

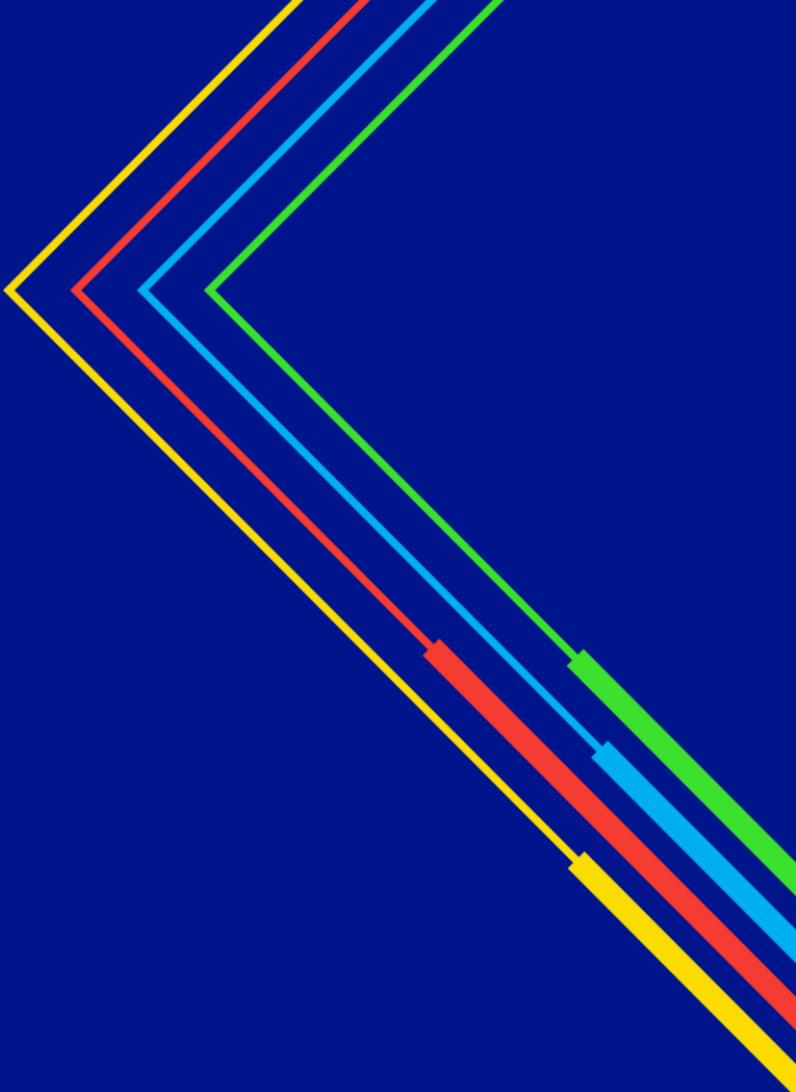


Electricity
Distribution

EIP126 - Optimising Asset Replacement Timing

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Tuesday 5th March 2024

nationalgrid



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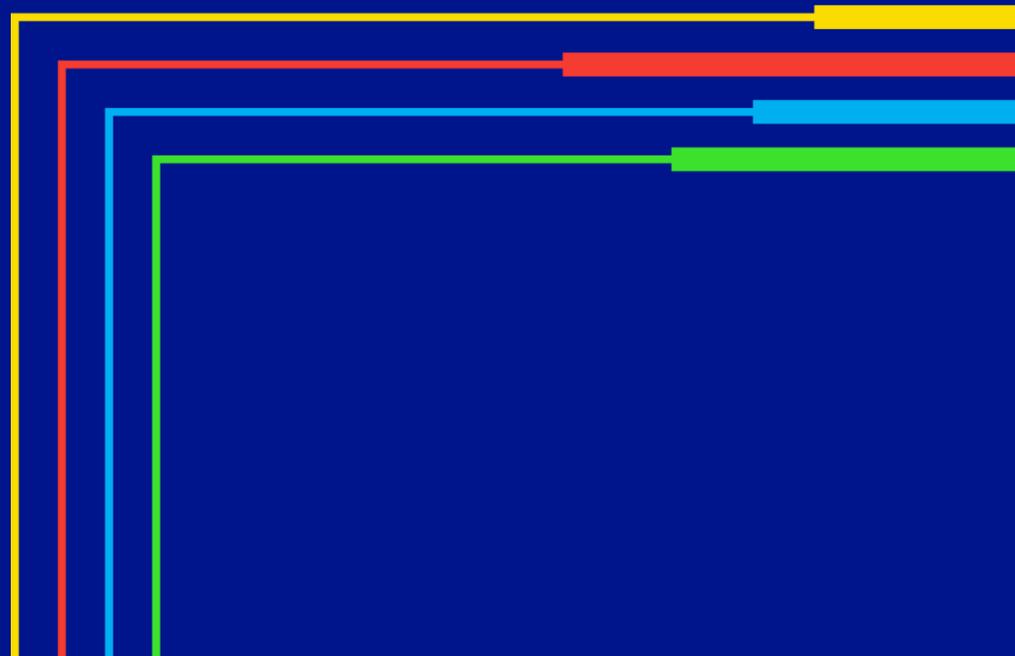
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01

The Problem



EIP126: Maximising asset lifespan increases operational efficiency

DNOs are always searching for solutions to increase the efficiency of their network, particularly around asset optimisation

- Most important towards the end of an asset's lifecycle.
- Limited options for re-use after decommissioning.
- Benefit if we optimise the replacement of ageing assets.
- Trade off between cost of managing asset, and benefit of extending asset lifespan.



Recent developments in Asset Management

Fixed Period Replacement

- Historically DNOs would replace network assets on a fixed asset lifespan basis.
- For instance, 11kV switchgear has a mean lifespan of 40 years.

Network Asset Risk Metric

- Network Asset Indices have three measures:
- **Health Index (HI)** – health of the asset, related to its Probability of Failure;
- **Criticality Index (CI)** – consequences of an asset failure. Quantified in terms of the impact upon the environment, network performance, safety and financial implications
- **Risk Index (RI)** – monetised measure of the overall long term condition-based risk for the asset,

Survivor Models

- Age based modelling, using age as a proxy for condition.
- Relies on knowing:
 - Current age of asset population
 - Mean life expectancy
 - An assumed distribution of replacement
- Used to provide an indication of the volumes of required activity where deterioration modelling is less reliable.
- Forecast of the probable volume of assets that require replacement not specific assets.

EIP126: What are we looking for?

We would be interested in understanding if there are underlying benefits from potentially increasing and / or decreasing the lifecycle of our assets.

We would then like to quantify the potential benefits from doing this.

Use of Flexibility

- How beneficial is procuring flexibility or load balancing techniques in slowing the aging of assets?

Refurbishment

- How beneficial is refurbishment, does it provide adequate life extension for the cost of doing the work?

Sweating Assets

- Can risk be managed by re-usable monitoring devices?
- What impact would amended maintenance & inspection regimes have vs their cost?
- Is it appropriate to sweat an asset that is in poor condition? etc.

EIP126: Data Quality issues mean Machine Learning / Artificial Intelligence solutions may not be appropriate

Our historic fault dataset has data quality issues and records of asset condition may not fully explain reasons for asset failure



Understanding the links between inputs and outputs need to be established to know cause and effect

