
Flexibility Innovation Programme Update

Flexibility Innovation Programme update event, 5th April, 2022



Department for
Business, Energy
& Industrial Strategy

Welcome and introductions

Bart De Leeuw, Head of Energy Storage and Flexibility Innovation
Science and Innovation for Climate and Energy



Agenda

Welcome & Intro	14:00
Programme Background	14:10
Flexibility Innovation Programme update	14:20
Ofgem UKRI Strategic Innovation Fund	15:10
Previously supported projects	15:15
Close	15:30



Housekeeping

- The event is being recorded, and the slides presented alongside a recording of the event will be published on the [Flexibility Innovation Programme website](#)
- We will **not** be taking Q&A but would welcome comments into the Question and Answer function (top right of screen)
- There will be an opportunity for Q&A on funding competitions under the Flexibility Innovation Programme at separate events and information days, links to which will be on the Flexibility Innovation Programme website.



Programme Background

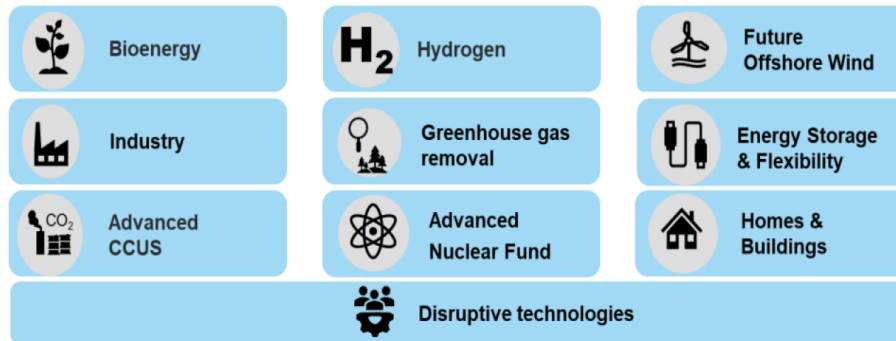
Matthew Bilson, Deputy Director
Science and Innovation for Climate and Energy

Emily Reves, Head of Strategic Delivery, Smart Energy
Energy Strategy, Networks and Markets

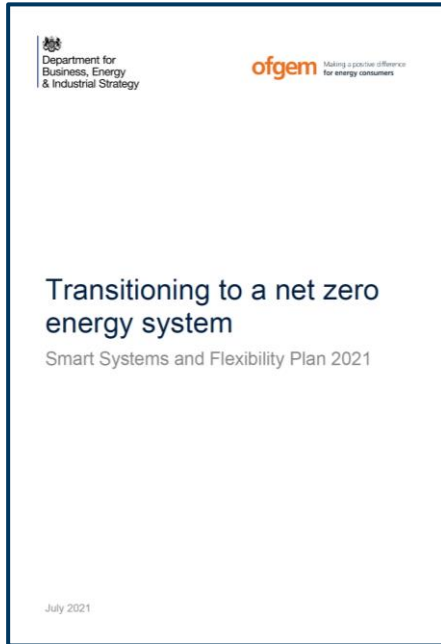


Net Zero Innovation Portfolio

- The Prime Minister's Ten Point Plan for a Green Industrial Revolution announced a **£1 billion Net Zero Innovation Portfolio (NZIP)**
- NZIP will accelerate the commercialisation of innovative low-carbon technologies, systems and processes in the power, buildings and industrial sectors.
- The portfolio will focus on ten priority areas:



Transitioning to a net zero energy system



We need much more **flexibility** in our electricity system.

The ability to shift energy in time or location to balance supply and demand is essential for decarbonising power, buildings and transport.

To meet the UK's target to have net zero emissions by 2050, we will have to shift away from fossil fuels to use low carbon sources of energy. This means:

- **More intermittent or inflexible generation**, particularly from wind and solar
- **Increased electricity demand**, as we electrify transport and heat.

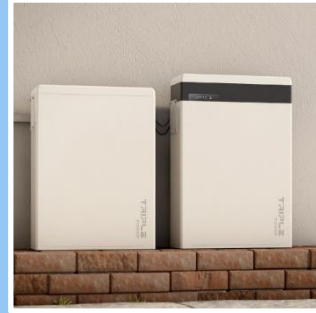
What is a smart, flexible energy system?

To overcome these challenges the system should match energy from the wind and sun to these new sources of demand and harness assets across the system, from large power stations to local-based solutions.

