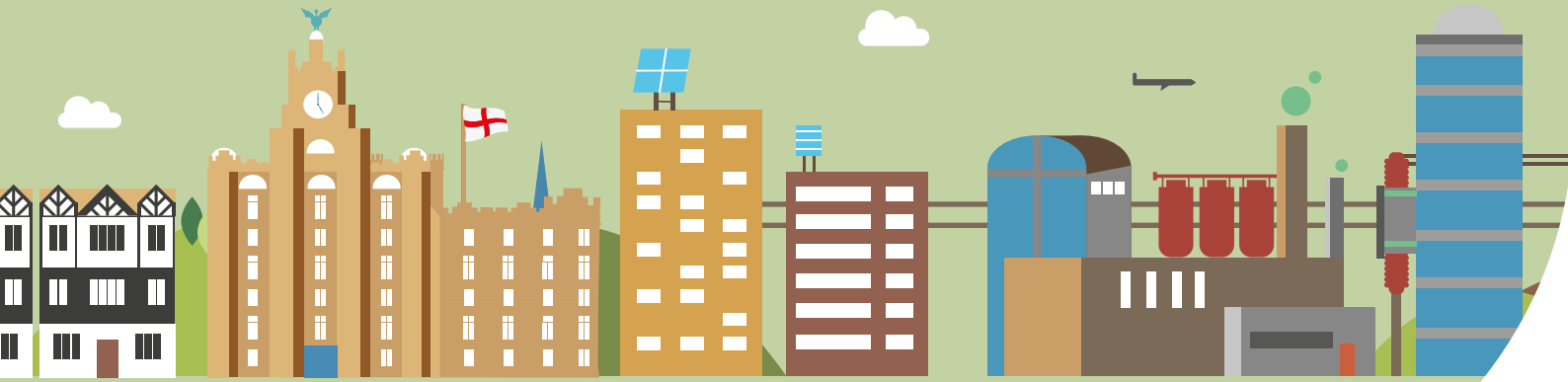
SP Energy Networks 2015–2023 Business Plan

SP Distribution plc
SP Manweb plc

Updated March 2014



SP ENERGY NETWORKS


SP ENERGY NETWORKS
www.spenergynetworks.com

Contents

Web Version 1.0 – 31st March 2014

Annexes

Refer to Chapter 11 – Glossary for a description of our Annexes

A. OVERVIEW

ii. Executive Summary

Plan on a page

Changes to our plan

B. CONTEXT

2. Our challenges

Written Evidence to Scottish Affairs Committee

Assessment of Overhead Line Performance During Severe Storms

Letter Regarding Storm Response

3. Stakeholder Engagement

Learning from Stakeholders

Stakeholder Engagement – Further Detail

RIIO ED-1 Stakeholder Consultation – Phase 1 Report

RIIO ED-1 Stakeholder Consultation – Final Report

Stakeholder Panel Scoping Phase – Final Report

C. OUR 2015–2023 PLAN

5. Outputs and Incentives

Network Resilience Strategy

Environment Strategy

Losses Strategy

Customer Satisfaction Strategy

Social Obligation Strategy

6. Expenditure

a. Expenditure Overview
- Expenditure Supplementary Annex

b. Asset Stewardship
- Long-Term Strategy
- Asset Health and Criticality
- Asset Management Health Index Reporting Assurance
- Asset Data and Information Strategy
- RRP Narrative Explaining Changes in Table V1 – Changes in Opening Balance
- Network Size Amendments Assurance
- Report on Network Size P3 & 4 Assets

c. SP Manweb Company Specific Factors
- SP Manweb Company Specific Factors

d. Load Related Investment
- Load Related Investment Strategy
- LCT Network Monitoring Strategy
- Transform Model Analysis and Support
- Heat pump and energy efficiency scenarios

e. Non-Load Related Investment
- 132kV Cable Strategy
- Rising Mains and Laterals Strategy
- LV and ESQCR Overhead Lines Strategy
- 33kV and 11kV Overhead Lines Strategy
- Regulatory Reporting Pack – Wooden Poles Guidance Document
- 132kV Overhead Lines Strategy
- LV Substation Plant Strategy
- 11kV Substation Plant Strategy
- 33kV Substation Plant Strategy
- SWG-02-007 Switchgear Assessment 6kV, 11kV and 33kV
- 132kV Substation Plant Strategy
- SWG-02-008 Assessment of the Operational Adequacy of 132kV, 275kV and 400kV Switchgear
- TRAN-02-002 Assessment of the Operational Adequacy of Transformers and Reactors 33kV and Above
- RIIO-ED1 HV and LV Network Investment Analysis – Phase 2
- Civil Strategy and Plans
- Operational IT and Telecoms Strategy
- BT21CN Mitigation Strategy
- Network Resilience Strategy
- Protective Equipment and Supporting Systems Strategy
- Legal and Safety Strategy

f. Network Operating Costs

g. Closely Associated Indirect Costs

h. Business Support Costs
- Non-Operational IT and Telecoms Strategy

i. Non-Operational Capex

j. Non-Price Control Costs

k. Non-Activity Based Costs

l. Real Price Effects
- Real Price Effects 2014/15 to 2022/23

m. **Cost Efficiency and Benchmarking**

- Cost Assessment, Efficiency and Benchmarking
- Cost Benefit Analysis
- Historical Data Comparable to RIIO-ED1 Ongoing Efficiency Gains

7. Business Readiness

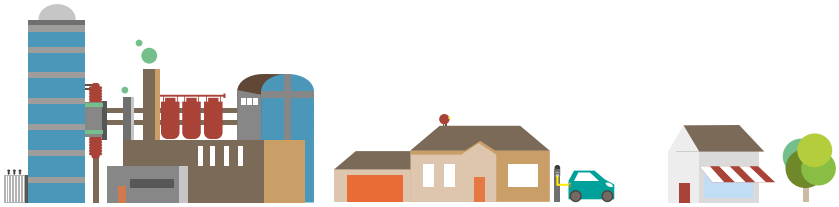
- Innovation Strategy
- Smart Meter Strategy
- Smart Grid Strategy
- RIIO-ED1 Review Project

8. Risk and Uncertainty

- Risk and Uncertainty
- Risk Modelling for RIIO-ED1
- Insurance Strategy

9. Financing

- Financing our Plans



i. A Message from Frank Mitchell CEO

I am pleased to present our final Business Plan for 2015-2023 for our electricity distribution networks in Central and Southern Scotland, Merseyside and North Wales. These plans have been constructed to incorporate the feedback we have received from our stakeholders and the 3.5 million customers we serve.

This document also lays out our plans to incorporate smart metering and to create the flexibility in our approach and network to accommodate new capacity as we build towards a low-carbon future.

Stakeholders may be aware that our July 2013 plan for our distribution businesses was not fast tracked by Ofgem. This outcome was disappointing to us since our SP Transmission business was the leading company in the RIIO-T1 process, and was fast tracked in 2012. It is also disappointing that this will delay the implementation of the plans that we developed in conjunction with our stakeholders.

We have taken the opportunity from our July 2013 plan being resubmitted to further improve our submission by:

- *Updating our costs and volumes in the light of latest information, delivering some £450m of further reductions to our controllable costs.*
- *Using the latest Ofgem information to demonstrate that our costs in many areas are already more efficient than the fast tracked company or the expert view. Where there are comparable unit costs we are 12% more efficient than WPD.*
- *Ensuring we build a stronger case to justify important elements of our plan that our stakeholders have told us are key e.g. Resilience investment of £225m[1], public safety investment of £265m and investment to improve the service we provide to poorly served customers.*
- *Providing additional information to help Ofgem to make fully informed decisions on investment volumes, particularly where these are higher due to the position that key assets are in terms of criticality and their life cycle.*
- *Retaining our original output commitments to customers, including double guaranteed standard payments.*

Ultimately all of our objectives are balanced against the cost to the end consumer. On a like for like basis, whilst increasing our outputs and commitments to customers, our costs will be around 2% less per annum than in DPCR5.

1. *Includes storm resilience, flooding and black start expenditure.*

Impact on our element of Customer Bills

Using average domestic consumption (3,300kWh) as required by Ofgem and comparing with the period 2010-2015:

- *Our domestic customers in central and southern Scotland will see a 11% reduction, average £99 p.a. to £88 p.a.*
- *Our domestic customers in England and Wales will see a 18% reduction, average £126 p.a. to £103 p.a.[2]*

Our stakeholders have fed back to us their priorities; these drive our submission and are as follows:

- *Stakeholders believe that they should not face increased risk from an ageing network and that it is critical to maintain public, staff and contractor safety.*
- *They recognise the benefits of reductions in interruptions (18% reduction in last 5-years alone) and in the duration they are off supply when interrupted (a 31% reduction in the last 5-years)[3]. Therefore continuing this improvement, further reducing the number and length of power cuts remains a priority.*

2. *These numbers are expressed in 12/13 prices and will vary depending upon actual inflation (RPI) and customer consumption.*

3. *Between 2008 and 2013, we reduced the number of interruptions experienced by our customers by 18%, the total amount of time customers were off supply by 31% and the average time a customer was off supply by 16%.*

- *Improving customer service across operations and connections. In DR5 our customers are scoring us between 8 and 9 out of 10 (which compares favourably with the top UK customer service companies[4] across all sectors).*

- *Our customer outputs set out more than 90 separate customer commitments to improve the essential service we provide. These are deliberately ambitious but our rate of improvement in DR5 demonstrates to all that they are deliverable.*

- *Our stakeholders want to see customer service continue to improve and we see the introduction of smart metering and smart grid technology as key to enabling this in ED1 and ED2.*

- *This winter has seen the UK significantly affected by severe weather. In our Scottish, North West England and Welsh territories we are perhaps more acutely aware of the impacts of these events given their relative frequency compared to the rest of the UK. Stakeholders wish to see us continue to invest more to reduce the impacts of major storms and this is why we have proposed £210m[5] to continue resilience programmes that we have now been running for over 15-years.*

- *Stakeholders want us to improve service to more than the worst served customers as defined by Ofgem. We have plans to extend our targeted performance improvement programme to cover 40% of what we define as poorly served customers, those whose supply is interrupted more than 10 times the average. To achieve this we are targeting £6m of investment in spur lines, with clear stakeholder support.*

- *Prepare the network for low-carbon technologies. To achieve this we plan to invest more than £358m to increase network capacity, to facilitate low-carbon technology as well as general load growth. We will use smart metering and network monitoring to target this investment where the need is greatest.*

We have begun to prepare for the challenge of ED1, a cross functional team drawn from across my business is focussed on building an implementation plan. During ED1 we will transform our business further and the service we provide by:

- *Bringing our business even closer to our customers to become more responsive, whilst also reducing our centralised support costs and overheads.*

- *Training our staff to harness the benefits of smart technologies to transform our customer relationships.*

- *Applying a stream of innovation to deliver long lasting benefits for our stakeholders.*

By 2023, we intend to lead the industry by continuing to apply our guiding principles to be:

- *A customer service focused company trusted by our communities and stakeholders.*

- *An engineering company with strong stewardship of assets and world class safety credentials.*

- *A company that attracts and develops skills for the future from the communities we serve.*

Application of these guiding principles has delivered significant customer benefits during DPCR5, including:

- *Our customers ranking us higher on customer service (25% improvement in SPD and 12% in SPM).*

- *Reduced cable fault repair costs by around 1/3rd.*

- *Reduced our customer interruptions and average time off supply by 7% and 10%.[6]*

- *Being on track to deliver 100% of our current regulatory contract.*

- *We have now connected 28% of GB renewable distributed generation to our networks, despite serving only 14% of GB demand customers.*

It is therefore with a significant degree of confidence that we propose this Business Plan to Ofgem. We have researched the needs of our stakeholders, we have benchmarked our costs in terms of efficiency, we have balanced risk decisions against value-for-money for paying customers and we have further improved our Business Plan. The application of our guiding principles has turned around our company's performance during DPCR5, this can be seen in our results both financial and non-financial in 2012/13 and will ultimately underpin our successful delivery of the RIIO-ED1 contract.

As I am sure you understand, the Business Plan is prepared on the basis that the present currency,territorial and regulatory arrangements in Great Britain will continue in their present form throughout the duration of the RIIO-ED1 price control. If there is a material change to any aspect of these arrangements, then the respective Business Plans of each of SPT, SPD and SPM and their revenues will have to be reviewed.

Finally, I would like to thank again the stakeholders who helped us develop our plans, and continue to engage with us through our enduring stakeholder panels and forums. I look forward to providing updates on our progress and obtaining your ongoing input to shaping our priorities to meet the challenges of the next decade.

Frank Mitchell

4. *Which? reveals best and worst brands for customer satisfaction out of UK's biggest brands rated on service 19 September 2013. Top 5 companies in UK score 8.2 to 8.8 out of 10.*

5. *Overhead line rebuild and resilience programme*

6. *From April 2010 to March 2013, customer interruptions reduced by 7%, total time off supply reduced by 16% and average time off supply improved by 10%.*

Executive summary

Our whole Business Plan in brief

This chapter sets out the key highlights from our 2015-2023 Business Plan.

We present **Our Recent Performance and Track Record** of continuous improvement. More detail is set out in **Chapter B1e – Delivering our 2010-2015 Contract.**

The Challenges we face in the RIIO-ED1 period and the future uncertainties are described in more detail in **Chapter B2 – Our Challenges.**

We provide an overview of what our stakeholders told us, their willingness to pay for incremental investments, and how we have incorporated this into our plans in **Stakeholder Priorities**. We provide further information in **Chapter B3a – Learning from Stakeholders**.

We explain **Our strategy for RIIO-ED1**, which is built on the foundation of our guiding values. We explain more about this in **Chapter B1a – Our Strategic Vision and Guiding Values**. We also outline the role of innovation and provide more detailed information in our **Annex – Innovation Strategy**.

We describe what our customers and stakeholders can look forward to in **Outputs**. Our comprehensive outputs framework, comprising more than 90 commitments is described in greater detail in **Chapter C5 – Outputs and Incentives.**

In **Expenditure** we provide a headline summary of our plans which are set out in more detail in **Chapter 6 – Expenditure** and in our more detailed **Annex C6 – Expenditure**. Financing our plan efficiently summarises the key financial parameters, with more detail set out in **Chapter 9 – Financing**.

The Impact of Our Plan on Customer Bills provides detail of the cost to our main customer groups comparing average 2010-15 to 2015-23.

Finally we explain how our plan is **delivering value-for-money** for our customers.

This Business Plan is prepared on the basis of the current EU and UK legal and regulatory framework applicable to SPD and SPM.

In this chapter we explain:

Topic	More detail in main Business Plan chapters
a. Our recent performance and track record	B1e – Delivering our 2010-15 contract
b. The challenges we face in RIIO-ED1	B2 – Our challenges
c. Stakeholder priorities	B3 – Stakeholder engagement
d. Our strategy for RIIO-ED1	B1a – Our vision and guiding values
e. Outputs	C5 – Outputs and incentives
f. Our total planned expenditure	C6 – Expenditure
g. Financing our plan efficiently	C9 – Financing
h. The impact of our plan on customer bills	C10 – Our revenues and impact on customer bills
i. Delivering value-for-money	C10b – Delivering value-for-money

a. Our Recent Performance and Track Record

Some highlights of what we have delivered during DPCR5

We have continuously improved our Safety performance

Since 2010 we have reduced the total number of accidents in our business by over 50%. Our Total Recordable Injury Rate ("TRIR") is 0.24 incidents per 100,000 hours worked, well below our aggressive target of 0.5 and **significantly better than the industry average**.

We have continuously reduced our costs

During DPCR5 our cost reduction focus has been on the direct activities of performing tasks. For example since 2010 **our cable fault repair costs have reduced by more than 30%**.

We have continuously improved storm resilience

Our networks had relatively **fewer customers affected by recent major storms** (Christmas 2013) than other affected DNOs **despite facing the highest wind speeds of all**.

We have continuously improved Customer Service

Our average score (out of 10) in the industry survey of customer satisfaction for SPD increased to 8.75 and in SPM to 8.35. The very best companies in other sectors score between 8 and 9 out of 10 on customer service.

Which? Top 5 companies:		Ofgem Scores:
1. Lush	8.8	SPD – 8.8 SPM – 8.4
2. Lakeland	8.5	
3. First Direct	8.4	
4. John Lewis	8.2	
5. RAC	8.2	

Which? reveals best and worst brands for customer satisfaction UK's biggest brands rated on service 19 September 2013

We have continuously improved our fault response

Operational initiatives and deployment of new technologies has enabled us to improve the number of customer minutes lost (CML) year on year since 2010. **We have delivered an 18% reduction in SP Manweb and a 10% reduction in SP Distribution**.

Find out more in our main Business Plan

The improvements we have delivered in DPRC5 have provided confidence that our output commitments to customers set out in **Chapter 5 – Outputs and Incentives** are challenging but achievable.

More detail on our DPCR5 performance is set out in **Chapter B1e – Delivering our 2010-2015 contract**, and our preparations for RIIO-ED1 in **Chapter 7 – Business Readiness.**

b. The Challenges We Face in RIIO-ED1

Our business environment and future uncertainties

Keeping our network fit-for-purpose

Much of our network was installed in the 1950s-1970s and is approaching the end of its operational life.

Our investment needs, informed by asset condition, are different across our two networks and different to other DNOs.

Accommodating Future Customer requirements

Network capacity and connections are key economic enablers. We are the only DNO to work across Scotland, England and Wales (with higher carbon reduction targets in both Scotland and Wales). **We are working with developers and government to connect renewable generation and enable customers to use low-carbon technologies.**

Our Future Workforce

Around 60% of our direct workforce and 60% of our contractor workforce are expected to retire in the next decade.

We and our contractors need to recruit, train and retain significant numbers of staff if we are to meet the challenges of the next 30 to 40 years.

Our unique network in Merseyside and North Wales

Was the most economic network design on installation more than 40 years ago.

Delivers better security of supply for customers but comes at a higher cost.

Is cost prohibitive to change to a traditional network design and customer service would suffer.

Resilience against extreme weather

There have been more severe weather events in the last 3 years than in the previous 10 years.

Our network has been made more resilient to storms over the last decade, however there is more to do.

Stakeholders want us to continue this work and do 10% more than we originally planned.

Uncertainties

We understand and are prepared for the risks and uncertainties of the RIIO ED1 period. Our plans are built around conservative forecasts of demand growth and customer uptake of low-carbon technologies, but we can respond to meet higher scenarios.

Devolved and local government plans to introduce new street works taxes are still at an early stage.

c. Stakeholder Priorities

An overview of what our stakeholders have told us and how we have incorporated this into our plans

Stakeholder feedback for our SPD licence area

Phase 1		Phase 2				Phase 3		Phase 4
Stakeholder priority areas	What we proposed in draft plan (Feb 2013)	Stakeholders workshops (voting)	Stakeholder on-line survey (simalto)	Employee on-line survey (simalto)	Customer face to face survey (simalto)	What was in our July 2013 plan?		What's in our March 2014 plan?
Storm resilience	Improving resilience to >10% customers	↑	⇔	⇔	⇔	↑	Draft plan + additional 10% of km in severe weather areas will be made resilient	Same output, lower cost
Poorly served customers	Improving service to 40% of poorly served customers	↑	↑	↑	↑	↑	Draft plan + additional 14% investment targeted to poorly performing overhead lines and cables	Same output, lower cost
Energy advice for fuel poor	No expenditure in draft plan	⇔	Proposed alternative output related to fuel poverty					No change
Network capacity information for new connections	No expenditure in draft plan *	⇔	Exploring options for this to be funded by connections customers					No change
Future-proofing the network	No expenditure in draft plan	↑	↑	⇔	⇔	↑	Investment in future-proofing, in line with £10m option presented at stakeholder events	No change
Earlier approach to network investment	7 new grid or primary sites, 14 uprated sites	↑	↑	↓	↓	⇔	Consistent with draft plan – triggering reinforcement 20% earlier	No change
Future innovation spend	No expenditure in draft plan **	↑	↑	↑	↑	↑	80p per customer per annum, based directly upon stakeholder feedback	No change
Service position inspections	Inspection every 5 years starting 2015	⇔	↓	↓	⇔	↓	Inspections to start 5 yrs after smart-meter installation – later than draft plan assumption. Reduced investment in ED1.	No change
Flood protection	Protect 48,000 customers against 1 in 200 year event	⇔	↑	↓	↑	↑	Accelerating our fluvial *** flood protection programme prior to ED1. Reduced ED1 investment.	Extra ED1 investment in protection against pluvial **** flooding

* As stakeholders demonstrated strong support for Future-proofing at our workshops, we presented an option for £10m investment in our surveys.
** As stakeholders demonstrated strong support for Innovation at our workshops, we presented an option for investment of 50p per customer per annum in our surveys.
*** Fluvial = river based floods.
**** Pluvial = localised rain based floods

SPD investment – our plans are £20m higher as a result of stakeholder priorities and willingness to pay

Incorporating Stakeholder Feedback into Our Plan

Highlights:

- *We have engaged with around 2,000 customers and stakeholders during our Business Plan preparations.*
- *97% of stakeholders who attended our draft Business Plan stakeholder events felt we were listening to their views.*
- *Stakeholder feedback varied between licence areas, highlighting the need to engage separately in each area.*

Throughout the engagement process we have received feedback at various stages from many groups of stakeholders. The tables above summarise the feedback at each phase and show what we have included in our final plan.

The arrows indicate the general direction of feedback across the investment options we engaged on in Phase2.

Increased investment options were tested through willingness to pay and bill impact.

In Phase 4 (March 2014) we have indicated what is included in this revised plan. In all cases we have maintained our commitments to stakeholders, whilst in some cases, we will deliver the same outputs at less cost. In addition, we have increased our plans for Pluvial (localised rainwater) flooding.

Stakeholder feedback for our SPM licence area

Phase 1		Phase 2				Phase 3		Phase 4
Stakeholder priority areas	What we proposed in draft plan (Feb 2013)	Stakeholders workshops (voting)	Stakeholder on-line survey (simalto)	Employee on-line survey (simalto)	Customer face to face survey (simalto)	What was in our July 2013 plan?		What's in our March 2014 plan?
Storm resilience	Improving resilience to >10% customers	↑	↑	↑	⇔	↑	Draft plan + additional 10% of km in severe weather areas will be made resilient	Same output, lower cost
Poorly served customers	Improving service to 40% of poorly served customers	⇔	↑	↑	⇔	⇔	Consistent with draft plan – investment targeted to poorly performing overhead lines and cables	Same output, lower cost
Energy advice for fuel poor	No expenditure in draft plan	⇔	Proposed alternative output related to fuel poverty					No change
Network capacity information for new connections	No expenditure in draft plan *	⇔	Exploring options for this to be funded by connections customers					No change
Future-proofing the network	No expenditure in draft plan	↑	↑	⇔	⇔	↑	Investment in future-proofing, in line with £10m option presented at stakeholder events	No change
Earlier approach to network investment	6 new grid circuits or transformers, 30 new or uprated sites	⇔	⇔	↓	↓	⇔	Consistent with draft plan – triggering reinforcement 20% earlier	No change
Future innovation spend	No expenditure in draft plan **	↑	↑	↑	↑	↑	80p per customer per annum, based directly upon stakeholder feedback	No change
Service position inspections	Inspection every 5 years starting 2015	⇔	↓	⇔	⇔	↓	Inspections to start 5 yrs after smart-meter installation – later than draft plan assumption. Reduced investment in ED1.	No change
Flood protection	Protect 120,000 customers against 1 in 100 year event	⇔	↑	⇔	↑	↑	Accelerating our fluvial *** flood protection programme prior to ED1. Reduced ED1 investment.	Extra ED1 investment in protection against pluvial **** flooding

* As stakeholders demonstrated strong support for Future-proofing at our workshops, we presented an option for £10m investment in our surveys.
** As stakeholders demonstrated strong support for Innovation at our workshops, we presented an option for investment of 50p per customer per annum in our surveys.
*** Fluvial = river based floods.
**** Pluvial = localised rain based floods

SPM investment – our plans are £19m higher as a result of stakeholder priorities and willingness to pay

Applying our Ongoing Stakeholder Engagement Approach

Our ongoing stakeholder engagement uses our 7 Pillar approach, ensuring we build strong relationships of mutual benefit.

We describe our approach in more detail in our main Business Plan **Chapter 3 – Stakeholder Engagement**

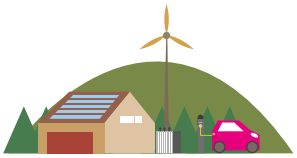
Stakeholder engagement underpins one of our three guiding values – we are a customer service focused company trusted by our communities and stakeholders.

Our approach was recently endorsed by Mid Galloway Councillor Alistair Geddes – *"SP Energy Networks has made a real effort to engage with the Mid Galloway Stakeholder Group and communication between the company and the local community has greatly increased. We welcome this new approach and encourage further engagement with this forum to strengthen relationships at a local level and provide a vehicle to voice opinion and suggestions on wider issues".*

Our engagement with stakeholders creates relationships with mutual benefit and helps us to deliver a stronger business

d. Our Strategy for RIIO-ED1

Built on the foundations of our guiding values and embracing innovation



Serving our customers

A Customer Service focused company trusted by our communities and stakeholders

- *Bringing our business even closer to our customers by devolving more responsibility and decision making to a local level.*
- *Setting high standards of service across all functions and geography.*
- *Increasing transparency to our customers via the web to allow them to drive their own service.*
- *Harnessing the benefits of smart technologies (both smart meters and smart networks) to transform our customer relationship for both existing and new customers.*

Managing our assets

An engineering company with strong stewardship of assets and world class safety credentials

- *Replace assets only when there is a clear needs case to maintain or reduce risk.*
- *Implement a stream of innovations with tangible long living benefits for customers.*
- *Back investment decisions with transparent cost benefit analysis.*
- *Develop a strength in asset data management to optimise investment decisions.*
- *Embedding the benefits of innovation within our plans to reduce customer bills.*

Developing our people

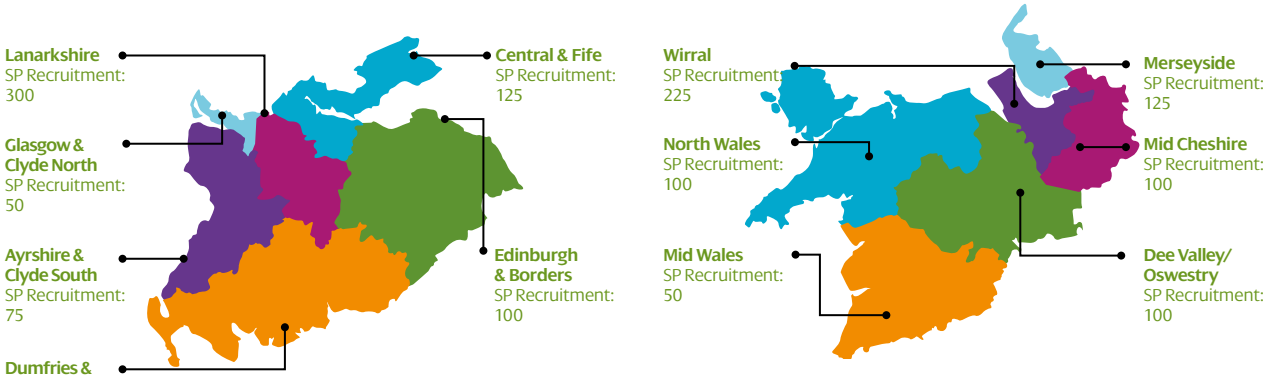
A company that attracts and develops skills for the future from the communities that we serve

- *Address our efficiency gap in support costs by moving our business closer to our customers.*
- *Replenish our ageing workforce from the communities that we serve so that the investment that we make in recruitment and training continues to deliver in the long-term.*
- *Develop and train our staff for a 'smarter' future, as technology and commercial innovations will enable staff to transform the service we provide.*

Deploying Innovation

Deploy commercial innovation to complement technical innovation and set the foundations for a future role as a Distribution System Operator actively managing energy flows on our network.

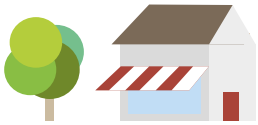
We plan to create more than 2,500 jobs across our supply chain



Plus 1000 contractors across both our areas.

e. Our Outputs

What our customers and stakeholders can look forward to in RIIO-ED1



Outputs

Our Outputs are the things that our customers and stakeholders directly experience and value. The full list of our output commitments are set out in **Chapter 5 – Outputs and Incentives**, and our supporting asset replacement / refurbishment commitments (Secondary Deliverables) are set out in **Chapter 6 – Expenditure**.

