Response to Ofgem's Call for input on the Future of Distributed Flexibility

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Introduction

Innovate UK is the UK's innovation agency, part of UK Research & Innovation. We help UK businesses to grow through innovation. Our mission is to help companies to grow through their development and commercialisation of new products, processes and services, supported by an outstanding innovation ecosystem that is agile, inclusive and easy to navigate.

Since 2018, UKRI's Prospering from the Energy Revolution (PFER) Challenge programme has invested £104 million in industry, local government bodies, not for profits and research to accelerate innovation in smart local energy systems. We have compiled the largest body of evidence on place-based net zero delivery ever in the UK, with 93 projects and 301 partners, and a co-investment of £783m so far from match and equity funding. All project findings, programme learnings & insights can be found on the programme website[1].

The programme's flagship projects include three demonstrators (LEO, ESO and Reflex) and 10 'detailed design' smart local energy system projects that are designing and operating smart local energy systems across the UK. All of these projects are working with local network operators (DNO/DSO, GDN, heat networks and private wires) as well as local authorities, communities and private enterprise to plan, design, deliver and operate smart local energy systems for towns and regions across the UK.

The programme also funded the EnergyREV academic consortium and the Energy Systems Catapult led 'Energy Revolution Integration service' (ERIS). ERIS is developing the local authority "Net Zero Go" toolkit and Local Area Energy Plans for regions as part of the programme. The programme also funds over 20 data and digital projects and collaborates with Ofgem and DESNZ (Department for Energy Security and Net Zero) as part of the Modernising Energy Data (MED) initiative. This has involved helping to fund and set up the Energy Data and Energy Digitalisation Taskforces.

Improving outcomes for people, communities and businesses

Market design and reforms should start with the users of the system, with focus on delivering improved outcomes for people, communities and businesses who pay for the system. Net zero provides an excellent opportunity to improve outcomes for society if we put people at the heart of the system. To date, we have not done this and we risk missing this opportunity by designing the market with a

[1] https://iuk.ktn-uk.org/programme/smart-local-energy-systems/

presumption that people, communities and businesses are passive price takers, rather than active (or passively active) participants in the energy system.

We agree that CER should be the priority, as we need to put people at the heart of reforms and markets. We also need to recognise that actors at the grid edge (people, businesses, DERs) will behave in different ways and need to ensure markets and flexibility work for all. The ability to be flexible in a net zero energy system will ensure that we deliver net zero at least cost, but this also gives us an opportunity to properly put people at the heart of the energy system and ensure that it works for all. If we do not put people at the heart of the system and markets, then we risk introducing significant inequalities in how the system works for all.

Evidence from the PFER programme helps show the benefits from, and potential mechanisms for optimally incentivising grid-edge flexibility. EnergyREV's research show between £0.9 – £3.1bn / year[2] saving to overall power system build cost if grid-edge flexibility is optimized. Morstyn et al's paper and associated work sets out similar results on potential for reduction in network reinforcement needed, but also outlines how multi-scale, multi-market coordination might work in practice for flexibility, operating within uncertainties of supply and demand by using probabilistic methods to ensure reliable systems[3].

A vision

PFER has evidenced the 'case for change' and a need for a common vision. This common vision needs to put people at the heart of the energy system and ensure that people, communities and businesses benefit from the net zero transition. The role of distributed flexibility for delivering these improved outcomes can form a part of this vision. The need for "An overarching strategy and vision for energy system decarbonisation" is one of the central recommendations from the "Enabling Decentralised Energy Innovation"[4] report commissioned by Innovate UK. This vision should be at the heart of market and system change and reforms, including REMA, flexibility markets and retail reform.

We are very supportive of the proposals in this call for input. We do, however, believe there need to be significant reforms to the retail market if we are to deliver a flexible, decentralized energy system that delivers improved outcomes for people, communities and businesses. We believe that reforms to the retail framework can and should improve competition and innovation for consumers, and enable customer focused businesses to develop tailored propositions for its target customer segments. We do not believe the current retail market arrangements will deliver these improved outcomes for people, communities and businesses including unlocking flexibility at scale.

Common energy digital infrastructure

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[2] https://www.energyrev.org.uk/outputs/insights/benefits-of-flexibility-of-smart-local-energy-systems-in-supporting-national-decarbonisation/

[3] T. Morstyn, I. Savelli, and C. Hepburn,"Multiscale design for system-wide peer-to peer energy trading," *One Earth*, 2021. https://www.energyrev.org.uk/outputs/academic-outputs/multiscale-design-for-system-wide-peer-to-peer-energy-trading/

[4] https://www.ukri.org/wp-content/uploads/2023/02/IUK-03022023-Enabling-Decentralised-Energy-Innovation.pdf

A common energy digital infrastructure is needed for a net zero energy system and should be developed as soon as possible. The Energy Digitalisation Taskforce touched on many aspects of infrastructure and governance, and distributed flexibility provides a key use case for joining up and delivering coordinated infrastructure needed for a net zero energy system.

The call for input discusses how 'thin' a layer of infrastructure is needed. Political imperatives may dictate that this layer is defined as thinly as possible to allow for market competition to define the best solution as much as possible. While this is desirable in many ways, this requirement should be balanced with the pace of change needed in delivering a digitalized energy system, fit for the future. It is likely that a more significant centralized digital infrastructure will enable a faster pace of change more appropriate to the current situation rather than allowing market evolution through competition and standard development. The real competition need will be in developing and delivering new services by using new access to open and shared data sets via the system digitalization. This is where competition in the market will be of most value, and this should not be confused with competing for the centralized infrastructure deployment.

One promising solution developed as part of PFER is the use of 'open standards' and 'open source' software. We believe these should be considered for implementation of common digital infrastructure. Open source software offers a number of advantages to the sector, particularly around governance. Monopolies and vendor lock in should be avoided where possible. Open source approaches and governance provide an opportunity to develop centralised infrastructure whist avoiding the pitfalls of proprietary software and vendor lock in due to intellectual property rights. Open source software and governance can also encourage collaboration across the sector, and ensure that digital infrastructure is governed for the needs of the entire sector, and not just a single commercial entity. An open source development and governance approach can also allow government and the regulator to be involved in the governance of critical national infrastructure.