ANNEX 13: SMART GRID STRATEGY

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Contents

1. Executive summary

Welcome to our smart grid strategy. This is an exciting time for our business; we face unprecedented change in the face of emerging challenges and opportunities brought about by climate change, the economic needs of our customers and the ever increasing importance of the reliability of energy networks. Our customers and stakeholders should be assured that our business plan is designed to meet these challenges and deliver the benefits, efficiencies and services they need.

Core to our business plan are three critical developments; our innovation strategy, our smart meter strategy and this our smart grid strategy. Our innovation strategy, Annex 23 describes our overall approach to embracing and developing new techniques and technologies for the benefit of our stakeholders. Innovation pervades all areas of our business plan from customer service, asset management planning and field delivery. Key to our businesses success will be the realisation of the significant potential of smart meters and smart grid. Our strategy for realisation of the benefits of smart meters is outlined in our smart metering strategy, Annex 28.

The development of smart grids is being championed as a key facilitator in the transition to a low carbon, low cost, greener future for GB. In this document we outline our vision of a smart grid in Electricity North West and point to a number of key activities and work areas which are contributing to the development of your future distribution network. Table 1 below outlines our summary forecast of the benefits of smart grids for our stakeholders over the RIIO-ED1 and RIIO-ED2 periods.

Table 1: Innovation funding and customers' benefits

<table>
<tr><th rowspan="2"></th><th rowspan="2">DPCR5 investment £m</th><th colspan="2">Savings £m</th><th rowspan="2">RIIO-ED1 investment £m</th><th colspan="2">Savings £m</th></tr>
<tr><th>DPCR5</th><th>ED1</th><th>ED1</th><th>ED2</th></tr>
<tr><td>IFI</td><td>8.5</td><td rowspan="2">64.1</td><td rowspan="2">55</td><td></td><td></td><td></td></tr>
<tr><td>LCN Fund</td><td>25.3</td><td></td><td></td><td></td></tr>
<tr><td>NIA</td><td></td><td></td><td></td><td rowspan="2">24</td><td rowspan="2">28</td><td rowspan="2">120</td></tr>
<tr><td>NIC</td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>33.8</td><td>64.1</td><td>55</td><td>24</td><td>28</td><td>120</td></tr>
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2. Our vision

The demands on electricity distribution networks are evolving owing in part to government strategy on climate change, increases in fuel prices and the move to de-carbonize heating and transportation. To fulfil our role in helping address these challenges we are proposing a number of key changes to the way in which we operate and maintain the distribution network. These changes are commonly referred to as a smart grid. This document outlines our vision of a smart grid and contains details of the strategic direction we will take as we transition to this future.

2.1 Smart grids by 2035/ 2050

At the heart of any smart grid are smart, informed and empowered customers who are enabled through a variety of systems to consume or produce power efficiently at times to suit their needs. This vision requires customers to have access to easily understood information representing cost drivers such as connections, system constraints and raw generation pricing from all components of the supply chain. The design of smart metering and other interactive smart grid systems such as home based energy management will evolve rapidly to allow these complex cost drivers to be presented in simple ways to customers allowing them to make informed choices.

Commercial offerings such as managed connections will continue to evolve delivering new products and services to customers. Initially smart grid developments have focused on generation, and industrial and commercial (I&C) customers enabling them to connect more demand and more generation at lower cost. These changes have brought competitive advantages to their businesses generating real value. It is our customers' need for affordable, reliable and secure power supplies that have allowed us to define and set out our smart grid strategy.

This work has already expanded to agencies such as social landlords who are embracing the opportunities offered and with the advent of smart metering will rapidly expand to encompass all customers.

To enable real choice and value for customers our network will need to change from its historic static design principle and become ever more interactive to customers' needs. We have already seen the huge benefits for customers from grid automation for supply restoration. These technologies are now being adapted for energy balancing and we will soon see truly adaptive networks sensing customers' usage, anticipating their needs and adapting the grid to deliver their needs.