These Outputs have been developed to meet the stakeholder and customer priorities identified through our ongoing programme of stakeholder engagement.

Our commitment to continuously improve is demonstrated by the increased customer compensation we will pay if we do not meet our standards:

- *Double Guaranteed Standard Payments, except for storms where we will make other arrangements that customers value more.*
- *In normal weather a domestic customer off supply more than 12 hours will receive compensation.*
- *In storms we will pay for hot meals and accommodation for vulnerable customers off supply more than 12 hours and other customers more than 48 hours.*

'Highlights' from our six output categories

Safety

Minimising the risks associated with distributing electricity:

- *Achieve zero employee lost time accidents.*
- *Remove high risk 'low' lines including those across roads by 2015 and all others by 2020.*

Reliability & Availability

Ensuring our network is resilient to extreme events and reliable under normal circumstances:

- *Reduce the average number of times customers lose power by 7%.*
- *Reduce by 16% the length of time those customers have no power.*
- *Reduce customers without power for more than 12 hours (outwith storms) by 70% by 2016 and 100% by 2023.*

Environment

Reducing our impact on the environment and playing our part in the low-carbon transition:

- *Reduce the carbon footprint of the business by 15%.*
- *Underground 85km of overhead lines in areas of visual importance.*

Connections

Providing excellent service to all customers who want new connections:

- *Continue to facilitate industry leading competition in our network areas.*
- *Improve availability and transparency of connection information and costs.*

Customer Satisfaction

Aiming to deliver the highest satisfaction scores of any DNO:

- *Improve our overall customer satisfaction scores by 20% by 2023 (our customers rating us more than 9 out of 10).*
- *Pay compensation of £10 where we do not deliver an agreed action on your enquiry.*

Social obligations

Recognising and meeting the needs of vulnerable customers:

- *Update and re-launch an awareness campaign for our Priority Services Register (PSR).*
- *We will establish a stakeholder panel to guide our board of directors.*

f. Our total planned expenditure

Including 1% p.a. ongoing efficiency. Controllable costs reduced by £450m (July 13 plan)

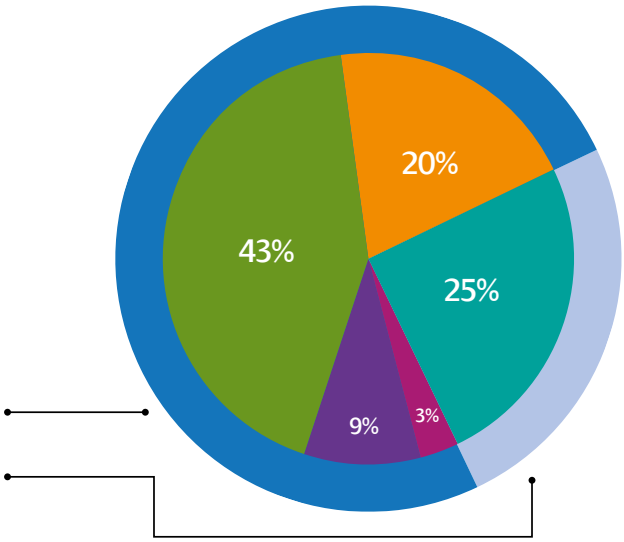
43% – £2.0bn of our costs relate directly to managing our ageing network

9% – £380m of our costs allow us to accommodate customers future requirements (including £20m to enable benefits of smart meters)

20% – £960m of our costs are engineering and corporate support activities

3% – £160m of our forecast costs are a real price effect contingency

25% – £1.2bn of our costs are non-core including corporation tax, business rates, transmission charges and legacy pension costs (including pensions update)



Total £4.7bn

75% – £3.5bn
Core business

25% – £1.2bn
External costs

Controllable costs down 2% from 2010-15 resulting from 30% reduction in support costs whilst delivering 10% more non-load and 28% more load investment

g. Financing our plan efficiently

Striking a balance of risk and reward between stakeholders

We propose a financing plan that is efficient, adheres to Ofgem policies laid out in its Strategy Decision document and is consistent with RIIO principles.

Our base financial plan gives a credit rating of Baa1 which is at the lower end of the range that underpins Ofgem's cost of debt index.

Our financeability demonstrates that we require:

- *as a minimum a cost of equity of 6.4% to enable us to attract and retain sufficient equity finance to provide the necessary investment to maintain network reliability and absorb the forecast expenditure volatility as we facilitate the transition to a low-carbon economy and*
- *a one period transition to longer depreciation lives.*

Our risk and financeability assessment in Chapter C9 of our main Business Plan, demonstrates that there is a significant chance that our investors may have to provide a substantial equity injection during RIIO-ED1 to maintain an investment grade credit rating.

Parameter	DPCR5 (Current)	SPEN July 2013	SPEN March 2014	Comment
Cost of Debt	3.6%	Indexed	Indexed	Reflecting Ofgem's policy decision
Cost of Equity	6.7%	6.7%	At least 6.4%	Considering risk relative to the fast track company
Notional Gearing	65%	65%	65%	Considering risks and opportunities
Dividend Yield	5%	5%	5%	No change
Capitalisation	85%	80%	80%	Reflecting statutory accounts
Asset Lives	20 years	45 years for all new investment	8 year transition to 45 years	Reflecting the loss of fast track reward and financeability relative to the fast track company
Financeability	Investment Grade			Reflecting Ofgem's policy decision

h. The impact of our plan on customer bills

What does our updated plan mean for our customers?

In order to provide comparability across network companies we are required to present the bill impact as movement relative to typical 2014–15 charges and using GB average domestic consumption 3,300 kWh.

We have also included average 2010–15 domestic customer charges (updated to 2012–13 price basis) consistent with the information at our stakeholder events.

The average domestic customer in Merseyside, Cheshire, North Wales and North Shropshire (SPM) will see our component of their bill drop 18% from £126 p.a. to £103 p.a. average (2015-2023).

The average domestic customer in Central and Southern Scotland (SPD) will see our component of their bill drop 11% from £99 p.a. to £88 p.a. average (2015-2023).

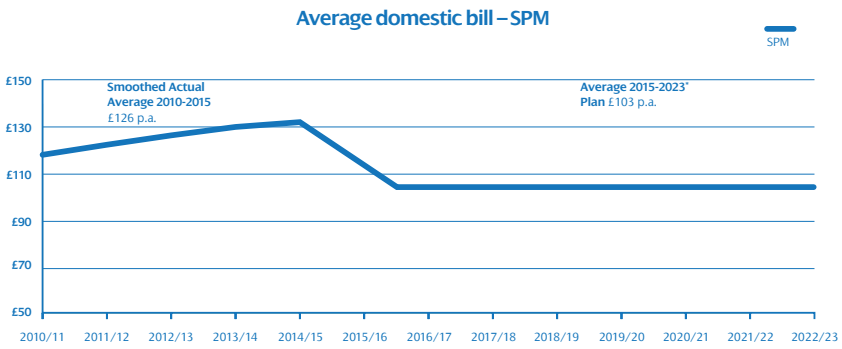
These numbers are expressed in 12/13 prices and will vary depending on actual inflation and consumption.

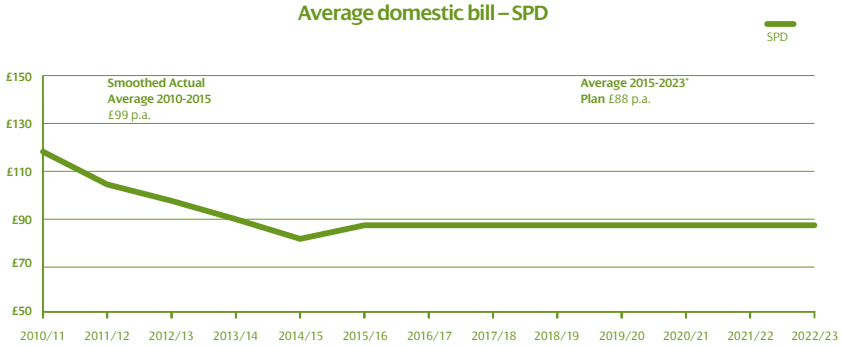
Why is the SPM bill higher?

There are two reasons for this, firstly this is a consequence of differences between when assets were installed in SPD and SPM.

Secondly, our distribution network in England and Wales includes the 132kV network, in Scotland this part of the network is owned by the Transmission companies and therefore these costs are included within the charges SPD customers receive via their energy supplier.

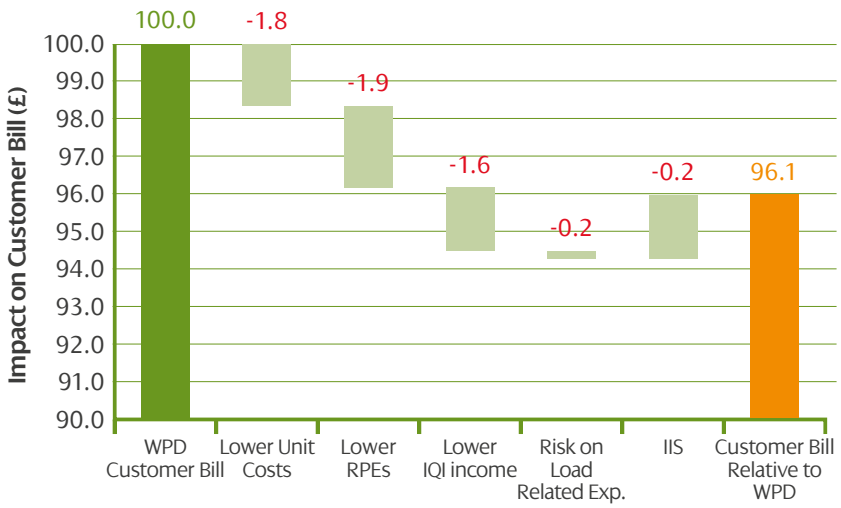
Based on average GB domestic customer consumption, our bills will reduce by an average 11% in Scotland and 18% in England and Wales.





i. Delivering value for money

Our Plan Results In a 4% Reduction in Customer Bills Relative to Adopting WPD's Proposals[1]



We set out how our overall set of proposals – on key financing, cost and uncertainty measures – delivers value-for-money for the consumer.

Analysis of our overall plan relative to WPD's, demonstrates that we assume lower costs or greater risk in a number of key areas:

- *lower unit costs for key asset activities;*
- *lower real price effects (RPEs);*
- *potential zero IQI income reward; and*
- *greater risk in relation to investment to accommodate changing patterns of demand.*

- *Our lower costs or willingness to assume greater risk in these areas correspond to an average customer bill that is 4% lower than would be the case if we were to adopt WPD's proposals, or alternatively, an effective return on equity of less than 4% relative to our proposed baseline cost of equity of 6.4% (and equal to WPD's allowed rate of return).*
- *Overall, our package results in greater value-for-money for consumers than WPD because – we assume greater risk for a lower return.*

Our plan results in a 4% reduction in customer bills relative to adopting WPD's proposals[1]

1. *Basis for calculation: We assume a baseline customer bill of £100, which corresponds to what SP customer bills would be if instead of SP's own unit cost, RPE, IQI income, LRE and IIS expenditure we would have used those granted to WPD. This bill level corresponds to an "adjusted SP revenue requirement" which is equal to the sum of (i) revenue*

How to navigate this document

How this plan fits together, how it meets the expectations of our stakeholders and how to navigate through the document

Our comprehensive Business Plan sets out our commitments to our customers and stakeholders, and our plans for delivering them during the period from April 2015 to March 2023.

Our plan is designed to be readable and accessible for our customers, stakeholders and staff. We know that our readership will come from a wide variety of expert and non-expert backgrounds.

Our plan is divided into three main sections:

A. Overview

B. Context

C. Our 2015-2023 Plan

Within each section there are a number of chapters. Each chapter has a number of parts.

We use extensive references to other parts of the plan, annexes and supporting documents throughout.

For example – Section B, Chapter 1, Part a. is referred to as **Chapter B1a – Our Strategic Vision & Guiding Values**.

Our more detailed annexes are referred to by main chapter number, title and author, for example **Annex C6c – SP Manweb Company Specific Factors – SPEN**

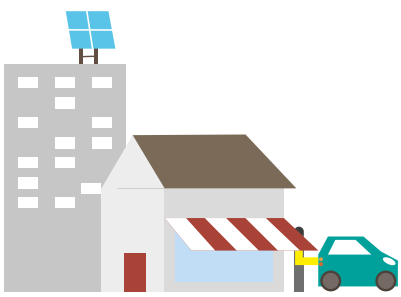
We have provided coloured tabs at the side of each page to help navigation. The **bold tab** helps readers keep track of their current location.

You can click on these tabs to hyperlink throughout the document.

In Our Published Business Plan we provide a description of each chapter, its purpose and the information it provides.

Chapter 11 – Glossary contains a list of our published annexes and supporting documents and provides a high level description of our annexes, their main purpose and their alignment with the main Business Plan document.

In **finding key information in our plan** we provide a table which aligns Ofgem's criteria to chapters within our plan to assist the reader in finding information.



a. Our published Business Plan

The table below outlines the main sections and chapters within this document and provides a brief description of each

Chapter	Title	Page	Description
Section A – Overview			
i	Message from Frank Mitchell, CEO	6	Our vision for ED1 and key elements of our plan.
ii.	Executive summary	9	Our whole Business Plan in brief.
iii.	How to navigate this document	21	How this plan fits together, how it meets the expectations our stakeholders and where to find information
Section B – Context			
1.	About us	25	Who we are, what we do and the things that are unique to us.
2.	Our challenges	41	The universal challenges and opportunities of the ED1 period and those unique to our areas of operation.
3.	Stakeholder engagement	51	Who we engage with, how we engage with them, the feedback we receive and how this has influenced our plans.
4.	Preparing our 2015-2023 plan	63	How we went about ensuring our plan is well justified, realistic, efficient and deliverable.
Section C – Our ED1 Plan			
5.	Outputs and incentives	79	Our ambitious and well justified output commitments and the related incentives.
6.	Expenditure	127	Our expenditure forecast and the processes we have used to make our expenditure efficient.
7.	Business readiness	219	Our preparations to deliver our commitments.
8.	Risk and uncertainty	241	Our plans to manage areas of uncertainty, such as the uptake of low-carbon technologies.
9.	Financing	251	Setting our competitive financial package to attract and retain funding from our investors.
10.	Our revenues and customer impact	297	The money we will recover from electricity suppliers and the effect this will have on our customers' bills.
11.	Glossary	309	Industry-specific terms explained.

Our published annexes and supporting documents

The table in **Section 11 – Glossary** outlines our annexes and supporting documents and provides a brief description of each

b. Finding key information in our plan

Criteria	Refer to
Process: Have we followed a robust process?	
Our Business Plan is clearly presented, with all key content included.	Chapter iii – How to navigate this document Chapter 4 – Preparing our 2015-2023 Business Plan
We have engaged with stakeholders, and explained how this has influenced our Business Plan.	Chapter 3 – Stakeholder engagement Annex B3 – Learning from stakeholders
We have submitted, and justified, all data templates and the PCFM.	Chapter 4 – Preparing our 2015-2023 Business Plan
Our Business Plan provides a strategy for long-term delivery.	Chapter 7 – Business readiness Annex C6 – Long-Term Strategy
Outputs: Does the plan deliver the required outputs?	
Our Business Plan covers the outputs specified in the Ofgem strategy decision and it provides clear and compelling justification for any departures from the strategy decision.	Chapter 5 – Outputs & incentives
We have explained the resource implications for delivery of each output identified.	Chapter 7 – Business readiness – Resourcing
We have explained how we will deliver outputs, and justified our output baseline/forecast.	Chapter 5 – Outputs & incentives Chapter 6 – Expenditure
We have explained the quality of our existing outputs and secondary deliverable information (including information on asset health, criticality and asset risk) and how we plan to improve this information in future.	Chapter 6 – Expenditure
Efficient expenditure: Are our costs for delivering the outputs efficient?	
We have demonstrated that cost projections are efficient.	Chapter 6 – Expenditure – Cost efficiency and benchmarking
Our plan compares favourably to the plans of other DNOs and our plan reflects best practice.	Chapter 6 – Expenditure – Cost efficiency and benchmarking
We have provided evidence that our costs are efficient (eg through market-testing).	Chapter 6 – Expenditure – Cost efficiency and benchmarking
We have explained cost projections in the context of historical performance.	Chapter 6 – Expenditure – Cost efficiency and benchmarking
We have demonstrated a consideration of alternative approaches to achieving value-for-money in the delivery of our outputs.	Annex – Our innovation strategy Chapter 6 – Expenditure – cost benefit analysis
We have clearly linked our expenditure to relevant outputs and secondary deliverables.	Chapter 6 – Expenditure
Efficient Financing: Are our proposed financing arrangements efficient?	
Our Business Plan conforms to the financial policies specified in the Ofgem strategy and any departures are well-justified.	Chapter 9 – Financing
We have provided evidence that our financial costs are efficient.	Chapter 9 – Financing
The data in our plan is consistent and we have explained cost projections in the context of historical performance.	Chapter 6 – Expenditure
Uncertainty & Risk: How well does our plan deal with uncertainty and risk?	
We have clearly articulated the key uncertainties we face and considered how we will address them (e.g. including uncertainty mechanisms).	Chapter 8 – Risk and uncertainty
We have considered risk and how to mitigate those risks.	Chapter 8 – Risk and uncertainty

1 About Us

Who we are, what we do, our business and our customers

This section is about SP Energy Networks. We are a regional electricity transmission and distribution company operating in a challenging and rapidly changing environment. We are excited to present **our strategic vision** of a safe, robust, reliable and resilient network – sustainable in the long-term.

Our network delivers electricity to 2 million of **our customers** in Central and Southern Scotland, and 1.5 million customers in Merseyside, Cheshire, North Wales and North Shropshire. Our workforce of 2,600 internal employees, spread across 34 locations, is supplemented by around 2,500 contractors.

Our guiding values shape the way we operate our business for the long-term:

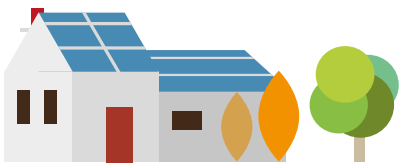
- *We are a customer service focused company trusted by our communities and stakeholders.*
- *We are a proud engineering company with a strong heritage in asset stewardship and world class safety credentials.*
- *We are a company that attracts and develops skills for the future from the communities we serve.*

Our business is part of the Iberdrola Group, one of the world's top five energy companies, a global company with distribution, generation, renewables and engineering operations in 40 countries worldwide.

We are proud to meet our commitments in **delivering our 2010-2015 regulatory contract**

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Our strategic vision and guiding values	
b. Our network	
c. Our customers	
d. Our business	
e. Delivering our 2010-15 regulatory contract	



a. Our strategic vision and guiding values

Our guiding values shape the way we operate our business for the long-term:

We are a DNO operating in a challenging and rapidly changing environment. We are excited to present our strategic vision of a safe, robust, reliable and resilient network – sustainable in the long-term.

Our strategic vision comprises three essential elements – serving our customers, managing our assets and developing our people for the future. These themes are woven throughout our plans, both today and for the longer-term.

Our customers have told us they deserve excellent service, we agree and are on our way to being an industry leader in customer satisfaction. Our approach also makes good business sense. It means we are more efficient and ready to face the challenges of the future. You will find out more about our approach to serving our customers in:

Chapter 1 – About us:

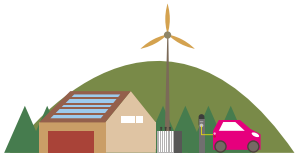
- *B1c – Our customers*

Chapter 5 – Outputs & incentives:

- *C5e – Connections*
- *C5f – Customer satisfaction*
- *C5g – Social obligations*

Serving our customers

We are a customer service focused company trusted by our communities and stakeholders.



Proactive management of customers

- *Industry leading customer service and customer care*
- *Communicating with customers via their media of choice*
- *Embracing our social obligations*

Connecting our customers more quickly

- *Access to an instant quote for customers*
- *Faster connection for all customers including renewables*
- *Minimised cost of connection*

We have helped to shape our industry's approach to asset management. Our expertise allows us to make the right engineering decisions now and for the future.

You will find out more about our approach to managing our assets in:

Chapter 2 – Our challenges:

- *B2a – Keeping our network fit-for-purpose*
- *B2b – Facilitating low-carbon technology*
- *B2c – Resilience against extreme weather*
- *B2d – Our unique Manweb network*

Chapter 5 – Outputs & Incentives:

- *C5b – Safety*
- *C5c – Reliability & Availability*
- *C5d – Environment*

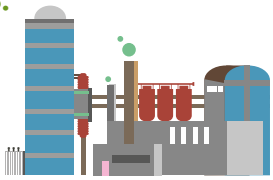
Chapter 6 – Expenditure

Managing our assets

We are an engineering company with strong stewardship of assets and world class safety credentials.

Optimised asset management

- *A safer network*
- *Our customers off supply less*
- *Reduced need for asset replacement and pushing down refurbishment costs*
- *Innovation in everything we do*



Resilience for the future

- *Smarter use of technology to connect generation sources quickly*
- *Value-for-money, innovative solutions*
- *A network more resilient to severe weather*

We recognise that having the right people, with the right skills, in the right place is essential to our success. We have established partnerships within the communities we serve to recruit and train our future workforce. You will find out more about our approach to developing our people in:

Chapter 1 – About Us:

- *B1d – Our Business*

Chapter 7 – Business Readiness:

- *C7f – Resourcing & Training*

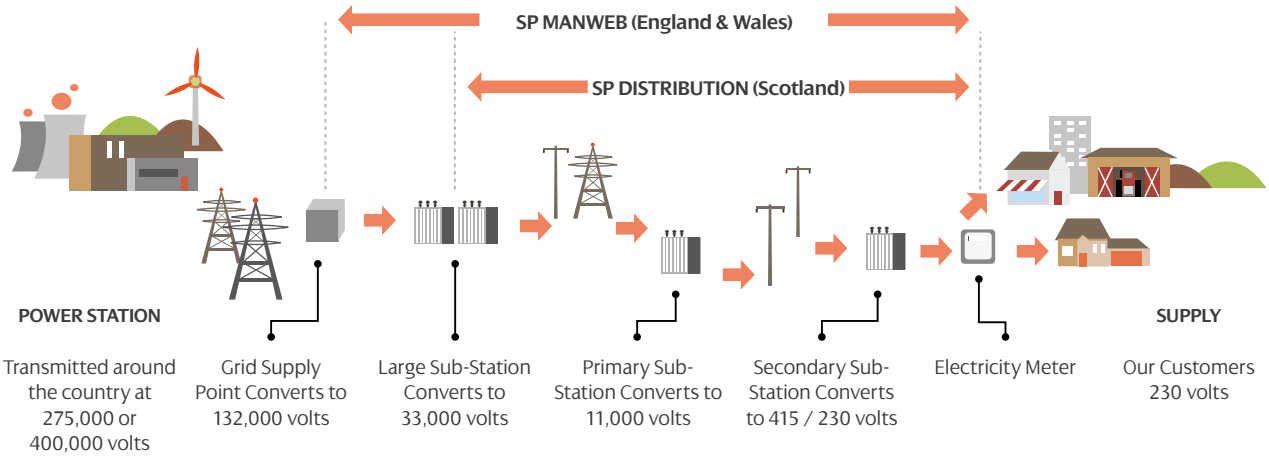
Developing our people

We are a company that attracts and develops skills for the future from the communities we serve.

Employer of choice

- *Recruiting, training and retaining more than 1400 direct staff and training around 1000 contracting staff*
- *Providing rewarding careers and highly skilled roles*

b. Our network

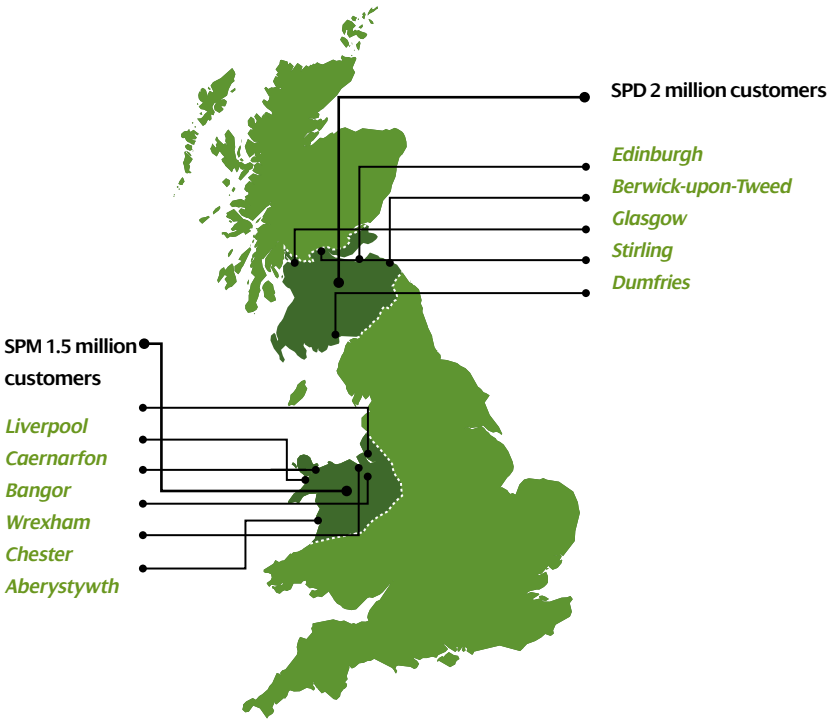


We are the licensed Distribution Networks Operator (DNO) for the Central belt and South of Scotland (SP Distribution, SPD).

We are the licensed Electricity Distributor for Merseyside, Cheshire, North Wales and North Shropshire (SP Manweb, SPM).

We have more than 40,000 km of overhead lines (once around the globe), 65,000 km of underground cables and 30,000 substations (one substation for every 100 customers). To replace our network today would cost more than £16bn.

Our network is expanding to accommodate renewable generation more quickly than any other DNO.



We serve less than 14% of the GB customer population, but have connected approximately 28% of all GB's distributed renewables to our network.

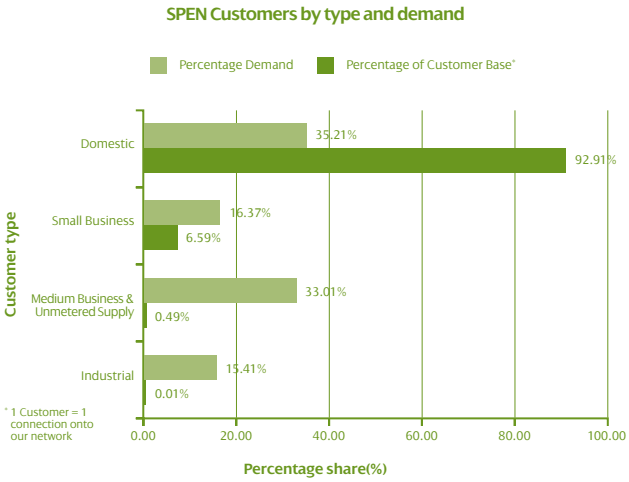
Our network traverses some demanding and difficult terrain, including severe weather areas and national scenic areas. Much of our network was installed in the 1950s-1970s, so is approaching the end of its operational life.

Uniquely in the UK, the majority of our MANWEB network is of a highly meshed design rather than radial. This design provides better performance and future-proofing capability, but is more expensive to maintain and operate than other networks.

68% of this network serves the Liverpool City region, to learn about the SPM network refer to **Chapter B2d – Our Unique Manweb Network.**

c. Our customers

Our customers are our most important stakeholders. We regularly survey them to understand their requirements.



We serve a wide range of customers:

- *Domestic customers in homes*
- *Small, medium and large business customers*
- *Large Demand industrial customers*
- *Distributed Generators using our network to transport the electricity they generate*
- *Developers connecting new homes and businesses to our network*

We operate in three of the UK's largest cities (Glasgow, Edinburgh, and Liverpool) accounting for 1.6m (43%) of our customers, as well as three significant rural areas (Scottish Borders, Dumfries and Galloway, Cheshire and North Wales).

