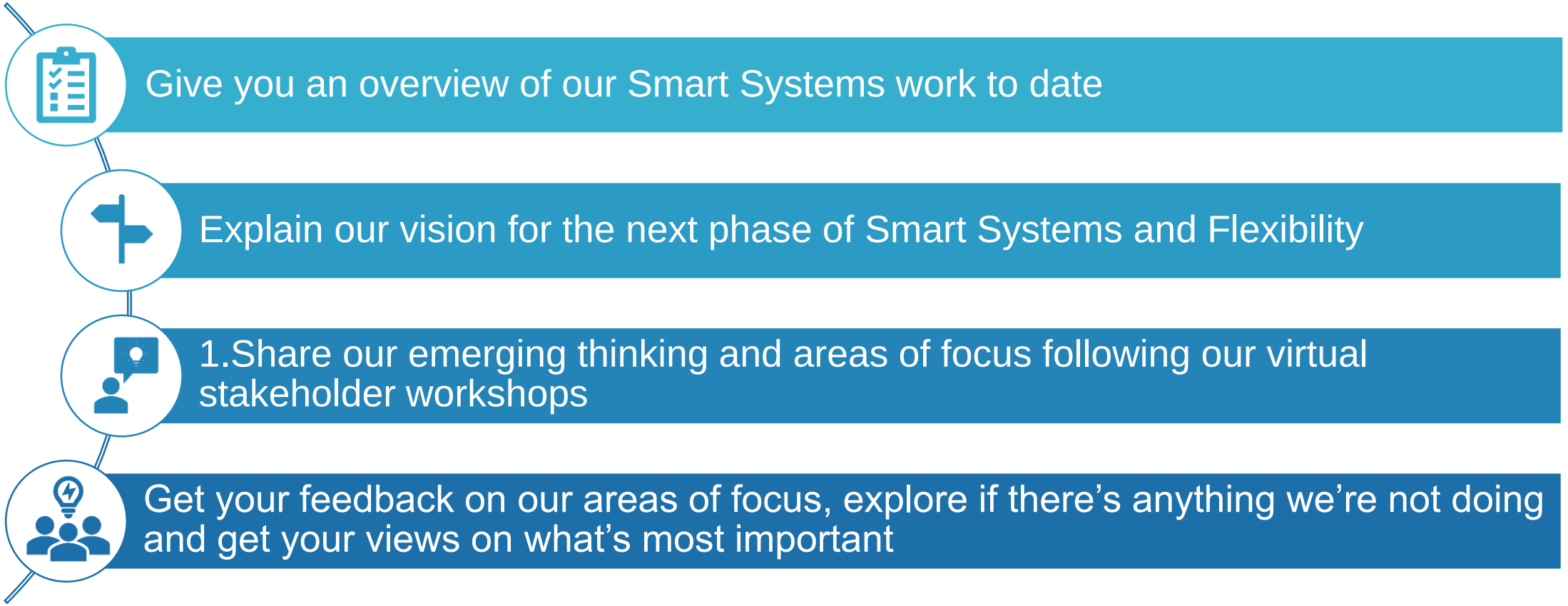
15:45 Storage, Consumers & Aggregators, Smart Buildings

16:05 Breakout 2 - MeetingSphere

16:25 Plenary session on overarching programme – Frances Warburton (Ofgem)

16:55 **AOB, final words and round-up**

# Aims of today's Smart Systems Forum



# Smart Systems and Flexibility Plan: Where are we now?

# Smart Systems and Flexibility Progress

**25 out of 38 actions implemented**

## Removing barriers to Smart technologies

6/10 actions implemented

### Progress since the last forum (Feb)…

- Legislation to take storage out of national planning regime
- Storage at Scale innovation comp
- Approved most code mods to end double charging of network costs for storage
- Storage H&S gap analysis

### Still to be implemented:

- Define storage in legislation
- Final consumption levies / licence
- Final code mod for storage charging
- Network connection queue management and code modifications

## Smart homes and business

10/17 actions implemented

### Progress since the last forum…

- SAP11
- Project Rapid £500m for charging
- Cyber security risk assessment
- BSI PAS standard review on smart appliances
- Half Hourly Settlement draft Impact Assessment, Consultation and Consumer Impacts paper published.