In turning our vision into a deliverable business plan we have adopted a number of key guiding principles:

- Customers have already paid for the power grid of today and much of this will still exist in 2050, therefore we must, wherever economic, exploit this huge asset to the maximum extent. Much of our work to date has therefore centred on maximising grid utilisation and the delivery of new services such as those identified in our CLASS[1] project from existing assets;
- Engagement of customers in the delivery of benefits requires a detailed understanding of their current and future needs. This principle is informed by direct engagement with our stakeholders and led to the development of our C_2C[2] project and the inclusion of the associated benefits within our business plan;
- Smart technologies can only ever offer real benefits if they solve real customer problems at a competitive price. This principle is important and assists us in focusing the main part of our development work on technologies that can deliver benefits today and in evaluating technologies such as storage that may be viable in the future;
- Truly smart solutions often require radically new approaches to old problems and hence our work challenges many existing engineering norms. Examples of this include our Smart Street[3] project that transforms how low voltage networks are operated by changing network configuration and voltage control principles to deliver up to 40% additional capacity for use by customers.

Core to many smart grid solutions is the use of operational information technology systems such as advanced distribution network management systems utilising data from a variety of network sensors and critically smart meters. The information technology system investments contained within our business plan are enablers to delivering this vision for our customers.

We recognise that Suppliers, generators, aggregators and transmission operators all have a role to play in delivering this vision for customers. Work on enabling market structures is therefore integral to the delivery of smart grid benefits and we will continue to play a leading role in the various industry fora that will inform the evolution of the GB energy sector. Our guiding principles in this work will be securing the benefits smart grids offer for our

[1] Further information on our LCN funded Customer Load Active System Services (CLASS) project is available at: www.enwl.co.uk/CLASS.

[2] Further information on our LCN funded Capacity to Customers (C_2C) project is available at: www.enwl.co.uk/C2C.

[3] Smart Street is the delivery name for our LCN funded *eta* project. Further information is available at: www.enwl.co.uk/smartstreet.

customers. Where efficient we have actively supported the opening up of market segments to new entrants such as IDNOs, this approach may be efficient in future for storage ownership models and for allowing DNOs to offer DSR services into the various ancillary services markets.

2.2 Our innovation strategy

Core to our business plan are three critical developments, our innovation strategy, our smart meter strategy and this our smart grid strategy. Our innovation strategy describes our overall approach to embracing and developing new techniques and technologies for the benefit of our stakeholders. Innovation pervades all areas of our business plan from customer service, asset management planning and field delivery as it is a core company value. Key to our businesses success will be the realisation of the significant potential of smart meters and smart grids. Our innovation strategy contains many smart grid development examples and this document contains additional details on our future work.

2.3 A shift in emphasis

The move to a smart grid is resulting in a change in emphasis from the traditional approach of 'fit and forget' asset installation and operation to one of actively managed energy distribution services. Here, network operators manage their networks actively on behalf of customers to minimize network constraints and optimise asset utilization. This requires use of novel technical and commercial techniques supported by the use of advanced communications and control infrastructure. These techniques will manifest themselves in a range of new activities and services and will require a different approach to be adopted. In particular real-time knowledge of the networks capability, status and users' requirements becomes crucial as does the introduction of increased volumes of remotely controllable plant.

Our entire asset management approach will move to a real time balancing and optimisation focus as the power network monitors customers' changing needs through smart metering and responds to meet them minute by minute.

This change will result in a switch in investment focus from heavy power assets such as new circuits and transformers to advanced knowledge based network management systems, smart meter data, sensing technologies and commercial techniques such as Demand Side Response contracts.