Within our two licensed areas are a range of communities, from remote rural communities – some of which are not on the gas grid and are more reliant upon electricity for energy – to some of the UK's most deprived and fuel poor locations:

We serve Mid Wales, which has the highest percentage of off-gas grid households in the UK.[1]

We serve the North West of England (including Liverpool), which ranks in the top three most deprived areas of England.[2]

We serve the Central belt and South of Scotland, which includes nine of the top ten most deprived areas in Scotland.[3]

We work hard to always deliver excellent service at an efficient cost.

Because we value our customers, they are at the heart of everything we do. Both our licence areas are in the top half of the Ofgem satisfaction index and we target throughout ED1 to deliver the highest satisfaction scores of any DNO.

1. Off-Gas Customers, William Baker, Consumer Focus – September 2011 (updated April 2013) – Annex 2

2. English Indices of deprivation 2010 (Pub Mar 2011)

3. High Level Summary of Statistics Trend Last update: Tuesday, 12 March 2013 – Scottish Index of Multiple Deprivation

d. Our business

Our Organisation

Iberdrola, through its wholly owned subsidiary Scottish Power Energy Networks Holdings Ltd ("SPEN"), owns three regulated electricity network businesses in the UK:

- *Distribution: SP Distribution plc ("SPD") and SP Manweb plc ("SPM")*
- *Transmission: SP Transmission plc ("SPT")*

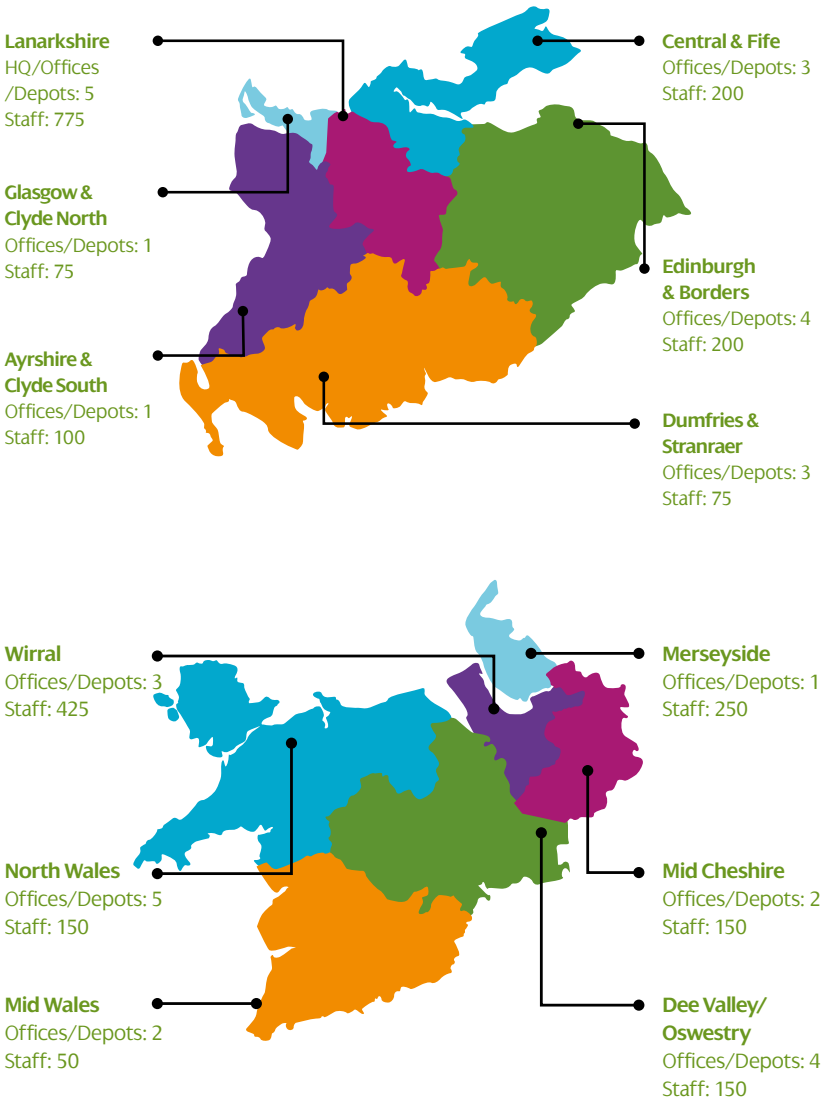
SPEN also has another main business: SP Power Systems Ltd. ("SPPS").

- *Services are solely provided to SPEN's regulated subsidiaries*
- *Principal activities include the provision of operational services, management and implementation of the investment programme*

SPEN is a substantial employer with a workforce of 2,600 internal employees made up of field staff, engineers, technical specialists, customer service and support staff based at 17 locations in the South of Scotland and 17 locations in England and Wales. We utilise around 2,500 contractors across these areas.

Our highly trained and specialist staff work 24/7 to:

- *Maintain the performance and safe condition of our electricity network*
- *Respond to customer enquiries*
- *Restore the supply as quickly as possible when a fault occurs on the network*
- *Provide new connections to the network*



We attract and develop the skills for the future from the communities we serve, giving our teams valuable local knowledge. Our teams are located in 12 local zones, where they respond quickly to local power cuts, deliver local work programmes and work with local communities to tailor our activities to their needs.

We operate to international standards across all aspects of our business. Our management systems are independently audited and certified by Afnor UK Ltd, who in turn, are a United Kingdom Accreditation Service (UKAS) certified company.

Our Transmission Network

We take electricity generated from power stations and large windfarms and transport it through our transmission network consisting of over 4000 kilometres of overhead lines and 320 kilometres of underground cables.

Many of the technical challenges historically faced by transmission networks are now being faced by DNOs because more generation is connecting at distribution voltages. Our transmission expertise means we are well placed to deal with this.

We were fast tracked in the RIIO-T1 regulatory price control process in 2012. This has brought a number of benefits:

- *Since April 2012 we have made strong progress on the engineering, procurement and delivery of projects. The charts opposite show our accelerated programme of non-load outputs.*
- *We have increased our engineering resource by over 200 people since 2011*
- *We continue to focus on introducing further innovation to our delivery model*
- *We are working closely with Government, the SO/TOs, and other stakeholders to deliver our projects*
- *Delivered 2 major wind farm connections ahead of contracted dates (Fallago 144MW / Harestanes 163MW)*

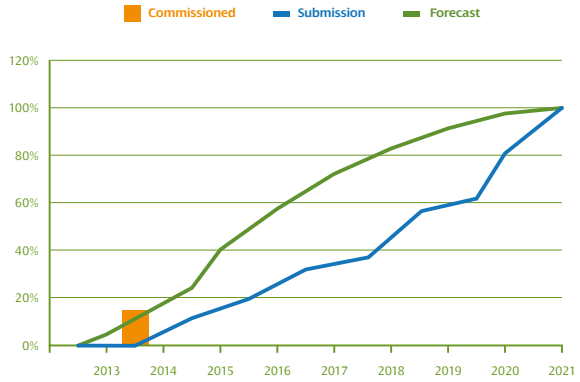
Further Information about our business and how we operate can be found on our website:

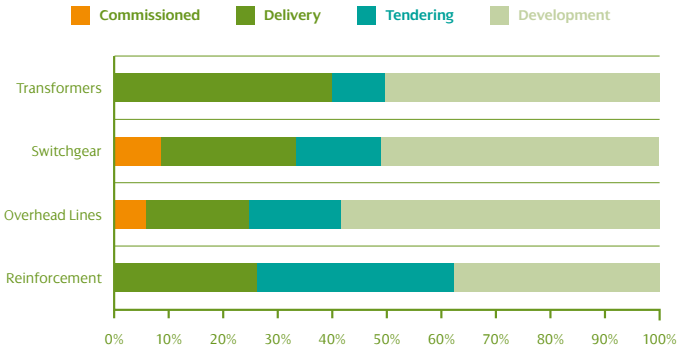
www.spenergynetworks.co.uk

Since being fast tracked, SP Transmission has accelerated plans…

Example – Non-load transmission outputs:

- *8.9% delivered by 2013 year-end*
- *At March 2014 we will have delivered 14% against RIIO-T1 submission of 10%*





Iberdrola tower – Bilbao

The Iberdrola Group

SP Energy Networks is part of the Iberdrola Group, one of the world's top 5 energy companies, a global company with Distribution, Generation, Renewables and Engineering operations in 40 countries worldwide.

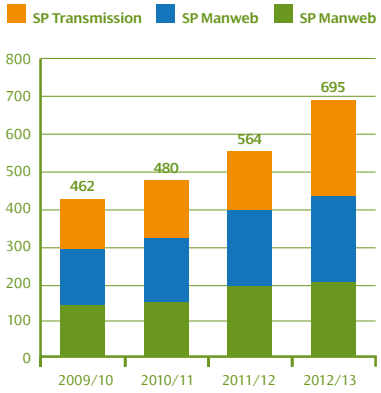
Iberdrola currently make 57% of their worldwide investment on electricity Networks and 41% of their total investment in the UK, reflecting the Group's decision to focus investments in this country.

We make the most of the experience and purchasing power of our parent group, Iberdrola, enabling us to work more innovatively and purchase services at more competitive costs, keeping costs down for our customers.

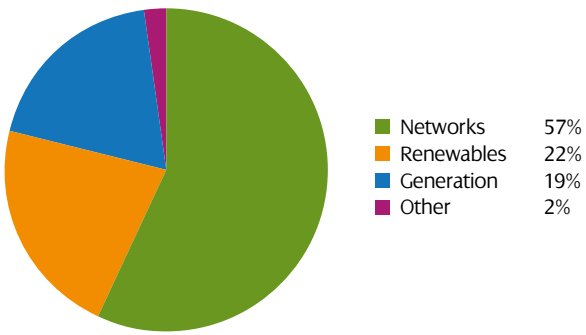
Iberdrola currently make 57% of their worldwide investment on electricity Networks and 41% of their total investment in the UK

Since 2009/10, Iberdrola has increased it's investment in UK networks by 63%

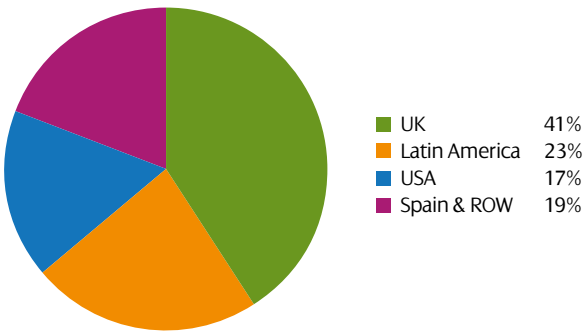
Annual investment (£M nominal)



Iberdrola global investment 2014-2016 by business type



Iberdrola global investment 2014-2016 by country



Across this highly innovative group, we engage extensively to share experience to build the future smart grid in an efficient and cost-effective way.

For example:

- *In this Business Plan the design and deployment of light current technology has been informed by the experiences of our Iberdrola colleagues in Spain [4], allowing 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, (where 2.3 million smart meters have been installed and over 10,000 substations adapted) 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.*
- *Access to data from our group's collaborative electric mobility programme in Spain is improving our understanding of the actual operating conditions of electric vehicles, enabling us to better predict the impact of this technology on our network.*

In 2013 Iberdrola was identified as the fourth most innovative utility in Europe by the European Commission, investing €159m in R&D, up 10% on the previous year. [5]

You can find out more about the Iberdrola Group on our website: *www.iberdrola.es*

4. Specifically the substation protocol standardisation to IEC 61850.

5. Source: Iberdrola 2013 Innovation Report

e. Delivering our 2010-2015 regulatory contract

We meet our commitments and actively manage our capability to deliver

Delivery

This section explains how we have approached the task of meeting our DPCR5 commitments and targets. Some of these targets we set for ourselves and some were set in our regulatory contract.

We take our commitments very seriously, and have a long track record of consistently meeting them at efficient cost. We manage our delivery capability actively and strategically – and do not shy away from making major investments or organisational changes to improve our ability to deliver.

Our performance in the current regulatory period (DPCR5) demonstrates our approach. We have invested in our long-term delivery capability and have changed how we do things – while at the same time meeting our immediate commitments over the DPCR5 period. This is already delivering significant benefits for consumers, and provides a flexible, scalable platform for the challenges of ED1.

Actions speak louder than words – we are on track to deliver comprehensively against all of our key commitments under DPCR5.

We believe that good customer service is an integral component of an efficient organisation and we have factored this into our decision making in DPCR5.

We chose a particular approach to delivering our DPCR5 investment plan – in the early part of the period, we prioritised tasks that addressed public safety issues whilst at the same time investing considerable effort in improving our delivery approach and supporting processes.

As a result, in the second half of the price control (2012-2015), we are:

- *delivering the bulk of our DPCR5 asset health and load investments*
- *achieving significant investment and fault repair cost reductions*
- *making material improvements in the quality of service to customers*

Our key deliverables for DPCR5 included:

- *Improving the service we provide our customers*
- *Delivering the Health Index (HI) investment programme we agreed with Ofgem. Refurbishing and replacing ageing assets, maintaining fitness for purpose and increasing resilience.*
- *Delivering the Load Index (LI) investment programme we agreed with Ofgem to address highly loaded sections of our networks.*
- *Delivering investment programmes to address key public and staff safety risks*
- *Improving cost efficiency through reductions in the direct cost of our works.*

We are comfortably positioned to complete our programmes of work and performance commitments as we enter the final year of DPCR5.

The following pages set out our progress in these areas:

Customer Service

As described in **Section C5f – Customer Satisfaction**, we have implemented a 10 step improvement plan to enhance the levels of service we provide to our customers.

Through the deployment of this plan and our relentless focus in this area, we have achieved the greatest improvements in customer service performance, as measured through Ofgem's Broader Measure of Customer Service, since the introduction of the mechanism in April 2012.

Together, our SPD and SPM licence areas show the greatest improvement in customer service scores in the industry

Public Safety

We are at the forefront of the industry in addressing public safety issues. In particular, we have pioneered the replacement of ageing service cabling in high rise and other multi-occupancy buildings. In DPCR5, we are on course to renew services to over 70,000 customers in such properties.

Our other key area of focus has been on the identification and removal of situations where our overhead lines (OHLs) do not meet the latest height and clearance standards. In DPCR5, we will have surveyed our complete OHL networks (40,000km) and will have eradicated high risk ground clearances, including all locations where our OHLs are below minimum clearance height at road crossings.

We are at the forefront of the industry in addressing public safety issues.

Health Index (HI)

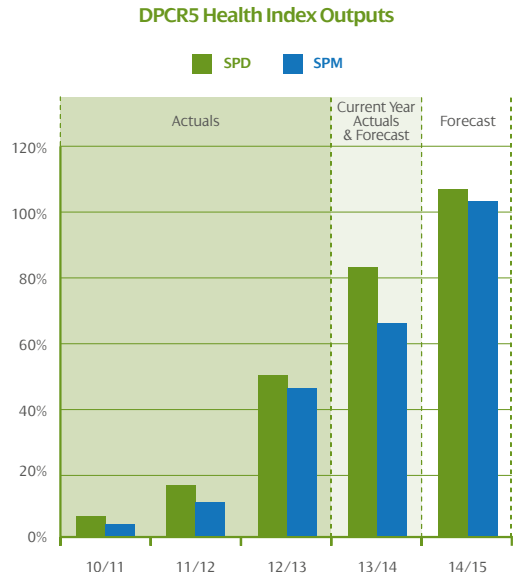
In March 2014 we will complete year 4 of 5 (80%) of the DPCR5 period.

In SPD we will have delivered 80% of the total HI outputs planned by 2015. The profiled investment programme that we planned meant that in 2013/14 alone we completed over 30% of the total outputs. This followed a similarly productive year in 2012/13.

In SPM we will have delivered over 65% of our HI outputs, up from 40% a year before. The position for SPM is significantly influenced by the timing of a number of large, multi-year 132kV projects, which will be completed in 2014 and 2015 (Note: in Scotland, 132kV assets are owned by the transmission companies). Our underlying rate of completion for all outputs at voltages below 132kV is in line with SPD and we expect to have over 75% of these complete by March 2014.

Our planned investment profile for DPCR5 means we are now comfortably resourced and organised to complete 100% of our DPCR5 programme and transition smoothly into the higher average investments planned for the ED1 period.

We are now comfortably resourced and organised to complete 100% of our DPCR5 health index programme and transition into ED1



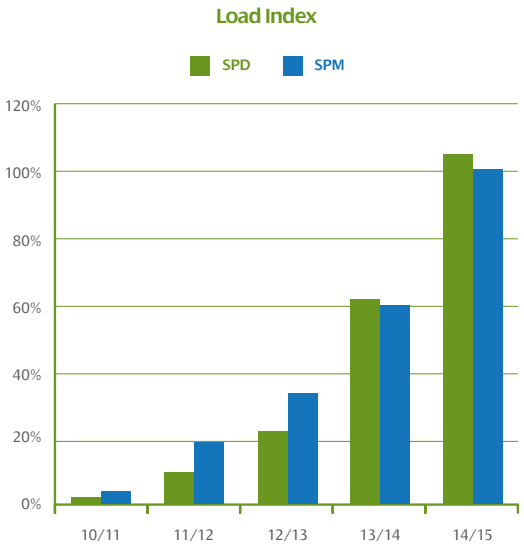
Load Index (LI)

LI is the key regulatory measure of the programme of reinforcement of our primary (33kV) and 132kV networks to accommodate load growth. It ranges from LI1 (lightly loaded) to LI5 (highly loaded). When a substation is assessed as an LI5 it is subject to an engineering risk assessment to establish if any intervention is necessary.

Maximum demand is driven by our customers' usage and varies over time. As a result, we continuously monitor system usage and adjust our investment programmes to reflect changes.

We have accommodated these changing needs within our programme including the effect of the economic downturn and remain on target to deliver as a minimum 100% of our regulatory commitments.

We are on target to deliver as a minimum 100% of our load index regulatory commitments



Reducing Direct Costs

We recognise the importance of operating an efficient business, not just in terms of making cost savings, but also because the eradication of waste in time and resource leads to faster and better service to our customers.

Better service to our customers also reduces our costs whilst also reducing our component of their bills.

In DPCR5, we have focussed heavily on cost reduction in the direct costs of delivering our work activities. Through our improvement programme, which included the deployment of 'six sigma' and 'lean' techniques along with a comprehensive procurement exercise which involved the retendering of all of our large labour and equipment supply contracts, we have delivered significant enhancements in the productivity of our internal and external resources.

This is demonstrated by the reduction in our fault costs shown.

Our focus as a business has now moved to support costs and further improvements to customer service that can be achieved by structuring our organisation in a manner that is more closely engaged with the diverse customers we serve. Our plan includes a 30% reduction in support costs in ED1.

Better service to our customers also reduces our costs and our component of customer bills

Flood risk

In preparing our plans for DPCR5, we used flood risk data from the environmental agencies to identify substations that were at higher risk of coastal and river flooding. Within our plan, we undertook to carry out detailed assessments and mitigation work where neccesary at 47 substations across our networks, working to EA and SEPA guidelines.

Through this work, we have been able to establish compliance with the relevant standards at 26 of these sites to date and will complete the remainder before March 2015.

We recognise the importance that our stakeholders place on flood defences and consequently we have accelerated assessment and protection measures at a further 40 sites that we had originally planned for the ED1 period and we will now complete these within the DPCR5 period as well.

We recognise the importance that our stakeholders place on flood defences and consequently we have accelerated assessment and protection measures

Asset Data Improvement

As part of our ongoing efforts to maintain accurate Asset Data, we established, in October 2011, a dedicated Team to review the accuracy of our legacy asset data and make improvements where needed. Through this work, we have:

- *Reviewed assets with a total replacement value of more than £16 billion.*
- *Carried out detailed analysis across 161 asset types as defined in the RIGs.*
- *Identified and investigated over 100,000 data discrepancies.*
- *Validated over 53,000 data items.*
- *Made over 47,000 corrections.*
- *Undertaken over 3000 site visits purely to clarify asset data Issues.*
- *Obtained external verification from acknowledged industry experts for the changes we have made to our data.*

The net result of all this work is an overall adjustment of less than 3% in the replacement value of our asset base. However, on an asset by asset basis, we have substantially increased our confidence in our data accuracy.

The net result of all of this work is an overall adjustment of less than 3% in the replacement value of our asset base

Summary

We are making strong progress on the delivery of our outputs and meeting the commitments of our current regulatory agreement. Our plan from the outset was based on accelerating the rate of delivery over the price control period, with the majority of outputs being delivered in the latter half of the 5 year period. We have made significant strides forward over the last 2 years and are on track to achieve our targets.

Despite shortages of specialist resources within the UK labour market, we have secured our needs right through to the end of the price control. We have developed innovative solutions, in particular within the area of overhead line delivery. In conjunction with our Contractors, our highly accredited partnerships with Dumfries and Galloway College and Forth Valley College in Scotland and Coleg Menai in Wales to train new workers for the industry demonstrates our ongoing commitment to support the communities we serve.

In **Chapter C7 – Business Readiness** we discuss further the detailed plans we have developed to ensure we can transition smoothly into delivering against our new commitments for 2015 to 2023.

Despite shortages of specialist resources within the UK labour market, we have secured our needs to the end of the price control period

2 Our challenges

The universal challenges and opportunities of the ED1 period and those unique to our areas of operation.

We are facing a unique combination of challenges as we enter the ED1 period. In this section, we explain what those challenges are. We also explain how we are organised to meet those challenges efficiently and effectively – today, over the ED1 period and beyond.

A large proportion of our network was installed between the 1950s and 1970s, so is approaching the end of its operational life. In **keeping our network fit-for-purpose,** we explain why we need to renew increasing numbers of end of life assets to ensure we deliver a safe and reliable service to our customers. We understand the scale of this programme and will manage it efficiently over several decades.

We also have a major role to play in **facilitating low-carbon technologies** and delivering the UK's low-carbon transition. These are challenges that all network operators are facing but there are also challenges that are unique to us that provide their own opportunities. The carbon reduction targets of the devolved administrations mean we are at the forefront of preparing our network for the low-carbon transition.

Large areas of where we operate are classified as severe weather areas and have driven our significant improvements in **resilience against extreme weather.**

Our unique MANWEB network is an interconnected design that provides excellent performance and future-proofing capability, but is more expensive to build and operate than other networks. We explain the work we have done to ensure our costs are efficient in this area.

We close this section by describing the challenge of recruiting, training and developing **our future workforce.**

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Keeping our network fit-for-purpose	Long-Term Strategy – SPEN Asset Health & Criticality – SPEN
b. Facilitating low-carbon technologies	Low-Carbon Technology – SPEN
c. Resilience against extreme weather	Network Resilience – SPEN Evidence to the Scottish Affairs Committee – SPEN Overhead Lines Performance During Storms – EATL
d. Our unique MANWEB network	SP Manweb Urban Network – SPEN Review of Manweb Regional Factors – Mott MacDonlad Review of Manweb Regional Factors – NERA
e. Our future workforce	

a. Keeping our network fit-for-purpose

A key challenge, fundamental to our role in the electricity supply chain, is to ensure that our network remains fit-for-purpose. By this we mean safe, reliable, resilient and capable of accommodating change. There are a number of facets to this challenge – some of which are increasingly acute.

Ageing assets

Network assets wear out. We must decide when to replace or refurbish our assets. Early replacement may impose unnecessary cost and disruption. Replacing too late can heighten risks of power cuts or delays to new connections. These issues are particularly acute for us because many of our assets are of an age and condition where decisions need to be made.

Range of design choices

Investment planning involves choices. Often there is a trade-off between cheaper short term solutions, and more expensive solutions that may be more cost effective in the longer-term. The range of options is growing as a result of new smart grid technology, and the possibility of new types of commercial arrangements (enabled by smart metering data). The challenge is made more acute because of uncertainty over future network demands (see below).

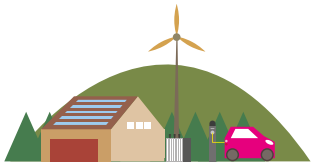
Rapid but uncertain changes to demands

How we use electricity is changing. This is driven by policy to reduce the carbon intensity of the energy sector, and thereby the UK economy, by deploying low-carbon technologies such as heat pumps and electric vehicles.

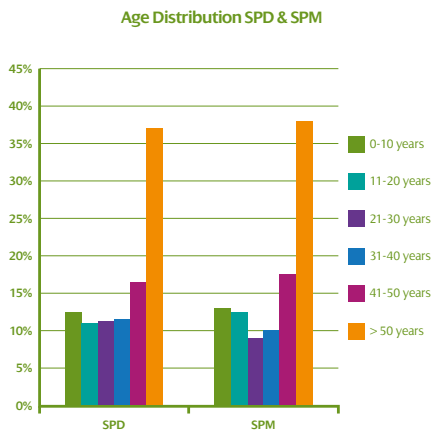
But the speed and form of these changes is uncertain – as evidenced by the range of scenarios developed by Government for use by DNOs. The analysis also shows our networks as being among the most impacted. Our own challenge is to deliver cost-effective flexibility.

Evolving public safety risks and requirements

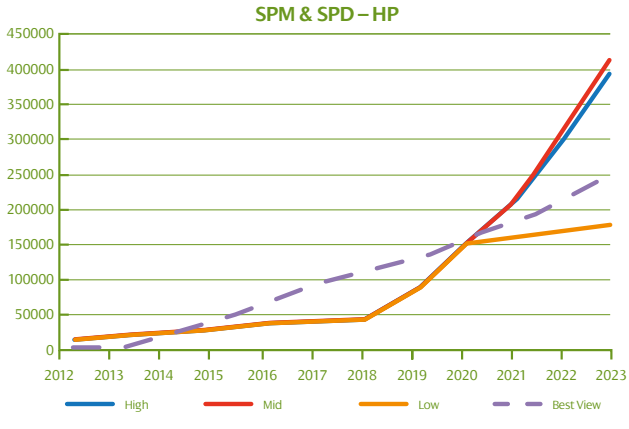
Maintaining high standards of public safety is a dynamic process. New or better understood risks need to be acted upon, and new requirements need to be met.



Asset age distribution for both of our licence areas



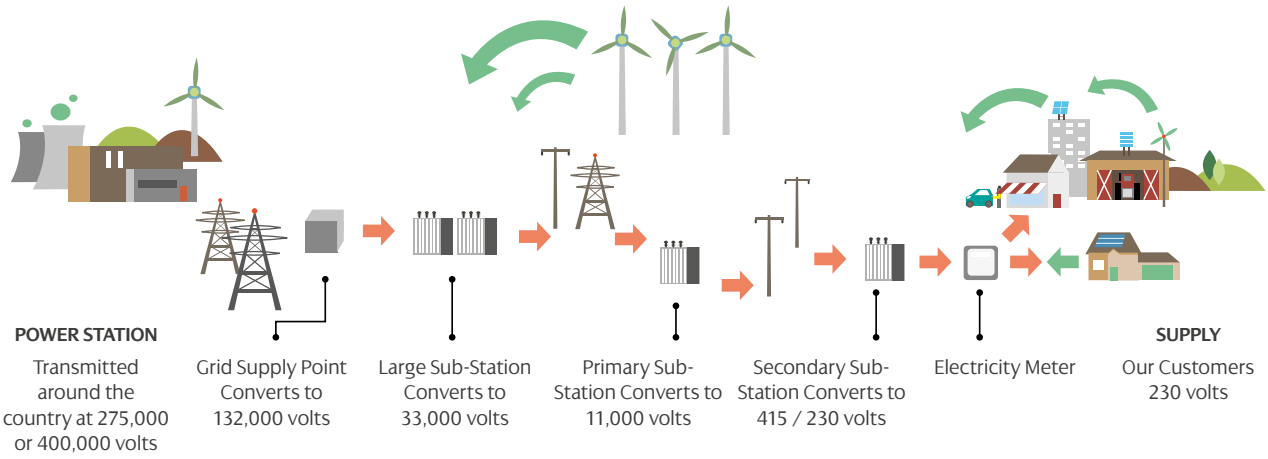
An example of future network demand – heat pump uncertainty



Our network needs to remain fit-for-purpose – safe, reliable, resilient and capable of accommodating change

b. Facilitating Low Carbon Technology

The transition to a low-carbon economy



The transition to a low-carbon economy

Demand for electricity is forecast to steadily grow. At the same time, we remain heavily reliant on fossil fuels that will run out sooner than many of us realise. The UK Government has set ambitious low-carbon targets. It is clear that we will all have to change to ensure a cleaner and more sustainable energy future. The future network and our role will need to accommodate:

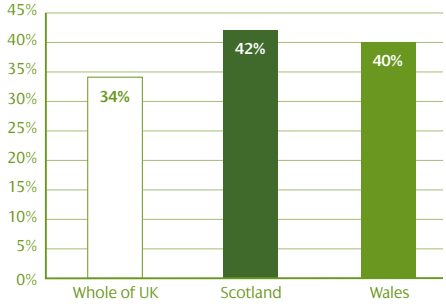
- *Increased demand arising from new uses of electricity such as heat pumps and electric vehicles and other low-carbon technology (LCT).*
- *A big increase in much smaller generation sources, with power coming back into the network from a variety of supply points and flowing in different directions.*

Scottish and Welsh low-carbon targets

We are the only DNO to operate in Scotland, England and Wales. While the overall UK target for 2020 is a 34% reduction in carbon emissions, both Scotland and Wales have more ambitious targets of 42% and 40% respectively. In the longer-term, the UK target is to reduce carbon emissions by 80% by 2050.