### Still to be implemented:

- Smart meters offered to every home
- Final decision on market wide HHS
- Consumer protection
- Cyber- security
- Consumer engagement
- Smart appliances regulation
- Future Homes Standard

## Markets for Flexibility

9/11 actions implemented

### Progress since the last forum…

- Opened BM, CM and NOA to flexibility assets
- Increasing volumes of flexibility tendered by DNOs
- Network digitalisation strategies, Data innovation competitions, Energy Data Catalogue, Code changes to improve data transparency, ENA working group
- RIIO-2 Draft Determinations for T and ESO & ESO 2019/20 incentives decision
- RIIO-ED2 Sector Specific Methodology Consultation

### Still to be implemented:

- Engineering standards
- DSOs: Open Networks to develop and embed coordination and reforms in ESO and DNO flexibility markets

# Forward look……

## Smart Systems and Flexibility plan next steps…

Roundtables and workshops: carbon, consumer protection, large scale storage, domestic storage, local flex markets, market co-ordination, innovation, smart buildings and more….

Draft Monitoring Strategy

Next Smart Systems Forum

Next phase of smart systems policy developed

Q4 2020

Q1 2021

Q2 2021

Storage modified generation licence decision

Access SCR minded-to-consultation

RIIO-ED2 Sector specific methodology decision

Implementation of the Clean Energy Package

BSI draft PAS 1878 published

ESO RIIO2 price control go-live

Access SCR Final Decision

Business Rates Call for Evidence closes

Storage Health and Safety Gap Analysis – final report

ESO RIIO2 Final Determination

Networks submit digitalisation str ategies / action plans

MEDA Phase 2 Complete

Cyber Risk Assessment complete

Energy Data Catalogue 'Alpha' complete

Decision on Half-hourly Settlement

Initial RIIO-ED2 business plans submitted

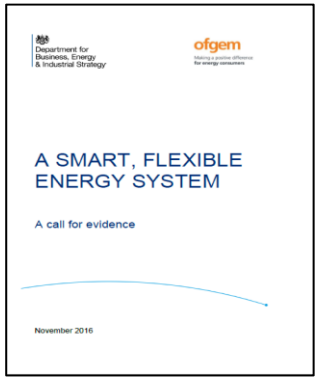
## Policy Milestones (just some of them!)

# Next phase of Smart Systems and Flexibility

# 2017 Smart Plan was first step… but there is much more to do

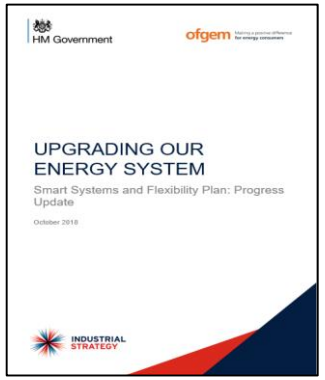
- We have made good progress, and the market is improving, however flexibility still not delivering at scale
- Since we published the Plan (and 2018 Progress Update) net zero legislation was passed
- We now need to:
  - Implement the remaining actions, and complete follow on work for all actions
  - Prioritise and develop further work, including unaddressed barriers
  - Set out vision, analysis, approach and work programme in light of net zero and related policies (heat, EVs)

2016 - A smart, flexible energy system: Call for evidence




2017 – The Smart Systems and Flexibility Plan


2018 – The Smart Systems and Flexibility Plan: Progress Update




Early 2021 - Next phase of smart systems work

# We identified key themes to explore with Stakeholders

## Flexibility Analysis

Updated analysis showing how much flexibility may be needed in a net zero system, and from what sources & technologies

### Consumers

Framework for driving participation and protecting consumers, through perspective of domestic, fuel poor, SME, I&C, local and public consumers. Cyber security and appropriate regulatory approach for aggregators.

### Buildings

Set a vision for smart buildings. Identify barriers for the technical aspects of DSR, and ensure a holistic multi-vector approach is taken to building decarbonisation across heat, energy efficiency, transport and other sectors.

