EIP023
How can we better serve our Worst Served Customers?

Problem Statement Details

Recognising limitations in its Interruptions Incentive Scheme (IIS), Ofgem introduced the WSC mechanism in 2010. The mechanism allows DNOs to invest in the network for customers experiencing the very worst quality of supply (QoS) that otherwise would not attract network investments, including IIS.

During RIIO-ED1, the mechanism allows DNOs to invest where customers experience twelve or more high-voltage faults over a three-year period with a minimum of three faults in each of the three years. For RIIO-ED2, Ofgem has worked with DNOs to review the WSC mechanism. As well as changing the qualifying threshold – reducing the minimum number of high-voltage faults in each year to two, while keeping the overall number of faults at twelve – Ofgem has enhanced the mechanism, making it more flexible, removing the efficacy constraints that limited available scope and solutions, thereby allowing DNOs to bring forward more significant mitigation.

Despite these changes, the mechanism remains purposely specific and narrow in its scope. The result of the qualifying criteria changing means that more customers will be classified as worst-served and spread more thinly across the network topology. This results in smaller pockets of customers experiencing poor levels of service.

Traditional network reinforcement, particularly involving undergrounding of overhead lines, overlay of old cable, or ringing in HV spurs/tees can take two or more years to deliver – often held up by legal consents. Furthermore, these solutions may be seen as not cost effective when involving only 1-50 customers.

An aging population has resulted in an annual increase in customers that can be deemed as vulnerable, many of which are on the Priority Services Register (PSR), related to e.g., age and medical needs. This number is predicted to increase through the course of RIIO-ED2, with customers becoming more reliant on a resilient electricity network. Many of these PSR customers are located in remote rural areas where restoration times post-fault may take longer. Additionally, there may also be reliance on electricity for local water pumping stations for example, either fresh or sewerage, and loss of these would further impact vulnerable customers.

Key Stakeholders

Worst Served Customers – improving the quality of supply to these customers will benefit this group.

Network Operations – A more reliable/resilient network would mean that a network fault is less likely to occur. Enhancement of the network should also mean quicker response is possible if, for example, better network automation is in place.

Network Control – Remote control of the network shall be enhanced.

Asset Management – The solution would allow quicker enhancement of the electricity network by Network Planning Teams, and potentially less reliance on a legal wayleave/easement process.

Target Market

UK Power Networks plans to invest up to £28m which will deliver at least 25% improvement in reliability for eligible WSCs. We expect that the equivalent of 10,000 customers per annum will see an improvement in the reliability of their power supplies from this investment. Where costs of traditional solutions prohibit their implementation, we wish to find innovative solution to improve service received by WSCs.

Vulnerable customers would see an improvement to their service in a shorter timescale than is allowed by traditional types of reinforcement. This solution would be directly beneficial to UK DNOs with Rural or mixed Urban/Rural type networks, particularly those with Worst Served Customers as defined by Ofgem.

Enablers and Constraints

- Customer data enables us to pinpoint where our PSR customers are located which would help with delivery of targeted improvements/solutions.
- Differing Network Standards across DNOs could require alternative solutions.

Better Spur Protection was a UK Power Networks' innovation project that aimed to see whether Fuse Savers could be installed on "clean" feeders that do not have reclosers and auto-sectionalising links (ASLs) and prove if they could operate in a superior fashion to ASLs and provide greater information regarding normal and fault conditions on the spur. Customers would benefit from the Fuse Saver as the feeder would retain the current level of protection but without the short interruptions that occur from the reclosers operating to activate the ASLs. The project proved the device worked as expected, could be safely installed by HV live line teams, and could work in the same manner as an ASL. However, this project only addressed short interruptions and ensuring these customers remain on-supply during a power cut remains a problem. The cost of improvement has constrained the ability to roll out a viable solution.

Silent Power was a Northern Powergrid project that was successful in installing a 40 kVA electrical energy storage system (EESS) into a standard sized fleet vehicle to restore power in the event of a network fault in place of a diesel generator. Although successful, this has limitations as a short-term solution rather than an enduring solution for worst served customers.

Scalability and Target Implementation Date

A successful solution should enable rollout across rural-type networks across Great Britain within a short timeframe. Implementation of options within RIIO-ED2 Control Period.

Innovation Strategy Target Areas

Innovation Theme	Target Area	Primary or Secondary
Data and Digitalisation	The shift to data-driven, digitally-enabled networks is critical as we move towards Net Zero. We need your help to drive standardisation, interoperability, security and digital skills whilst accelerating our transformation to data-driven networks by the mid 2030s.	Not applicable
Flexibility and Market Evolution	Energy networks must quickly and efficiently respond to the rapidly evolving needs of the energy system transition. We need your support to eliminate barriers to new market entrants, deploy novel commercial and network management solutions whilst ensuring fair participation and eliminating regulatory barriers within the RIIO-2 price control periods.	Not applicable
Net zero and the energy system transition	In order to meet the UK net zero targets of 2050 we must start converting our networks to deliver low carbon fuels today. We want to work with you to develop the role of our gas networks into the future by investigating, trialling, implementing and delivering safe, low carbon alternatives to natural gas such as Hydrogen.	Not applicable
	Net Zero requires connection of more low and zero carbon sources of energy generation, storage and demand to both the transmission and distribution networks. We need your innovative methods for effective network management and accessing flexibility to improve visibility, forecasting and modelling of low carbon technologies.	
Optimised assets and practices	Innovation has a key role to play in ensuring our networks continue to remain reliable, safe, secure and resilient to our changing climate. We are constantly looking to improve and welcome support to identify methods to prevent interruptions, ensure resilience, reduce climate impact and future-proof our networks.	Secondary
Supporting Consumers in Vulnerable Situations	Equality and fairness are the foundations of a just transition to Net Zero. We hope you can provide insight into the transient and situational nature of vulnerability and how we can overcome the impact the energy system has on consumers, building strong relationships for the future.	Primary
Whole Energy System Transition	The energy system must consider the full range of opportunities, risks and interdependencies that exist across the energy networks to integrate and optimise them in a way that best serves the consumer. We are looking for ways to improve visibility of the networks and transitional options, co-ordinate approaches and collaborate across the UK.	Primary