We are the only DNO to operate in Scotland, England and Wales

Carbon Reduction Targets by 2020



We have a track record of working collaboratively with developers and government over many years to help in achieving these targets.

'We welcome both the open and transparent approach which SP Energy Networks is committed to and the co-operative planning approach developed with the Scottish Government and renewables developers to better facilitate the achievement of Scottish low-carbon targets, while retaining the confidence of communities.'

Mary McAllan, Director Energy and Climate Change
Scottish Government

Low-carbon uncertainty

A key feature of a fit-for-purpose network is its ability to accommodate change. This is a heightened challenge because of the level and range of uncertainty of change anticipated as a result of the take up of LCTs, and the range of potential network and non-network solutions.

This fundamental change in the general usage of electricity will require a change in the way distribution networks are designed, operated and managed. The current approach was sufficient when power flow was one way and customer loads were fairly predictable, but future networks require a more flexible approach in order to get the most out of the network assets.

The scale of this change is outlined in the 4th Carbon Budget[1] from the UK Government which was published in 2013 and sets out a variety of scenarios which may materialise for the UK to achieve the environmental targets which have been set. The four main DECC scenarios, each of which represent a different pathway to meeting the Government's 2050 Greenhouse Gas Emissions targets, have radically different impacts on the distribution networks.

For example, the number of heat pumps connecting in the SPEN networks by 2023 could range from 190,000 to over 400,000. Refer to B2a – Heat pump uncertainty chart.

You can view our video on the changing energy landscape here:

1. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47613/3702-the-carbon-plan-delivering-our-low-carbon-future.pdf

Technology uptake

To help to assess the impact of the challenge on networks we have worked with DECC, Ofgem, other DNOs and stakeholders to translate these scenarios into the volumes of technology which each DNO may have to facilitate. In addition, the industry, via the Smart Grid Forum, developed a model (TRANSFORM) to translate these forecasts into quantified network impacts (required investments). The TRANSFORM model considered:

- *the likely uptake of each technology within each of the DNO's licence areas,*
- *the impact of clustering of technology, and*
- *the likelihood of adoption based on building type and existing fuel sources.*

Our plans include a best view of the DECC uptake scenarios and we will facilitate:

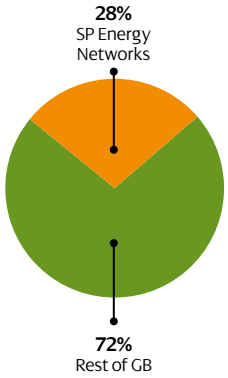
- *224,000 solar panel installations (6.5% of households).*
- *238,000 heat pump heating systems (6.9% of households).*
- *63,000 electric vehicles (1.8% of households).*
- *Up to 5.5GW of distributed generation*

The model also reflects the higher targets that have been made by the Scottish and Welsh Governments for carbon reduction.

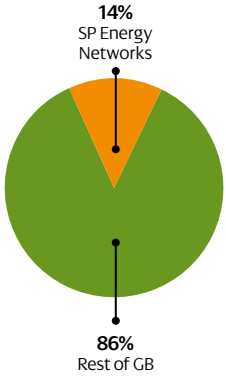
For example, areas of Scotland and Wales are more susceptible to having a higher adoption of heat pumps as a higher proportion of customers are not connected to the gas grid, the impact of which is detailed further in **Section C5g – Social Obligations**.

Our network is enabling the connection of renewable generation more quickly than any other DNO

Distributed renewables connected



UK customer population



Long-term view

In the longer-term we expect the uptake of LCT to be even greater in the period following ED1 as the market becomes more established and confidence in the technology is higher. This also needs to be a consideration to ensure that some of the important enabling technologies are in place before the higher uptake begins. We are working innovatively to meet these challenges and minimise the costs for our customers.

For example, our plans to facilitate LCT uptake use 80% innovative solutions and 20% traditional solutions.

c. Resilience against extreme weather

Large proportions of our network and customers are located in areas classified by the Met Office as at risk of particularly severe weather. The maps below show these severe weather areas overlaid onto our licence areas. As well as Met Office data, we use information from the Environment Agency and the Scottish Environmental Protection Agency to assess the flood risk to our substations and network equipment.

Severe weather can affect electricity supply to our customers in a number of ways:

- *Localised flooding can impact substations;*
- *High winds can blow branches or other wind borne debris onto our overhead lines;*
- *High winds can blow whole trees over onto our overhead lines;*
- *Cold weather and snow can lead to our overhead lines being coated in large amounts of ice (line icing), this increases the weight of the lines and significantly increases the force that wind exerts on them.*

Severe weather also affects our ability to repair faults quickly, for example:

- *Snow and fallen trees can block access roads, sometimes for several days;*
- *Our Linesmen cannot climb poles or towers safely in high winds.*

We are acutely aware of the hardships that customers experience when they are without electricity after major storms, and that this is more significant for vulnerable customers.

Severe weather events have increased in frequency in recent years. We have experienced more storms in the last 3 years than the previous 10 years combined.

For example, during the Boxing day 2013 storm[2] and again in February 2014, the highest winds in the UK (in excess of 100mph) were recorded in our SPM licence area.

In December 1998 parts of the UK were battered with some of the worst storms on record for over 30 years.

The famous Boxing Day Storm sent winds of up 125mph across central Scotland.

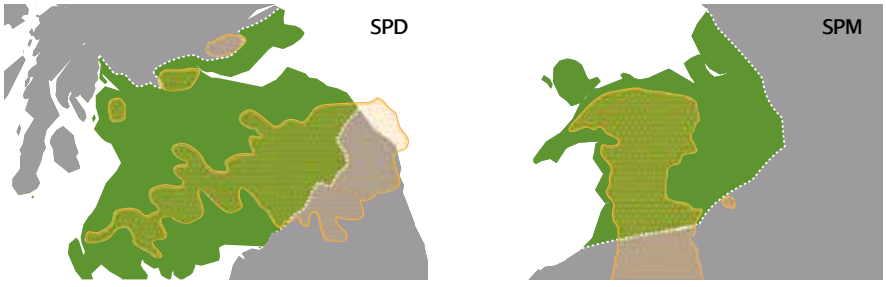
This event:

- *Affected more than 230,000 customers and took 8 days to fully restore all customers supplies.[3]*
- *Helped us to define our network resilience and operational response strategies.[4]*

Since then our investments have ensured fewer customers are impacted by storms, and those that are impacted are restored more quickly.

We explain how we go about managing network resilience and the significant improvements our approach has delivered in recent years in **Chapter C6b – Asset Stewardship.** We set out our outputs for the ED1 period and our continued commitments in this area in **Chapter C5c – Reliability & Availability,** and we describe our proposed resilience investments for both our SPD and SPM networks within **Chapter 6 – Expenditure.**

Areas susceptible to line icing and high winds combined



2. Refer to Annex B2 – Letter from Fergus Ewing (MSP) regarding storm response.

3. Refer to Annex B2 – Written evidence to the Scottish affairs committee.

4. Refer to Annex B2 – Assessment of overhead line performance during severe storms.

d. Our unique Manweb network

Not all electricity networks are the same. The SP Manweb (SPM) network was predominately designed and built throughout the 1950-1970s with a different design philosophy. Large parts of the SPM network are configured as an interconnected mesh whereas other distribution networks are mainly radial. Central London also has an interconnected network but in SPM the interconnection extends across our entire 33kV network and over half of our 11kV and low voltage networks.

This level of interconnection has advantages and disadvantages. The main advantage is better system performance for customers, however, it costs us more to operate and maintain.

The SPM interconnected network design delivers high levels of network performance meaning customers can expect less interruption to their electricity supply, on average, than any other customers outside of central London

An interconnected distribution network provides more paths for the electrical energy. Consequently, when there is a fault it will tend to affect a relatively small number of customers. This effect can be observed in any comparison of Customer Interruptions – SPM's urban network performance leads the industry and the overall performance is significantly better than could be achieved with a radial network covering the same territory.

Another feature of an interconnected network is that it can make connection of new load or generation easier. When there is spare capacity in an area of interconnected network, connections will tend to be cheaper. This is valid up to the point when the interconnected area becomes saturated. At this stage a more costly upgrade would be required to create new capacity.

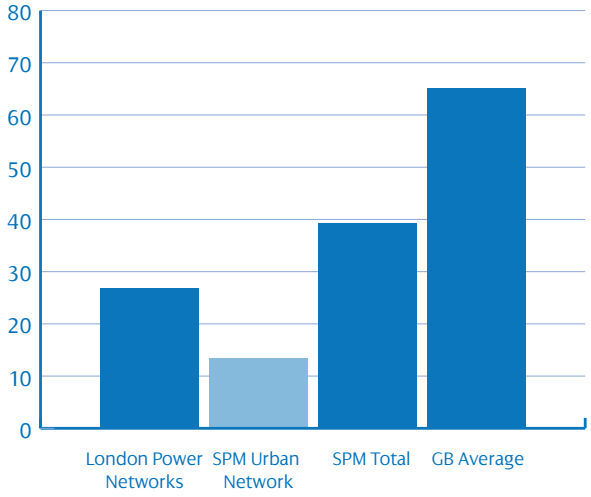
Incremental costs for the SPM interconnected network are driven by a combination of complexity and equipment specification.

For example a ring main unit (RMU) which is a switch used in an 11kV substation when used in the Manweb Interconnected network has additional components over an industry standard RMU, and therefore costs £4800[5] more to buy and install.

In RIIO-ED1 we are proposing to replace 1706 end of life units, therefore this will increase our costs over traditional networks by £8.2 million

We have reviewed and updated a critical assessment of the options for the SPM network. These have all concluded that it would be prohibitively expensive to convert the SPM network to a radial design. Therefore, our challenge is to preserve the benefits to customers of this unique design while ensuring we do so, in a highly efficient manner. Refer to **Chapter C6c – SP Manweb Company Specific Factors** for more information.

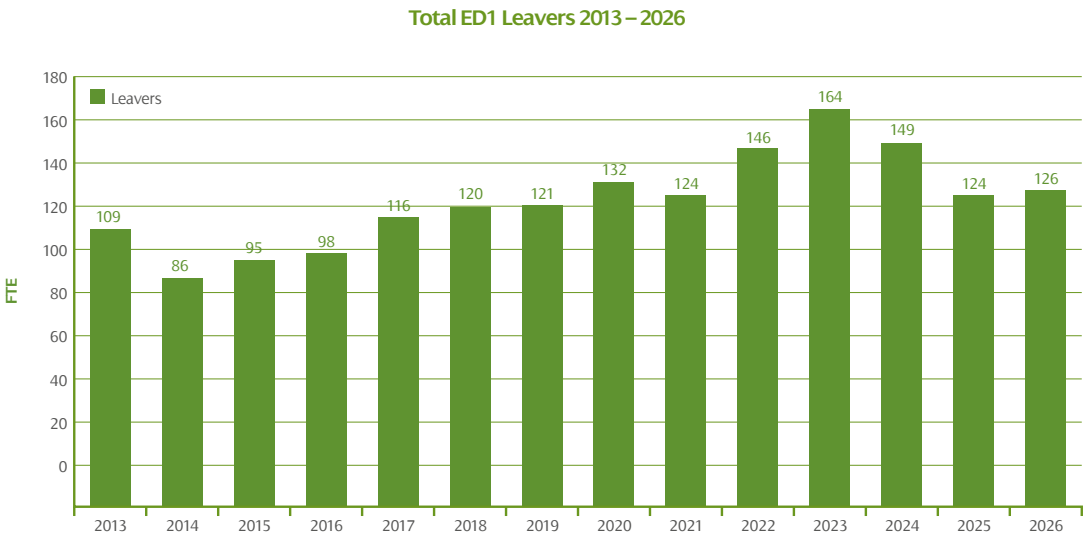
2011/12 – Customer Interruptions per 100 customers. Showing performance benefit of SPM Urban Networks



NATIONAL FAULT AND INTERRUPTION REPORTING SCHEME, NATIONAL, SYSTEM AND EQUIPMENT PERFORMANCE, 2011/2012 Table 3

5. X type RMU replacement cost is an additional £1,500 compared to Y–type. Additional installation costs are £3,300 and therefore total additional cost is £4,800.

e. Our Future Workforce



Overview

Having the right people with the right skills in the right place is essential for efficient and effective delivery. We need suitably experienced employees with the specialist skills to deliver our investments. With the challenges associated with the growth of our industry and adapting to the low-carbon future, it's clear that we need to recruit and train new staff.

In addition to these challenges, our analysis indicates 1400 of our people will be retiring or leaving work between now and 2023. The scale of this challenge is highlighted in the graph above.

Our current workforce

We employ a wide range of highly trained staff to operate and maintain our network, deliver our investment programmes and respond to the needs of our customers 24/7. Our workforce also includes staff to support these functions.

Our workforce of 2600 can be categorised as follows:

- *1050 field staff – linespersons, jointers, fitters and support staff*
- *980 engineers and technical specialists*
- *390 customer service staff, central support staff and managers*
- *180 trainees – engineers and field staff*
- *We also utilise approximately 2,500 contracting staff.*

What we need to do

We have reviewed our recruitment and training programmes to ensure that we are ready to replace 1300 staff and make the required increases to support the changes in our investment plans.

Working with EU Skills and the other DNOs we have identified that the ageing profile of staff is a UK wide issue across the energy sector.

Although our attrition level (the rate at which people leave the business for reasons other than retirement) of 1.82% is among the lowest in the UK, the large numbers required to replace those who are leaving means we need to recruit and train a whole new generation of highly skilled staff. Our dedicated workforce renewal programme is already up and running. In 2013 we recruited a total of 218 people into our business. Of these, 87 were apprentices and 47 graduates. The remainder were specialist engineers, project managers and additional support staff.

Our guiding value is to recruit from the communities we serve and work in partnership with local colleges and training centres.

Managing appropriate resource is a key part of our long-term strategy.

In **Section C7f – Resourcing & Training** we explain the comprehensive work we have undertaken to develop our resourcing strategy and detailed plans to address the resourcing challenge.


SP ENERG
NETWORK
Panasonic
RETRO MAX

3 Stakeholder engagement

Who we engage with, how we engage with them, the feedback we receive and how this has influenced our plans

Stakeholder views are important to us. In this section, we explain the process of **Learning from Stakeholders** and how we have incorporated this feedback into our plans for the ED1 period. We also recognise the importance of longer-term, ongoing relationships with a whole range of diverse stakeholders and therefore, in **Our Ongoing Stakeholder Strategy and Approach** we explain our strategy for the future, the approach we will take and how this is of mutual benefit to our business, stakeholders and customers.

We have engaged with more than 2,000 stakeholders and customers in the development of our plan

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Learning from stakeholders	Annexes – B3 Learning from stakeholders Stakeholder Engagement for ED1 – SPEN Stakeholder Feedback Reports (Ph1 and final) – Explain
b. Our ongoing stakeholder engagement strategy and approach	Annex B3 – Stakeholder panel scoping phase report – 3KQ

a. Learning from stakeholders

Here we outline the comprehensive engagement process undertaken when developing our ED1 plans. A more detailed description is contained within our **Annex B3 – Learning from Stakeholders.**

Highlights:

- *We have engaged with around 2,000 customers and stakeholders during our Business Plan preparation.*
- *97% of stakeholders who attended our draft Business Plan stakeholder events felt we were listening to their views.*
- *Stakeholder feedback varied between licence areas, highlighting the need to engage separately in each area.*

Who did we engage with?

We have directly engaged with around 1,100 individual domestic customers and around 900 other stakeholders as part of the planning process. We have held six stakeholder events involving 274 attendees, supported by senior staff from across our business.

How did we engage?

Phase 1 – 2012 – Choosing our priorities

We sought stakeholder views on priority areas **before** preparing the draft Business Plan, through:

- *Customer focus groups.*
- *Stakeholder workshops, interviews, events, meetings, and targeted engagement.*
- *Employee leadership event.*

Phase 2 – February 2013 – Our draft plan

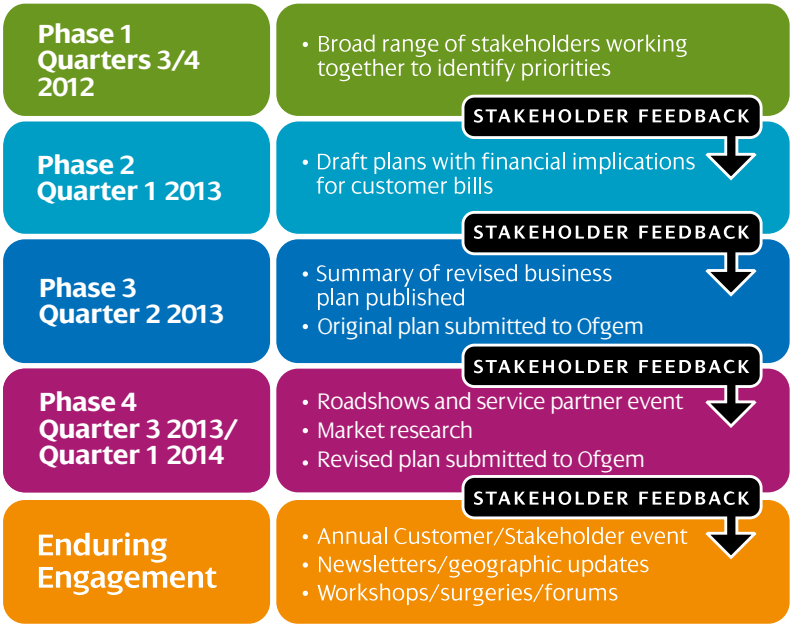
We explained our draft plan to our stakeholders **during** plan development, through:

- *Customer surveys, one-to-one and on-line.*
- *Stakeholder workshops, an online survey, one-to-one meetings and targeted engagement.*
- *Employee on-line survey.*

Phase 3 – May 2013 – Our revised plan

We shared the revised Business Plan with our stakeholders **after** it was completed, by:

- *Publishing the proposed changes on our website.*
- *Consulting on the revised Business Plan summary.*



Phase 4 – July 2013 – March 2014

We have incorporated the feedback from our stakeholders on our July 2013 plan and included the latest information in our March 2014 updated Business Plan.

Giving stakeholders detailed options

Getting the right level of detail

Stakeholders told us that detail was important if they were going to be able to make decisions about future investment in our electricity network.

Impact on all customer bills

We presented a detailed breakdown of the typical bill for domestic and various categories of business customer.

Impact by location

We made sure we showed the bill impact by licence area.

Publishing our changes

Based on stakeholder suggestions, we published all our findings, explained how we were going to use them to make changes to our plans and what impact this would have on the customer's bill.

Feedback incorporated into our plan

We have incorporated stakeholder feedback and customer willingness to pay results at relevant points throughout our Business Plan. This is reflected within our proposed outputs and our forecasted expenditure over the eight year period. Where there is a clear engineering case and stakeholder support, we have ensured that we have made the appropriate changes to our level of investment.

We have built stronger links with local authorities, special interest groups, community agencies and charities. We have listened to our supply chain and contractors to better shape our delivery plans. Through our brand awareness campaign and engagement events we have raised awareness of SP Energy Networks, the unique services we deliver and the broader support we can offer to the communities we serve.

We have learned much about our stakeholder community throughout the process of engagement and as we transition into our enduring engagement activities, we believe that this will serve us well into the future. At times, it has been necessary for us to balance the varied and sometimes conflicting requirements of different groups of stakeholders, whilst setting this against customer priorities and their willingness to pay. We believe our draft Business Plan achieves the right balance of benefits for all interested parties.

For more detailed information on stakeholder engagement please refer to **Annexes – SPEN – Learning from Stakeholders, SPEN – Stakeholder Engagement for ED1, Explain – Stakeholder Feedback Reports (Ph1 and final).**

'Useful to be involved in these discussions at an early stage'

Consumer group representative who attended the Phase 1 stakeholder event in Glasgow

Overview of feedback – The table below summarises feedback and shows increased investment included in the final plan. The arrows indicate the general direction of feedback across the investment options

Stakeholder feedback for our SPD licence area:

Phase 1		Phase 2				Phase 3		Phase 4
Stakeholder priority areas	What we proposed in draft plan (Feb 2013)	Stakeholders workshops (voting)	Stakeholder on-line survey (simalto)	Employee on-line survey (simalto)	Customer face to face survey (simalto)	What was in our July 2013 plan?		What's in our March 2014 plan?
Storm resilience	Improving resilience to >10% customers	↑	⇔	⇔	⇔	↑	Draft plan + additional 10% of km in severe weather areas will be made resilient	Same output, lower cost
Poorly served customers	Improving service to 40% of poorly served customers	↑	↑	↑	↑	↑	Draft plan + additional 14% investment targeted to poorly performing overhead lines and cables	Same output, lower cost
Energy advice for fuel poor	No expenditure in draft plan	⇔	Proposed alternative output related to fuel poverty					No change
Network capacity information for new connections	No expenditure in draft plan *	⇔	Exploring options for this to be funded by connections customers					No change
Future-proofing the network	No expenditure in draft plan	↑	↑	⇔	⇔	↑	Investment in future-proofing, in line with £10m option presented at stakeholder events	No change
Earlier approach to network investment	7 new grid or primary sites, 14 uprated sites	↑	↑	↓	↓	⇔	Consistent with draft plan – triggering reinforcement 20% earlier	No change
Future innovation spend	No expenditure in draft plan **	↑	↑	↑	↑	↑	80p per customer per annum, based directly upon stakeholder feedback	No change
Service position inspections	Inspection every 5 years starting 2015	⇔	↓	↓	⇔	↓	Inspections to start 5 yrs after smart-meter installation – later than draft plan assumption. Reduced investment in ED1.	No change
Flood protection	Protect 48,000 customers against 1 in 200 year event	⇔	↑	↓	↑	↑	Accelerating our fluvial *** flood protection programme prior to ED1. Reduced ED1 investment.	Extra ED1 investment in protection against pluvial **** flooding

* As stakeholders demonstrated strong support for Future-proofing at our workshops, we presented an option for £10m investment in our surveys.
** As stakeholders demonstrated strong support for Innovation at our workshops, we presented an option for investment of 50p per customer per annum in our surveys.
*** Fluvial = river based floods.
**** Pluvial = localised rain based floods

Our response

Overview of feedback

Throughout the engagement process we have received feedback at various stages from many groups of stakeholders. The tables above summarise this feedback and shows what we have included in the final plan. The arrows indicate the general direction of feedback across the investment options we engaged on during Phase 2. Feedback in some areas was very strong and we have responded positively to this in a number of ways.

Flood protection

Stakeholders were supportive of our plans for flood protection with on-line stakeholders demonstrating high importance and high willingness to pay. Customers in both SPD and SPM ranked flood protection as one of the most supported investment options.

In response, we have substantially accelerated our investment plans to reduce the risk of flood related disruption to approximately 168,000 customers and will have completed our flood protection programme in advance and added extra investment to protect against pluvial (localised rainwater) flooding.

Storm resilience

Stakeholders would like to see us invest more in storm resilience than we originally presented in our draft plan, in particular at our SPD stakeholder events with a further 45% wanting us to do more than our draft plan. Political stakeholders were very supportive of our approach to storm resilience and the benefit it has delivered in recent storm events. Employees, online stakeholders and customers rated storm resilience to be of high importance.

The storms of 2013/14 have drawn further attention to the risk that severe weather poses to the availability of the network. Our past investment in storm resilience helped us to ensure that no customers affected by the Christmas Eve storms were without power on Christmas day. We strive to improve the availability of our network and will continue to invest in storm resilience measures on the network. **In response, we have decided to invest more in storm resilience than originally proposed, making an additional 10% of our network, in severe weather areas, storm resilient.**

Responding to polarised feedback

Earlier network reinforcement

The feedback we received was not always aligned. For example, we were minded to go further than planned with

Our investments are £39m higher as a result of stakeholder priorities and willingness to pay

Stakeholder feedback for our SPM licence area:

Phase 1		Phase 2				Phase 3		Phase 4
Stakeholder priority areas	What we proposed in draft plan (Feb 2013)	Stakeholders workshops (voting)	Stakeholder on-line survey (simalto)	Employee on-line survey (simalto)	Customer face to face survey (simalto)	What was in our July 2013 plan?		What's in our March 2014 plan?
Storm resilience	Improving resilience to >10% customers	↑	↑	↑	⇔	↑	Draft plan + additional 10% of km in severe weather areas will be made resilient	Same output, lower cost
Poorly served customers	Improving service to 40% of poorly served customers	⇔	↑	↑	⇔	⇔	Consistent with draft plan – investment targeted to poorly performing overhead lines and cables	Same output, lower cost
Energy advice for fuel poor	No expenditure in draft plan	⇔	Proposed alternative output related to fuel poverty					No change
Network capacity information for new connections	No expenditure in draft plan *	⇔	Exploring options for this to be funded by connections customers					No change
Future-proofing the network	No expenditure in draft plan	↑	↑	⇔	⇔	↑	Investment in future-proofing, in line with £10m option presented at stakeholder events	No change
Earlier approach to network investment	6 new grid circuits or transformers, 30 new or uprated sites	⇔	⇔	↓	↓	⇔	Consistent with draft plan – triggering reinforcement 20% earlier	No change
Future innovation spend	No expenditure in draft plan **	↑	↑	↑	↑	↑	80p per customer per annum, based directly upon stakeholder feedback	No change
Service position inspections	Inspection every 5 years starting 2015	⇔	↓	⇔	⇔	↓	Inspections to start 5 yrs after smart-meter installation – later than draft plan assumption. Reduced investment in ED1.	No change
Flood protection	Protect 120,000 customers against 1 in 100 year event	⇔	↑	⇔	↑	↑	Accelerating our fluvial *** flood protection programme prior to ED1. Reduced ED1 investment.	Extra ED1 investment in protection against pluvial **** flooding

* As stakeholders demonstrated strong support for Future-proofing at our workshops, we presented an option for £10m investment in our surveys.
** As stakeholders demonstrated strong support for Innovation at our workshops, we presented an option for investment of 50p per customer per annum in our surveys.
*** Fluvial = river based floods.
**** Pluvial = localised rain based floods

respect to early network reinforcement based on strong stakeholder feedback at the Phase 2 stakeholder events, in particular in the SPD area. However, the customer willingness to pay research showed this to be the **least supported investment option by customers.** We therefore decided to maintain our draft plan position on this – the draft plan already included a 20% improvement in this area.

Responding contrary to feedback

Educating young people

The feedback received did not always align with our core values and one area was in public safety and the education of young people. Whilst many stakeholders highlighted this as a priority, individual domestic customers were more mixed in their opinions, with some suggesting this was already represented in the school curriculum and that it was a not a priority for spending by a DNO. We believe our spending on public safety is proportionate and we plan to continue our industry leading public education programme.

Responding to localised feedback

In the SPD region, all stakeholder groups demonstrated support for doing more with respect to improving service to poorly served customers. In SPM region there was support for maintaining the draft plan proposal. To improve service for our poorly served customers, we are targeting underperforming overhead lines and cables. **In response to the feedback in the SPD area to do more, we are investing a further 14%.**

Feedback incorporated into our plan

We have incorporated stakeholder feedback and customer willingness to pay results at relevant points throughout our Business Plan. This is reflected within our proposed outputs and our forecasted expenditure over the eight year period. **Where there is a clear engineering case and stakeholder support, we have ensured that we have made the appropriate changes to our level of investment.**

We have built stronger links with local authorities, special interest groups, community agencies and charities. We have listened to our supply chain and contractors to better shape our delivery plans. **We believe our Business Plan achieves the right balance of benefits for all interested parties.**

b. Our ongoing stakeholder engagement strategy and approach

Our engagement with stakeholders creates relationships with mutual benefit and helps us to deliver a stronger business with increased reputation.