### Infrastructure

Identification of specific regulatory barriers to smart technologies, including large-scale long-duration storage and domestic batteries.

### Markets

Ensure flexibility is fairly rewarded, improve co-ordination and assess value of carbon across markets. Consider new markets and reforms to wholesale markets.

### Data & Digitalisation

Set out joint strategic approach to digitalisation and opening up data across energy sector, including development of key products, data architecture and best practice guidance.

## Innovation

Set out approach to innovation for both technologies and business models across each of the above smart systems themes

## Flexibility Monitoring

Set out how we will monitor how much flexibility is coming forward, assess whether this is in line with estimated system needs, and propose the indicators we'll use to know whether/how to adapt our approach.

# We are aiming to have the next phase of policy ready by Spring

**Next steps:**

- Sept to Jan – continued stakeholder engagement, workshops, roundtables, ministerial meetings
- Dec – draft monitoring strategy
- Jan – another Smart Systems Forum
- Mar/Apr – set out next phase (tbd what form this will take)

# Feedback on engagement so far – and areas of BEIS/Ofgem focus

# Markets for Flexibility

**Issue:** We have made reforms to individual markets to value flexibility; however barriers remain to participation in existing markets, flexibility is not always fully valued and new markets (local flex, voltage/inertia) require development. There is a lack of a whole system co-ordination to system operation, and the negative externalities of carbon are not accounted for across all markets.

**Agenda:**
Ofgem/BEIS vision for the development of flexibility markets to 2030 and sought feedback on:

- ESO/DNO ancillary services & non-network asset solutions
- Market facilitation
- Wholesale market
- Carbon in flexibility markets

80 participants & 546 comments

*Access and Charging was discussed in a separate Ofgem forum*

| Engagement events |
| --- |
| Workshops 7 Feb and 27 March |
| Carbon in flexibility markets deep-dive (mid-Oct, BEIS-led) |
| Further sessions TBC |

**Workshop summary**
Stakeholders were positive and supportive of our vision and goals.

**ESO & DNOs:** Need for processes to be clear and consistent, reflecting whole system value; Need to consider joined up approach across DNOs and ESO; Need for greater transparency supported by clear roles and responsibilities.

**Market facilitation**: Consider end-to-end provider journey; Need for coordinated approach to market design and development of independent platforms; Make it easier to move between and stack across markets.

**Wholesale market**s: Minimising distortions and removing barriers; review market design and consider need for locational elements; Review of wholesale market design and policy interdependencies.

**Carbon**: Broad agreement on need to value the externality of carbon and to report on carbon intensity in all flexibility markets; Clearer view on the role of ESO/DNOs in decarbonising markets.

# Markets for Flexibility – areas of focus going forwards

## ESO & DNO ancillary services and non-network solutions

- Facilitate development of clear and consistent flexibility processes, reflecting whole system value and optionality benefits of flexibility
- Improved transparency and data on both markets and network operation
- Clear criteria and timeframes for future DSO roles & responsibilities
- Clarify our expectations for how flexibility markets will interact with and complement Access & Charging reform

## Market facilitation

- Continue reforms that make it easier to move between markets and stack revenues
- Continue work to make data more widely available
- Ensure flexibility policy coordinates with wider energy policy, particularly on heat and transport

## Wholesale markets and CfD

- Consider whether flexibility could be better integrated into the CfD
- Consider longer term need for locational elements to be better priced in the wholesale market
- In the long term, consider the need for wider market reforms. May include assessing benefits and costs of closer to realtime markets or other changes to market design

## Carbon in flexibility markets

- Build quantitative evidence on the size and scale of the problem
- Consider options to improve carbon signals in these markets
- Consider options to ensure that carbon intensity is transparently measured and reported on in all markets
- Work to clarify the role of ESO/DNOs in decarbonising markets

# Monitoring Strategy Virtual Workshop (5 May)

**Issue:** The energy market is changing rapidly and smart policy needs to be adaptive to be effective. A robust and systematic monitoring strategy is key to knowing how much flexibility is coming forward, whether barriers exist to flexible participation in the energy market, and whether the Smart Plan is addressing these issues.