We need to use low carbon sources for flexibility. These low carbon sources will be used in a **smart** way – enabled by data and digitalisation.

It will be more affordable than a system with minimal flexibility, **giving consumers more control** over their bills, and more **security**. It will also create **jobs and exports** for the UK economy.

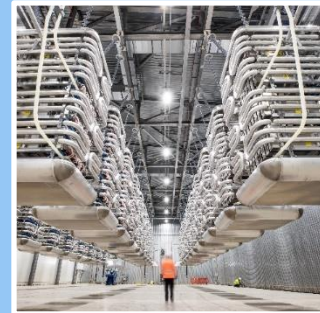
Electric batteries



Demand side response



Interconnection



Flexibility Innovation Programme update

Kate Robertshaw & Sarah Butler, Energy Innovation Programme Managers
Matthew Hamman, Energy Innovation Project Manager
Lara Ruetsch, Energy Innovation Project Advisor
Science and Innovation for Climate and Energy

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www.gov.uk/government/publications/flexibility-innovation



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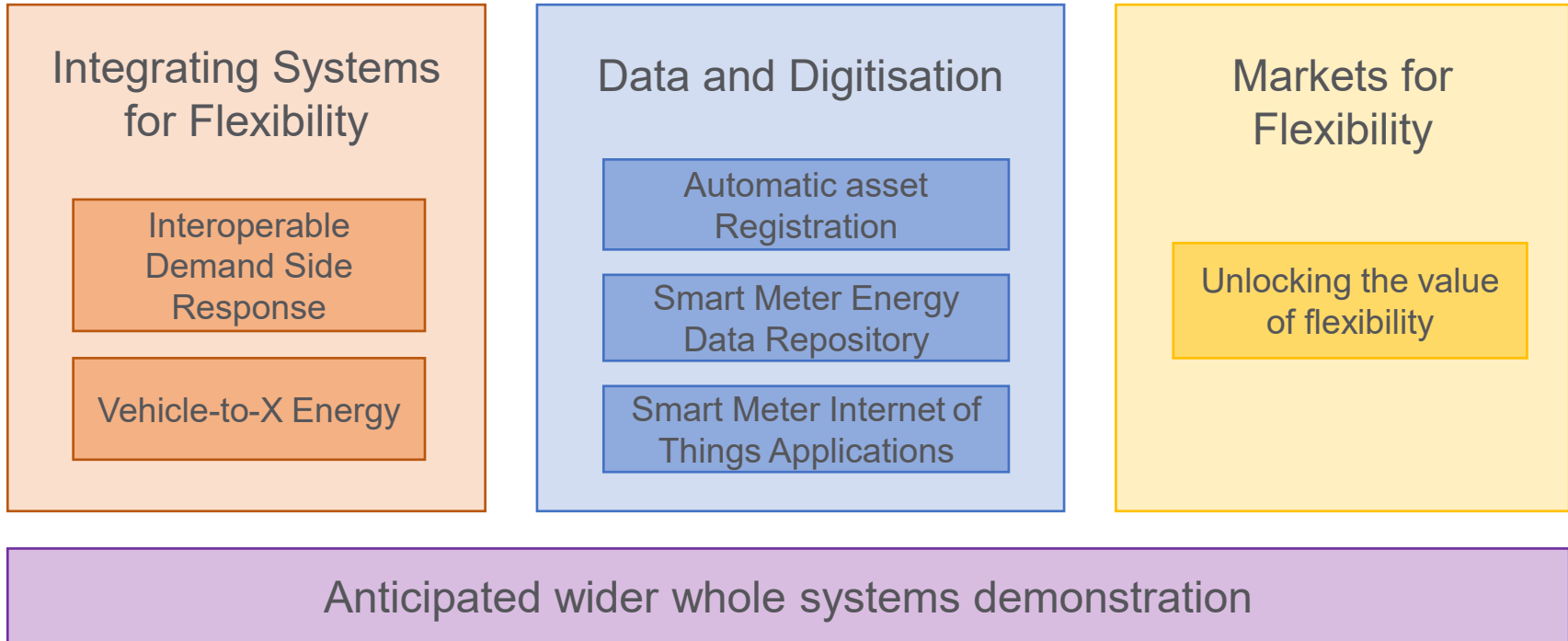
Flexibility Innovation Programme Overview

Develop innovative solutions to enable **large-scale widespread electricity system flexibility** through smart, flexible, secure, and accessible technologies and markets