Our objectives

In this section we describe our long-term strategy for stakeholder engagement and how we apply our approach to develop relationships of mutual benefit.

We recognise that the views of all of our stakeholders are important for setting priorities for the SPEN networks. In preparing our Business Plan, we have drawn strongly on the lessons we have learned from engagement with a wide range of stakeholders, including customers, local authorities, emergency planners, consumer groups, NGOs and many others. As we move into the RIIO-ED1 period we will be maintaining our engagement with stakeholders to help monitor how we are performing.

Our responsibilities

Customers pay for everything we do, so they have a right to expect the highest possible standard of service and to have confidence that the services we deliver are value-for-money. It is important that we're regularly talking to our customers and stakeholders, asking them what they think our priorities should be now and into the future. Our licence areas are diverse, covering:

- *areas of Scotland, England and Wales (we are unique in this respect);*
- *rural areas and areas with low access to mains gas;*
- *areas of deprivation;*
- *areas with greater than average uptake of and demand for renewable generation;*
- *areas of demanding and difficult terrain, including severe weather areas;*
- *scenic areas, including Snowdonia National Park; and*
- *urban areas including Liverpool, Glasgow and Edinburgh.*

This diversity generates different profiles of need by location and interest group. Our challenge is to ensure that our strategy for engagement enables us to engage appropriately with this broad range of stakeholders and to prioritise their needs holistically. Ways that we remove barriers to engagement include providing Welsh language versions of our key documents and holding our stakeholder events in a variety of accessible locations.

We recognise that regularly talking to stakeholders is only worthwhile if we then use their feedback to change the way we do things and shape our plans for the future. We are committed to doing this.

In **Chapter 5 – Outputs and Incentives**, we describe how stakeholder engagement has influenced our Outputs targets. **In Chapter 6 – Expenditure**, we reference the specific areas of our expenditure which have been directly influenced by stakeholder feedback.

Mapping stakeholder engagement throughout our Business Plan document suite

Topic	Related Chapters, Annexes and Supporting Documents
Our stakeholder engagement strategy and approach	Annex – SPEN – Stakeholder Engagement Annex – 3KQ – Stakeholder Panel Scoping Phase Report
Our stakeholder engagement process for preparing our RIIO-ED1 plans	Annex B3 – Learning from Stakeholders Annex – SPEN – Stakeholder Engagement – Further detail
Feedback incorporated into our plans	Chapter 5 – Outputs and Incentives Chapter 6 – Expenditure Annex – Explain – Stakeholder Feedback Report (Ph1) Annex – Explain – Stakeholder Feedback Report (final)

Our strategy

The aim of our stakeholder engagement strategy (see **Annex – Stakeholder Engagement – SPEN**) is to develop relationships with mutual benefit and help us to strengthen the performance and reputation of our business by:

- *actively seeking out stakeholder input;*
- *listening to the feedback we receive from stakeholders; and*
- *acting on the feedback we gather.*

Engagement with our stakeholders supports both operational and strategic improvements in our performance, ultimately helping us to deliver a better service for our customers on the electricity network, now and into the future.

Mutually beneficial relationships

The benefits that stakeholder engagement brings to our business include improvements in reputation, resilience during difficult situations, addressing risks and improved long-term planning.

Benefits for stakeholders include:
Greater opportunity to influence future customer service
More open and transparent lines of communication
Improved access to decision making process
Early identification of synergies for working together

Benefits for our business include:
Higher quality decision making
Addressing areas of risk
Expertise on new areas (e.g. fuel poverty)
Increased reputation
Improved resilience in difficult situations
Increased capacity to innovate
Early identification of external changes

Regular and recurring opportunities

Through regular and recurring stakeholder engagement activity, we have established a level of engagement that will deliver real benefits for both our business and our stakeholders. Examples of our regular engagement include an annual event with our service partners, fortnightly topic updates to our online customer community and a stakeholder working group on social obligations.

Our robust approach to engagement

Our robust approach to stakeholder engagement is built on seven key pillars, as summarised in the diagram below. We discuss each pillar in turn below, explaining its purpose and the benefits it delivers.

- *Governance*
- *Centralised data*
- *Engagement plans*
- *Systematic approach*
- *Feedback loop*
- *Resources*
- *Assurance*

Our 7 stakeholder engagement pillars

Governance	Centralised stakeholder database	Engagement plan	Systematic approach	Feedback loop	Resources	Assurance
• Internal Action group • External advisory panel(s) • Reporting • Quarterly Executive review	• Categorisation • Prioritisation • Tracking log	• Focus on strategic and material issues • Consider mechanisms • Assigned leads in business	• Tool kit of materials • Centralised support • Training	• Transparent • Communicate • Recurring engagement	• Core support team • Business leads deliver engagement	• External audit of activities and process

Interactions

Governance

Our governance structure for stakeholder engagement provides a systematic approach to the discussion, recording and collation of stakeholder feedback within our business.

This internal governance is supplemented by annual assurance work, to ensure our engagement is consistent with a recognised standard, and an external panel who provide external views on topics and themes.

Internal Action Group

Our Internal Stakeholder Action Group includes representatives (senior managers – referred to as business leads) from each area of our business, chaired by our Stakeholder engagement manager.

The group meets monthly and has responsibility for shaping the stakeholder engagement strategy and for managing and reporting on action plans addressing our key strategic engagement priorities.

The group has responsibility for coordinating stakeholder engagement activity across the business and for reporting back to the group on the engagement activity taking place within their respective business units.

See **Annex B3 – Stakeholder panel scoping phase report – 3KQ** for the terms of reference for this group.

External Advisory Panel – the Strategic Stakeholder Panel

In 2013-14 we have been working with key stakeholders to develop an External Advisory Panel, supported by topic-specific working groups. We have engaged an independent stakeholder practitioner, who has undertaken an exercise with stakeholders to determine the best format for this strategic panel. This panel, known as the Strategic Stakeholder Panel (SSP), and its supporting workgroups will be independently convened. This strategic panel links directly into the SPEN Board and Executive Team, giving stakeholder engagement feedback a platform at the highest decision-making level.

Reporting

Our reporting structure enables stakeholder engagement to be embedded into decision making at all levels:

- *Our monthly Internal Stakeholder Action Group collects, collates and reports stakeholder feedback.*
- *This data is reported in a 'You said, we did' format and is reviewed monthly by our Executive Team.*

Executive Review

Our Executive Team discusses the themes coming through from stakeholder engagement as evidenced by the monthly reports and changes to business strategy or processes are considered.

Example Engagement Plan

STAKEHOLDER ENGAGEMENT PLAN
2013-14
DISTRIBUTION

Timing	Activity	Stakeholder group
	Regulatory deliverables	
Q2 2013	Stakeholder Engagement Submission	All stakeholders
	Business plan specific	
Q2 2013	RIIO ED1 Phase 2 stakeholder workshops x 2	All stakeholders
Q2 2013	RIIO ED1 Phase 2 Customer Willingness to Pay	Customers
Q2 2013	RIIO ED1 Phase 2 Stakeholder Willingness to Pay	All stakeholders
Q2 2013	RIIO ED1 Phase 2 Political drop-in events x 3	Politicians
Q2 2013	RIIO ED1 Plan on-line consultation	All
Q3 2013	RIIO ED1 Plan published	All
Q1 2014	Revised RIIO ED1 Plan published	All
	Communication and feedback	
Q3 2013	Annual stakeholder submission published on web	All
Q3 2013	Annual stakeholder newsletter via e-bulletin to stakeholders	All
Q4 2013	Customer awareness campaign	All
Q4 2013	Twitter for customers & stakeholders	All
Q1 2014	Facebook	All
	Business-as-usual engagement	
Monthly	On-line Community for Customers	Customers
Monthly	Connecting customer surgeries x 2	DG / Housing / I&C
Aug-13	Street works stakeholder workshop	Local authority / Contractor / supplier
Nov-13	Contractor/supplier stakeholder workshop	Contractor / supplier & local authorities
Q2/3/4 2013	Community engagement Mid-Galloway	Community councils / Local Authorities
Q3 & Q4 2013	Agricultural safety engagement (Royal Highland Show)	Agricultural community
Q3 2013	Metal theft safety engagement	Customers / Public safety / All stakeholders
Q4 2013	Winter readiness engagement workshops x 2	Local Authorities / Emergency services
Q4 2013	Flexible Networks Dissemination event	DNOs / Low carbon / Academics /Supply chain
Q3 2013	Ashton Hayes Smart Village Dissemination event	DNOs / Low carbon / Academics / Supply chain / Com
Q1 2014	Accelerating Renewable Connections Shaping event	Low carbon / Renewable developers / Financiers /
Q1 2014	Ease of contact survey work	Customers / Connections
Quarterly	Mid Wales developer forum	Renewable developers
Quarterly	North Wales developer forum	Renewable developers
	Business-as-usual engagement (key external events)	
Q4 2013	LCNF Conference	DNOs / Low carbon / Academics /Supply chain
Q3 2013	All Energy Conference	Renewable developers/ Low carbon / Academics /Supply chain
Q3 2013	BASE Glasgow conference	Local authorities / Supply chain / Low carbon
Q4 2013	Renewable UK conference	Low carbon / Agricultural Community
Q4 2013	ENA Distributed Generation Fora x 3	Low carbon / Renewable /DNOs
Q1 2014	Scottish Renewables Conference	Renewable developers/ Low carbon / Academics /Supply chain
Q1 2014	Metal Theft Security (Scottish Business Resilience Centre)	Customers / Business / All stakeholders
	Stakeholder governance	
Q2 2013	Assurance against AA1005E	All
Q4 2013	Scoping of strategic engagement vehicle	All
Q1 2014	Feedback on scoping and proposal for strategic engagement vehicle x 1	All
Q1 2014	Feedback on scoping and proposal for strategic engagement vehicle x 1	All
	Internal Governance	
Q3 2013	Establish internal stakeholder action group and kick-off workshop	Internal
Monthly	Monthly Stakeholder Action Group meeting	Internal
Q4 2013	Stakeholder training & capacity building workshop	Internal
Q4 2013	Annual review stakeholder plan	Internal
Q4 2013 / Q1 2013	Annual review of stakeholder mapping	Internal
Q1 2014	Annual review of stakeholder strategy	Internal
	Measurement	
Sep/Oct/Nov/Dec 2013	Stakeholder survey monthly (engagment priorities and communication methods) x 4	All
Q4 2013	Community engagement & landowner survey (Mid-Galloway)	Landowners / Customers
Q4 2013	Customer awareness base-line measurement	Customers
Q1 2014	Customer awareness post campaign measurement	Customers

	Business-as-usual engagement
Monthly	On-line Community for Customers
Monthly	Connecting customer surgeries x 2
Aug-13	Street works stakeholder workshop
Nov-13	Contractor/supplier stakeholder workshop
Q2/3/4 2013	Community engagement Mid-Galloway
Q3 & Q4 2013	Agricultural safety engagement (Royal Highland Show)
Q3 2013	Metal theft safety engagement
Q4 2013	Winter readiness engagement workshops x 2
Q4 2013	Flexible Networks Dissemination event
Q3 2013	Ashton Hayes Smart Village Dissemination event
Q1 2014	Accelerating Renewable Connections Shaping event
Q1 2014	Ease of contact survey work
Quarterly	Mid Wales developer forum
Quarterly	North Wales developer forum

Centralised Stakeholder Database

Key to developing mutually beneficial relationships, our centralised database enables us to better understand our stakeholder base across all areas of our business, and to ensure that the needs of our stakeholders are prioritised effectively based on their interest and influence.

Categorisation and Prioritisation

We have undertaken a mapping exercise to define and identify stakeholders across every area of our business. These stakeholders have been categorised into sub-groups and their needs prioritised on the basis of an influence / interest matrix. We engage an independent third party to support this stakeholder mapping activity, conducting interviews across each business area to establish our priority map.

Categorising and prioritising in this way ensures that allocation of resources and budget for stakeholder engagement activity can be targeted at material issues and high influence/high interest stakeholders.

Tracking log

A centralised log records feedback collected and actions in response to feedback from centralised engagement activities.

From 2014 onwards, stakeholder engagement activity will be recorded in our new Contract Relationship Management System (CRM), which will allow us to associate themes, documents and notes to individual events or groups of events allowing us greater visibility of emerging trends and more targeted engagement.

Engagement plan

Our centralised annual engagement plan outlines our high-level annual stakeholder engagement activities for the year. The engagement plan is owned by the Stakeholder Engagement Manager and regularly updated during the year with input from the internal Stakeholder Action Group.

Focus on strategic and material issues

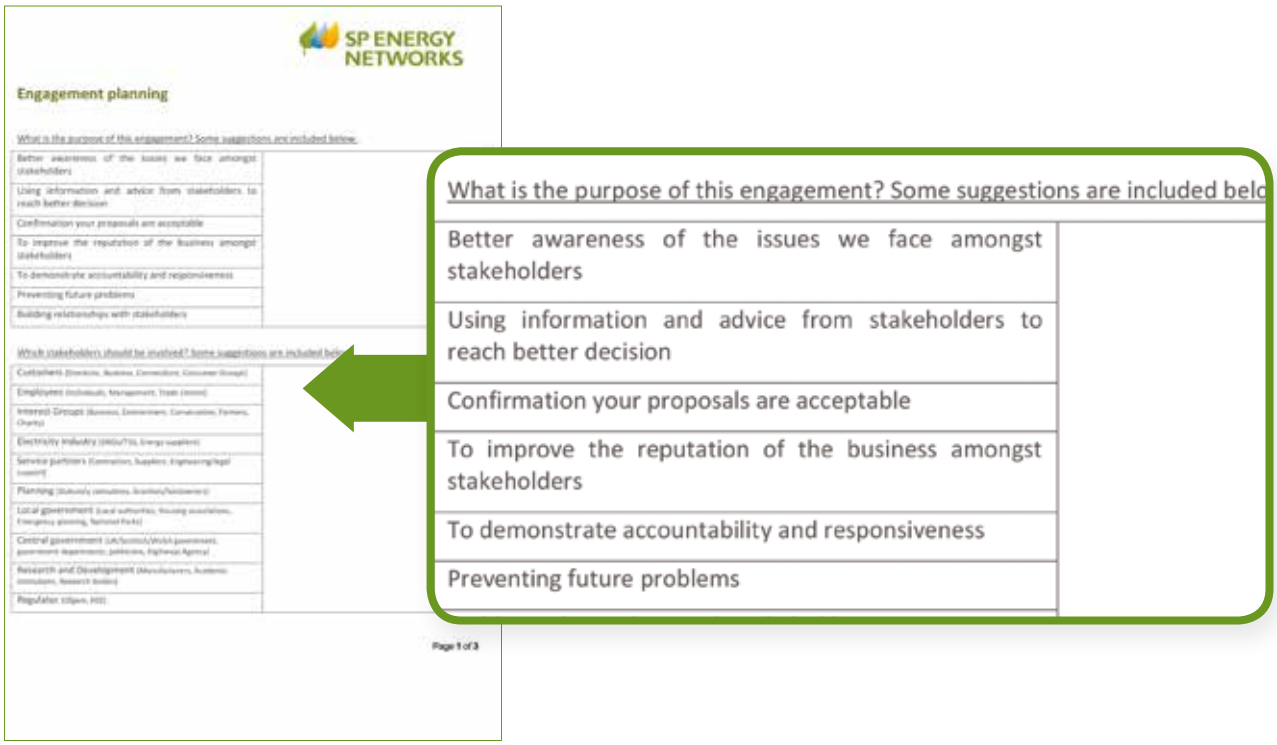
The engagement plan lays out the engagement activities we will undertake in response to the key strategic and material engagement themes for the year.

The engagement themes are reviewed annually through a survey of our stakeholders to ensure that inclusion and prioritisation of themes remains valid.

Considering which mechanisms

Our engagement planning considers the most appropriate engagement mechanisms for the stakeholder group and topic. An annual plan of customer and stakeholder research activity is developed in collaboration with an independent market research company and supports the activities in the engagement plan, helping to shape the direction of future engagement.

Example Toolkit Template



Assigned leads in business

The business leads in our Internal Stakeholder Action Group also have their own more detailed action plans for engagement activity to supplement the central engagement plan.

Systematic approach

Our cross-business approach to stakeholder engagement is facilitated by our Internal Stakeholder Action Group and supported by a toolkit of materials and centralised support in order to develop a systematic approach.

Toolkit of materials

We have developed a stakeholder engagement toolkit that standardises our approach to developing stakeholder engagement plans. It prompts our engagement leads to consider the following questions while planning their engagement activity:

- *What is the purpose of this engagement?*
- *Which stakeholders should be involved?*
- *What does success look like to these stakeholders?*
- *Which method(s) of engagement would be most appropriate?*
- *What process(es) will be used to record feedback?*
- *What other process(es) will be used to feed back to the business?*
- *What process(es) will be used for reporting?*
- *What process(es) will be used for transparency?*

This toolkit includes templates for engagement planning, scribe notes, meeting notes and reporting on engagement activity. The benefit of these is that engagement can be approached in a consistent manner across our business.

Centralised support

Our central stakeholder engagement team provide support and advice to those planning engagement activities to ensure all aspects of the engagement process are considered.

Training

We have introduced stakeholder engagement training to:

- *develop a common understanding of stakeholder engagement across our business; and*
- *develop a common language for our stakeholder activities across our business.*

20 senior managers, including members of the Internal Stakeholder Action Group and key individuals involved in stakeholder engagement, took part in a full day training workshop in 2013.

Feedback loop

A healthy feedback loop is crucial for us to:

- *develop trusting and mutually beneficial relationships;*
- *continue to strengthen our business; and*
- *continue to strengthen our reputation.*

Transparent

Key elements of good practice stakeholder engagement are transparency and inclusivity. We seek out those whose input is valuable and we are transparent about what has been said, what we have heard and what action we have taken as a result. To achieve this, we make stakeholder engagement information available widely using the web, we share openly with stakeholders and make them aware of information.

Communicate changes

We actively communicate the changes that we make as a result of stakeholder feedback. Where there are good reasons not to make changes suggested by our stakeholders, we communicate the reasons for this. After having spent time designing engagement with stakeholders and them having spent time engaging with us, it is crucial that we return to them and share with them what we've done in relation to that feedback or what we have chosen not to do and why.

Recurring engagement

We have established recurring engagement, where regular updating can be provided and progress can be seen. (see Example Engagement Plan)

Resources

Core support team

Our small central stakeholder team supports business leads in delivering stakeholder engagement across our business and collates and reports on stakeholder engagement activity and actions. It is this team's responsibility to promote stakeholder engagement and to define the strategy for engagement.

External expert resources are used to support engagement activity including market research practitioners and stakeholder engagement practitioners.

Business leads deliver engagement

Our business leads deliver engagement initiatives with the support of the core stakeholder team. It is important that the ownership of stakeholder engagement activities and actions sits with each area of our business, whilst being coordinated centrally.

Devolving the responsibility for delivering engagement to the relevant business area gives business leads direct interface with their stakeholders, autonomy to act on stakeholder feedback and accountability for closing the feedback loop. Training, support and our stakeholder engagement toolkit brings consistency to engagement across the business.

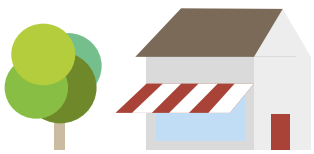
Assurance

External audit of activities and process

Each year we undertake assurance of our approach to stakeholder engagement with reference to the AA1000SE Stakeholder Engagement Assurance Standard and the principles of inclusivity, materiality and responsiveness included within that standard.

Continuing to apply our approach

Through the application of our seven key pillars we are continuing to work with our diverse range of stakeholders for the mutual benefit of our business and customers.



4 Preparing our 2015-2023 plan

We are confident that our plan is well justified, realistic, efficient and deliverable.

This section is aimed at helping readers understand the process we have gone through in developing our Business Plan.

In **Developing Our Plans for RIIO ED1** we explain our approach, which includes stakeholder engagement, innovation, developing our outputs, preparing to deliver our plans and our development of an appropriate financial package. We provide an overview of the lengths we have gone to in ensuring our costs are efficient and how these costs impact on our customers.

The robust process we have followed ensures that our plan is:

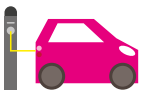
- *driven by stakeholder priorities;*
- *well justified;*
- *realistic and deliverable;*
- *and efficient.*

We first submitted our Business Plan to Ofgem in July 2013, it was assessed and we received feedback. In **Addressing Feedback on Our July 2013 Plan**, we respond to the key points within that feedback and outline how we have dealt with these aspects within this revised March 2014 version.

Finally, in this section, we explain our **Governance, Assurance and Approval Process** which provides our stakeholders and customers with confidence that our plans are accurate, complete, fully understood at all levels and approved by our Directors, CEO and Board.

In this chapter we explain:

Topic	Further detail can be found in the following Annexes and Supporting Documents:
a. Developing our plans for RIIO-ED1	C7 – Innovation strategy • C6 – Cost benefit analysis • C7 – Business readiness
b. Addressing feedback on our 2013 plan	C6 – Asset data and information strategy
c. Governance, assurance and policy development	C8 – Risk and Uncertainty



a. Developing our plans for RIIO-ED1

Our Business Plan Approach

Throughout the process of preparing our 2015-23 Business Plan – July 2013, and this March 2014 update, we've tried to make our plans useful and accessible to as full a range of people as possible.

We have approached the preparation of this plan in a robust and inclusive manner, incorporating further feedback from our stakeholders, including our industry regulator, Ofgem. The accuracy and completeness of our Business Plan is very important to us – we want our stakeholders to have absolute confidence in it. We have processes in place to ensure the content of the plan has undergone scrutiny both within our business and from a range of external specialist organisations.

We have ensured that innovation, stakeholder engagement and delivery of outputs have all been considered and are key inputs to our plan. We have developed an appropriate financial package that is efficient and balanced for all our stakeholders.

Overview

Our Business Plan represents a well-justified and realistic view of how we will address the challenges of the period 2015-23 and beyond.

Our Business Plan:

- *Justifies our strategies to deliver our outputs backed by a thorough understanding of long-term trends. These are detailed in **Chapter 5 – Outputs and Incentives***
- *Demonstrates our commitment to play our part in delivering the UK carbon targets. This is detailed in **Chapter 2 Our Challenges b – Facilitating Low-Carbon Technologies** and **Chapter C6f – Load Related Expenditure.***
- *Clearly links expenditure to our proposed outputs. This is detailed in **Chapter 5 – Outputs & Incentives.***
- *Incorporates the views of stakeholders across our plan. This is summarised within **Chapter 3 – Stakeholder Engagement**, **Chapter 4 Preparing our 2015-23 Plan and within our stakeholder facing document – Learning from our Stakeholders** and detailed throughout the Business Plan.*
- *Demonstrates the application of innovative techniques to deliver long-term value-for-money. This is detailed within **Chapter C7c – Innovation & Future Networks** and throughout **Chapter 6 – Expenditure.***
- *Provides a holistic view of an appropriate financial package. This is detailed **Chapter 9 – Financing.***

Creating Our Business Plan

We established a team of business experts, drawing on the knowledge of experienced senior personnel from across our business organised in five work streams, as shown in the diagram opposite.

The five work streams (Stakeholder Engagement, Innovation, Outputs & Expenditure, Programme Delivery, and Finance & Economics) all lie within an overarching policy development, governance and assurance framework.

We worked collaboratively across our organisation and with the wider energy industry to create a high level of business and stakeholder engagement. In addition we enlisted a range of specialist organisations to inform our Business Plan. These are referenced throughout the Business Plan and within the supporting annexes.

We are confident that our plan is well justified, realistic, efficient and deliverable

The process used to develop our plan

Policy Development, Governance and Assurance

Helping to develop the ED1 Policy and making sure our business plan is robust, accurate and complete

Stakeholder Engagement	Innovation	Outputs & Expenditure	Programme Delivery	Finance & Economics
Consulting with our stakeholders and incorporating their needs into our business plan	Incorporating innovation into our business plan and identifying future projects	Developing our outputs and the efficient expenditure to deliver our business plan	Our long term approach to deliver our plans for ED1 and beyond	Developing an appropriate financial package that meets the needs of our stakeholders

Stakeholder Engagement

In **Chapter 3 – Stakeholder Engagement** we described how we learned from our stakeholders and incorporated this feedback into our Business Plan. We have directly engaged with around 1,100 individual domestic customers and around 900 other stakeholders as part of the planning process. We have held six stakeholder events involving 274 attendees, supported by senior staff from across our business.

Our phased approach ensured that we sought views **before** preparing our draft plans, **during** plan development and **after** our Business Plan was published.

We have incorporated stakeholder feedback and customer willingness to pay results extensively throughout our Business Plan. This is reflected within our proposed outputs and our forecasted expenditure over the 8 year period.

We have built stronger links with local authorities, special interest groups, community agencies and charities.

We have carefully listened to our supply chain and contractors to better shape our delivery plans. Through our brand awareness campaign and engagement events we have raised awareness of SP Energy Networks, the unique services we deliver and the broader support we can offer to the communities we serve.

Innovation within our Business Plan

Innovation runs throughout all of our business activities and is not confined to formal industry innovation trials. We deliver innovation through:

- *Technology innovation – New assets and equipment and how we operate the network.*
- *Operational and process innovation – The way which we manage our organisation.*
- *Commercial innovation – Contractual arrangements with customers as well as with suppliers.*

We designed our Business Plan with innovation at its core, using not only what we have learned from our formal innovation trials (Low-Carbon Networks and Innovation Funding), but the application of innovation to our operations, our processes and our commercial activities. We have also shared information with other network companies to adopt technology they have trialled for the benefit of our customers.

We have made the most of being part of the Iberdrola Group, in particular experience of smart metering in the USA and Spain, light current technology, cost effective purchasing and collaborative electric vehicles mobility programme.

In developing our innovation plans we have balanced the risk associated with adopting new approaches against the overall costs and benefits they may achieve. For our larger projects we have captured this in a formal cost benefit analysis. Further details on our approach to innovation can be found in **Chapter C7b – Innovation and Future Networks.**

Our supplementary **Annex C7 – Innovation Strategy** describes the detailed development and application of innovation within our business. It provides case studies and explains the funding mechanisms for innovations within the ED1 period.

Our Outputs Framework

We have developed a transparent and robust outputs framework that clearly shows:

- *What we will deliver to our customers.*
- *How we will demonstrate our performance throughout the ED1 period.*

Our commitments for the ED1 period take into consideration:

- *Stakeholder priorities.*
- *Past, present and future performance, our own and other companies.*
- *Challenges during the ED1 period.*
- *Levels of planned investment.*
- *Foreseeable innovation.*

All areas of our business have been involved in the development of our outputs framework. Directors with the responsibility for delivering outputs were actively involved in their design and approval.

Overall, we have committed to measure our performance through a range of more than 90 outputs across six categories. Details of these are described in **Chapter 5 – Outputs and Incentives**.

Our expenditure process

In developing our expenditure plans we:

- *Carried out a detailed review of our current strategies.*
- *Assessed the suitability of our assets in the long-term (out to 2040)*
- *Considered the increasing age of our network.*

We have made sure that what we propose to spend is suitable and efficient.

- *We talked to our stakeholders, and will deliver our investment plan in line with the priorities they identified.*
- *We held peer reviews with our internal experts.*
- *We talked to experts within the global Iberdrola business.*
- *Our internal Asset Stewardship Groups (ASGs), made up of a cross section of our employees, reviewed our plans.*

Non-load related investment describes what we will spend to renew and refurbish our substations, overhead lines and underground cables.

