

2.1

Annex

SP Energy Networks 2015–2023 Business Plan

Innovation strategy

SP Energy Networks

June 2013

Our innovation strategy

The ways in which we use innovation to improve our services and provide long term value for money

Innovation is key to getting more out of the network and delivering value for money for customers. We are part of a global group with a strong innovation heritage recognised as one of the top 5 most innovative European Utilities. We have a strong track record of converting innovation trials into practical applications and making our innovation spend go further by collaborating with others. We recognise the importance of sharing our knowledge on innovation developments to make sure others can benefit from our learning.

In this strategy:

- Our priorities for ED1
- Innovation at SP Energy Networks
- Applying existing innovation in ED1
- Innovation funding in RIIO-ED1
- Outputs from innovation
- From inspiration to solution
- Making the most of being part of Iberdrola



Our priorities for ED1



The use and generation of electricity in the UK is changing. We want to help shape the future and be prepared for the challenges it brings. To deliver our 2023 vision, our network and our organisation need to evolve and adapt.

Our Think Big, Start Small, Scale Fast approach enables us to be at the forefront of innovative practice.

At SP Energy Networks, we believe in the power of innovation to enhance all aspects of our business and improve our service for the benefit of our customers. We will deliver innovation to reduce costs to customers and meet their future requirements through:

- *Technology innovation — operating our network more dynamically.*
- *Operational and process innovation — driving efficiency and service benefits.*
- *Commercial Innovation — new contractual arrangements with customers and suppliers.*

We have a strong record of translating innovation trials to practical application. The table on the next page shows the roadmap that our vision will take us on and links the projects to customer benefits.

We will continue to co-operate with other UK network companies to ensure that all UK customers benefit from customer funded innovation trials.

Innovation embedded in our draft plans will deliver more than £100m of customer benefits.

SP Energy Networks are part of the Iberdrola Group, one of the largest energy companies in the world. The Iberdrola group prides itself on its commitment to innovation.

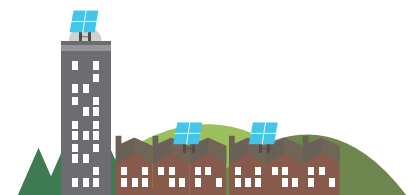
Across the Iberdrola group in 2012:

- *in excess of €145 million was invested in Research & Development.*
- *over €50 million of the investment was associated with networks.*

• *innovation involves a variety of R&D across distribution and transmission.*

• *investment includes funds leveraged from a variety of sources including European Framework programmes, government funding and stakeholder investment.*

Our Think Big, Start Small, Scale Fast approach enables us to be at the forefront of innovative practice



Our innovation roap map

	Timeframe				Outputs achieved					
	2010-15	2015-2017	2017-2019	2020-23	Safety	Reliability & availability	Environment	Connections	Customer satisfaction	Social obligations
Automation	Automation deployed through trials by SPEN and other DNOs	Substations designed to be automation ready.	Application of automation for managing load flows	Increased automation intelligence for self healing networks	✓	✓			✓	
Demand side response	Demonstration projects currently underway by other DNOs, SPEN demonstration in 2013/14	Further pilot projects at scale to quantify benefits		Development of relevant standards to enable as business as usual		✓	✓		✓	✓
Energy storage	Projects being undertaken by other DNOs	Continue to observe demonstration and adopt learning from others	Demonstration project to build on learning from other DNOs	Build business case and confidence in technology for roll out as the market evolves		✓	✓	✓		
Using smart meters	Simulation project being undertaken in 2013/14	Initial systems constructed to manage data as it becomes available	Application of smart metering data to improve customer service and operation of the network	Advanced application of Smart metering data for improved asset management and demand response		✓		✓	✓	✓
Active network management	SPEN project in the Scottish Borders Other DNO projects being observed	Conclude project and reflect learning into policies, applying where relevant across our practices	Active Network Management contracts become normal practice for generation connections	Linkage of Active Network management with other technologies including dynamic rating as normal practice		✓	✓	✓		
Monitoring and managing fault levels	Development of Fault Level monitoring and Limiters	Deployment of Fault level monitors at various sites. Continued development of fault current limiter technology	Management of fault level through automation and monitoring.	Deployment of fault current limiter as part of business as usual to mitigate reinforcement costs	✓	✓	✓	✓		
Dynamic rating of network in real time	Project with generators in North Wales on 132kV overhead network. Application to cables and Transformers being tested on other projects.	Application of Dynamic rating to mitigate initial reinforcement schemes. Demonstrate alternative means of dynamic rating	Use of Dynamic rating as a standard alternative to replacing highly loaded substations.	Integration of Dynamic rating with other solutions including Active Network Management		✓	✓	✓		

Innovation at SP Energy Networks

In this section:

- Overview
- Innovation at SP Energy Networks
- Innovation case studies
- Sharing knowledge

Overview

We have a strong commitment to investing in innovation for the future, backed up by a track record of innovative projects and direct applications.

