



# Network Innovation Allowance Annual Summary 2015/16

**July 2016**

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Author	Chris Goodhand

## 2015/16 NIA Annual Summary

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### Revision Record

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### Introduction

1. This report has been prepared by Northern Powergrid to inform interested parties of the innovation activities of its electricity distribution licensees, Northern Powergrid (Yorkshire) Electricity Distribution plc, and Northern Powergrid (Northeast) Ltd. It covers the period from 1 April 2015 to 31 March 2016.
2. A single report has been prepared because the two licensees are operated under common management, sharing best practice between them. Our approach to research and development is no exception, and we draw no arbitrary distinction in the innovation carried out for the two licensees and our innovation strategy is designed to be equally applicable across our full geographic area of operation. Projects and programmes are therefore set up and progressed jointly for both licensees.
3. The report focuses upon research and development work eligible for Ofgem's Network Innovation Allowance (NIA) however some details of our other activities are given where necessary to provide a broader context for some of the innovation being undertaken within the company. Innovation is funded through a variety of routes including other price control revenues, specialist industry funding sources (e.g. Innovate UK) and participation with universities (funded by UK research councils).
4. The report has been prepared in accordance with standard condition 46 of the electricity distribution licence, the associated Regulatory Instructions and Guidance (RIGs) and the Electricity Network Innovation Allowance Governance document. In particular the obligations specified in sections 6.6 and 6.7 relating to the requirements for an annual summary of NIA activities.

### Progress of Innovation Activities

5. For the reporting year Northern Powergrid has participated in 16 separate NIA projects. Nine of these are collaborative projects with at least one other GB electricity distribution network operator (DNO) or gas distribution network.
6. We have at least one collaborative activity with each of the other DNOs. We also have similar activities with some GDNs. This is very much in line with the view expressed in our innovation strategy; we would seek to undertake joint activities wherever possible, both for improved learning and project quality and to maintain good cost control.

7. As discussed in last year’s IFI report we deliberately reduced the number of projects that we were running during the last year of the previous price control period in anticipation of the change to the new innovation governance framework being introduced at the start of the ED1 period. We are still in the process of building the portfolio of innovation projects to the previous level. This ramp up is taking longer than anticipated as we are now investigating larger projects with potentially larger benefits. These do require more investment of time and effort in project design and mobilisation but their impact on the delivery of the innovation strategy will become apparent during 2016/17.
8. The following table shows all of the projects which have been active during the reporting period:

Project	Ofgem NIA Project Ref.	Project Type
Vonaq Utility Pole Strength Measurement	NIA_NPG_001	EIC collaboration, NPg lead
Integrated Substation Condition Monitoring	NIA_NPG_002	Northern Powergrid activity
Smart Data	NIA_NPG_003	Northern Powergrid activity
Development of an Improved Distribution Load Estimates Methodology	NIA_NPG_004	Northern Powergrid activity
Activating Community Engagement (ACE)	NIA_NPG_005	Northern Powergrid activity
Modelling Asset Risk	NIA_NPG_006	Northern Powergrid activity
Foresight - LV Pre-Fault Recognition and Management	NIA_NPG_007	Northern Powergrid activity
Development of Oil-Filled Cable Additive	NIA_NPG_009	EIC collaboration, NPg lead
Pollywood - Alternative Wooden Pole System for OHL	NIA_NPG_010	Northern Powergrid activity
Beyond Visual Line of sight Aerial Inspection Vehicle	NIA_SGN_0035	EIC collaboration, SGN lead
Improved Statistical Ratings for Distribution Overhead Lines	NIA_WPD_008	ENA collaboration, WPD lead
Project Concur	NIA_NGN_142	EIC collaboration, NGN lead
Reactive Power Exchange Application Capability Transfer (REACT)	NIA_NGET_0100	ENA collaboration, NGET lead
Review of Engineering Recommendation P2/6	NIA_ENWL_003	ENA collaboration, ENW lead
Smart Grid Forum Work Stream 7 - DS2030	NIA_NGET_0154	ENA collaboration, NGET lead
Sustainable Multistorey Communities	NIA_NGN_068	Northern Gas Networks led collaboration

9. The table identifies those projects where we are sole participant or, where we are working alongside other licensees, the nature of the collaboration involved. For projects where Northern Powergrid is either sole participant or, in the case of collaborative innovation, where Northern Powergrid is the designated lead licensee we have posted the required annual progress update on the ENA Smarter Networks Portal.
10. In addition to these activities we also participate in several activities in a supporting role, either as engineering consultants providing insight into the network compatibility issues or acting in a more active steering role. These projects are not formal NIA funded activities but are important in allowing us to influence the development activities of others and to stimulate the market. Examples of these projects include a Horizon 2020 funded smart cities activity, the development of new vehicle battery management systems and contributing to regional and sub-regional economic and innovation strategy development. By interacting in this way with others’ projects we help them to deliver better learning outcomes and we leverage our innovation funding by accessing additional understanding at relatively low cost.
11. Internally, within Northern Powergrid, additional innovation is also being undertaken. Several activities are underway which are aimed at delivering improvements in our customer facing processes such as delivery of connections where we have been re-engineering processes in the year to improve customer satisfaction. Again these are not NIA funded but are, nevertheless, innovative activities. Where we see these improvement activities are unable to deliver the improvement needed we will seek improved technological solutions through the innovation stimulus mechanism if that is appropriate.