- *Our investment plans are based on the condition of our assets and the consequence of them failing.*
- *These factors are captured within our Asset Health & Criticality Index.*

Load related investment is important to stakeholders and customers as:

- *It creates the additional capacity in our network to allow new customers to connect.*
- *It deals with increases in demand from our existing customers before this presents a higher risk of power cuts.*

To identify the future requirements of our networks we have considered a number of factors:

- *Independent forecasts of economic growth.*
- *Cities' and local authorities' development plans.*
- *The appropriate triggers for us to take action to create additional capacity in our network.*
- *Department of Energy and Climate Change (DECC) scenarios for the uptake of low-carbon technologies including the more ambitious Welsh and Scottish 2020 carbon reduction targets.*
- *Opportunities to use innovation to reduce our costs and charges to customers.*

More detail on each of these steps is detailed within **Chapter 6 – Expenditure**

Cost assessment

We are acutely aware of the financial pressures on our customers, particularly in the current economic climate. Consequently we have sought to make our plan the most efficient possible in order to deliver reductions in our customers bills.

To review and challenge the efficiency of all aspects of our operations, we have:

- *Carried out comprehensive benchmarking using other DNO's data shared following publication of Business Plans in July 2013.*
- *Compared our costs against other parts of the Iberdrola Global Networks Business.*
- *Identified areas where we can improve our own efficiency, including through innovation.*
- *Identified areas where we could challenge contractors' margins.*
- *Identified areas where we could work more effectively with our contractors and suppliers.*
- *Set out plans to deliver these efficiencies.*
- *Embedded the identified efficiencies into our plans to deliver benefits for customers.*

Our robust approach to cost assessment is described in more detail in **Chapter 6 – Expenditure**.

Cost benefit analysis

In defining our investment programmes we have actively identified and explored the alternative options available to ensure that we deliver long-term value-for-money. Where we have identified more than one solution we have carried out a cost benefit analysis.

Our approach to cost benefit analysis is:

- *Proportionate*
- *Robust*
- *Compliant with current HM Treasury Green Book guidelines (July 2011 update)*

Ofgem commissioned Cambridge Economic Policy Associates Ltd. (CEPA) to carry out an independent assessment of each DNO's cost benefit analysis at July 2013. We were assessed favourably, strongly supporting our assertion of delivering long-term value-for-money.

In this March 2014 version of our plan we have completed 70 CBAs totalling £1.2bn which represents in excess of 70% of our load and non-load investments.

The outcome from our cost benefit analysis has been fed into our investment plans and is outlined in **Chapter 6 – Expenditure** and in our supplementary **Annex C6m – Cost Benefit Analysis.**

Preparing to deliver

We have made thorough preparations to ensure we are ready to deliver our commitments as we move from the current price control period into ED1 and beyond. We have carried out a comprehensive review of our resourcing strategy and purchasing requirements, engaged with our contracting community and completed pre-project planning on a zone by zone basis across all our operational areas.

Our range of preparations include:

- *Detailed site surveys for our main programmes of work.*
- *Comprehensive engineering studies looking at alternative approaches.*
- *Programme and project planning activities.*
- *A thorough review of our contracting strategies.*
- *The development of a revised resourcing strategy.*

In **Chapter C7 – Business Readiness** we describe our detailed preparations for transitioning into the ED1 period and our plans for moving our operations closer to our customers.

Our efficient financial plan

Investments in our network are funded by a mixture of shareholder investments and debt raised in the financial markets.

In building our plans we have considered the most efficient financing arrangements that:

- *Provide an appropriate balance of cost to customers and returns for shareholders.*
- *Reflect the levels of risk that shareholders are being asked to carry.*

As part of our Governance and Assurance framework we established a Financial Issues Steering Group including representatives from Iberdrola's senior financial directors.

Involvement of our wider business experts and advisors is key to the successful deployment of our financial risk assessment. We developed our approach to risk modelling in conjunction with NERA.

The analysis is also informed by joint work undertaken under the auspices of the ENA drawing on expertise from Oxera.

In **Chapter 9 – Finance**, we provide clear evidence that our financial plan is efficient for customers, provides value-for-money and provides appropriate levels of returns for shareholders.

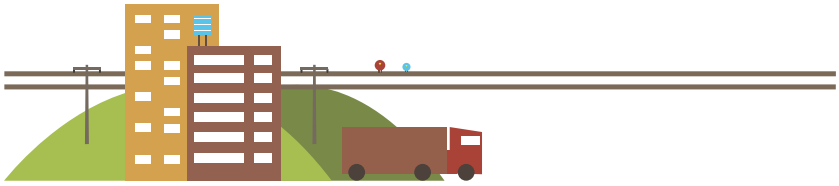
Impact on customer bills

While our efficient financial plan makes sure that customer bills fairly reflect our costs, customers and suppliers have also told us that they want their bills to be predictable and fair in the long-term.

We have detailed the impact of our Business Plan on the Distribution Use of System (DUoS) element of our customers' bills in each of our licence areas in **Chapter 10 – Our Revenues and Impact on Customer Bills and Value-for-money**. Typically the DUoS element represents 16% of an average customer's bill.

Governance and Assurance

The accuracy and completeness of our Business Plan is very important to us. We want our customers, stakeholders, collaborators, and regulator to have absolute confidence in it. Throughout the development of our ED1 Business Plan, we have implemented an assurance and governance framework to ensure our plan is robust, realistic and accurate. Our assurance framework is made up of three essential elements: Governance, Risk Management and Compliance. In **Chapter B4c – Governance, Assurance and Approval** we describe the steps we have taken to assure our Business Plan.



b. Addressing Feedback on our July 2013 Plan

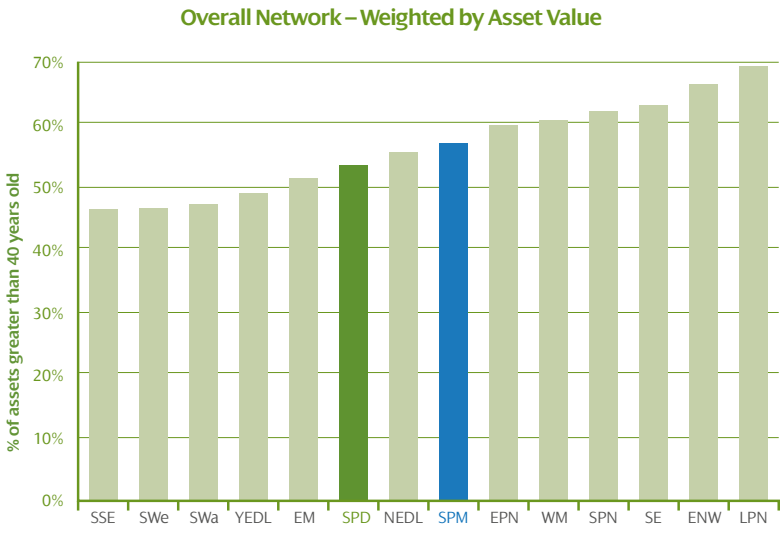


Figure 1 – Asset age profile – All DNOs.

Following publication of the first version of our plan in July 2013, we have listened to the feedback from Ofgem and other key stakeholders and have acted upon this to ensure that the plan we are now presenting addresses the issues that they raised with us. Key issues included:

- *Health Index versus the age of the asset base*
- *Accuracy of our asset data*
- *Coverage of criticality data*
- *Level of detail on Manweb 132kV investments*
- *Substantiation of the Manweb Company Specific Factors case*
- *Coverage of our cost-benefit analyses*

Health Index versus the age of the asset base

Ofgem's analysis of our July 2013 plan indicated that for the average age of the asset base, we appeared to have proportionately more Health Index 5 (poorest condition) assets than the other DNO groups. This raised the concern that we may be operating a more conservative policy when modernising assets than the norm within the industry. We have carried out extensive analysis of asset age profiles, health indices and renewal rates across all of the UK DNOs and have reached the following conclusions:

Asset age profile

As shown in figure 1, across all asset classes, our average asset age is mid-pack compared to other DNOs, measured by the proportion of assets greater than 40 years old. In this analysis, asset value is used as a weighting factor to provide a representative comparison.

However, this is very much an average and in developing our asset plans, we do not make decisions on high level averages, but work at a much more detailed level. We also never make investment decisions based on asset age alone.

At the level of individual asset classes, our assets are in the oldest half of the industry in the majority of cases. For example, SPM has the oldest population of 11kV ring main units and the second oldest population of 132kV circuit breakers, whilst SPD has the fourth oldest transformer population. This is offset by having the third youngest population of switchgear and fourth youngest overhead line pole population in SPD and the sixth youngest transformer population in SPM.

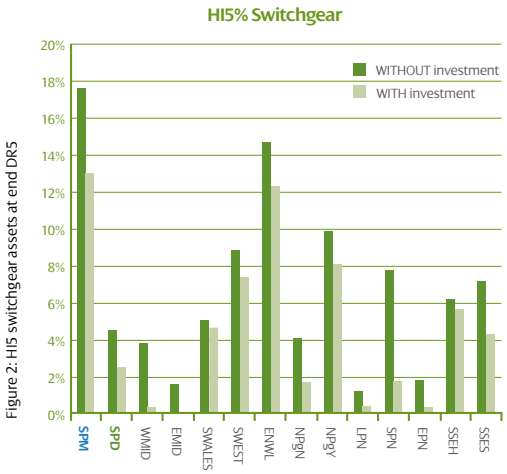


Figure 2: HI5 switchgear assets at end DR5

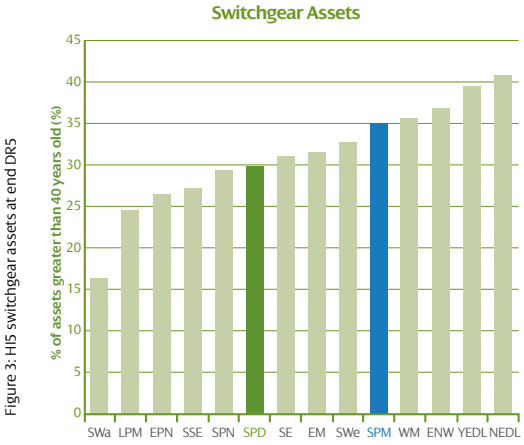


Figure 3: HI5 switchgear assets at end DR5

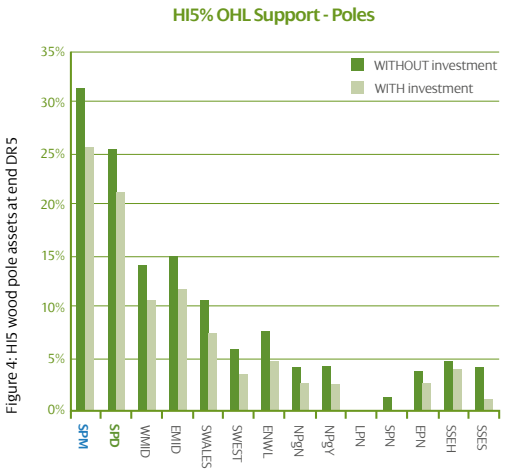


Figure 4: HI5 wood pole assets at end DR5

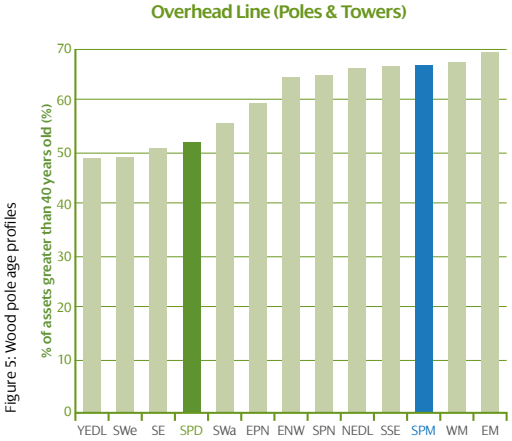


Figure 5: Wood pole age profiles

Asset age comparisons of this type are dominated by the relative ages of cable assets, as these represent a larger proportion of total asset base value than the other asset areas. In our July plan, we presented an age profile for our cable assets that was based purely on cable age records held against the Individual assets in our asset registers and pro rated for cables of no known age.

This was a departure from previous cable age profiles that we have historically used, which have been based to a significant degree on estimations as the lack of comprehensive cable age data for pre-privatisation assets, an industry-wide issue, means that we only hold age data for a small percentage of the cable population, more often than not the more recently Installed assets. This had the effect of presenting our overall cable age profile as being the youngest in the industry. This had no effect on our investment plan as our cable investment decisions are made on condition and performance.

For our revised plan, we have reverted to our previous approach based on a combination of the industry estimations created In DPCR4 and our actual age records, and are confident that this presents a more representative view of cable age, positioning us mid pack with respect to the other DNOs.

Health Index

We have analysed relative HI positions at the end of DPCR5 and the end of ED1 for all DNOs' July 2013 plans. We have identified areas where our level of HI5 (end of life) profiles are higher than others. In Figure 2, which shows the position at the end of DPCR5, it Is clear that the proportion of switchgear in SPM Is amongst the highest in the industry. SPD, on the other hand, has a relatively low proportion of switchgear assets at end of life going into ED1. This shows a strong correlation with the relative age profiles for switchgear assets, presented in figure 3.

The main area where we have a higher proportion of HI5 assets than other DNOs is in relation to our overhead line wood pole assets. The relative proportions of wood poles are presented in figure 4, alongside the relative age profiles across the DNOs in figure 5.

Whilst the graphs show a clear correlation for our 2 licences between HI5 proportion and age, it is also obvious that our HI5 populations appear to be considerably higher than those of other DNOs with an equivalent level of aged poles. We classify all poles that do not comply with the minimum height requirements set out in current legislation as HI5 assets.

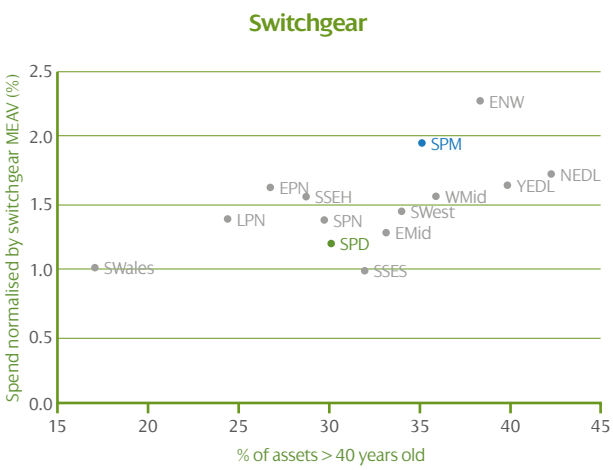


Figure 6: Switchgear investment versus age profile

Figure 7: Switchgear Investment versus HI profile

We do not think this Is the case for other DNOs, but recognise the limitations of direct comparison of HI data across the industry, given the current lack of a harmonised set of definitions to enable definitive comparison. Moving forward into ED1, we remain keen to engage with both Ofgem and other DNOs to address this limitation.

Asset renewal rates

We have also looked at asset renewal rates compared to asset age and HI profiles to assess the appropriateness of our plans compared to the other DNOs. Figures 6 and 7 provide examples of this analysis for switchgear. For every asset class, we have analysed our relative positioning and within our expenditure plan section and its associated annexes, we describe In detail how we have arrived at the volumes of interventions built into our plan.

In summary, we are comfortable with our positioning in respect of asset age, health indices and replacement rates within the Industry and our work has not Identified any areas where we are not in a strong position to explain the appropriateness of our plans either in absolute terms or in relation to those of the other DNOs

Accuracy of our asset data

In their assessment of our July 2013 plan, Ofgem expressed concern over the quality of some of our historical asset data. We recognise that the quality of our asset data is of fundamental importance to critical aspects of how we run our Business. We firmly believe that a robust Business Plan must have as part of it foundation high quality asset data. It is for these reasons that we have invested heavily in our asset data systems and improving our asset records over the last 10 years, including the implementation of market leading systems such as SAP and ESRI to manage our asset data.

As part of our ongoing efforts in this area and following on from a comprehensive implementation of the SAP Integrated system across many of our core business processes, we established in October 2011 a dedicated team, the Network Data Improvement Programme, to review the accuracy of our legacy asset data and make improvements where needed. We advised Ofgem of the creation of this team In late 2011 and have provided numerous updates since. The work was prioritised to ensure that the most critical asset types were addressed first. Through this work, we have:

- *Reviewed assets with a total replacement value of over £16 billion*
- *Carried out detailed analysis across 161 asset types as defined in the RIGs*
- *Identified and investigated over 100,000 data discrepancies*
- *Validated more than 53,000*
- *Made over 47,000 corrections*

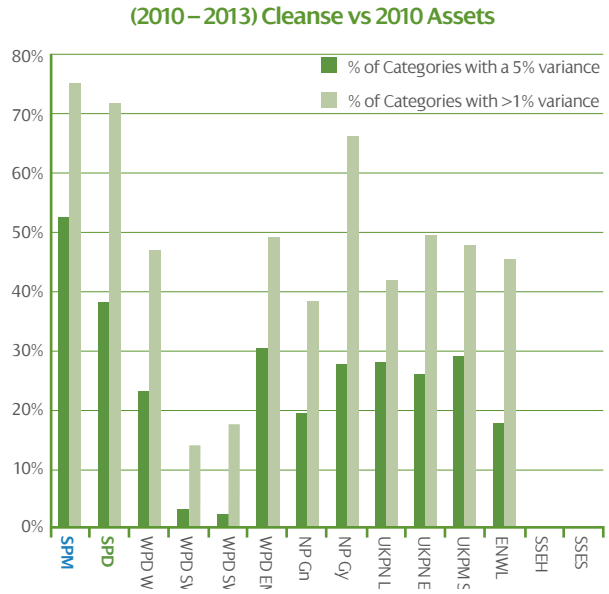


Figure 8: DNO Asset data cleansing activity 2010 – 2013

Health and criticality index movements – SPD LV wood poles

SPD	HI1	HI2	HI3	HI4	HI5	Total CI
CI1	7749	-1004	-1043	-971	-5042	-311
CI2	11561	-1560	-1526	-1317	-7622	-464
CI3	1505	-159	-158	-135	-1114	-61
CI4	1481	-173	-170	-152	-1046	-60
Total HI	**22296**	**-2896**	**-2897**	**-2575**	**-14824**	**-896**

- *Undertaken over 3000 site visits purely to clarify asset data Issues*
- *Obtained external verification from acknowledged industry experts for the changes we have made to our data*

The net result of all of this work is an overall adjustment of less than 3% in the replacement value of our asset base. However, on an asset by asset basis, we have substantially increased our confidence In our data accuracy.

Asset data cleansing is a normal, healthy, and in our view, essential process within the operation of a large asset intensive business

We have analysed the activity of other DNOs in this respect and the results are presented in Figure 8. As can be seen in this chart, all but one of the UK DNO Groups has actively cleansed data over the course of the first 3 years of DPCR5.

We have carried out more cleansing than other DNOs. As our knowledge of other DNOs' current approaches to this activity is very limited, we cannot comment on whether there is any significance in the relative volumes of cleansing being carried out. What we do know is that during this period, we have undertaken a highly intensive process that has resulted in a steep rise in the rate of asset data improvement.

Further details of how we manage our asset data are provided in **Annex C6b – Asset Data and Information Strategy.**

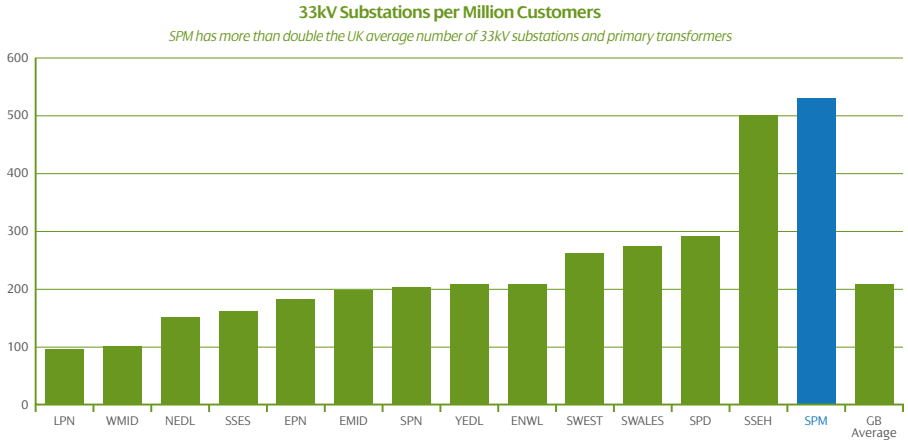
Coverage of criticality data

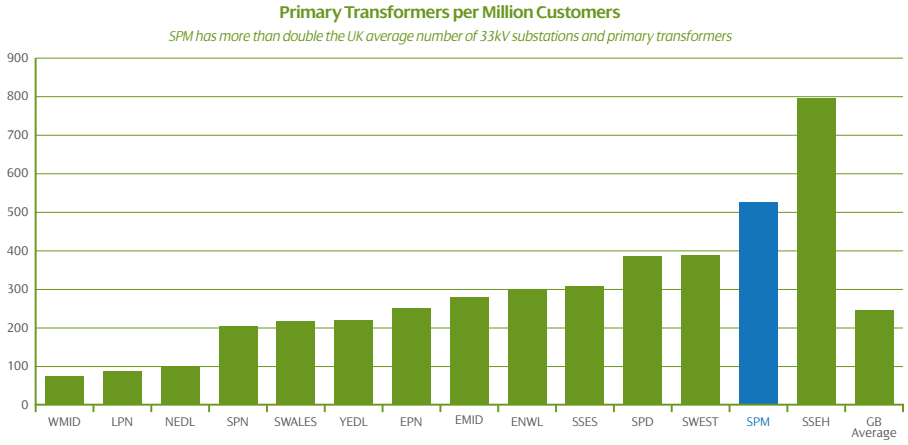
The concept of the Criticality Index (CI) is relatively new within our industry and is being introduced as a reporting requirement for ED1. We are fully supportive of this initiative and have long considered asset criticality within the development of our asset management and associated expenditure plans.

At the time of submitting our plan in July 2013, we were still developing our assessment approach to meet the specific requirement of the new CI methodology. At that stage we had applied it to our 33kv and 11kV primary switchgear and 11kv ground mounted transformers. We wanted to make sure that the CI ratings we applied to our assets were derived from fully traceable data held within our core asset management IT systems and were therefore not prepared to submit ratings for other asset classes which would not have had full substantiation.

Since July, we have been working to expand coverage of CI to all assets within our Health Index programme.

We have achieved this target and our revised plans for HI assets are fully informed by CI analysis





Level of detail on Manweb 132kV Investments

Investment levels vary between price reviews and across DNOs as a result of asset life cycles. We recognise that in the case of our 132kV assets in SPM, we are moving into a period where significant investment is needed to replace assets at or approaching end of life.

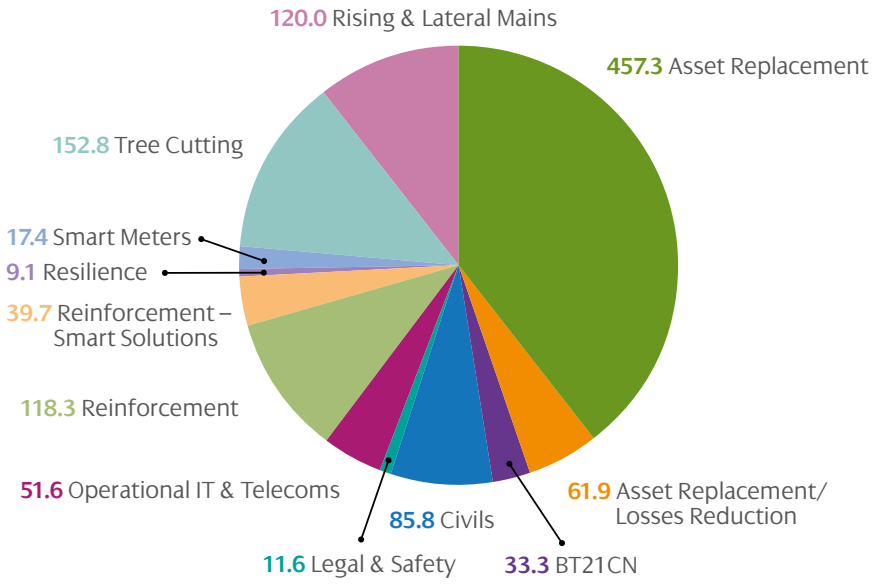
We have acted on the feedback that this aspect of our Investment programme would benefit from more coverage in our revised Business Plan and have addressed it in significantly more detail in the **Chapter C6 – Expenditure** than was the case in our previous publication.

Substantiation of the Manweb Company Specific Factors case

Ofgem commented in its assessment of our July 2013 plan that we had not provided sufficient quantitative evidence to explain the level of increased cost we had stated as being associated with the operation of the unique large-scale interconnected network we operate in urban areas of Manweb.

The fact that this design of network costs more to build and operate is not a new issue and has been a recurrent topic in previous price reviews. Over the years and at each price review, we have demonstrated that wholesale replacement of this network design with a conventional radial architecture is neither viable nor desirable.

We accept that we could have provided more detail in relation to how the costs differ between the two types of network and we have addressed this issue by adding additional sections on this company specific issue in both **Chapter B2d – Our unique Manweb Network** and **Chapter C6c – SP Manweb Company Specific Factors**. In providing this additional detail, we have taken the opportunity to revisit our technical and economic assessments of our proposed strategy for the interconnected network and we have engaged external experts to re-examine this and provide an updated independent analysis to ensure that what we are proposing is in the best interests of our customers.



Coverage of our cost benefit analyses (CBAs)

Cambridge Economic Policy Associates, in their report to Ofgem on the CBAs in our July 2013 plan stated that:

"The main positive of their work is that it is very clear and generally easy to follow. The inclusion of a detailed CBA annex makes it easy to understand why they are including a CBA and the link to the Business Plan; most importantly it also gives the sense that the CBAs have been used as a tool to help with their overall decision making – overall, SP's presentation of the CBAs analysis is the clearest of all the Groups."

They also go on to say:

"SP's analysis presents the most convincing discussion of alternative options for consideration within their CBAs. They consider two or more options against the baseline in sixteen of their twenty-two CBAs (compared to WPD which considers only one option in 118 out of 150 CBAs). More importantly our more detailed assessment of their models suggests that they have generally considered a sensible range of options, taking the care to assess relevant strategies / approaches for each of their CBAs."

However, they also pointed out that more of our total expenditure in our July 2013 plan could have been covered by CBAs. As part of preparing our revised plan, we have extended the coverage of our CBAs so that we have now completed 70 CBAs totalling £1.2bn, which represents in excess of 70% of the load and non-load investment plan. We have also prioritised the analysis onto the projects with greatest materiality and/or optionality.

More information is provided in our **Annex C6m – Cost benefit analysis**.

We have extended the coverage of our CBAs so that we have now completed 70 CBAs totalling £1.2bn, which represents in excess of 70% of the load and non-load investment plan

c. Governance, assurance and approval

Our assurance process

The accuracy and completeness of our Business Plan is very important to us. We want our customers, stakeholders, collaborators, and regulator to have absolute confidence in it. Throughout the development of our ED1 Business Plan, we have implemented an assurance and governance framework to ensure our plan is robust, realistic and accurate.

Our assurance framework is made up of three essential elements: Governance, Risk Management and Compliance. The figure below shows how these three components work together:

Governance

At each stage of our Business Plan development, we focused our governance and approval process on areas of higher risk. The governance forums established for ED1 included members of the:

- *ScottishPower Energy Networks Executive Team.*
- *Iberdrola Global Networks Business Executive Team.*
- *Licensee boards.*
- *Board of SPEN Holdings Ltd.*

Our governance framework makes sure that our plans are fully understood, endorsed and approved at appropriate levels within our organisation.