**Agenda:**

Presentation of draft monitoring strategy and sought feedback on:

- High-level objectives.
- Selected indicators and suggestions for new indicators.
- Expectations for publication and use of monitoring data.

52 participants & 500+ comments

**Workshop summary**

- Support for the work and generally agreed with our approach to monitor markets.
- Consumer participation: Monitoring indicators for consumer engagement with flexibility need more development.
- Distributed energy: Consider both technology types and other asset characteristics (size, owner, etc.) to monitor competitive landscape.
- Publication: Data should be made available consistent with Data taskforce recs.
- Engagement: Stakeholders emphasised collaborative work on the strategy, with opportunities to comment on future iterations.
- Carbon: Some stakeholders encouraged more consistent carbon monitoring to relate to objectives from markets workshop.

## Future engagement

- We intend to continue working collaboratively with stakeholders in developing the strategy.
- We will re-engage with attendees with a full summary of the feedback collected at the workshop and will aim to share a draft monitoring strategy by the end of the year.

# Monitoring + Analysis – areas of focus going forwards

Based on feedback from our 5 May workshop, these are the areas we're going to explore further in terms of developing our monitoring strategy:

## Designing an adaptive approach to monitoring

- Strategy must be robust to changing markets and new services.
- Quantitative metrics must be consistent across time and market design.
- We will look to share a draft report by the end of the year with stakeholders, as part of an iterative development process.

## Co-ordinating with data owners

- BEIS will work with the owners of the data sets used in the monitoring strategy to identify data gaps, suggest templates or formats.

## Including new indicators

- Improve monitoring of distribution-level markets, and reporting on DNO flexibility tenders.
- Develop measurement of retail level flexibility, including consumer purchases and time-of-use price incentives.

## System modelling

- We are updating our analysis on the power sector benefits of flexibility to be Net Zero-consistent.
- This will inform policy development for the next phase of smart systems work.
- Outputs could provide an 'ambition' for a subset of indicators which the monitoring strategy could be assessed against.

# Data & Digitalisation

**Issue:** Data & digitalisation are essential pre-requisites for a smart and flexible energy system, in which millions of assets are optimised across power, heat and transport. However, today the culture is one of data being hoarded or neglected instead of created, curated and shared through services that put stakeholders' needs first, (e.g. by using common data standards). This impedes competition, innovation and new business models.

## May workshop feedback summary

118 participants & 700 comments

- Positive on approach to digitalisation of the energy system, but flagged that certain areas need further clarification
- Consensus that a comprehensive approach to digitalisation of the energy sector is needed
- Further clarity needed on regulatory expectations, e.g. 'presumed open'
- A desire for an iterative programme and communication, including timelines and dependencies of ongoing activities
- Providing the required data standards and digital infrastructure that enable improved exchanges of information by the sector

## July Ministerial seminar

22 participants

- Government should set a clear, strategic vision for digitalisation of the energy system.
- Publish a timetable of implementation activity and also a roadmap to the desired outcomes
- Enable the sharing of data across the different energy sectors (e.g. power, heat, transport, buildings etc)
- Support a 'bottom-up' approach to innovation alongside 'top-down' leadership and policy/regulatory frameworks

# Data and Digitalisation – our approach to delivering change

Based on the stakeholder engagement and policy development thus far, below are the broad categories of all our planned activity for delivering our objective, i.e. ‘modernising energy data’

## Leadership

- **Communicating progress** of our activity since EDTF publication
- **Setting a vision** for digitalisation of the energy sector
- Providing a **coordination function** across the landscape of all relevant activity/initiatives (e.g. ENA-DWG, energy digital services forum)
- Regulator **investing in** its own ‘data & digital’ **capabilities**
- **Engaging with wider networks** for cross-sectoral coordination (e.g. CBDD-NDT programme, DCMS-National Data Strategy)

## Building Blocks

- A prototype energy data visibility service (aka data catalogue) with ONS
- A co-ordinated series of innovation programmes (with Innovate UK).
- Developing an effective asset registration process

