EIP037

How can we optimise future asset and system reliability?

# Problem Statement Details

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| Electricity Network Owners require physical access to their assets to deliver critical asset maintenance and interventions, and enable new, transformative, decarbonised infrastructure and grid connections. This is achieved through the planned outages submitted to and approved by the NGESO. However, outages are becoming more difficult to secure, due to:* More connections and more critical connections to enable a decarbonised grid,
* Greater demand (due to electrification of transportation and heating),
* Greater intermittent (renewable) generation,
* Greater necessity for network availability, security and reliability, and
* Demand side response (DSR) increasing unpredictability of network availability and, subsequently, outage planning capability.

Failure to deliver critical asset maintenance and new infrastructure has impacts on:* Safety – failure to maintain asset health can lead to many different (type and severity) risks, ranging from compliance to catastrophic events of asset failure, which cause harm to people (e.g., site engineering, general public) and damage to valuable, critical assets/network.
* Network Reliability – inability to manage network assets decreases the asset and overall network reliability due to higher probability of asset degradation and condition.
* Facilitating and connecting new generation, demand, and infrastructure – not delivering the critical new connections & infrastructure will reduce the rate at which Great Britain can achieve Net Zero and the subsequent greater network flexibility.
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# Key Stakeholders

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| **Beneficiaries** – Electricity Network Owners & Asset Managers (e.g., Transmission Owners, Offshore Transmission Owners); enable electricity infrastructure owners to effectively, affordably (for consumers) manage respective asset bases.**Partners/Third Parties** – This challenge aims to enable the management and planning of the GB Electricity Network assets whilst delivering strategic network development and transformation. Therefore, this challenge may have interactions with industry-wide/national strategic network planning activities, such as Network Planning Review (NPR) being led by the ESO, and the Electricity Transmission Network Planning Review (ETNPR) being led by Ofgem. |

# Target Market

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| **GB Electricity Network Owners** – This challenge aims to enable all GB electricity network owners i.e., TOs, DNOs, OFTOs… (with potential application to gas networks/other utilities) to optimally deliver asset management interventions whilst maintaining high reliability and security of supply and delivering major infrastructure and connections. |

# Enablers and Constraints

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| Existing innovation project; NGESO: The Virtual Energy System (an NGESO SIF-funded project) aims to create a virtual model of the UK Energy Infrastructure for forecasting, scenario planning and constraint analysis. This tool would be valuable for the assessment of outage scenarios and the capacity for planned outages on the continuously developing network. |

# Scalability and Target Implementation Date

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| Target implementation date: prior to 2030, to align to major UK infrastructure transformational targets, including the electrification of transport and heat, and major change to the GB Energy Mix (e.g., 50 GW 2030 East-Coast offshore wind generation target). This would enable electricity network asset owners to (safely and optimally) plan and deliver asset management and new infrastructure works alongside the energy transition. |

# Innovation Strategy Target Areas

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| 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. | Secondary |
| 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. | Primary |
| 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. | Primary |
| 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. | Not applicable |
| 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 |