In the first two years of DPCR5 we have invested over £5m through the Innovation Funding Incentive (IFI) and Low Carbon Network Fund (LCNF). This has been leveraged against other funding sources, to generate a total value of research, development and demonstration in the order of £24m. Thanks to this investment, a number of our projects have been developed into solutions that are already being deployed as part of business as usual, while we have other projects that will be in a position to be applied in the ED1 timeframe:

- *The Power Network Demonstration Centre is a world leading facility to help accelerate technology development to a point where it can be deployed on the network.*
- *Network automation is being developed in collaboration with various companies to ensure we have a robust communication infrastructure as well as system intelligence. This has helped to significantly improve our response to faults and storms.*
- *We have developed active network management solutions to connect renewable generation faster and at lower cost.*

We have also been active in other areas of research and development, most notably:

1: We are participating in a Knowledge Transfer Partnership with University of Strathclyde about energy consumption and how this will shape the network in the future. This has been match funded by the Technology Strategy Board.

2: We are a partner in the Step Up (Strategies Towards Energy Performance and Urban Planning) European FP7 funded project. ScottishPower is leading the energy analysis element of the project, creating an energy masterplan for the city of Glasgow. A range of stakeholder information will be used to create this plan, which will:

- *Map the energy consumption across Glasgow*
- *Highlight key energy users and the role they could play as 'anchors' to planned energy projects*
- *Highlight potential 'zones' for specific technologies, such as district heating and heat pumps.*
- *Highlight the potential to link key infrastructure projects with anticipated development in Glasgow.*

The outputs of this analysis will be used to shape local and national policies to promote and facilitate projects that help deliver Glasgow's ambition of achieving a 30% reduction in carbon emissions by 2020.

3: The Scottish Power Active Research Centre (SPARC) is a collaboration with University of Strathclyde that has been running since 2006. In this programme we sponsor research that is relevant to the power sector with particular emphasis on how ScottishPower can improve the network in the short to medium term. The programme has delivered new techniques for cable health monitoring and software tools for the analysis of alarms, among many other developments. The collaboration also gives us new R&D opportunities and insight into new technologies.

For every £1 of customers' money we spend on R&D, we secure a further £4 from other sources such as project partners or research grants through academia

SPEN total	LCNF	IFI	No of Reported Projects	Leveraged funding
2004/05		£223k	12	£1.5m
2005/06		£546k	36	£3.0m
2006/07		£1282k	41	£5.0m
2007/08		£1793k	50	£7.0m
2009/09		£1978k	38	£9.0m
2009/10		£1462k	35	£7.0m
2010/11	£700k	£1621k	27	£8.0m
2011/12	£900k	£1975k	40	£11.0m

Innovation Case Studies

— Some examples of our technology innovation

Dynamic Thermal Rating

Initiative

Maximising the capacity of our network assets through real time monitoring of their loading. This is now achievable through enhanced visibility, communication systems and data processing.

Through our landmark LCNF Tier 1 project, we have proven the application and limitations of dynamic thermal rating of particular assets on the network. This has improved our confidence in the concept to a position where we will be deploying this in ED1 as part of our reinforcement solution set. Through this solution we believe we can create up to 30% additional capacity on existing overhead lines at a significantly lower cost to constructing a new circuit.

Benefits

- Increased network capacity
- Reduced need for reinforcing the network in certain applications.

Active Network Management

Initiative

The control and dispatch of generation around constraints on the network. This removes the need for extensive upgrades of the network to facilitate generation.

As part of our LCNF Tier 2 ARC project, along with the development of projects by other parties, this is now being considered as a solution for optimising the network, particularly in areas of high distributed generation. This features both commercial innovation in the way that connection agreements are structured, as well as the deployment of novel technology. We believe this may offer savings of more than 20% to the cost of generation connections as well as offering a faster time to connect.

Benefits

- Faster connection of distributed generation.
- Lower cost for the connection of distributed generation.

Technology Innovation

Partial Discharge Mapping

Initiative

Partial discharge is a key indicator of where cables will fail. Mapping of partial discharge enables asset replacement before failure occurs, improving quality of service.

Through our active research centre with the University of Strathclyde, a number of projects are now maturing into solutions which we will be applying in the near future. Notably, research related to partial discharge monitoring of underground cables using protection CTs is now being tested in real applications. The successful testing of this solution could lead to a lower cost solution for identifying cable asset health and allowing for replacement before failure. PD mapping of cable circuits with high occurrences of faults will help to target future investment and increase system reliability.

Benefits

- Asset replacement before failure.
- Reduced number of faults.
- Targeted investment on cables that are in greatest need of replacement.