Supporting the transition to a **smart, flexible, decarbonised energy system**

- Up to £65m
- Running till March 2025
- Innovation activities across 3 focus areas

Flexibility Innovation Programme Overview



Integrating Systems for Flexibility

V2X Energy

Launched 24th March

Aims to address barriers to enabling energy flexibility from bi-directional electric vehicle charging

Interoperable Demand Side Response

In development (Engagement event held 4th March)

Anticipated to support the development and demonstration of energy smart appliances for the delivery of interoperable demand side response



V2X Innovation Programme *(Phase 1 launched)*

£11.4m Vehicle-to-everything (V2X) Innovation Programme aims to address barriers to enabling energy flexibility from bi-directional electric vehicle charging

	Total Funding Opportunity	Funding route
Phase 1 – development of V2X bi-directional charging prototype hardware, software or business models	Up to £2.0m	Grants
Phase 2 – small scale demonstrations	Up to £9.4m	Grants (anticipated)

Two phase programme:

Phase 1 V2X bidirectional charging competition (Open) – deliver prototype hardware, software or business models which reduce barriers to entry for domestic or non-domestic use of V2X bi-directional chargers to provide energy flexibility services.

(Anticipated 2023) Phase 2– support small scale V2X demonstrations

UKRI – Innovate UK will deliver the V2X Innovation Programme on behalf of BEIS

Interoperable Demand Side Response *(In development)*

	Funding Route
Stream 1 – Interoperable DSR to PAS 1878/79	Grants
Stream 2 – Interoperable DSR via the GB smart metering system	Grants
Stream 3 – Interoperable energy management systems	SBRI
Laboratory testing and demonstration of interoperable DSR applications in settings indicative of the real world.	Procurement closed 7 th March 2022

Anticipated innovation activity aiming to support the development and demonstration of energy smart appliances for the delivery of interoperable demand side response via the following technical frameworks:

- Publicly Available Specification (PAS) 1878 and principles of PAS 1879
- GB smart metering system and standalone auxiliary proportional controller (SAPC) specification and PAS 1878 (building on Annex D and Annex F)

Whilst meeting the core principles of interoperability, cyber security, data privacy and grid stability set out in Smart Systems and Flexibility Plan 2021.

Data and Digitisation

Automatic Asset Registration

Launching today

Supporting the development of innovative solutions that will simplify the collection of data during the asset registration process for small-scale assets

Smart Meter Energy Data Repository

Engagement event upcoming

Exploring options for an innovation activity which may consider the feasibility of a repository for live smart meter energy data

Smart Meter Internet of Things (IoT) Applications

Engagement event upcoming

Exploring options for an innovation activity which may consider the use of the existing smart meter system network to support IoT applications



Automatic Asset Registration *(Launching today)*

	Total Funding Opportunity	Funding route
Phase 1 – Feasibility Studies	Up to £300,000	SBRI
Phase 2 – Development	Up to £1.2m	SBRI
Phase 3 – Pilot testing	Up to £500,000	SBRI

Innovation activity aiming to support the development of an automatic, automated secure data exchange process for registering small-scale energy assets and collecting and accessing small-scale energy asset data.

This will make grid connected assets more visible, helping with network planning and operability.

The solution will enable the secure, digitalised exchange of both 'static' and 'dynamic' asset data.

