

Innovation Needs

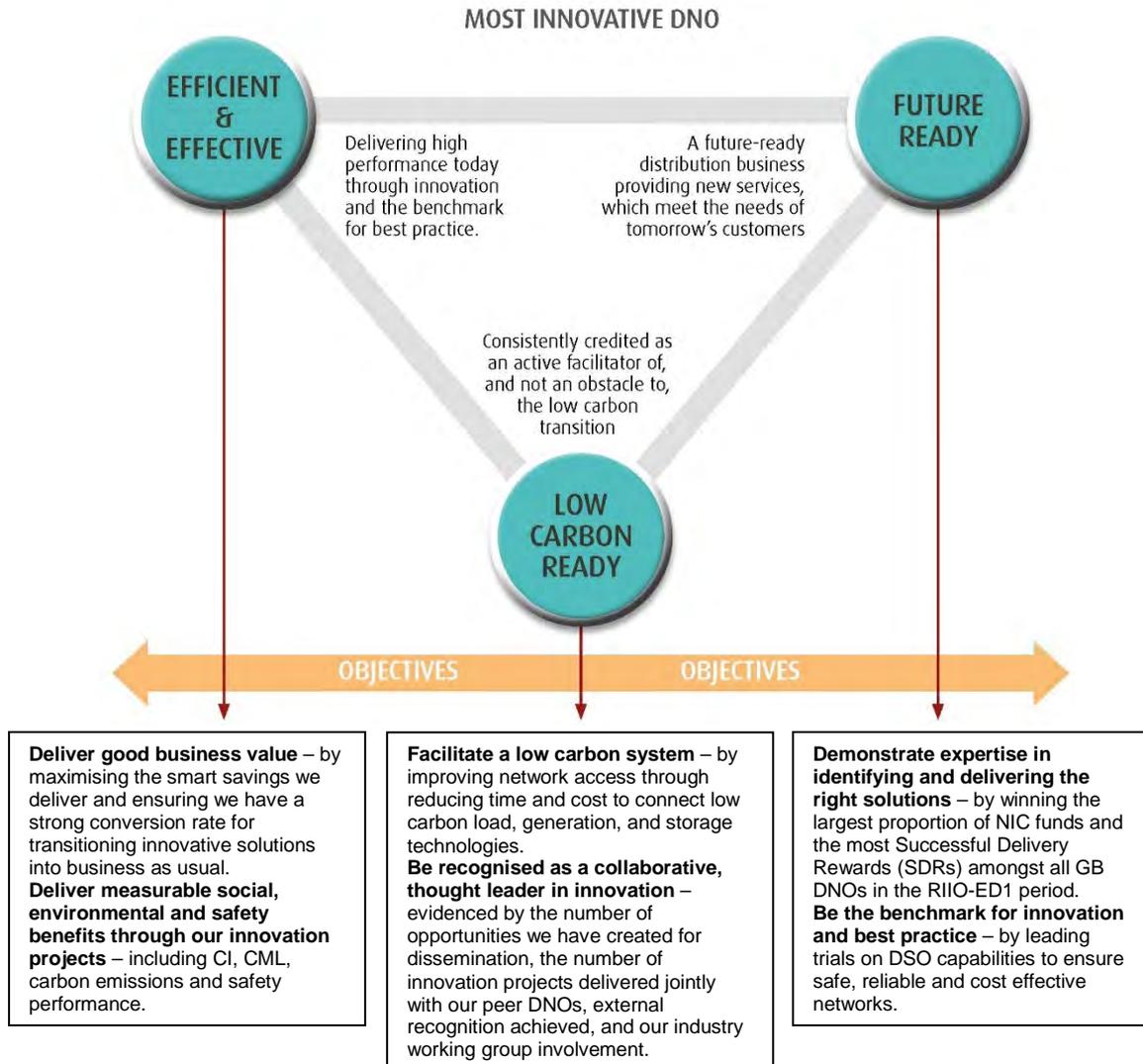
UK Power Networks challenges requiring innovation
October 2017 edition



1 Introduction

1.1 Innovation strategy

At UK Power Networks we are continually seeking to remain the lowest cost distribution network operator in the UK. To do this we have to innovate to continue delivering new solutions to both the challenges of today and the potential challenges of tomorrow. As such we focus our innovation across three areas.



Further details on these areas and how we prioritise our innovative ideas can be found in our [Innovation Strategy](#).