Fault Level Monitoring

Initiative

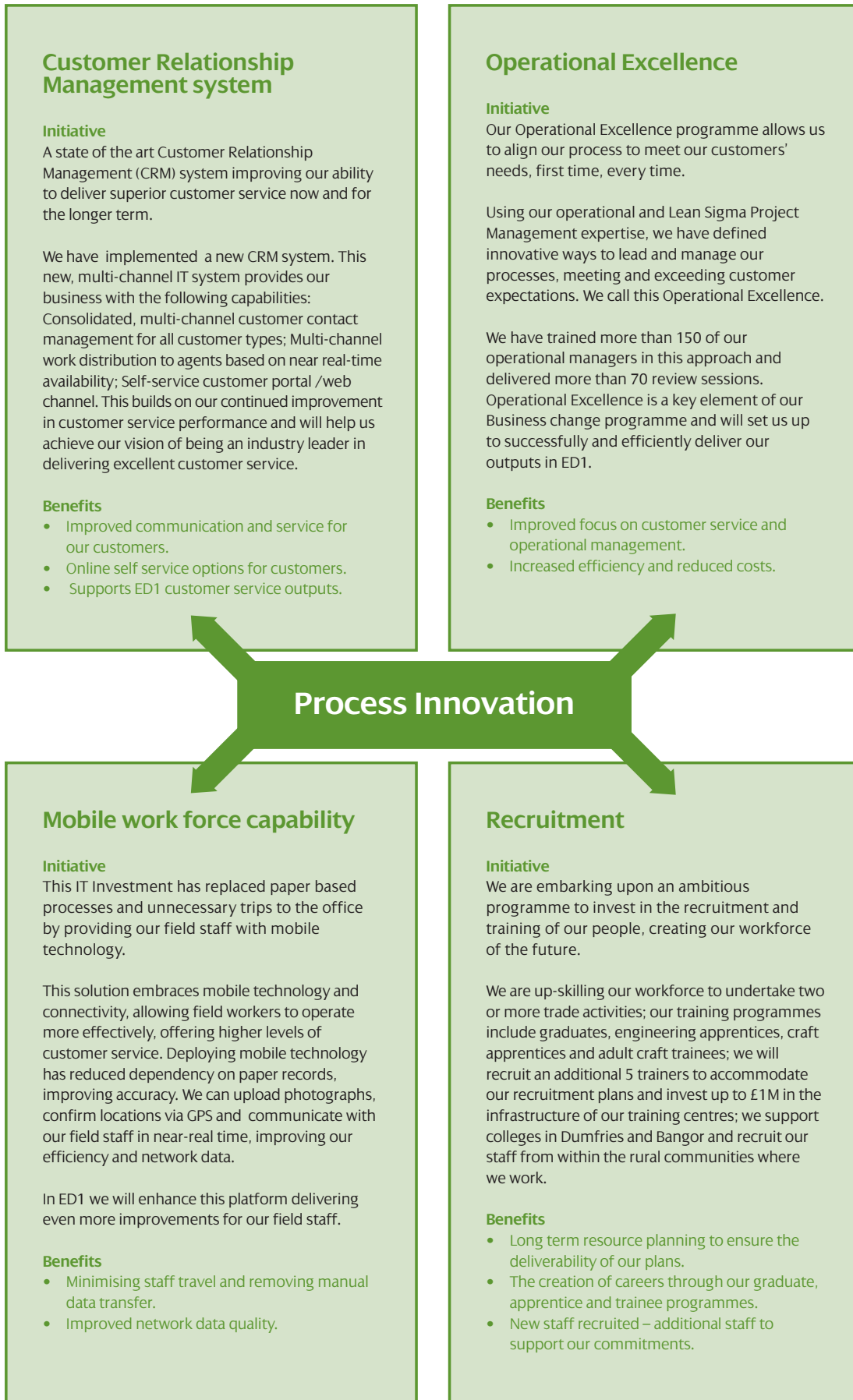
The measurement of fault level allows better informed investment in assets that need to be replaced.

As a result of our IFI investment with Outram Research, the fault level monitor which has been developed is now a component of our reinforcement plans as a solution to fully justify and potentially mitigate the need for some fault level asset replacement. The reliable measurement of fault level has never before been possible for such a low cost solution.

Benefits

- Avoided many millions of pounds being spent by deploying a device costing just tens of thousands of pounds.
- Avoided asset replacement before it end of life.
- Being deployed by us and another leading DNO in ED1.

Innovation Case Studies — Some examples of our process innovation



Innovation Case Studies

— Some examples of our commercial innovation

Connection agreements for distributed generation

Initiative

Alternative connection agreements are being offered as part of our Low Carbon Network Funded (LCNF) Accelerating Renewable Connections project.

We are in the process of offering non-firm connection agreements on a business as usual basis rather than by exception, allowing generation to be efficiently managed, rather than firm agreements that can require high cost investment and cause delays to generation being energised.

Benefits

- Increased speed of connection of distributed generation.
- Lowered cost of connections to the network.

Excavation and Cable Laying Contract

Initiative

Replacing our “defined cost” excavation and cable laying contract with a “schedule of rates” contract, we introduced zonal coefficients, reflecting the reduced or increased costs due to rural/urban working, contractor locations and establishment costs and mix of work.

The contract also introduced multiple contractors across our areas, some doing planned-only work and some covering reactive faults. This change to a non-exclusive contract allows contractors to flexibly manage their productivity.

We introduced Quantity Surveyors to assist in controlling fault costs, supported by a major training initiative prior to contract start.

Benefits

- Reduced costs due to improved productivity and commercial management.
- Reduced risk through multiple contractors.
- Improved customer service through greater localisation.