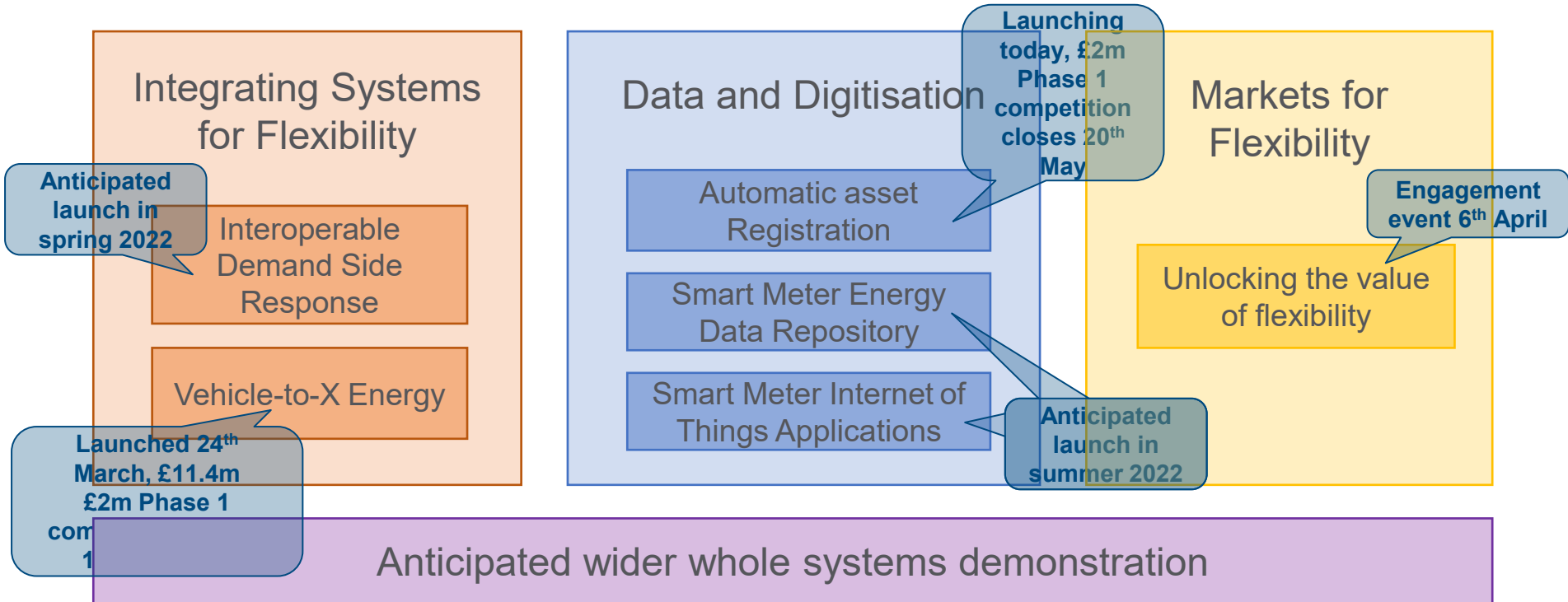
Markets for Flexibility

Unlocking the value of flexibility

Pre-procurement market engagement event for potential innovation activity in this area 6th April

Anticipate this programme would look to enable better visibility of the value of flexibility provided by Distributed Energy Resources (DERs) and demand-side technologies through modelling and the development of an innovative digital tool

Flexibility Innovation Programme Overview



Upcoming

Engagement events

Unlocking the value of flexibility	Wednesday 6th April, 2-4pm
Smart Meter Energy Data Repository & Internet of Things (IoT)	TBC

Competition Information Days

Automatic Asset Registration	Thursday 21 st April, 2-3.30pm
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Collaboration Platform

Anticipated platform to help bring innovators together	More information to come
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Ofgem UKRI Strategic Innovation Fund (SIF)

David Richardson, Innovate UK UKRI



Previous BEIS innovation funding recipients

Kelsey Devine, Piclo
Eleonore Glendinning, Voltalis



Piclo Innovation



Successful delivery of Piclo Flex and Piclo Exchange through BEIS Innovation funding



Worked with all UK DSOs and National Grid ESO and over 400 Flex Service Providers



Use of innovation funding to further develop the platform and build relationships with new partners

POWER OF HOMES: DOMESTIC DSR FOR THE UK POWER SYSTEMS

Background

- Carbon-neutrality by 2050 : electricity demand could double by 2050 + UK government aim to quadruple offshore wind capacity by 2030.
- Dealing with intermittency: for 40GW of offshore wind in 2030, 30GW of flexibility will be needed.
- UK homes potential: 20-25GW of flexible assets, and growing.

The UK Power Systems need domestic flexibility.

The benefits of automation

- Consumers do not have the time or knowledge to respond to flexibility.
- Automation allows for frequent, high speed demand-side response from both dumb and smart appliances. The technology has been deployed at scale for +12 years.
- Comfort levels can be maintained during DSR events.

Automated DSR systems will enable large volumes of domestic flexibility in the UK.

The Project

- 500 sites with electric heating, from April 2019 to March 2022.
- No upfront cost, leading to high adoption rates.
- **High levels of customer satisfaction.**
- Demonstrated how domestic properties can benefit both the power systems and the end consumers.

Lessons learnt

- Consumers are willing to share their flexibility as operated by an aggregator, provided they don't pay: as electricity markets can pay for the technology.
- **DSR can service power system needs**, with fast reaction times and a range of delivery length (from seconds to hours/days) and can provide high capacities (GW and TWh) to the system via markets.
- To unlock the investment, **all markets must open urgently to DSR**, on equal terms with generation.

Thank you for attending

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