1.2 Innovation needs

This document has been compiled by UK Power Networks to enable third parties to present innovative solutions which may address our business needs. It is not comprehensive, and offers no guarantee that ideas presented to address these needs will be purchased or developed through funded projects.

UK Power Networks also post specific Calls for Innovation to address business needs through the [Energy Innovation Centre](#) (EIC) from time to time. Please sign up to the EIC to receive notice of these calls.

1.3 Electricity industry innovation strategy

The Electricity Networks Association (ENA) is currently developing an innovation strategy for the electricity industry. The [plan](#) for development of the strategy is available on the ENA website with the strategy due for publication in March 2018. This will be consulted on before publication. The industry innovation strategy contains a more comprehensive list of challenges to overcome than those listed here. Some of these challenges will be less applicable to UK Power Networks or of a lower priority for investigation.

For reference the ENA's [Smarter Networks Portal](#) includes a complete list of all current and previous innovation projects that have been funded under the Network Innovation Allowance (NIA) and Network Innovation Competition (NIC) mechanisms. Please check and see what is currently being done / has been done previously before proposing an innovative solution.

2 Innovation solutions needed

2.1 Forecasting

Forecasting is a key capability area for a Distribution System Operator (DSO). As network power flow becomes more variable and more generation and dispatchable energy resources are connected to the network, there will be greater challenges forecasting the requirements of the network. This has an impact on network operation from post-fault supply restoration to long term investment planning. We are carrying out work looking at short and medium term forecasting however we are keen to further develop our long term forecasting capabilities. Inaccurate forecasting could lead to future network reliability challenges or over-investment, with moveable energy resources such as electric vehicles presenting both challenges and opportunities.

2.2 Community energy and Smart Cities

In order to support economic development and growth in community energy schemes it is likely that new mechanisms for energy trading and use of system charging will be required. In order to facilitate the economic development of the network it would be beneficial to be able to co-ordinate local area planning and investment, potentially allowing other parties to drive optimisation, with assigned responsibility for security of supply (note: this is a focus area we are developing for a 2018 NIC bid).

2.3 Enhanced visibility and control

We are looking to improve the overall visibility and control of network data. This includes looking at how network data is sensed, how the data is stored (locally or centrally), processed (locally or centrally), transported and analysed. There is ongoing work in this area but we are open to innovative ideas to further improve our business.

2.4 Link box safety

Link boxes have been known to fail disruptively due to water ingress and overheating. We are keen to see effective, scalable and cost-efficient techniques to prevent, predict, detect or measure water ingress into link boxes. Communication to link boxes presents a particular challenge. Additional value can be gained from monitoring solutions if they can also communicate electrical parameters.

2.5 Protection operation and fault level

As network arrangements and fault levels become more variable it will be required to ensure that network protection continues to operate correctly in all circumstances. Non-traditional network protection which is not based upon magnitude of fault current would be of interest.

2.6 Fault response and repair

We seek to reduce the customer impact and cost of identifying, locating and repairing network faults. Ideas should be focussed at preventative, reactive and monitored solutions.

2.7 Condition assessment of linear assets

Across UK Power Networks there are around 140,000 km of underground cables and 45,000 km of overhead lines that are up to 100 years old. The condition of some of these assets is well known while others less so. We are keen to identify methods of better understanding the condition of these assets in an economical manner (note: we are not interested in partial discharge techniques).

2.8 Environmental impact

In all aspects from vehicle emissions to network losses UK Power Networks is seeking to reduce the environmental impact of running the network, while minimising the overall cost to its customers.

2.9 Distribution overhead line structures

The negative health and environmental benefits of creosote have long been understood however wooden poles preserved with it remain the most cost effective distribution overhead line structure in many circumstances. We are seeking alternative materials and structures that would present a single or range of cost-effective alternatives.

2.10 Mobile generators for emergency supply restoration

When it is not possible to restore an electricity supply in a timely manner temporary diesel generators are often used. We are seeking alternative, lower carbon, cost effective alternatives to provide this function with a lower environmental impact. We are also seeking solutions to ensure the safe and secure connection and earthing of these devices in urban and rural areas.

3 Actions

If you believe you have a potential solution to address the challenges discussed here please contact us at innovation@ukpowernetworks.co.uk stating the challenge you are looking to address and the benefit your proposal will bring. We will then review your idea and get back to you requesting more information or providing some initial feedback. This document offers no guarantee of funding or product purchase.

Please check your proposal against publicly available information including the ENA's [Smarter Networks Portal](#) before submission to confirm the novelty of your proposal. This is especially important if you are seeking funding to support product development.