Commercial Innovation

Group Purchasing arrangements

Initiative

Organising our purchasing activities through both our Global Purchasing Group and UK Purchasing means we can purchase equipment and services at competitive rates.

We purchase key strategic assets, such as cables, switchgear, and transformers globally. We are working to create standard specifications across our global networks business.

Locally, we procure a mixture of contractors within our multi-contractor model. Using commercial innovation in both of these approaches, we obtain the best value for money for our stakeholders.

Benefits

- Improved commercial arrangements, bringing new sources of supply to the market.
- Improved flexibility especially in rural areas in emergency/out of hours conditions.
- Reduced our costs
- Improved data quality and customer service.

Introduction of new participants in market

Initiative

We established Iberdrola Engineering and Construction (IEC) as a design and delivery organisation.

IEC programme manage our major projects and we place multiple contracts with our suppliers. This removes multiple contract layers which normally would contain a risk premium. This approach therefore reduces costs.

Benefits

- More efficient management of major projects.
- Reduced costs.

Sharing Knowledge

The new approaches we develop are important to others as well as ourselves. We recognise the importance of sharing our knowledge to make sure that others can benefit from our learning.

We're active participants in the Energy Innovation Centre, a vital platform that helps to connect organisations with DNOs and other utilities with new ideas. Within the Energy Innovation Centre we can talk to SMEs with innovative ideas, collaborate with other DNOs, and work with other organisations such as Gas Distribution Networks.

We have been active in a number of ENA industry working groups to share our learning, engage with a broad group of stakeholders, and keep up to date with industry developments.

We have been engaged with the Smart Grid Forum and participated in a number of the working groups.

The development of the TRANSFORM model through the Smart Grid Forum has been valuable in sharing learning from IFI and LCNF activity to influence the definition of the model outputs. We've also used the TRANSFORM model in the development of our load-related investment plans.

We have co-chaired the Scottish Smart Grid Sector Strategy and Action Plan . This is designed to:

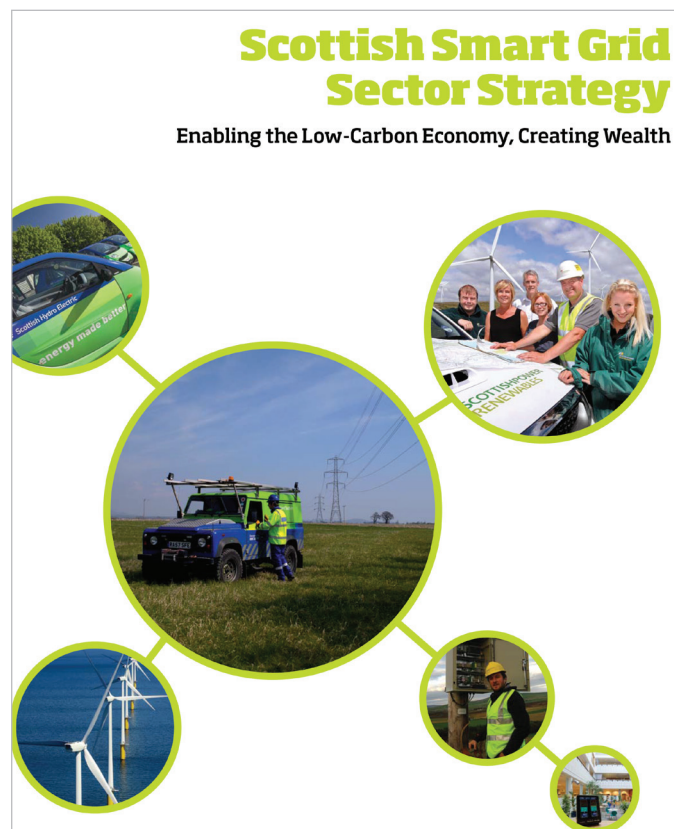
- *highlight the potential benefit of creating a smarter network.*
- *raise awareness of how organisations can be involved in the development of a smarter grid.*
- *discuss how the transferability of these skills can create economic benefit for the country.*

We are a member of Smart Grid GB, which allows us to interact directly with smart grid technology manufacturers on a regular basis and help shape the national benefits of smart grids.

We participated in the Low Carbon Network Fund conference over the past two years to share our learning with other DNOs, suppliers and industry participants. Our learning is now being reflected in the activity of other DNOs who are building on our successes, for example the integration of Fault Level Monitoring with Active Network Management.

Our investments have the wider social benefits of job creation, skill development, and new commercial opportunities. We have seen this in the growth of SMEs working with us on projects.

We integrate our innovation process and development across our network activities so the whole business benefits



Applying existing innovation in ED1

The Innovation Funding Incentive (IFI) and Low Carbon Network Fund (LCNF) were the key innovation funding mechanisms within the DPCR5 period.

Throughout DPCR5 we have:

- *been active within both the IFI and LCNF funding schemes.*
- *created a Business change team to oversee innovative process improvement and new commercial arrangements.*
- *created a Future Networks team who were responsible for the portfolio of LCNF and IFI projects.*
- *ensured that learning was shared effectively between network operators.*

Applying this innovation is an important part of our business plan, and innovation developed throughout the DPCR5 period will be applied in ED1. Some of the most significant initiatives that have been built into the business plan are summarised in the table below.