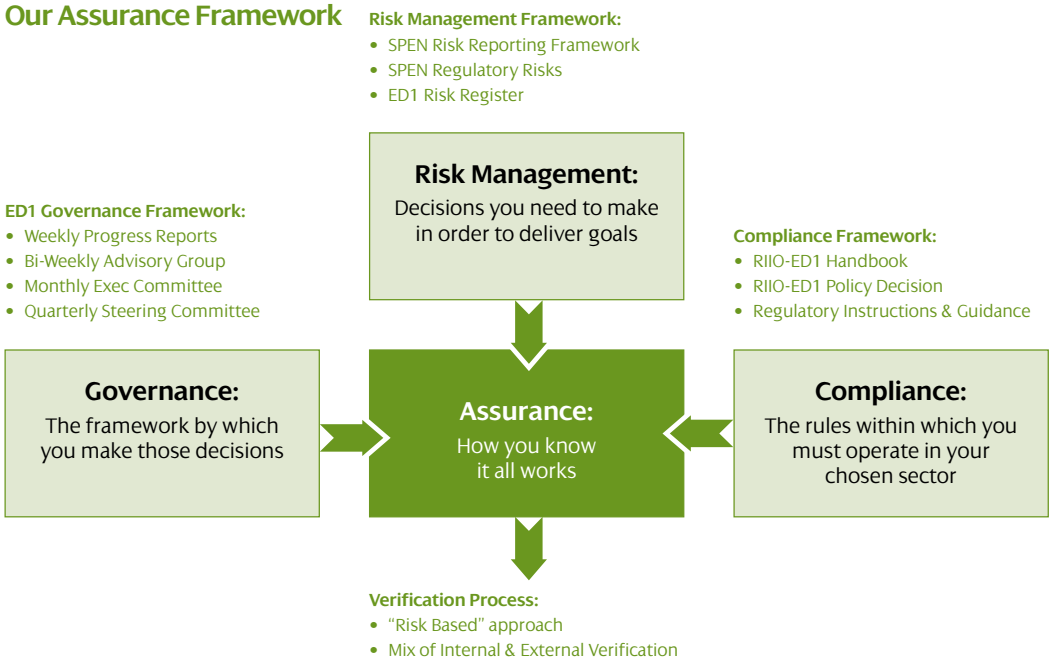
Risk management

We have a well-established business risk reporting framework to help us understand and manage risks.

This framework has been fully implemented within the ED1 Programme and takes a view of the likely risks of the 2015-23 period and beyond.

- *We've identified key risks.*
- *We've identified ways to manage or eliminate these risks.*
- *We have a programme risk register, which is reviewed on a regular basis.*

Our Assurance Framework



- *Significant risks are reported through our governance framework.*

The risks associated with the ED1 period are explained in **Chapter C8 – Risk and Uncertainty** and our more detailed approach to risk management is described in our **Annex C8 – Risk and Uncertainty.**

Compliance

We have taken necessary and appropriate steps to ensure our Business Plan submission to Ofgem accords fully with the appropriate regulatory guidance, including:

- *RIIO-ED1 Handbook.*
- *RIIO-ED1 Policy Decision.*
- *RIGS Regulatory Instructions & Guidance.*

Data assurance

We have a regulatory obligation to report on a number of key attributes associated with our regulated power network. The accuracy of our asset data is critical in effectively managing our network, making informed investment decisions and ensuring a hazard free environment for our staff and the general public.

Significant investments have been made over many years in evolving our IT systems to support improvements in data quality and accuracy. Implementation of leading edge solutions has allowed more granular information to be captured, to benefit both customers and our asset management processes.

We have continued to drive improvements in our processes, and have established a key improvement programme recently to thoroughly and robustly review the quality of our asset data. This programme has been independently assessed to ensure that it is comprehensive, and that the process and outcomes can be validated.

Ofgem have been fully informed of the existence of this programme and provided with progress updates at key stages and we have recognised any changes to our data as part of the annual regulatory reporting process.

Ofgem have recently requested information from all DNOs on asset data quality. We have responded fully and explained our extensive approach to data assurance.

Further detailed information is contained within our **Annex C6 – Asset data and information strategy – SPEN.**

Ofgem's data assurance trial

We are participating in a trial of Ofgem's Data Assurance Guidance (DAG), before the full implementation in April 2015. We have considered the guidance provided in the DAG and, where possible, adopted the principles for our ED1 Business Plan submission.

Our assurance process is designed to make sure our Business Plan accords with Ofgem's RIIO criteria, and the requirements of our stakeholders and customers. During the assurance process we used:

- *Internal SP Energy Networks resources.*
- *ScottishPower internal audit.*
- *External independent reviewers.*

Our assurance process included:

Second Person Reviews

A check to ensure our submission is complete and accurate.

Senior Management Sign-off

A detailed review of our submissions by an accountable senior manager.

Internal Submission Process Audit

An internal independent review of the governance framework and assurance processes adopted in developing our Business Plan, carried out by ScottishPower Corporate Internal Audit.

Independent Verification of our Stakeholder Engagement

Stakeholder engagement reviews including internal management interviews, external stakeholder interviews and reviews of supporting evidence, carried out by Two Tomorrows.

Our approval and sign-off process

Our Business Plan submission has been subjected to rigorous challenge, review, approval and signed-off as follows:

Senior Manager Sign-off	**Regulation and commercial director (and head of RIIO-ED1)**
Detailed review of the business plan submission.	
Director Sign-off	**Functional directors**
Final review completed prior to submission.	
CEO Sign-off	**CEO**
Sign-off for completeness and accuracy.	
Board Sign-off	**SPEN Holdings Ltd**
High-level overview.	

Statement of Assurance and Accuracy

We have made a clear statement within our submission on the assurance of our Business Plan and the accuracy of the information submitted within the detailed data tables and accompanying narrative. The statement of Assurance and Accuracy has been included in our detailed submission to Ofgem.

5 Outputs and incentives

Our ambitious and well justified output commitments and incentives

In this chapter we describe our transparent and robust outputs framework which comprises over 90 outputs for delivery in the Business Plan period.

Our outputs respond to stakeholder and customer feedback and address our core values on health and safety, customer service and strong stewardship of our assets.

Our commitments on **Safety** go far beyond legal requirements and continue our focus on public safety.

Our customers have told us that **Reliability and Availability** of their electricity supply is important, so we will drive down the average time customers are off supply by 25% and double the compensation should we fail to meet standards. Strong stewardship of our assets is achieved through knowing the health and criticality of our equipment in order to target our investment appropriately.

Within **Environment** we explain how we assist with the achievement of the UK low-carbon targets and how we reduce the Environmental Impact of our business activities.

In the area of **Connections** our priorities are faster connections, providing first class customer service and facilitating the competitive market.

Our goal is to become one of the leading DNOs for the delivery of customer service, this is reflected in our **Customer Satisfaction** outputs section where we explain our plans and how we will achieve our goal.

We complete this section by describing our **Social Obligations**. Our role in the changing social landscape has never been more important and we recognise the part we play in the social agenda of the energy sector.

In this chapter we define and justify:

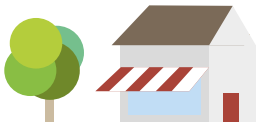
Title	Annexes and Supporting Documents
a. Overview	B3 – Learning from Stakeholders C7 – Our Innovation Strategy
b. Safety	C6 – LV and ESQCR Strategy C6 – Rising Mains & Laterals Strategy
c. Reliability & Availability	C6 – Asset Health & Criticality B2 – Evidence to Scottish Affairs Committee B2 – OHL Performance During Storms C6 – Load Related Strategy
d. Environment	C5 – Environment Strategy
e. Connections	C5 – Customer Satisfaction Strategy
f. Customer Satisfaction	C5 – Customer Service Strategy
g. Social Obligations	C5 – Social Obligations Strategy
h. Linking our outputs and expenditure	C6 – Expenditure

a. Overview






Our outputs reflect stakeholder feedback and focus on those areas of our activities which are important to our current and future customers



Outputs:

We have developed a transparent and robust outputs framework that shows:

- *What we will deliver to our customers.*
- *How we will demonstrate our performance throughout the ED1 period.*

Our commitments for the ED1 period take into consideration:

- *Stakeholder priorities.*
- *Past, present and future performance.*
- *Challenges during the ED1 period.*
- *Levels of planned investment.*
- *Foreseeable innovation.*

Our outputs reflect stakeholder feedback and focus on those areas of our activities which are important to our current and future customers. Our outputs are the things that our customers directly value. In the RIIO-ED1 framework defined by Ofgem these outputs fall into six categories:

- *Safety – minimising the safety risks associated with distributing electricity.*
- *Reliability & Availability— ensuring that our network is resilient and reliable.*
- *Environment – reducing our impact on the environment and enabling the introduction of low-carbon technology.*
- *Connections – providing excellent service to those who wish to connect to our network.*
- *Customer satisfaction – continuing to improve our customer service.*
- *Social obligations – recognising and meeting the needs of vulnerable customers.*

We have detailed our outputs across all six output categories, including many that go far beyond the minimum expectation of Ofgem.

All areas of our business have been involved in the development of our outputs framework. Directors with the responsibility for delivering outputs were actively involved in their design prior to committing to them. This framework provides a measurement of our business performance for the ED1 period and links with our day to day Operational Excellence approach (for more information on our operational excellence approach refer to our supplementary **Annex C7 – Innovation Strategy**).

Secondary Deliverables:

Secondary Deliverables are indicators of performance which, in themselves, are not directly experienced by customers, but necessary to achieve delivery of our primary outputs. For example, we use network health and load indices to determine the investments necessary to maintain network reliability.

Within **Chapter 6 – Expenditure**, we describe our proposed investments and why these costs are necessary. These secondary deliverables form a key element of our regulatory contract and are described in our reliability and availability section.

Incentives:

The RIIO Regulatory Framework allows us to develop and agree incentives with Ofgem to help deliver the things that are important to the future shape and direction of our industry. Our robust outputs and efficient expenditure plans will enable us to perform well against these incentives, allowing us to earn rewards should we deliver strongly whilst delivering improvements that our stakeholders value and benefit from. In some cases the incentives also apply penalties for poor performance. The incentives are designed to encourage efficiency, good customer service, innovation, and ensure the delivery of our outputs. There is a strong correlation between the incentives and the six primary output categories of the RIIO framework.

In our detailed **Annex B3 – Learning from Stakeholders** we explain our phased approach to stakeholder engagement and how we built stakeholder and customer feedback into our ED1 plans.

b. Safety

Safety is at the forefront of everything we do

Our stakeholders want us to:

- *Maintain our excellent safety record.*
- *Continue to replace old service cables in tenements and high rise dwellings.*
- *Continue to protect our equipment from metal theft.*
- *Continue to educate young people about electrical safety.*

Our safety outputs:

Reducing harm	Compliance with health & safety law	Operational integrity	Substation security	Educating the public
We will achieve zero employee lost time accidents	We will lead the industry for public safety.	We will safeguard residents of flats and tenement buildings by continuing our major investment programme to modernise service positions and cables.	We will safeguard our staff and members of the public and minimise disruption to supplies by implementing additional security measures to reduce the impact of interference & metal theft at our high risk substations	We will increase our extensive public education programmes: • "PowerWise" Classroom Safety Education Programme – delivering 4000 teaching days to 400,000 children • "PowerWise Web Site" – exceeding 1 million hits • "Crucial Crew" Community Safety Events – delivering 576 events to 60,000 children • Fixed Safety Education Centres "Risk Factory" and "DangerPoint" – combined footfall in excess of 128,000 visitors. • Delivering safety demonstrations to the agricultural community at the Royal Highland Show and Royal Welsh Show.
We will conduct thorough incident investigations, learn lessons quickly and implement changes to make our business safer.	We will always have positive discussions with the Health & Safety Executive about any of our business activities.	We will eradicate all low overhead line clearances across roads by April 2015 and will continue to enhance public safety by upgrading all of our overhead line clearances to the latest industry technical standards by 2020.		
We will help our contracting teams to reduce their accident rate by 75%.		We will increase the rate at which we modernise our substations by over 20%, improving safety and security of supplies at a lower overall cost.		
We will put the Health into Health & Safety – All our employees will benefit from a wellbeing programme.				

Key:

- What our customers will experience
- Our supporting initiatives

Our approach

Safety is at the forefront of everything we do. Our commitment is total.

Compliance with health & safety law

We recognise that we must comply with relevant health and safety legislation, e.g. The Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002, The Health and Safety at Work Act (HSWA) 1974 and The Electricity at Work Regulations (EAWR) 1989. Our management systems are independently audited and certificated to the latest international standards, notably British Standard OHSAS 18001.

However, we view this as a basic minimum requirement and reach well beyond in our goal of zero harm to our employees, contractors and members of the public. Indeed, we demonstrate our guiding value as an industry leader in public safety through our behaviours and through our investments in operational integrity and our comprehensive public education programmes.

Operational Integrity

Our commitment to legal compliance and reducing public safety risk to the lowest practicable level is total. We have worked closely with the Health and Safety Executive and lead the industry in addressing the issue of low overhead electricity line clearances. Refer to **Annex C6e – LV and ESQCR Strategy**.

By April 2015 we will have eradicated all low clearances across public roads and our ED1 plan will ensure that our entire network will meet the latest minimum clearance standards by 2020.

Some common areas of high-rise and tenement flats contain very old cables. It is not always clear whether the responsibility for the maintenance and eventual replacement of these cables lies with the building owner or the electricity distributor. We believe that this poses a safety risk to the buildings' occupants and we are proactively replacing these cables where no clear ownership can be easily established.

Refer to **Annex C6e – Rising Mains and Laterals Strategy**.

In 2010-12 we invested more than £20m to address this public safety risk and we were the only UK distribution company to seek and obtain approval from Ofgem for additional works in the period 2012-2015. By the end of DPCR5, we will have modernised services for almost 70,000 customers in such buildings and we will address a further 227,000 during ED1.

During ED1 an additional 227,000 premises will be made safer because of our proactive approach to dealing with public electrical safety in flats and tenements

Educating the Public

Substation Security

Over recent years, metal theft from our network has increased significantly with almost 1500 substations targeted since January 2011. More than 140,000 homes have been put at risk as a result of these thefts. We're working hard with a range of agencies to reduce this impact. This is not a victimless crime and can have dire consequences directly for the thieves, but wider impacts by causing power cuts and leaving our assets less secure, where innocent members of the public or curious children may stray.

Since the prohibition of cash transactions for scrap metal in England and Wales, we have seen a reduction of metal theft incidents in our Manweb licence area from approximately 300 incidents per year to 50 incidents in 2013.

We are working with the Scottish Government to consider the introduction of similar measures in Scotland.

In 2013, as part of our ongoing public awareness programme, we delivered a further hard hitting communication campaign which ran for four weeks and appeared in the regional editions of the mainstream press.

We also continue to improve education and awareness with our local schools and communities on the dangers of electricity.

Electrical Awareness

We are at the forefront of delivering proactive public education programmes within the schools and local communities of our licensed areas through 'PowerWise' and other education programmes. Specifically, we focus on metal theft and the education of primary school pupils on electricity and energy. We have concentrated a renewed focus on the agricultural community to improve their safety and minimise disruption to our network.

We have a history of working with other agencies at community safety events organised by Local Councils and Emergency Services. Crucial Crews are safety events arranged for children in the final year of primary school education whereby they attend a half-day session to learn about a range of safety topics relevant in their community.

In our licensed areas, two fixed centres operate to educate children about safety and risk; The "Risk Factory" in Edinburgh *(http://www.theriskfactory.org/)* and "DangerPoint" in North Wales *(http://www.dangerpoint.org.uk).* Mock overhead power lines and substations are permanent scenarios at the centres and visitors learn the key messages about staying safe near electrical apparatus. Each year we invest in each of the centres by supporting the production of a workbook for schools and improving the electricity safety scenarios.

We have been making links with established safety groups in industries at high risk from inadvertent contact with the electrical network. In 2013 we attended the Royal Highland Show, specifically to educate the agricultural community in the dangers of working near overhead power lines. The show attracts an average of 183,000 visitors each year. Our attendance at both the Royal Highland Show and the Royal Welsh Show achieved the equivalent of our attendance at 16 lesser events.

Reducing Harm

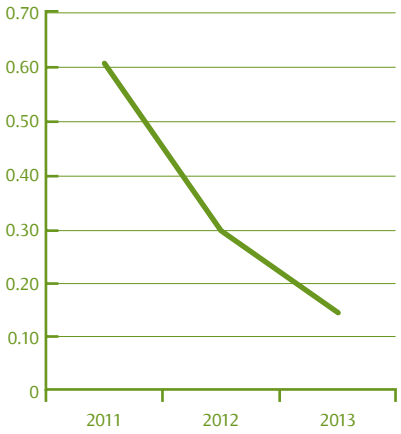
Our industry is recognised as leading in the area of health and safety and while our performance is undoubtedly strong, we are not complacent. Indeed, we believe that recording merely lost time incidents is too blunt a measurement of performance. Far richer information comes from analysing all health and safety incidents, an approach which is adopted by world leading health and safety organisations. This allows for more intelligent intervention and better outcomes. We have significantly improved our Reportable Incident Rate year on year and will continue to do so up to and throughout the ED1 period.

Whilst we aim to eradicate safety incidents, we are mindful that when incidents do occur we will conduct thorough investigations, learn lessons quickly and implement improvements right across our business for the benefit of our staff, our contractors and the wider industry.

But it is not all about safety incidents, the health of our staff is of utmost importance to us. Our wellbeing programmes aim to help our staff maintain a fit and healthy lifestyle.

Our reportable incident rate has improved year on year, and will continue to do so

Recordable incident rate Lost Time/Medical Treatment Rate per 100,000 hrs



We follow HSE guidelines on tolerable risk in driving our asset management programmes.

Our Safety Outputs

Our commitments go far beyond legal compliance and include continuing our focus on public safety

Overview

In applying and extending our established approach we have developed a comprehensive set of outputs to clearly demonstrate our intention to continue to lead on public safety while continuing to protect our employees and contractors from harm.

Ewan McMillan

Health & Safety Director

Our commitments go far beyond legal compliance and include continuing our focus on public safety, achieving the ultimate goal of zero employee lost time accidents, working more closely with the Health & Safety Executive, investing in the integrity of our network, installing the latest substation security measures and continuing our comprehensive public education programme.

Reducing Harm

Our industry is recognised as leading in the area of health and safety and we plan to build upon this. As well as recording all health and safety incidents we will develop our analysis of the resulting data to gain better insights into the root causes.

We have significantly improved our Reportable Incident Rate year on year and will continue to do so up to and throughout the ED1 period.

We are targeting zero employee lost time accidents during the whole ED1 period. This ambitious goal demonstrates our commitment to the health and wellbeing of our employees and the confidence we have in our safe systems of work and professionalism of our workforce.

As well as our own staff, we work with a network of contractors, who are equally essential to the delivery of our outputs.

We work in partnership in targeting health and safety improvements, so much so, that we are committing to help our contracting teams reduce their accident rate by 75% by the end of ED1.

We will also emphasise the health aspects of "health and safety" by extending our wellbeing programmes to all of our employees, regardless of their role or location.

To reduce harm we will:

- *achieve zero employee lost time accidents.*
- *help our contracting teams to reduce their accident rate by 75% with a longer-term aim of zero lost time accidents.*
- *conduct thorough incident investigations, learn lessons quickly and implement changes to make our business safer.*
- *put the Health into Health & Safety – All our employees will benefit from a wellbeing programme.*

Compliance with health & safety law

We regard compliance with health and safety legislation as a minimum requirement and will continue to aim beyond this. We plan to be recognised as an industry leader in public safety through both our investments in Operational Integrity and our comprehensive Public Education programmes.

We will continue our open approach to dialogue with the Health and Safety Executive, sharing relevant information to help improve the safety performance of our own organisation and the industry as a whole.

In compliance with health & safety law we will:

- *lead the industry for public safety.*
- *always have positive discussions with the Health & Safety Executive about any of our business activities.*

Operational Integrity

We will continue our proactive approach to tackling risks associated with our network assets. Having recently surveyed 100% of our overhead line assets for legacy issues we will address all low overhead line clearances during the RIIO-ED1 period. We will continue with our comprehensive inspection regime for all assets and will further develop our information systems to make effective use of the information gathered. In addition, we will continue to operate a robust response process to deal with any safety related hazards found, either by our own staff or by members of the public.

To maintain our high standards of operational integrity we will:

- *increase the rate at which we modernise our substations by over 20%, improving safety and security of supplies at a lower overall cost.*
- *eradicate all low overhead line clearances across roads by April 2015 and will continue to enhance public safety by upgrading all of our overhead line clearances to the latest industry technical standards by 2020.*
- *safeguard residents of over 200,000 flats and tenement buildings by continuing our major investment programme to modernise service positions and cables.*

Substation Security

We will continue to invest in the latest security measures for our high risk substations. These measures may include the installation of security doors, locking systems, alarm systems, CCTV and electric fences. We are also trialling the installation of an innovative electronic theft detection system in areas of highest risk.

In Substation Security we will:

- *safeguard our staff and members of the public and minimise disruption to supplies by implementing additional security measures to reduce the impact of interference & metal theft at our high risk substations.*

Educating the Public

We will continue our proactive public education programmes with the schools and local communities within our licensed areas. Specifically we will focus on metal theft and the education of primary school pupils on electricity and energy. There will be a renewed focus on the agricultural community to improve their safety and minimise disruption to our network.

For example, during the price control period we will deliver over 4000 teaching days and 400,000 children will be taught about safety from the electricity network at a critical developmental stage in their lives.

The "PowerWise" classroom education programme will be refreshed and the target audience will be expanded to include children in secondary education.

Our website will have much improved functionality, better support the educational programmes and be more widely publicised and therefore we expect the number of hits to exceed 1 million. *www.powerwise.org.uk*

Our staff who volunteer for community safety events in the communities where they live, will support an additional 576 dates at Crucial Crew events delivering safety messages to over 60,000 children.

Building on the success with the construction safety groups, we plan to join other established groups increasing our predicted number of safety events for micro construction companies from 6 in the current price control period to 20 in ED1.

In 2013 we will attend the Royal Highland Show, specifically to educate the agricultural community in the dangers of working near overhead power lines. The show attracts an average of 183,000 visitors each year. Our attendance at both the Royal Highland Show and the Royal Welsh Show will achieve the equivalent of our attendance at 16 lesser events.

In Educating the Public we will increase our extensive public education programmes by delivering:

- *'PowerWise' Classroom Safety Education Programme – 4000 teaching days delivered to 400,000 children*
- *'PowerWise Web Site' – will exceed 1 million hits*
- *'Crucial Crew' Community Safety Events – 576 events delivering safety messages to 60,000 children*
- *Fixed Safety Education Centres 'Risk Factory' and 'DangerPoint' – combined footfall in excess of 128,000 visitors.*
- *Delivering safety demonstrations to the agricultural community at the Royal Highland Show and Royal Welsh Show.*

We will lead the industry for public safety

c. Reliability & Availability

We are committed to improving the reliability of supply to our customers.

Our stakeholders want us to:

- *Maintain our leading position in terms of reliability and availability of supply*
- *Minimise the length and number of power cuts experienced*
- *Continue to improve storm resilience across the network*
- *Continue to improve resilience against substation flooding*
- *Target investment to improve service to customers who are currently 'worst' or 'poorly' served*

Incentive scheme:

Interruptions Incentive Scheme (IIS) – Targets are agreed for planned and unplanned electricity power cuts. Performance is measured by both number and duration of power cuts. It both rewards outperformance and penalises underperformance against targets.

Guaranteed Standards of Performance (GSOPs) – Set the minimum level of customer service. They cover a range of activities including connections, supply interruptions and responses to complaints. We pay compensation to customers if we fail to meet these service levels. For ED1 we are voluntarily doubling GSOP payments.

Our Reliability and Availability Outputs

Network performance	Enhancing network resilience	Guaranteed standards
We will reduce the average number of times our customers lose their power supply by 7%. We will reduce the length of time those customers are without power by 16%. By doing this we will reduce the average time our customers are off supply by 25%	We will ensure that all of our rural customers benefit from a distribution network that is resilient to severe weather events by 2034.	We will reduce by 70% the number of customers experiencing a power cut of greater than 12 hours by 2016
	We will make 25% of our rural high voltage network resilient to severe weather by 2023 and we will continue investment in our low voltage overhead line networks making a further 16% resilient by the end of 2023	We will aim to reduce by 100% the number of customers experiencing a power cut of greater than 12 hours by 2023
	We will deliver a guaranteed standard to reconnect our customers after storm events within 36 hours.	We will target zero failures in all other guaranteed standards
We will improve service to 40% of our poorly served customers	We will accelerate our fluvial (river) flood protection plans to be complete by the end of March 2015.	We will double the compensation for all guaranteed standard failures (excluding exceptional events e.g. storms where we make other arrangements)
	We will mitigate pluvial flood risk at 28 high risk grid and primary substations	
	We will increase substation battery life to 72 hours in the event of major power losses	

Key:

- What our customers will experience
- Our supporting initiatives

Our approach

We develop our network in an economic and efficient manner to deliver superior performance for our customers

Reliability of customer supply

Our priority is to deliver a reliable supply of power to our customers. We have significantly reduced power cuts over recent years, and we will further reduce the number and duration of power cuts by 2023. Our targets cover the number of Customer Interruptions (CI) and the time that those customers are off supply (Customer Minutes Lost, CML). These targets take into account:

- *The topography of our network – the Manweb network design delivers industry leading performance.*
- *The geography of our service area.*
- *Improvements already achieved.*
- *Improvements of other companies.*

As we embrace the low-carbon future, our customers will become increasingly reliant upon electricity for heating and transport. This means that our network must perform to a higher standard. We are investing and innovating to ensure we meet this challenge.

SP Energy Networks customers currently have 30% fewer interruptions than the UK average.

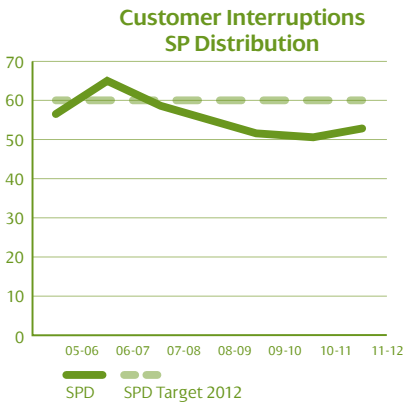
- *Currently, an average customer in our SPD area experiences 5.3 power cuts every 10 years. Each of these power cuts lasts an average of 93 minutes.*
- *Currently, an average customer in our SPM area experiences 3.6 power cuts every 10 years. Each of these power cuts lasts an average of 121 minutes.*

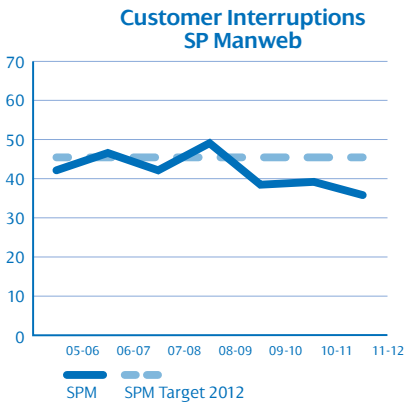
To further improve the level of service our customers receive we will:

- *Reduce the average number of times our customers lose their power supply by 7% and reduce the length of time those customers are without power by 16%. This means that:*
  - *By 2023, our customers in SPD will experience an average of 4.9 power cuts every 10 years.*
  - *By 2023, our customers in SPM will experience an average of 3.4 power cuts every 10 years.*
- *This means that by the end of the ED1 period, the average amount of time that a power cut lasts will be reduced to 78 minutes in SPD and 102 minutes in SPM.*
- *As a result of these improvements, reduce the average time off supply for our whole customer base by 25%.*

On average we have around 10,000 customers off supply each year for more than 12 hours across both our networks. We will:

- *In the first year of ED1, reduce by 70% the number of customers experiencing a power cut of greater than 12 hours.*
- *Double our compensation payments for customers experiencing a power cut greater than 12 hours in the ED1 period (excluding major storms).*
- *Aim to have zero customers experiencing a power cut greater than 12 hours (excluding major storms) by the end of ED1.*





Our Reliability and Availability Outputs

SP Energy Networks customers currently experience 30% fewer interruptions than the UK average and in ED1 we will be doing more.

Guy Jefferson

Operations Director

Network Performance

We are committed to improving the reliability of supply to our customers. We are already amongst the industry leaders in terms of customer interruptions with our customers experiencing 30% less power losses than the UK average.

We manage the performance of our networks in a number of ways. The underlying reliability and availability are the result of our maintenance and investment programmes. To maximize performance, we need to ensure that the expenditure we make in these programmes is channelled into the right activities. To assist us focus our investment, we have used asset health and criticality assessment to address the deterioration of the components that make up the network.

Ensuring the network is capable of meeting the load demands made on it is also fundamental to being able to provide a reliable power supply to all of our customers, both old and new. We undertook a comprehensive analysis of our system, informed by load index assessment to identify our load related investment priorities.

Despite our best efforts, it is inevitable that faults will occur. Our priority in responding to faults is to ensure that customers' supplies are restored as quickly as possible.

We have chosen our Reliability and Availability outputs for a number of reasons. First, they deliver improved reliability – and reduce differences between the best and worst served customers. Both of these directional outcomes were strongly supported in our engagement with stakeholders. Second, the outcomes are achievable through a capital programme which is deliverable in the timescales, and at reasonable cost to consumers. We have confidence in the design and cost of our proposed capital programme because of the high quality of asset management analysis that underpins it.

