

# EIP007

## How does extreme heat impact network assets?

### Problem Statement Details

The strain that extreme heat poses on critical infrastructure is unknown, let alone the impact of rapid temperature stepped change (e.g., Denver experienced a 65°C drop from 50°C to -15°C in just 16 hours).

We know heat and cold waves affect the normal operation of electrical components. With climate change, these phenomena will be on the rise and hence a proper optimisation analysis is imperative to control the associated risks, especially for the aged equipment.

Some coordinated approach to optimise assets output and equipment operations in substations is necessary to support clean energy delivery even under extreme heat situations. Optimising in extreme heat or rapid temperature fluctuations in a power system environment is key.

Currently, there is no method to clearly indicate how service delivery is affected by rapid heat changes and high temperature occurrences. Research to-date includes literature on efforts underway in improving risk modelling and strategies for other extreme weather events besides heat.

Heat waves may lead to power system malfunctions that can disrupt service delivery or in worst cases relatively short outages.

### Key Stakeholders

Asset Management Teams and System/Network Operators across all network operators (e.g., NG, TNOs, DNOs, ESOs).

### Target Market

Assuring cheaper and adequate power supplies under extreme weather conditions to millions of customers.

### Enablers and Constraints

Enablers: Asset management strategy and policy; resilience strategy.

### Scalability and Target Implementation Date

Once the solution has been presented and approved, a pilot phase to implement the solution can be run at NGET's Deeside Centre of Innovation during 2023/24.

## Innovation Strategy Target Areas

Innovation Theme	Target Area	Primary or Secondary
<b>Data and Digitalisation</b>	<p>The shift to data-driven, digitally-enabled networks is critical as we move towards Net Zero.</p> <p>We need your help to drive standardisation, interoperability, security and digital skills whilst accelerating our transformation to data-driven networks by the mid 2030s.</p>	Not applicable
<b>Flexibility and Market Evolution</b>	<p>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.</p>	Not applicable
<b>Net zero and the energy system transition</b>	<p>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.</p> <p>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.</p>	Secondary
<b>Optimised assets and practices</b>	<p>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.</p>	Secondary
<b>Supporting Consumers in Vulnerable Situations</b>	<p>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.</p>	Not applicable
<b>Whole Energy System Transition</b>	<p>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.</p>	Primary