Throughout the RIIO-ED1 period we will continue to engage with customers, and innovation will be one of the elements of this engagement.

Activity 2015–2023	Source of innovation 2010–2015	Benefit
Partial Discharge Mapping	SPEN IFI project	We can replace assets before they fail by identifying cables with a high probability of a fault occurring.
Fault Level Monitoring	SPEN/WPD LCNF Tier 1 project	We can measure fault levels and actively manage rather than using traditional calculation-based evaluation.
Smart Enabled Primary/Secondary Groups	Iberdrola best practice	Our substations will be ready for the future and operable with new equipment.
Active Network Management	Various LCNF projects	We can equip substations for the management of new generation on a non-firm basis, facilitating future connections at lower cost.
HV Statcom	Other DNO LCNF projects	We can apply power electronics to control system voltage and avoid reinforcement.
Dynamic rating	SPEN LCNF	We can maximise the capability of our assets through real time analysis
Online condition monitoring of primary breakers	Iberdrola best practice and technology developments	We can optimise condition monitoring to improve maintenance and replacement
Secondary Sub monitoring	Various project	We can increase network visibility of power flows and emerging issues for improved load indexing.
Soule switch	SPEN best practice	We can replace manual switches with automated switches to improve fault response.
Fault passage indicators	SPEN Fault practice	We can identify faults faster to reduce duration of power cuts
Low loss transformers	SPEN best practice	We are using low loss technology as standard, reducing the losses on the network and overall environmental impact

Innovation funding in RIO-ED1

In this section:

- What are the innovation funding mechanisms
- Proposals for the network innovation allowance
- Consulting with our stakeholders
- Proposals for the network innovation competition
- Proposals for the innovation rollout mechanism

There are various different funding mechanisms within the RIO-ED1 framework, and we will use them to build on our previous innovation successes.

Our range of innovation projects will be focused around the priorities outlined above, and form a balanced portfolio of short, medium and long-term deliverables. This approach allows for initiatives at all stages to be pursued, from academic research through to demonstration activity.

What are the innovation funding mechanisms?

A Network Innovation Allowance (NIA)

Designed to fund smaller innovation projects.

A Network Innovation Competition (NIC)

An annual competition to fund selected flagship low carbon and environmental innovation Projects

An Innovation Rollout Mechanism (IRM)

Designed to fund the rollout of proven innovations that will contribute to the development of a low carbon energy sector in Great Britain or broader environmental benefits.

Proposals for the Network Innovation Allowance (NIA)

Our existing portfolio includes a broad range of activity, from academic partnerships (such as the Scottish Power Active Research Centre) through to technology demonstration (such as our LCNF Tier 2 project Flexible Networks).

Based on our experience and view of the current industry, we will focus our ED1 innovation activity on a number of topics. We have mapped these topics against our stakeholders' priorities below.

Operating Our Network Safely/ Providing Value for Money / Delivering Excellent Customer Service

Improving service to poorly served customers	Improving customer service during power cuts	Reducing the number & duration of power cuts	Investing in storm resilience	Managing an ageing network	Preparing the network for low carbon technologies
Application of smart metering data			Alternative conductor materials	Demand side response as an alternative to asset replacement	
Network visibility through online systems		Low voltage automation		LV voltage contro;	
Advanced automation			Remote asset tracking	Community led solutions	
Tackling metal theft			Alternative conductor materials		
Smart metering data for active network management			Insulation failure detection		EV charging management
Energy efficiency	Advanced mobile workforce capability			Remote asset inspection	Local energy management
Energy storage		Research in asset management			Network optimisation to reduce losses
Distribution system operator model					
Power electronics technology		Superconducting technology		Hydrogen systems	
Alternative conductor materials					

Short Term	Medium Term	Long Term
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Funding level	Additional cost per customer p.a. (approximate)	Stakeholder Response	Strategy
No funding	£0.00	10%	Not to utilise the NIA
0.5% revenue	50p	36%	Significant emphasis on short term activity, some focus on medium term activity and marginal focus on long term activity
0.75% revenue	75p	33%	Comprehensive focus on short and medium term activity with marginal focus on longer term activity
1% revenue	£1.00	21%	Comprehensive focus across short, medium and long-term horizon.