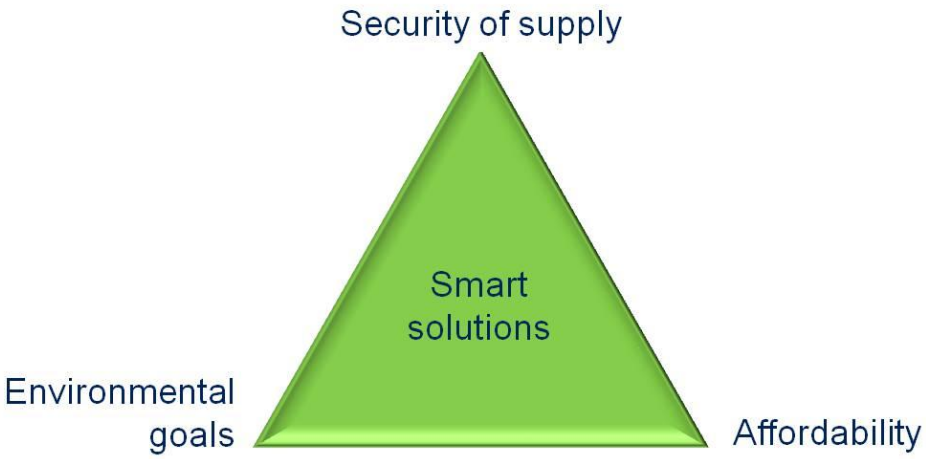
3. Our challenge

During the next ten years our customers and stakeholders will respond rapidly to technological, economic and environmental drivers on them. These will significantly affect our business and we expect to face fundamentally different challenges to the ones we have traditionally managed. We have heard of the expected increase in electricity demand driven by decarbonisation of heat and transport needed to meet environment targets. Some forecasts show this as potentially doubling customers' demand for electricity but what is often not fully appreciated is that associated with this increase is an increase in customers' dependency on electricity; as it becomes their sole source of energy. Our stakeholders tell us that reliability of supply and affordability are their paramount concerns and increased dependency will become a key satisfaction driver. Combine these priorities with significant increases in demand and the connection of large volumes of wind generation, solar PV arrays, micro-CHP generation and the scale of the challenges to our business become apparent.

3.1 Emerging need

Our network has already had to change to accommodate stakeholders' needs; for example we now have distributed generation connected equal to 50% of our maximum demand - a scenario beyond any of our projections just 10 years ago. Our smart grid strategy outlines how we will implement our innovation work to offer new commercial and technical services to customers. The changes required will move all distribution network businesses increasingly towards distribution system operators.

Figure 1: The networks' trilemma



Recent work in both GB and elsewhere across the world seeks to harness new technologies, new commercial approaches and customer engagement to strike the right balance between of all the factors shown in the above diagram. Our smart grid programme is working to develop the smart solutions that will enable the most cost effective solutions and tradeoffs.

3.2 Changes in customer behaviour

Our customers are starting to amend their behaviour and will continue to do so as GB responds to the challenges brought about by climate change and the global economy. As part of its ongoing commitment to European targets on carbon emissions reduction, the UK government has launched a number of initiatives on energy efficiency, carbon costs, renewable energy generation sources and electric vehicle and heating incentives. Coupled with a general increase in public awareness of low carbon issues these initiatives are expected to significantly affect electricity consumption in terms of usage patterns and overall demand and generation levels. As an example, solar PV feed-in tariffs, introduced in the UK in 2011, have resulted in a number of large clusters of installations across the network thus introducing intermittent electricity generation to low voltage networks where it was never originally envisaged, changing the low voltage network from a largely passive to an increasingly active state.

Furthermore, the Renewable Heat Incentive, introduced in 2012, is expected to result in similar levels of customer activity over the years of RIIO-ED1 giving a substantial additional demand from heat pumps. Social landlords have been early adopters of PV and our work shows that this pattern is being repeated with renewable heat technologies resulting in geographic clustering of installations. We are working with these key stakeholders to understand their needs and the effect of these low carbon technologies (LCT) on our network through a variety of IFI and First Tier LCN Fund projects. These projects encompass advanced sensing technologies, customer demand patterns and network analysis.