## Frameworks

- **Consulting to clarify regulatory expectations**, (e.g. best practice guidance, DSAPs; DSO key enablers and next steps
- **Embedding** regulatory expectations **into regulation**, such as new licences conditions being included in the RIIO-2 determination process
- **Engaging with the wider regulatory topics**, such as the SO review to include data specific governance issues within its scope of reforms

# Breakout 1

- To what extent do you agree with the areas of focus we have identified for the next phase of work?
- Is there anything which has not been mentioned today and that we should prioritise?
- What are your priority areas for Government and Ofgem in order to achieve a smarter more flexible system? (Sticky dot exercise)

# Break

*Back in 10 minutes*

# Storage Virtual Workshop (14 May)

**Issue:** There is currently 4GW of storage on the system. Industry estimates we could need 15-40GW by 2050[1]. Some types of storage still face significant barriers – in particular, domestic storage is excluded from some of our existing work, and large-scale storage has high upfront costs and a lack of long term contracts which is a barrier to investment

## Agenda:

Overview on actions for storage to date, where we think the market is and how this has led us to focus on:

1. Driving existing actions to implementation
2. Facilitating deployment of domestic storage
3. Facilitating deployment of large-scale, medium-long duration storage

Asked stakeholders whether we've missed any barriers

70 participants & ~110 comments

## Future engagement

| |
|---|
| **Barriers to the deployment of domestic storage** (BEIS/Ofgem led) |
| **Barriers to the deployment of large-scale, medium-long duration storage** (BEIS/Ofgem led) |

[1] Aurora: The Road to 2050, 2019 - 30GW
National Grid: Future Energy Scenarios, 2020- 20-40GW
NIC: Net Zero: Opportunities for the power sector, 2020 - 15-20GW

## Summary of workshop feedback

- Overall positive feedback for the event and strong sense that the 3 overarching themes we have identified are the right ones.
- **All storage** – lack of clarity on future regulatory framework and market causing investment issues e.g. charging reforms outcome won't be certain until 2022/23; supply chain and sustainability not being addressed across all scales; lack of targets.
- **Domestic/small-scale** – metering requirements for this scale needs to be proportionate across markets; emphasised importance of HHS and ToU tariffs for business case at this scale; address mis-selling and increase consumer engagement; at this scale need to be thinking about smart home as a whole; tax system disincentivises storage at this scale; enduring solution for FCLs important.
- **Large scale, longer duration storage** – issue is high CAPEX vs. potentially insufficient forecastable/bankable revenue streams; de-risking mechanism could be needed as per other high capex low carbon technologies; need further innovation to commercialise techs; address different arrangements under BM for pumped hydro.

# Electricity storage – areas of focus going forwards

Based on stakeholder engagement and feedback, we intend to take forward the following activities:

| | |
|---|---|
| All-Storage | • Deliver updated Planning Practice Guidance and identify if further guidance is needed.<br>• Work with H&S Gov Group on outcomes of gap analysis and prioritised areas.<br>• Working with HMT and industry to identify distortions for Business Rates through current consultation.<br>• Are further actions needed on connections for storage? |
| Domestic/small-scale storage | • Explore actions to improve business case for storage at this scale, for example removing **final consumption levies** and considering **VAT treatment**.<br>• Consider actions that could be taken to ensure metering requirements are proportionate.<br>• No barriers were identified that we weren't already aware of – want to check this with industry? |
| Large scale, longer duration storage | • Carry out analysis on the role and system benefits, supported by interviews with academics/consultants in the sector.<br>• Consider options to ensure a level playing field for high capex storage technologies.<br>• Consider how innovation funding could be used to support these technologies. |

# Aggregators Virtual Workshop (15 June)

Issue: Aggregators have a key role to play in enabling consumer participation in a smart energy system. The regulatory approach to aggregators is uneven and undefined. Government wants to ensure that policy maximizes the potential for growth for this sector, while mitigating potential risks to consumers and the electricity system.

**Agenda:**

- Update stakeholders on policy/regulatory landscape, and on progress.
- Discussion on how to define and future proof the aggregator function.
- Discussions on barriers, risks, and next steps to support the sector and to mitigate risks.