Consulting with our stakeholders

In mapping our innovation projects onto the priority areas identified with our stakeholders, we took into account the following factors:

- *Many of our innovation initiatives will fulfil more than one priority at a time.*
- *Individual projects will be assessed relative to others in terms of the overall cost, effort, risk and benefit to customers and the network.*
- *The successes of innovation projects will be an important input to the ongoing strategy.*
- *What we learn from our innovation initiatives will have an impact on the overall innovation priorities. Where we have addressed a problem the priority may become less relevant, or if an initiative is unsuccessful that priority may require greater focus.*

We presented our innovation proposal to our stakeholders as part of our engagement programme, and asked for their views on a range of options including:

- *not to utilise the NIA at all (so that stakeholders did have this as an option).*
- *a low cost strategy focused on short term challenges only, equating to approximately 50 pence per customer per annum (0.5% of annual revenue).*
- *maximising amount of funding available to look at a broad spectrum of long, medium and short term challenges, equating to approximately £1 per customer per annum (1% of annual revenue).*
- *a combination of these approaches with greater emphasis on short and medium term challenges and a lesser amount of long term focus, equating to approximately 75 pence per customer (0.75% of annual revenue).*

Innovation was rated the most important with the highest willingness to pay

The proposed strategy was outlined against each option so the benefits and costs of different allowances could be considered. The range of options and responses are summarised below.

Over 50% of stakeholders we asked were in favour of an allowance of at least 0.75% based on our proposed strategy and benefits

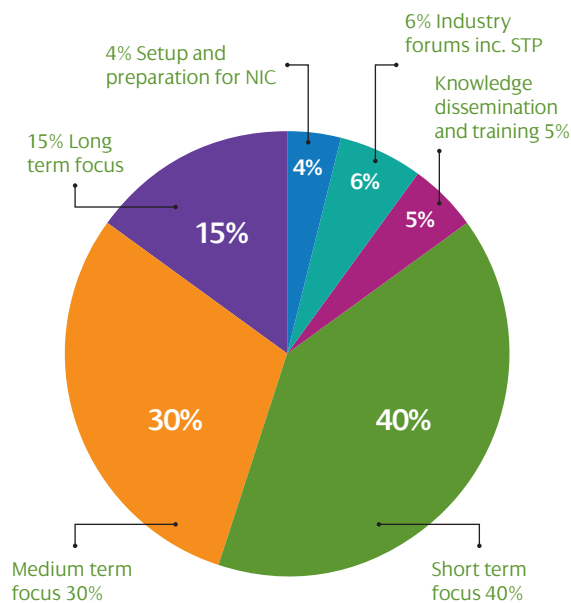
Over 50% of stakeholders we asked were in favour of an allowance of at least 0.75% based on our proposed strategy and benefits.

This was further supported by our customer on-the-street survey which included 1100 members of the public. Out of all the areas surveyed, innovation was rated the most important with the highest willingness to pay in both our license areas.

In light of this response, and with consideration of our innovation plans, we propose an innovation allowance for both SPD and SPM of 0.8% of annual revenue. We expect this level of funding to be split as shown in the figure below.

A number of our projects will start in the period leading up to ED1, and continue into the new innovation funding framework. We'll ensure all of these are consistent with our proposed approach for ED1.

Proposed NIA Spend





Proposals for the Network Innovation Competition (NIC)

In the first three years of the LCNF Tier 2 process, we have been awarded two projects. In the ED1 period, we will continue to develop larger scale demonstration projects as part of our ethos of:

“think big, start small, scale fast.”

Our projects will be developed within the guidelines of the NIC and also align with our stakeholders views. Particular areas of interest include:

- *Advanced application of Smart Metering data.*
- *Demonstrating the DSO concept and the future role of the DNO.*
- *Consumer involvement in the network through DSR and exploring other possible services.*

- *Facilitating the smart city and community.*
- *Loss reduction solutions.*
- *Energy solutions for vulnerable and off gas grid customers.*
- *Medium Voltage DC systems to improve connectivity.*

This is not an extensive list as we expect the priorities to change over the period depending on the success of other projects.

Proposals for Innovation Rollout Mechanism

The Innovation Rollout Mechanism is in the early stages of development, and we will use it as we see appropriate throughout ED1. We regularly review technological developments, both our own and those of other DNOs, and we will evaluate the rollout potential and benefits of these new technologies as necessary.

Outputs from innovation

Our focus for innovation is on real issues that the distribution network will be faced with, informed by stakeholder feedback.

Our innovation activities align with the business plan outputs:

Network reliability

We plan to develop new automation schemes on the Low Voltage network to restore customers faster using embedded intelligence. This will be a key element in reaching our target of reducing fault restoration times by 16%.

Customer satisfaction

We'll apply smart metering data to proactively provide improved information on what is happening on the network, particularly during fault conditions.

Connections

We'll demonstrate demand side response solutions to assist in allowing for faster connection to the network.

Environment

We'll develop alternative conductor and insulation materials to reduce the use of oil in our equipment.

Safety

We'll develop new approaches to combating metal theft through alternative detection, such as using technology currently being developed through the Energy Innovation Centre.

Social obligations

We'll provide communities with information from smart meter data and incentives to change their energy consumption behaviour for their own and the network's benefit.