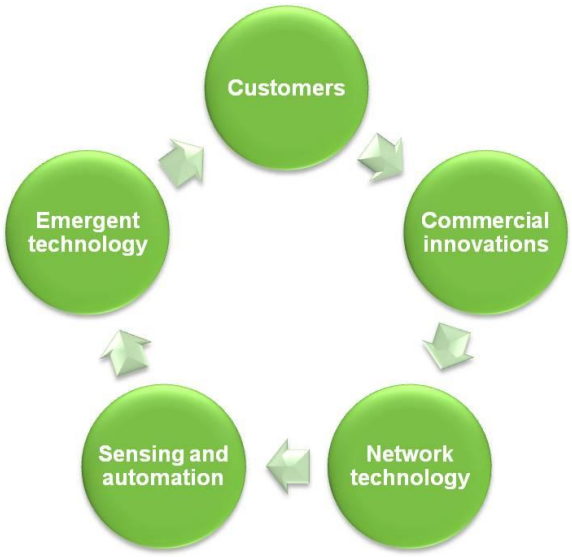
There is still significant uncertainty in the development and adoption of low carbon technologies and consequently on the development of smart grids. This is very important when considering the very long term nature of investments in electricity infrastructure. Electricity North West has therefore adopted two planning horizons; the short to medium term representing 2013 to 2023 and 2024 to 2035 for the long term. The development of technologies over the next 10 to 15 years will have a significant impact on the configuration and operation of the network out to 2050. As such only these initial key periods are considered in detail within this strategy document.

4. What are we doing to make the smart grid a reality?

The evolution of smart grids has been underway for the past several years however our work has now advanced to a stage where pilot projects are turning into business as usual bringing a range of benefits to customers.

In this section we outline the main areas of our work, our progress so far and our anticipated future direction. For us our customers' changing needs is the starting point for all our thinking about the development of our business. From this flows our thinking on new commercial innovations and new technologies, and these interact in a continual cycle as illustrated in Figure 2 below. This means that whilst we can anticipate and plan for the changes required we must continually review all elements of the cycle to ensure customers receive all the benefit smart grids offer. This is ensured by our ongoing engagement as laid out in our innovation strategy, annex 23 and you will see the results of this in our annual innovation strategy report.

Figure 2: Continuous development



4.1 Industry leadership and collaborative working

It is clear that the scale of the smart grid challenge cannot be economically solved by one business alone; hence we have for some time been actively leading industry collaboration through a variety of fora.

Our chief executive is a member of the Smart Grid Forum and has lead the development of the Transform[4] model in Work Stream 3. He also chairs Work Stream 7 which is now undertaking detailed modelling to support the development of smart distribution grids with a 2030 horizon.

We chair the strategic technology programme delivered by EA Technology Limited at which all distribution network operators collaborate in the research, development and deployment of new smart grid technologies. We are one of the founding members of the Energy Innovation Centre which seeks to attract and evaluate new technology proposals from new sector entrants. Additionally Electricity North West chairs the Energy Networks Association's LCT working group and which has previously led the industry response to technologies such as domestic heat pumps. We also actively participate in the Smart Grid Forum chairing a number of the smart grid related Work Streams.

We chair the Distribution Code review panel and have used this opportunity to push the development of both GB and European standards work. Our innovation work has been directed to drive real change into network thinking challenging many of the established norms.

[4] A modelling tool collaboratively developed by the DNOs and EA Technology.

4.2 Working with customers

Our innovation work with customers includes domestic, I&C and generation customers. Numerous projects are trialling demand side response in all its forms whether that is load shaping, peak demand shifting, or post fault response. We are also trialling a variety of means of delivering price signals and incentives to customers through new connection contracts and changes to existing customer contracts.

Our LCN Fund projects C_2C and CLASS are focused in this vital area to get customers involved in the operation of our network by offering them additional value and services they need.

Commercial innovation is core to all our work with customers and we seek to ensure smart grid solutions are commercially attractive and appropriately marketed to customers. Our work on C_2C contained a significant element to evaluate the different drivers within different segments of the I&C market and to understand which contract forms would be viable. This study enabled us to price post fault DSR and we have already started offering these new contract forms to customers through managed connection agreements as a direct result of our innovation work. Our work proves that commercial innovation runs in parallel with technological innovation and these two work areas are the real enablers of smart grids.

Our work on the marketing of DSR contracts through both C_2C and its predecessor projects has shown that network operators will need to change to re-establish a direct relationship with customers. Whilst agents and aggregators have an important relationship to play, our work shows that maximum value can best be ensured for customers when we work directly with them to understand their needs.