## Innovation Strategy Delivery

12. Our innovation strategy contains four strategic objectives that remain highly relevant:
  - the creation of a smarter powergrid;
  - the introduction of smart meters;
  - continued growth in web-based and digital-enabled services; and
  - issues of affordability.
13. Further, the priority areas identified in the innovation strategy are:
  - Network environmental footprint (including safety);
  - Network reliability and availability;
  - Network management and flexibility;
  - Demand side response (including customer flexibility);
  - Network planning and design;
  - Communications and engagement;
  - IT enabled process improvements; and
  - Social obligations
14. The bulk of our current activities are focussed on the first five of these priority areas. That is a result of the IFI and, to a lesser extent, the LCNF legacy. These areas represent key engineering strands of our innovation requirement that have been in place for several years. Several of the projects undertaken here are long-term projects that were transitioned from the previous IFI governance regime.
15. The information technology enabled processes and customer engagement activities are relatively new and the project portfolio is still in its relative infancy. Activities such as the collaborative Project Concur, being run with other electricity and gas distribution network operators through the Energy Innovation Centre (EIC) has increased the level of this activity. This feasibility study has examined the extent to which collaboration across sectors may deliver better customer service through collaborative approaches to obtaining data.
16. Of the more technical priority areas, network flexibility is the area where there is least activity currently. This is deliberate. A very large amount of work has been undertaken by the industry as a whole in the area of smarter grid technology as part of the low carbon network funded activities. We are currently reviewing this information in the context of likely future scenarios to inform new innovation priorities.
17. Supporting our strategic objectives, network and customer flexibility are key areas of transition for the electricity system in general and network operators in particular. We anticipate an evolutionary path which will pass through smarter grids and move onwards to new distribution services. This will require increased understanding of technologies, commercial offerings and societal needs. Consequently we are preparing to focus much of our ED1 period portfolio in this area to ensure that we are prepared for these changes and this will be reflected in the next update of our innovation strategy.
18. We have continued to support the EIC. This is an activity undertaken in collaboration with the majority of DNOs and GDNs. It is designed to both identify and encourage innovations from new sources, such as other industries or SMEs with no previous experience of working with the electricity distribution network

operators. Several new projects from this source have been identified and initiated this year. The costs of running the EIC have been distributed across the running projects identified from this activity.

19. During the reporting period we have been restructuring our innovation delivery process in order for the business to better support innovation. This was one of the activities outlined in our innovation strategy as published.
20. To ensure high level support for innovation we have instituted an executive-level innovation steering group. This meets at regular intervals to ensure that the innovation strategy remains appropriate, is effectively delivered, that the portfolio of active projects supports the delivery of that strategy and that new projects can be adequately resourced and appropriately championed across the entire business.
21. We intend to publish an updated version of our innovation strategy during 2016. We do not anticipate a major revision since our original thinking remains reasonably unchanged. Further, the Environment Report being produced in October 2016 will also contain further updates to our innovation progress and outlook.

## Learning

22. The annual reports for each of the individual projects are available on the ENA smarter networks portal. These address the learning, both in terms of the delivery process and the project outcomes for each activity in detail.
23. Many of our projects are in progress and their nature is such that the conclusions on the learning delivered cannot be fully understood in the context of a partially completed project and the activities must run to their scheduled end point before conclusions can be drawn.
24. The Beyond Visual Line of Sight project is designed to allow network operators to fly unmanned vehicles for asset inspection in a way which is not permitted under current Civil Aviation Authority (CAA) regulations. The first phase of this collaborative project was completed during this year and has delivered, based on simulations of requirements, a specification for further development with the CAA. This follow-up is currently being discussed and designed with our collaborating partners.
25. The Multistorey Communities project is a collaboration between electricity, gas and water utilities supported by a housing association and a city council. This project aims to understand the energy needs and preferred styles of engagement of communities in blocks of flats in the Northeast. The objective is to design energy interventions based on systems of technologies that as far as possible optimally meet the needs of all parties. Although this work is not yet complete it has been observed that engagement with these communities on any utility increases engagement and interest in all other utilities at the same time, including collateral areas such as recycling up-take. On the basis of this observation we are now looking to do multi-utility interventions in another part of our region in areas of fuel poverty and priority services. This work is expected to start in the second half of 2016.
26. Modelling Asset Risk is a follow-up project to one completed in early 2015 and enhances our ability to optimise our investment delivery portfolio to achieve target levels of network asset risk reduction. This is one of the few decision improvement projects to which we believe we will be able to attach a quantitative value once complete. The enhanced modelling capabilities which the project delivers will reduce the internal resource associated with carrying out intervention plan modelling and optimisation. Further benefit will be realised from optimising the

investment pipeline over and above the work already carried out in this area, as a result of the enhanced modelling capabilities and intervention strategies that can be evaluated and compared. We believe that the learning being developed in the Modelling Asset Risk activity may go beyond the project objectives and provide important, broader insight into innovation cost benefit assessment.

27. Our Smart Data and Improved Distribution Load Estimates projects are now both coming to an end and should report their findings during the latter part of 2016. Both of these projects were conducted as postgraduate research at the universities of Sheffield and Durham respectively. Both of these projects have demonstrated that the large scale data flows are potentially problematical. Data is imperfect, incomplete and requires a lot of management for it to be useful. We saw similar issues with the Customer-Led Network Revolution project and more recently in the Activating Customer Engagement project. This has potential implications, as a general issue, for future smart grid implementation. It is important that data quality assessments are incorporated into all innovation projects and smart grid implementations at the earliest possible stage.

## Summary of 2015/16 Network Innovation Allowance Investment

28. We can also summarise the total network innovation allowance spending for the reporting period across the two Northern Powergrid licence areas:

Eligible Project Spending (external)	£1,219,407
Eligible Project Spending (internal)	£233,366
<b>Grand Total</b>	<b>£1,452,774</b>

29. Internal spending represents 16% of the total investment. This is below the governance maximum limit of 25%.