Our innovation and collaboration with other parties will:

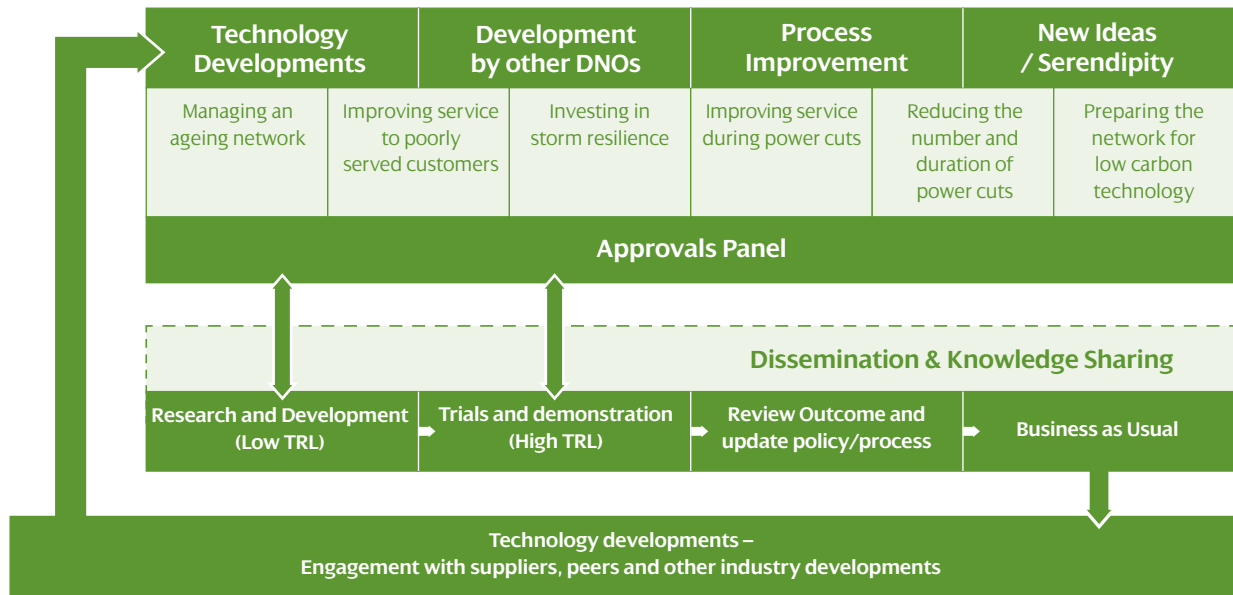
- *help develop the supply chain to understand our future requirements and coordinate suppliers to work together for mutual benefit.*
- *forge stronger links with the academic community.*
- *engage a wider range of community and stakeholder groups.*
- *allow us to understand how other parties can help facilitate the low carbon transition.*
- *share learning to help accelerate the development of new, innovative solutions.*

Innovation is essential for our future, and the detrimental consequences of not innovating would include:

- *Losing our opportunity to reduce the cost of operating the network through the application of new technologies and commercial arrangements. Although a lack of innovation might look like a saving in the short term, it could cost customer more money in the long term.*
- *Hindering the low carbon transition as we adapt to face unprecedented challenges.*
- *Hinder our preparation for the further challenges of ED2, when the uptake of new technology will increase further and place new strains on our network. Without timely investment in alternative solutions the longer-term cost may be higher, as highlighted through the Smart Grid Forum work stream 2 and 3 reports.*
- *Continuing to deploy asset intensive solutions, and failing to be in a position to adopt new technology as it is developing due to a lack of confidence.*

From inspiration to solution

Technology Developments flow chart



Through the development of our innovation strategy, we have discussed our plans and shared knowledge with others.

- *The leading technology company 3M are consistently recognised as one of the most innovative companies in the world. We held a knowledge-sharing event with them to compare our innovation management processes with an organisation outside our sector. This exercise helped us to review our process and the way we think about developing new solutions on the network.*

- *We benchmarked our process with the innovation team in Iberdrola. This helped us to ensure we are at the forefront of innovation management, ensure value for money, and create a more productive environment.*
- *We reviewed our innovation activity with University of Strathclyde to agree our objectives and keep abreast of academic developments.*

The key steps of our innovation process are:

1: Idea generation

Ideas can come from a variety of sources. We have internal initiatives such as 'What's the big idea' that encourage staff from all parts of the business to propose new ideas to our Executive team.

These can include ideas for business improvement as well as innovation. The other areas where we look for new innovative ideas are:

Technology developments

The introduction of new technology by suppliers or academia. This includes working within the competitive marketplace and working collaboratively with others.

Developments by other network companies and wider industry

This includes the developments by other DNOs as a result of LCNF, IFI and NIA/NIC in the future. A watching brief will be maintained on developments outside the UK, in particular the outcome of FP7 projects and activity within other parts of the Iberdrola group.

Process improvement

Our business change team is working to improve the way that the business operates. We use proven Lean Sigma methods to ensure the customer is at the heart of our procedures.

Serendipity

As with some of the best developments in history, innovation cannot always be planned. Our innovation plans includes a degree of flexibility to allow new developments to be pursued if we believe they will provide benefits to customers.

2: Approval

Our R&D approvals panel reviews all technology innovation projects before they progress with NIA/NIC funding. This is to ensure that the project aligns with our strategy, offers value for money, and is expected to deliver benefits that will justify the cost and risk. Following feedback from our Transmission innovation strategy, we are also aiming to reorganise our R&D approvals panel over the course of 2013 to include a number of external stakeholders such as University of Strathclyde for external verification. External governance will allow further scrutiny of our investments to ensure value for money, however we will balance this against any potential conflicts of interest that external involvement could introduce.