Our business plan contains provision for the establishment of a dedicated DSR sales team who will work with customers to purchase commercial solutions to deliver the benefits identified in our plan. We have already established strategic customer relationships with customers who own and operate geographically diverse sites; as we see these as key partners in establishing DSR as a business as usual smart grid solution.

Our work with customers extends wider and encompasses important work to test customers' sensitivity to voltage and harmonic levels on the network. This work spans a number of projects and will inform the future evolution of national and European standards. This work will be shared with a wide variety of stakeholders including DECC, Ofgem and industry bodies.

4.3 Our demonstrators and deployment

We have undertaken a number of smart grid demonstrator projects notably our three Second Tier LCN Fund flag ship projects C_2C, CLASS and Smart Street. These demonstrations coupled with our First Tier trial projects act as a catalyst in the development, manufacturing, purchasing and installation of new devices and systems. These activities typically build upon work already underway in the IFI funded research and development area and help support our overall learning; critically they allow us to take proof-of-concept trials to deployable reliable solutions.

These demonstration projects also allow us to develop the framework needed to analyze smart grid costs and benefits, which is necessary to help build the business case for cost-effective smart grid solutions to our customers' needs.

The final development and deployment of new smart technologies has only been possible through our collaboration with several key partners notably, General Electric and Siemens in the area of advanced DMS development, Kelvatek in the development and adaptation of new LV network devices, The University of Manchester in understanding the performance of new systems and importantly Impact Research in understanding and determining the effects of these technologies on customers. Our work with these partners will provide a firm base for our future work on smart grid development and deployment.

4.4 Smart grid security

The dramatic increase in the distributed nature and complexity of network monitoring and control systems as smart grids are developed requires organisational adjustment through the development of people, processes and technologies. Smart grids will expose networks to new dynamic threats which are constantly changing and unpredictable. Information technology security and system reliability and maintainability form key risk considerations for us in our development of a smart grid. We will continue to hold security amongst our highest priorities and work with peers to develop the necessary standards and systems required. We already carry our regular aggressive intrusion testing of all our systems and will extend this rigour to our new smart grid systems.

4.5 Harnessing the benefits of smart metering

The benefits of GB adoption of smart meters will mirror that seen in a number of countries where such technologies are already in place. These benefits will accrue to customers initially via Supply businesses and then latterly through Network Operators. We believe that smart meters have a significant role to play in serving as a platform for a variety of service and cost improvements.

In the early period of the roll out programme, immediate benefits such as reduced meter reading costs and access to time based tariffs will be realised by customers. Under our predicted DECC low load growth scenario the benefits to customers from network operators will be less immediate but will eventually include such things as improved network visibility resulting in reduced or deferred network reinforcement costs; improved management of power outages resulting in better overall system availability; improved connection processes, reduced costs for micro generation customers, access to the commercial opportunities offered by demand side response, network losses reduction and improved customer service across a range of routine activities. Critically the period between 2015 and 2023 will be the bedding in period and their full integration into our future systems in preparation for wider scale adoption of low carbon technologies and hence greater demand growth. Our smart metering strategy, annex 28, outlines our plans to realise the benefits of smart meters for our customers in more detail.

4.6 Working with all stakeholders

Stakeholder involvement in and engagement with our innovation activities is essential in allowing us to successfully identify emerging R&D needs, for sharing of lessons learned, for continuous improvement and allowing the exchange of technical and cost data. Information obtained from our innovation project portfolio is shared through a variety of dissemination channels; for example via our website[5], at various dissemination events, in numerous whitepapers etc. This information helps to inform decision makers about smart grid technology options and thus facilitate their adoption.

4.7 In-house capability

4.7.1 Research and development

Research and development investments are being made to advance smart grid functionality by developing innovative, next-generation technologies and tools in the areas of control, monitoring, operations, investment planning, power electronics, cyber security and the advancement of precise time-synchronized measures of key parameters across the distribution network. Further research is planned into the behaviours and expectations of our customers and key stakeholders to help us develop appropriate response to future challenges.