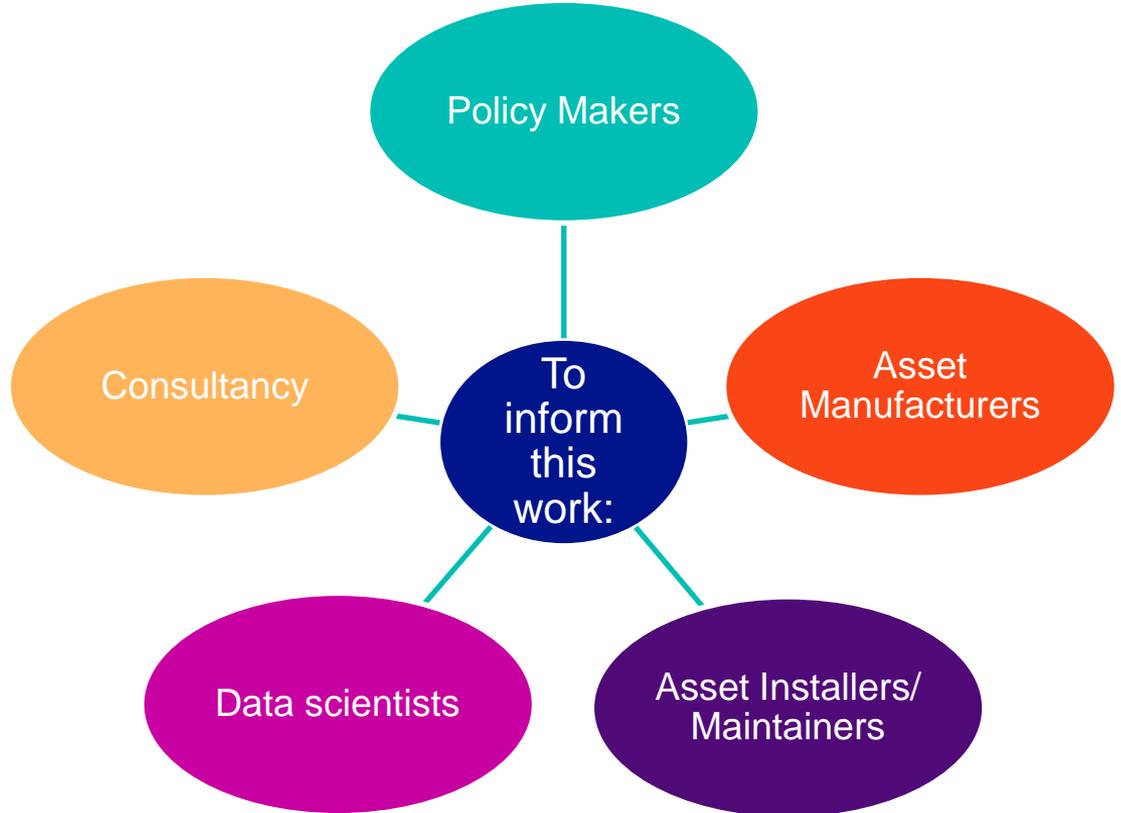


Consistency of outputs is essential to providing an actionable schedule of work.