3: Project management and monitoring risks

All of our projects are managed inline with the ENA Good Practice Guide for Innovation in Electrical Distribution Networked Systems (G85). A project manager is assigned to all projects to ensure effective ownership, and our project managers can either be from the Future Networks team or from another part of the business. All projects are monitored throughout their lifecycle and reported on back through the R&D approvals panel. Should the anticipated benefits not arise through the course of the project, the Approvals Panel have the necessary authority to stop the project.

4: Project closure and adoption into business as usual

The manager for each project is responsible for directing the learning that comes out of a project to the relevant internal policies for use within our business. The same manager also tells the rest of our business about the project through a variety of channels including our intranet, team briefs, and other internal documentation. Where a significant change to policy is identified, we create a project charter that outlines the benefits and steps that are required. Each charter is overseen by our business change department to ensure the innovation is implemented into the wider business.

Reviewing our innovation strategy

The environment we work in is constantly changing, and our innovation strategy needs to adapt to this. We will be undertaking an annual review of our innovation strategy through our R&D approval panel and in line with our stakeholder feedback. Because innovation takes time to develop the benefits, we do not expect to update our strategy every year, but will review its content depending on the learning and other developments by our suppliers and other DNOs.

We know that we can't do this alone. We work with a variety of collaborators on our projects, with multiple benefits. Collaboration allows for the sharing of ideas, which in turn allows us to make greater progress, faster. It also allows a sharing of risk so that no one party is carrying all the consequences of a project failing. This in itself is recognised as an important learning point; proving why things don't work can be just as important as proving what does.

We work with a wide variety of collaborators



Throughout the ED1 period and beyond, we want to ensure good practice and continually review our innovation process.

- We have worked along with other DNOs as part of the Energy Networks Association R&D group to develop G85 Good Practice Guide to R&D Management.
- We will hold a bimonthly review of the progress of all NIC and NIA projects to ensure risks are being managed effectively.
- Larger projects are subject to a project charter (administered by the business change team) to ensure that the project is not only delivered but that the proposed benefits from the project are realised. This charter is reviewed at an Executive level.

• Our objectives will be subject to a formal internal review on an annual basis to ensure that they are still appropriate.

- A continuous review will be undertaken as part of the ongoing stakeholder engagement programme throughout the course of ED1.

Since 2011, we have run an internal innovation conference and over 150 members of staff from across our company have attended to date. This event showcases a number of our projects, provides an update on what other DNOs are doing, encourages open discussion on the areas we are focussing on, and invites feedback on new areas where staff feel we should be focussing. The conference has included speakers from some of our project partners as well as internal staff. It has proven to be very successful with a lot of positive feedback, and we intend to continue running the conference during the ED1 period and beyond.

Making the most of being part of Iberdrola

Innovation at Iberdrola

SP Energy Networks are part of the Iberdrola Group, one of the largest energy companies in the world. The group prides itself on its commitment to innovation. Across the group:

- *in excess of €145 million was invested in R&D in 2012*
- *over €50 million of the investment was associated with networks.*
- *innovation involves a variety of R&D across distribution and transmission*
- *investment includes funds leveraged from a variety of sources including European Framework programmes, government funding, and stakeholder investment.*

This impressive investment demonstrates Iberdrola's commitment to innovation.

In 2012 Iberdrola was identified as the 5th most innovative utility in Europe by the European Commission. Iberdrola were the only utility with UK network presence to feature in the top 300 companies

Source: Iberdrola 2012 Innovation Report

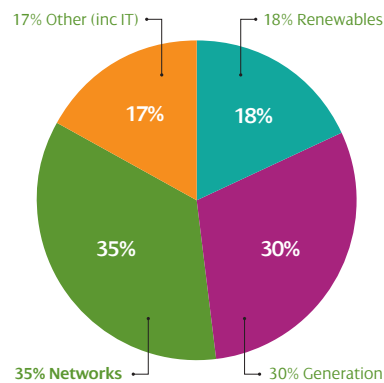
We want to make the most of being part of this highly innovative group. We collaborate extensively with other areas of the Iberdrola group, looking at all elements of networks, led by an international steering group for Smart Grids. To give three examples:

In our ED1 business plan the design and deployment of light current technology was informed by experiences of our Iberdrola colleagues in Spain (specifically the substation protocol standardisation to IEC 61850). This has allowed us to contact a greater variety of suppliers, thereby increasing competition and reducing costs.

Iberdrola's experience of smart metering in the USA and Spain, and the data this creates, has helped us to plan our IT strategy and refine our requirements for the IT systems we will purchase over the ED1 period.

Iberdrola also have a collaborative electric mobility programme in Spain with SEAT to obtain and share data on the actual operating conditions of electric vehicles. Our access to this data will improve our understanding of the impact of this technology on our network.

R&D investment in 2012 across Iberdrola



Iberdrola R&D investment (€m)