4.7.2 Policy and standards

[5] www.enwl.co.uk/thefuture

Our Policy and Standards activities ensure that all new devices, techniques and commercial offerings will successfully integrate with existing legacy assets. The development of the company, UK, European and international standards are essential to create a secure and reliable framework for the deployment of innovative digital and engineering technologies throughout the electricity delivery system.

Planning and operating standards, such as ENA Engineering Recommendation P2/6 are a focus area for our work and we are leading the review of these industry design standards together with their operational equivalents. Our starting point is to maximise the value of the assets customers have already paid for and that are already in the ground. This approach coupled with trialling new technologies such as storage and adaptive protection systems will we believe be the key to unlocking existing network capacity for use by customers during RIIO-ED1 and the early part of RIIO-ED2.

The rapid evolution of standards such as P2/6 needs full engagement with and support from all stakeholders. Our customers hold security of supply as their number one priority and hence any change in this area must have their full support. Nevertheless it is already clear from the smart grid demonstrator projects C_2C and Flexible Plug and Play[6] that capacity can be released without jeopardising security of supply; indeed C_2C has already shown that both security and capacity can be increased simultaneously at much lower cost than previously thought possible.

4.7.3 Training and development

Any business depends on its people to deliver the services needed by its customers and Electricity North West is no different, so the development and training of our staff and contractors in smart grid technologies forms a key part of our plan.

Our workforce development plan addresses the impending workforce shortage by developing a greater number of well-trained, highly skilled power sector personnel that are knowledgeable in smart grid operations. Our recently commissioned Power Training Academy and our ongoing partnerships with universities and manufacturing entities that perform part of the research, development and deployment supply chain are essential to developing a smart grid capable work force.

4.8 Use of innovation funding

The Innovation Funding Incentive (IFI) introduced by Ofgem in DPCR4 successfully encouraged network operators to invest in the research and development of its key activities. In DPCR5, alongside IFI, Ofgem launched its Smart Grid, Smart Metering and Low Carbon Networks (LCN) funds to stimulate the industry to respond to the carbon challenges agreed by government. In particular, the LCN Fund is designed to promote innovation, trial and deployment of new technologies, commercial mechanisms and techniques.

In 2015 with the introduction of a new eight year distribution price control period, we will see the introduction of a new innovation funding mechanism; the Network Innovation Allowance (NIA) intended to replace IFI and the First Tier element of the LCN Fund and the Network Innovation Competition (NIC), the successor to the Second Tier of the LCN Fund to further support flagship demonstrator projects. In both cases, the funding will rely on the submission of an innovation investment plan with a clear emphasis on delivering specified output measures whilst ensuring good value for customers.

At Electricity North West we have and will continue to use this vital funding to develop the technologies and commercial techniques required to make the smart grid a reality. In our innovation strategy we have outlined how we involve our stakeholders in the development of our innovation plans, govern the delivery of real solutions to customers' needs through smart grid technologies and transform our network towards our vision.

[6] A Second Tier LCN Fund Project being delivered by UK Power Networks.

5. Technology work areas

Our technology development work spans a wide range of themes many of which are focused on asset management. These are detailed in our innovation strategy however those areas of work that are specifically smart grid focused are outlined below.

5.1 Network configuration

We are actively exploring the opportunities offered by dynamically reconfiguring networks to run in interconnected (or commonly referred to as meshed) as opposed to radial configurations. Our work has shown that such configurations offer significant benefits in terms of capacity release, power quality, losses reduction and security of supply.

The required technologies include advanced network automation and we are the leading network operator in this rapidly developing area of work. Meshing also requires advance real time power flow and contingency analysis techniques and the deployment of new network devices such as the WEEZAP[7] and LYNX[8] devices developed under our Smart Street project.

5.2 Voltage control and regulation

We have a number of projects exploring advance voltage control and regulation technologies both through the enhanced usage of existing tap changers and from deploying network capacitors. The benefits of these technologies are very significant in terms of capacity release, peak demand management, losses optimisation and conservation of energy. Full realisation of their benefits is in large part dependent on the availability of smart meter data.