EIP126: We seek a collaborative approach blending expertise

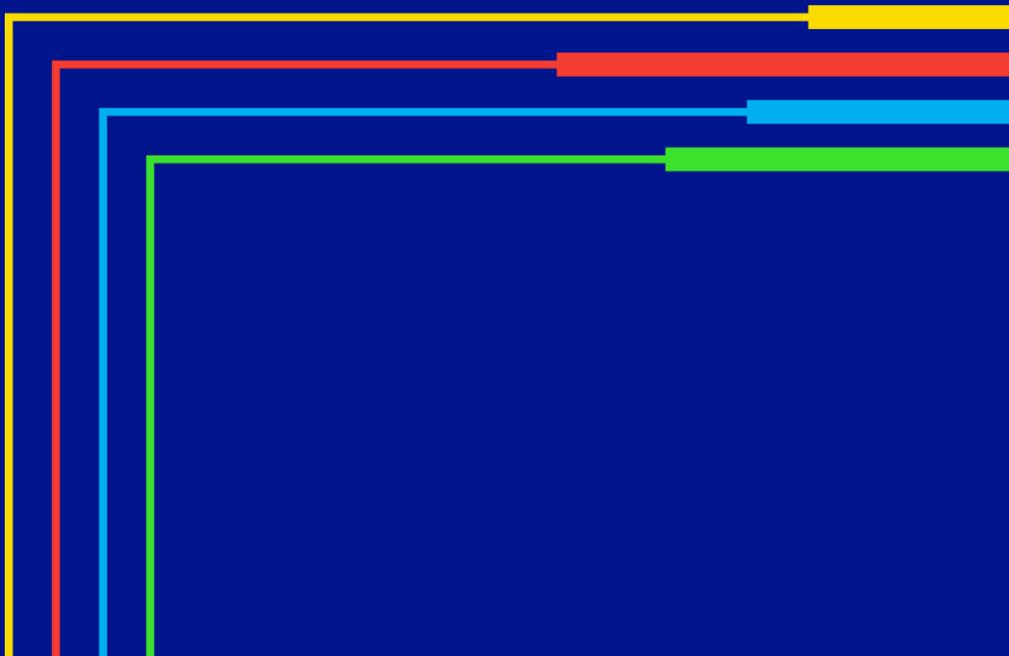
Successful proposals would bring a range of expertise:

- Verified asset data and an understanding of current practices
- DNO asset management experience



02

Solution Constraints



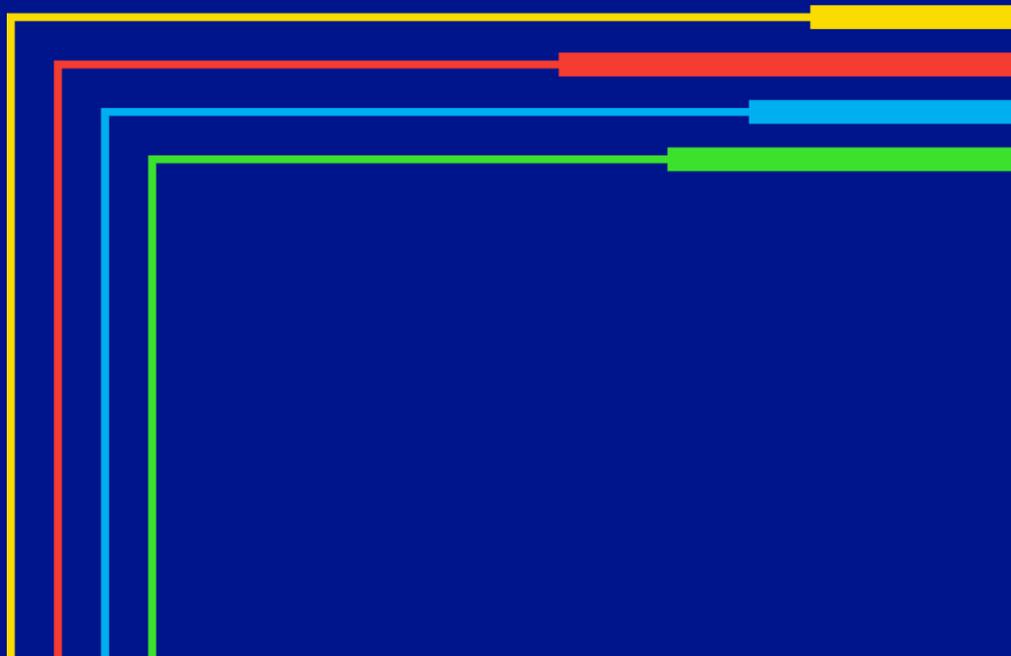
EIP126: Solution Constraints

The solution must;

- Consider a range of assets and manufacturers
- Meets the requirements of relevant industry codes, technical specifications and engineering recommendations
- Be applicable to all distribution voltage levels
- Be evidence based following risk based decision making to allow us to make justified decisions on making updates to asset policy
- Consider impacts on reporting of Outputs under RIIO ED2.

03

Contacts



Contacts

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