82 participants & 400 comments

**Workshop summary:**

- Positive feedback on structure, pertinence of the questions, and quality of debate.
- **Definition**: stakeholders emphasised that we should not be limited to the technical function of load control, as consumer interaction is a central element. A range of potential actors were cited, including aggregators, suppliers, EV/smart technology manufacturers, local authorities and large tech companies. Stakeholders felt that we should be agnostic on business models, but as part of that, it should be possible for aggregators to opt for segmentation or to work across the consumer spectrum, and that partnerships between actors will be essential to reduce costs.
- **Barriers:** a wide range of technical and cultural barriers were cited, including the absence of market-wide HHS, the complexity of energy industry codes, onerous prequalification and testing requirements, the absence of tailored consumer protections, marketing/advertising costs, and consumer awareness/acceptance.
- **Risks:** some scepticism was expressed as to cyber and grid stability risks, given the current size of the aggregator sector, but comments included a call for a joined up cyber security strategy cross-Government. The emphasis instead was on the need for robust consumer protection, e.g. to address the risk of mis-selling. It was noted that the ADE's voluntary code of conduct for DSR aggregators is a good start point to build on.

# Demand side response – areas of focus going forwards

Based on feedback from our workshop and wider engagement, these are the areas to explore for further policy development:

## Smart Energy technology

- Support the deployment and uptake of smart energy devices/assets including:
- Continued rollout of smart meters, with target-based framework from July 2021
- Publication of standards on the classification of energy smart appliances
- Taking powers and regulating smart appliances
- Ensure compatibility with regulation of smart charging and consumer IoT

## DSR operation

- Support measures to address barriers to optimal DSR operation, including:
- Publication of energy smart appliance standards on small scale DSR operation
- Implementation phase of market-wide half hourly settlement programme
- Ensure that residual technical and cultural barriers (e.g. awareness) are identified and that work is underway to address them

## Cyber security

- Risk assessments will provide recommendations on mitigations and support development of a smart energy cyber security strategy
- Cyber security embedded across policies, including smart appliance regulation, standards development, load controller requirements and consumer protection

## Facilitators of flexibility (inc. aggregators)

- Appropriate policy/regulation to support this intermediary role and mitigate risks:
- Develop options via our internal cross-Govt working group, linked to smart charging, smart appliance and domestic DSR standards, etc.
- Working assumption that we need a solution in place by 2025, in part because this is when we think cyber security risks may start to become material.

## Consumer participation/protection

- Appropriate policy/regulation to ensure consumer protection in a smart energy system, in the context of wider retail considerations:
- Develop actions, including on smart tariff price comparison, consumer engagement, behavioural barriers and needs of different types of consumers for different types of DSR, and innovation to serve low income and vulnerable consumers.

# Smart Buildings Virtual Workshop (Nov/Dec)

**Issue:** To achieve our net zero targets, our buildings will need to be part of the energy system. Smart buildings would be more efficient and aid system balancing to facilitate more intermittent low carbon generation and the electrification of heat and transport.

We will need to incorporate a range of technologies that will complement each other, operate coherently and communicate together. Current policies across energy efficiency, heat, solar, electric vehicles and flexibility need to be co-ordinated for this to happen.

## Potential Aims

- To consider policy priorities for delivering **Net Zero Smart Buildings**.

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**Possible Agenda:**

- Discuss, and highlight policy overlaps with smart, and potential joint approaches with:
  - SAP, Smart Readiness Indicator, Future Homes Standard, EPCs, Building regulations, private rented sector regulations, ECO, Green Deal, energy technology list, climate change agreements etc
- Consider priority areas
- Consider cross-vector skills development.

# Breakout 2

- To what extent do you agree with the areas of focus we have identified for the next phase of work?
- Is there anything which has not been mentioned today and that we should prioritise?
- What are your priority areas for Government and Ofgem in order to achieve a smarter more flexible system? (Sticky dot exercise)

# Plenary session on overarching programme

This session will be recorded through MS teams.

- Overall to what extent do you agree with our approach to the next phase of Smart Systems and Flexibility work?
- Is there anything which has not been mentioned today and that we should prioritise?

# AOB, final words and round-up