5.3 Network optimisation

Advanced network automation and energy resource management will require the development, testing and implementation of new network optimisation technologies to ensure the optimum efficient level of network service. These technologies fall into two broad categories; site based deterministic systems and centrally based generic optimisation systems. Our work indicates that the latter offers significantly greater benefits for customers in the medium to long term and is the focus of our work. The former technology is being explored by a number of other network operators including Scottish & Southern Power Energy Networks and Scottish Power Energy Networks and we are closely monitoring their trials.

5.4 Fault level management

We were the first network operator in the UK to deploy a fault current limiter device in a live substation. We have continued to develop a number of new innovative solutions to fault level issues caused by both the level of demand and generation connected to the network. These projects are part of our short to medium term trial work.

5.5 Protection systems

Protection systems are an essential safety component in any power network and we are actively working on how these systems will need to evolve to manage the establishment of large volumes of distributed generation and new sustained loads such as electric vehicle charging. This work spans all network voltages from low voltage to the 132kV level.

[7] A remotely controllable retrofit LV vacuum circuit breaker that replaces a standard J type fuse in a distribution board. The WEEZAP is a Kelvatek product and further information is available at www.kelvatek.co.uk/weezap.php.

[8] A remotely controllable retrofit LV switch that replaces a solid link in an underground link box. The LYNX is a Kelvatek product and further information is available at www.kelvatek.co.uk/lynx.php.

5.6 Network simulation and modelling

The ability to forecast the behaviour of power systems will become increasing important as power flows increase in both volume and complexity. We are working to develop new tools and techniques to understand this challenge and produce deployable tools for use by engineers and by our customers. This work is closely linked to our work on standards and forms part of our work in early RIIO-ED1.

5.7 Sensing and automation

Smart grids are in part about increased visibility and control of our networks and this will require the use of additional sensors fitted at strategic points across our network to provide in real-time accurate information on network status and capacity. With the introduction of increased capability to control remotely network devices such as switches allows us to actively manage the network to optimize its response and promote greater access at lower cost. Such sensors are complementary to the data obtained from smart meters but gather additional information such as harmonic content when required.

5.8 Storage

In conjunction with the University of Durham and the ENA Energy Storage Operators forum we are collaborating with all the DNOs to evaluate the various storage technologies, their operational characteristics and economic viability. Other DNOs are leading field trials in this area and we are monitoring these closely. Our forecast shows that these technologies will only have a niche role until the early 2020s and hence they do not feature as field trials in our near term work plan.

5.9 Integration to customers' systems

Domestic and I&C customers' internal systems will become increasingly complex and able to interact with the local power grid. We are working with social landlords on the utilisation of aggregated domestic DSR and with I&C customers on integration to their systems. This work will increase over the coming period as technology systems within building evolve to a state where they can respond without affecting customers' perception of comfort. Core to this work is the use of smart meter data as both a sensing media and as the platform for price response signals.

6. Benefits for customers

We have summarised in Table 2 below the financial benefits for customers included within our business plan and those they will receive in subsequent periods.

Table 2: Innovation funding and customers' benefits

Benefit area	RIIO-ED1 period value £m	Savings included in RIIO-ED1 Bus Plan	RIIO-ED2 period value £m	RIIO-ED3 period value £m
Network operation	71.4	Yes	107.1	133.9
Planning and design – reduced connection cost	0.5	Yes	0.8	1.1
Network capacity	10.6	Yes	15.9	19.9
Benefits within plan	82.5			

These benefits are based on our best view scenario which aligns with the DECC Low scenario. These benefits therefore represent the lower end of the benefits range and in the event of higher LCT adoption rates then benefits will rise proportionately. Under the higher scenarios, benefits related to network capacity investment will more than double.

It is of note that the efficiency incentive mechanisms applicable during the RIIO-ED1 period provide a strong incentive for the continued development of innovative solutions to generate savings for customers. This efficiency incentive will drive further benefits for customers as we continue to develop our smart grid and smart meter strategies to secure further savings for all stakeholders.