Our plan aims to improve the performance of our network through our actions in all of these areas. Through the effective combination of our inspection, maintenance and investment programmes, we will reduce the number of times our customers lose their supply by 7%.

We will also take action to reduce the average duration our customers are off supply in the event of a fault by 16%.

To achieve this we continue to develop staff to be more flexible and capable to deal with any situation presented in the field, further enhancing authorisations and providing the latest technology to allow swift fault identification and location leading to improved restoration. Further initiatives currently being piloted include the use of impedance mapping techniques on our high voltage networks using remote active network analysis to progressively narrow down the source of a fault allowing us to dispatch our teams to a tightly defined target area. SPEN also periodically review and implement improvements to both our field vehicles and logistics process to ensure maximum effectiveness in our response and repair processes. We will also rollout new telecommunication technology that has proved successful in providing links to areas of our network previously deemed "black spots" potentially adding many minutes to customer restorations. We will also seek to continue our focus on telecontrol of remote switching points and building switching schemes which automatically reconnect customers in the event of an interruption.

Through the combination of reducing the number of times customers are off supply by 7% and the length of time they are off by 16%, overall, the average time our customers are off supply will reduce by 25%.

Whilst our network performance for the vast majority of customers is exceptionally high, there are a minority of our customers who experience a service that is ten times worse than the average customer.

In SPD around 1% of our customers, and in SPM around 3% of our customers experience more than ten times the average interruptions per annum. These customers are typically served by poorly performing 'spur lines' and cables.

Our stakeholders and customers support our planned investments to improve service to 40% of our poorly served customers. We will also use the Worst Served Customer funding mechanisms provided by Ofgem to reduce the number of power cuts to 25% of our very worst served customers.

To improve Network Performance we will:

- *Reduce the average number of times our customers lose their power supply by 7%.*
- *Reduce the length of time those customers are without power by 16%.*

- *As a result of these improvements, reduce the average time our customers are off supply by 25%*
- *Improve service to 40% of our poorly served customers and 25% of our Worst Served Customers*

We have made substantial improvements over the last 3 price review periods in improving the resilience of our networks to severe weather events and can demonstrate a reduction of 75% in the number of faults experienced

Enhancing Network Resilience

Large proportions of our networks are in areas classified by the Met Office (UK's National Weather Service) as particularly at risk of severe weather.

We have made substantial improvements over the last 3 price review periods in improving the resilience of our networks to severe weather events and can demonstrate a reduction of 75% in the number of faults experienced **(refer to Chapter C6b – Asset stewardship)**.

We will build on this success by continuing our overhead line rebuild and resilient tree cutting programmes making 25% of our HV rural overhead network resilient to severe weather by 2023 and we will double investment in our LV overhead line network, making a further 16% resilient by the end of 2023.

As a direct result of our stakeholder and customer survey results, we have substantially accelerated our investment plans to reduce the risk of flood related disruption to approximately 168,000 customers.

By the end of March 2015, all of our primary sites will be capable of withstanding at least a '1 in a hundred year' flood event.

The GB Power Network is normally operated in a state of dynamic equilibrium between connected load and available generation. In the rare event that this equilibrium is disturbed then the result could be total or widespread loss of the power network. Recovery from this situation is termed 'Black Start'.

Previously the timescale required to implement a Black Start recovery was estimated to be 18 to 24 hours. However recent work carried out across the GB power industry through the Energy Emergencies Executive Committee (E3C) has revised this to 72 hours. In order to accommodate this change, we will invest to upgrade the battery systems in our major

substations to support communications and remote operation of our equipment throughout a black start event of this duration.

To enhance network resilience we will:

- *ensure that all of our rural customers benefit from a distribution network that is resilient to severe weather events by 2034.*
- *make 25% of our rural high voltage network resilient to severe weather by 2023 and we will continue to invest in our low voltage overhead line networks making a further 16% resilient by the end of 2023.*
- *deliver a guaranteed standard to reconnect our customers after storm events within 36 hours.*
- *increase substation battery life to 72 hours in the event of major power losses.*

"Our approach to network resilience has delivered a 75% reduction in network faults during recent severe weather events."

Pearse Murray

Asset Strategy & Network Programmes Director

Guaranteed Standards

Guaranteed Standards of Performance set the minimum level of service expected by customers, as defined by Ofgem. They cover a range of activities including supply interruptions.

Through increased usage of mobile generation, developing the use of fault location technologies and improving the capability and flexibility of our staff we aim to reduce by 70% the number of customers experiencing a power cut of greater than 12 hours.

If we fail to meet the agreed service levels, we will double the financial compensation to customers in accordance with Ofgem's published schedule of payments (excluding exceptional events).

We are acutely aware of the hardship customers experience when they are without supplies for several days, and this is more significant for vulnerable customers after a storm event. With this in mind, we will deliver a guaranteed standard to reconnect our customers within 36 hours after a storm event.

In Guaranteed Standards we will:

- *reduce by 70% the number of customers experiencing a power cut of greater than 12 hours by 2016*
- *reduce this by 100% by 2023*
- *target zero failures in all other GSOPs.*
- *Pay double the compensation for all guaranteed standard failures (excluding exceptional events where we make other arrangements)*

We will pay double the compensation for all guaranteed standard failures (excluding exceptional events where we make other arrangements[1])

Asset Health and Criticality Indices

As mentioned above, we use asset health and criticality analysis in the development of our investment plan to manage the condition of our networks. The health index was introduced in 2010 as a regulatory measure to track the condition of assets and the improvements that we plan to carry out in the period. These Health Indices categorise assets on a 1 to 5 scale with 1 representing new assets and 5 representing assets which have come to the end of their useful life and should be considered for replacement. As part of RIIO-ED1, DNOs are taking this one step further and also categorising assets by their criticality.

Criticality represents the consequence of failure for a particular asset and covers four main consequences – Safety, System, Environment and Financial. By applying this in addition to our Health Indices we can prioritise our investments on those assets which are in poor condition and/or which have a greater consequence of failure than an average asset.

Within **Chapter C6 – Expenditure** and its associated annexes, we have published the current health and criticality of our assets and the expected future health and criticality both with and without our planned investments. These planned investments are known as Secondary Deliverables and form part of our regulatory contract. Further detail on these deliverables are presented in **Chapter C6 – Expenditure**.

Load Index

The loading of our assets is tracked through a measure known as the Load Index (LI). In **Chapter C6d – Load Related Investment** we described our approach to managing loading of our assets to ensure a proper balance between cost and availability.

The LI scale runs from 1 to 5 with 5 representing assets that are most heavily loaded. Under this definition an asset that has reached LI5 is deemed to require investigation.

In some circumstances, it is perfectly acceptable for highly loaded assets to remain on the system. Our plans for RIIO-ED1 will continue to address the highly loaded parts of our network where we have been running our assets harder than other DNOs.

Our solutions range from conventional investment in higher capacity assets to the use of new technology which can sometimes achieve the extra capacity needed at lower cost.

We model the effect of load growth and load movement across the networks to predict how the load indices for our assets will change over time. We do this based on our proposed interventions and we compare this with a "do nothing" option.

In addition to the use of load indices, we have also undertaken fault level analysis. When certain faults occur in the network it is possible for large amounts of fault current to flow through the system until this is interrupted by switchgear.

Each item of switchgear on the network is designed with a defined fault level capability. Whilst the network has been designed to cater for these flows, it is possible from the increase in embedded generation and large motors connecting to the distribution network that the capability of the switchgear could be exceeded, in which case we must act in the interests of safety.

The detail of the deliverables from our load investment plans are set out in **Chapter C6 – Expenditure** and its associated annexes.

Secondary Deliverables

These are indicators of performance which, in themselves, are not directly experienced by customers, but necessary to achieve delivery of our primary outputs. For example, we use network health and load indices to determine the investments necessary to maintain network reliability.

The full range of deliverables associated with our investment programmes are set out in **Chapter C6 – Expenditure** and its associated annexes. The following are examples of these deliverables:

- *Repair more than 180,000 network faults.*
- *Inspect and maintain 30,000 substations, 70,000km of underground cables and 40,000km of overhead lines.*
- *Complete circa 3.5million asset inspections.*
- *Cut trees away from more than 300,000 spans of overhead lines (public safety).*

1. *Such as offering to pay for hot meals and alternative accommodation*

- *Clear trees away from 5000km of overhead lines (storm resilience).*
- *Maintain around 850,000 items of network equipment.*
- *Replace main equipment at 37major substations each supplying 19,000 customers (average).*
- *Replace transformers and/or switchgear at over 200 large substations each supplying 3,000 customers (average).*
- *Extend the life of about 190 large substations each supplying 3,000 customers (average).*
- *Replace switchgear at over 3600 small substations each supplying up to 500 customers.*
- *Replace more than 200,000 services inside customers' homes & buildings.*
- *Make 25% of our high voltage network, and an additional 16% of our low voltage network resilient to storms.*
- *Upgrade 98 major substations (each supplying between 1,000 and 20,000 customers) creating up to 500MW of local capacity for future customer needs.*
- *Connect up to 5.5GW of renewable generation.*
- *Connect up to 2.5GW of housing, commercial and industrial customers.*
- *Accommodate load growth (including LCTs) of 1.6% (SPD) and 1.2% (SPM).*

d. Environment

We consider and respect the environment in everything we do.

Our stakeholders want us to:

- *Increase the amount of 'future-proofing' on our network*
- *Minimise oil and greenhouse gas (Sulphur Hexafluoride, SF6) leakage*
- *Continue to underground cables where there is a proven benefit in terms of visual amenity*
- *Engage with local authorities and developers to understand their priorities and align our plans.*
- *Develop our network in a way that is sensitive to the environment.*

Incentive scheme:

Losses – Electricity losses are an inevitable consequence of transferring energy across electricity distribution networks and are a significant source of greenhouse gas emissions. Ofgem's Losses mechanism is made up of four components – licence obligation, losses reduction expenditure, annual reporting and a discretionary reward.

Facilitating increased volumes of Low-carbon Technologies (LCTs)	Reduce the carbon footprint of the business	Reduce the environmental impact of our activities	Improving visual amenity in Areas of Outstanding Natural Beauty	Reducing Electricity Losses
We will use Smart technology to ensure all generation sources are supported quickly.	We will use our electronic vehicle management system to optimise our vehicle utilisation keeping vehicle numbers, broadly similar in ED1.	We will install oil containment around all new and high risk plant containing high volumes of oil and exceed IEC international standards for SF6 switchgear by specifying a maximum leakage rate five times more stringent for 33kV and below and twice as stringent for higher voltages.	We will underground 85km of overhead lines in Areas of Outstanding Natural Beauty.	We will install lower loss transformers to reduce losses by 50% at more than 1300 of our secondary substations, reducing the costs Energy Suppliers build into customers bills by £50 – 60m over the lifetime of the assets.
We will reduce costs to customers by developing modern "Smart Grid" network solutions.	We will monitor and reduce the energy used within our substations, invest in lower carbon buildings and reduce energy use in existing buildings.			
We will be connecting 4.5GW of distributed generation by 2018, with up to 5.5GW of generation connected to our network by 2023.	We will utilise low-carbon alternatives to travel, through the use of technology and smarter ways of working.	We will reduce oil leaks by 50% through the replacement of poorly performing 132kV cable in SPM.		
We will carry out "Smart" asset replacement – using future-proofed assets where justified.	We will reduce our carbon footprint (excluding network losses) by 15% by 2023.	We will continue to engage on the environmental impacts of our developments from a very early stage.		
We will identify LCT hotspots using network monitoring, data from smart meters and stakeholder engagement.	We will increase the use of electric vehicles and charging points.			

Key:

- What our customers will experience
- Our supporting initiatives

Our approach

SP Energy Networks is committed to environmental sustainability

We recognise the significance of our impact on the environment, both as a direct result of our operations and, indirectly, by helping stakeholders achieve their own environmental goals. **Chapter B2b – Facilitating low-carbon technology** covers the latter by setting out our approach to the facilitation of low-carbon technologies. The remainder of this section deals with our own business impact.

SP Energy Networks is committed to environmental sustainability and the pursuit of policies that minimise the impact of our activities on the environment. Our stakeholders have indicated that they take this for granted and expect no less.

We have a robust set of policies and objectives, governed by our ISO 14001:2004 certified Environmental Management System (EMS), which ensure that we comply with environmental legislation and continually minimise our environmental impact. Environmental impacts and risks are formally considered within our risk management system when evaluating risks identified within our business.

We have also supported development of the new ISO 14001 standard via the International Environmental MA consultation workshops in 2013.

The Iberdrola Group places significant emphasis on the environmental performance of all its businesses. SP Energy Networks benefits from a number of group-led environmental initiatives which encourage a culture of environmental awareness and diligence amongst staff. In addition, the adoption of Iberdrola-wide standards, such as the energy performance requirements for new offices, is delivering environmental benefits as well as financial savings.

The process of distributing electricity impacts upon the environment in a variety of ways, from the energy losses that naturally occur in our equipment to the visual impact of our assets in the landscape.

Our main environmental impacts are categorised as follows:

- *Losses*
- *Business carbon footprint (excluding losses)*
- *Oil leakage*
- *Visual amenity*

We will reduce our Business Carbon Footprint by 15% by 2023

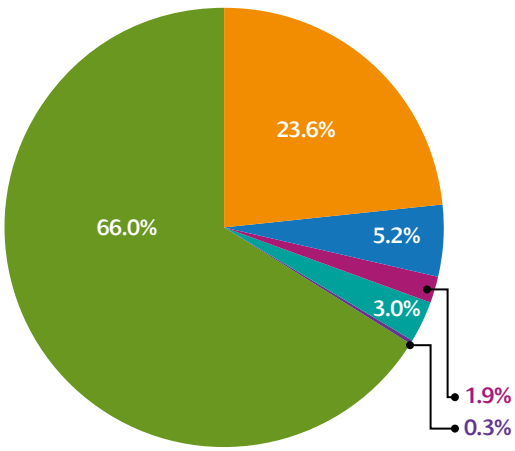
We target all of these areas to ensure that we minimise our environmental impacts. In particular we:

- *Establish baseline data and ongoing trend information to improve visibility and help inform the development of initiatives*
- *Seek best practice and build into business as usual*
- *Encourage staff and contractors to take a proactive approach to environmental issues*
- *Use innovation to develop new solutions*

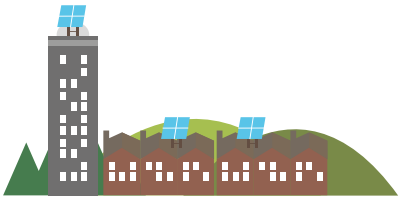
Losses and Business Carbon Footprint (BCF) can be expressed as CO2 equivalent which enables comparison of the relative impacts. The chart below shows a detailed breakdown for the most recent data[2].

Business carbon footprint 2012

Buildings and substation energy use	23.6%
Operational transport	5.2%
Business transport	1.9%
Fugitive emissions	3.0%
Fuel combustion	0.3%
Losses	66.0%



2. In previous price controls, substation electricity usage was reported within the Losses category.



We have installed electric vehicle charging points at our main locations with the intention of expanding the role of electric vehicles within our business

It is evident that electricity losses represent our most significant environmental impact. We have set out our approach to losses in a detailed strategy **Annex C5 – Losses strategy – SPEN**. Our existing processes are designed to meet relevant legislation as a minimum and to go beyond this where it is economic to do so. We have initiatives in place to tackle technical and non-technical losses proactively. For example, our procurement process is already securing transformers that exceed future European design requirements. We have commercial processes in place to detect electricity theft and we will make use of smart metering in future to enhance this service.

Our BCF is formally reported and in recent years we have made progress in reducing our impact in the sub-categories of the BCF. Our offices and depots have advanced metering installed which allows us to gather accurate and detailed information for each location. This data is analysed to identify trends and unexpected changes in usage. Information is published on a regular basis to enable staff to understand energy usage at their location and propose improvements.

We are working with contractors to extend the scope of our BCF reporting to include their contribution

Our asset management approach is progressively reducing the amount of oil used on our network. Some of our cables are oil filled and a small proportion of these leak oil. We identify leaks quickly and replace problem sections of cable with modern (non-oil) cable designs. We are also reducing the amount of oil filled switchgear through delivery of our investment plans.

Visual amenity continues to increase in importance and forms a major part of our process for new developments. We also work with stakeholders in Areas of Outstanding Natural Beauty (AONB), National Parks and National Scenic Areas (NSA) where we are committed to using our funding allowance to place sections of our network underground within these areas.

Our Environment Outputs

Facilitating increased volumes of Low-Carbon Technologies (LCTs)

In **Chapter B2b – Facilitating low-carbon technologies** we explained the challenges we face in connecting increasing volumes of LCTs to our network. Scotland and Wales have more ambitious carbon emission targets than the UK as a whole.

In addition, our licence areas have a higher percentage of customers who, as a result of having no access to the gas grid, will more readily adopt electricity based LCT solutions.

Therefore, our networks will have to be 'low-carbon ready' sooner than the UK average. We have developed a set of outputs based on stakeholder feedback to allow this transition to take place quickly and at minimum cost to our customers.

During RIIO-ED1 we will:

- *Implement advanced monitoring in 8% of our secondary substations to help optimise our network and identify LCT hotspots as they emerge.*
- *Install an additional 400 voltage control relays to help stabilise the network as the penetration of LCTs increases*
- *Extend the coverage of modern communications to all of our main substations to allow us to collect the necessary data.*

Reducing the carbon footprint of the business

By 2023 we plan to reduce our Business Carbon Footprint (BCF) by 15%. The main contributors to our carbon footprint are transport and energy use in properties.

Transport

Since 2008 we have reduced year on year the number of vehicles in our operational fleet. This, combined with vehicle renewals, has reduced our environmental impact.

In addition, we have invested in an electronic vehicle management system across our entire fleet of vehicles. This has delivered safety and environmental benefits by allowing us to optimise our fleet and improve our vehicle utilisation.

We are therefore forecasting that our vehicle numbers will broadly remain at these reduced levels throughout the ED1 period.

We have reduced our business transport costs in part through the use of video and audio conferencing rather than travel. As technology improves we anticipate that there are further gains to be made in this area.

We already utilise electric vehicles and a small number of LPG powered vehicles within our fleet and we have installed electric vehicle charging points at our main locations with the intention of expanding the role of electric vehicles within our business.

- *We will continue to minimise operational transport mileage through the use of mobile technology amongst our field based workforce*
- *During ED1 we will expand the use of electric vehicles. This approach aligns with our Low-Carbon Technology forecast.*

Energy usage

We have a mix of property types in our portfolio with a range of energy efficiencies. During RIIO-ED1 we will continue to review our property estate with a view to transitioning to a more modern and consolidated range of buildings.

Where we relocate offices and operational depots we will invest in lower carbon buildings, enhancements in metering and seek to reduce energy use in existing building by introduction of other enhanced technologies and continue to influence staff behaviours.

Contractors

Our operations are reliant upon the use of contractors for highway excavation and reinstatement, substation civil refurbishment, tree clearance maintenance and major project construction and a range of other services.

During ED1 we will expand the range of contractors reporting under the BCF requirements. We will enhance the requirements for reporting in contract and set performance criteria for carbon management where appropriate, seeking to influence reduction of our indirect "scope 3" carbon footprint.

"By 2023 we plan to reduce our Business Carbon Footprint (BCF) by 15%. The main contributors to our carbon footprint are transport and energy use in properties."

Jim Sutherland
Network Development Director

- *We will continue to gather, monitor and report data on energy use within substations*
- *We will deploy enhanced technologies to reduce energy usage in 105 substations*
- *We will extend BCF reporting by our contractors*

Reducing the environmental impact of our activities

The majority of our 33/11kV transformers do not have full oil containment. In order to ensure compliance with environmental legal obligations and minimise the risk and impact of oil spillage in terms of revenues and reputation we have established a programme to improve and mitigate against such events.

Many of our circuit breakers contain large quantities of oil which we are progressively reducing through replacement.

We will continue to install noise reduction measures for power transformers at key sites identified by proactive Environmental Impact Assessment and reactive general noise assessment in order to prevent and mitigate noise impacts on local stakeholders.

Sulphur Hexafluoride (SF6) is an insulating gas present in electrical switchgear and is considered the most potent of all greenhouse gases. To reduce the environmental impact of SF6 leakages from our equipment we will introduce equipment with more stringent leakage rates than currently required under IEC international standards.

Some of our older high voltage cables contain oil based fluids which help to insulate and cool the cables. We will invest to replace some of our most poorly performing cables on the 132kV network in SPM with polymeric cable.

- *We will install enhanced oil containment around 526 transformers (new and existing) containing high volumes of oil*
- *Through our circuit breaker replacement programme we will remove over 1.5 million litres of insulating oil from our system*
- *We will exceed IEC international standards for SF6 switchgear by specifying a maximum leakage rate five times more stringent for 33kV and below and twice as stringent for higher voltages.*
- *We will reduce oil leaks by 50% through the replacement of poorly performing 132kV cable.*

Improving visual amenity in areas of outstanding natural beauty

In order to supply electricity to remote areas, overhead lines have historically been built to take the most expedient route. The first Area of Outstanding Natural Beauty (AONB) was awarded in 1956 and as more have been declared it has been identified that many overhead lines in the UK run through these areas.

As a result, UK DNOs have started a programme of undergrounding the overhead lines that run through AONB areas to improve the visual amenity.

Our strategy is to spend our full allowance to deliver improvements in visual amenity within Areas of Outstanding Natural Beauty (AONB), National Parks (NPs) and National Scenic Areas (NSAs).

Our programme has been developed through consultation with our stakeholders (Snowdonia National Park, Anglesey, Llyn Peninsula, and Denbighshire AONBs and in Scotland through discussions with the Loch Lomond & the Trossachs National Park).

- *We will underground 85 km of lines in AONBs, NPs and NSAs.*
- *Also as part of our village LV modernisation programme we will underground more than 150 km of LV overhead line in villages, thus improving the visual amenity.*

Reducing electricity losses

Electricity losses are an inevitable consequence of transferring energy across electricity distribution networks. Losses occur in both transformers and cables as electrical power is transferred across the network. This is energy generated , but never consumed by customers, and is considered to be a significant source of greenhouse gas emissions.

Historically, losses have been difficult to measure accurately for a variety of reasons, including inaccuracies associated with unmetered supplies, uncertain amounts of theft and the fact that readings from conventional meters are received infrequently.

However, as we install more monitoring equipment across our network and as smart meters are gradually rolled out we will be able to establish a much clearer picture of the energy flows in our network, particularly at lower voltages.

This will allow us to create a baseline measure for losses and will facilitate the use of data analysis to uncover problems such as high loss equipment.

Although we currently analyse metering and settlement data to identify properties where theft is taking place, the advent of a richer data set will make this much more effective.

For many years we have optimised the design of the grid and primary transformers we install to balance purchase costs and lifetime operating losses. Investment to reduce losses for secondary transformers have traditionally not been cost effective. However, we have a high number of pre-1962 secondary transformers which have relatively high electrical losses compared to more modern transformers. We intend to replace these over time as part of a focused programme to reduce losses.

This programme has been justified through cost benefit analysis which demonstrates that based on future traded carbon prices there is a clear benefit to replace additional units over and above the current replacement programme, only limited by deliverability.

As part of this programme we will apply monitoring equipment in a sample of locations to verify the losses benefit of the policy.

We have completed a cost benefit analysis (CBA) to assess the merit of installing larger size conductors when rebuilding overhead lines in normal weather areas. This offers two potential benefits; reduction in electrical losses and "future-proofing" to accommodate potential future load growth. The CBA demonstrates that it is beneficial to adopt this policy on selected circuits with a higher number of connected customers.

The increase in LCTs connected to our network has the potential to increase losses.

For example, renewable generators located remotely from our customers can increase our network losses.

In addition, some of the new network technology that we will be employing to facilitate LCTs and mitigate the need for investment will also tend to increase losses.

Although the benefits of these technologies outweigh the adverse impact on losses, one consequence is that the future level of losses is uncertain. We address this as part of our **Annex C8 – Risk and Uncertainty**.

- *We will establish an accurate baseline measure for losses using the data from our network monitors and from smart meters.*
- *We will improve data analysis to improve our theft detection success rate.*
- *We will install lower loss transformers to reduce losses by 50% at more than 1300 of our secondary substations. (this will reduce the costs Energy Suppliers build into customers' bills by £50 – 60m over the lifetime of the assets)*
- *We will install larger size conductor when rebuilding Overhead Lines in normal weather areas with higher numbers of connected customers.*

Between 2015 and 2023 we will connect around 5.5GW of distributed generation to our network

Further details on our environment approach and outputs can be found in **Annex C5 – Environmental strategy – SPEN** and **Losses strategy – SPEN**.

e. Connections

Our stakeholders want us to:

- *Ensure greater flexibility in the connections process to remove red tape*
- *Further improve our communication with customers and provide a single point of contact for queries*
- *Improve transparency of information, including budget quotations and network capacity*

Incentive schemes:

Guaranteed Standards of Performance (GSOPs) – Set the minimum level of customer service. They cover a range of activities including connections, supply interruptions and responses to complaints. We pay compensation to customers if we fail to meet these service levels.

Time to Connect Incentive – This new reward-only incentive measures a combination of the time to provide a quotation and the time to deliver the connection for minor* connection customers. Targets get tighter throughout the period.

Incentive on Connections Engagement (ICE) – A penalty only incentive designed to encourage engagement with major connection customers.

** Minor – a new development of 4 or less house plots*

Our commitments for faster connections	Providing First Class Customer Service	Facilitating the competitive market
Contact the customer within 1 working day of receiving their application to provide a single point of contact to manage their project through our quotation process.	We will actively engage customers and stakeholders through events, monthly surgeries, surveys and one to one meetings to understand their ongoing needs.	We will continue to work proactively with 3rd party groups wishing to connect to our network.
Ask our Customers when they want their quote and work with them to deliver a fast-track quotation and connection when they need it.	We will ensure our customers are kept informed of the connection process throughout every stage: • We will be proactive in our approach minimising the need for customers to have to contact us – we will contact them first • We will communicate with our customers through their media channel of choice • We will develop communication plans tailored to meet individual needs • Through our communication plans we will remove any uncertainty.	We will continue to promote competition in every way we can.
Reduce the average time taken to issue quotations year on year.		We will continue to engage with OFGEM and ICPs to extend the boundaries of competition.
Contact the customer within 2 working days of receiving their payment to provide a single point of contact to manage their project through our delivery process and where possible provide a date for connection.		
We recognise that the time to connect is very important to our customers and is often critical to the success of a project. We will engage and proactively work with our customers to meet their preferred completion and "power on" date.	We will continue to work with our major customers to further improve the service we offer.	
Reduce the average time to deliver connections year on year.	We will build our business, operating and improvement plans around the needs of our customers and stakeholders.	
Continually develop and improve our processes, based on our customers' expectations and customer feedback.		
A 'Process Explained' leaflet will be issued to all customers at initial enquiry stage and is available on the website.		
Our processes and internet site will be continually developed and improved, based on our customer expectations and feedback, to enable year on year improvements to be made.		
We will ensure our average time to deliver connections is in the top group of DNOs.		
We will reduce our general load investment trigger by 20%, enabling quicker connections in future.		
We will use innovative solutions to meet the uptake of low-carbon technologies.		

Key:

- What our customers will experience
- Our supporting initiatives

Our approach

Feedback from our customers helps us to improve our processes, shorten delivery timescales and meet their expectations

Our connections business connects new customers to our distribution networks. We span a range of activities from single premise connections through to large property developments. We also serve the industrial and commercial market. Our network is expanding to accommodate renewable generation more quickly than any other DNO. We serve less than 14% of the GB customer population, but have connected approximately 28% of all GB's distributed renewables to our network.

In response to customer preferences, we offer electricity, gas, water, telecoms and embedded generation connections.

Many parts of the new connection process are competitive and our distribution areas have seen the highest levels of competition[3]. We are committed to operating in a competitive market and ensuring that Independent Connections Providers (ICPs) have equal and fair opportunities to undertake contestable works in our licensed areas.

Our stakeholders have told us that they want us to:

- *Ensure greater flexibility in the connections process to remove red tape*
- *Further improve our communication with customers and provide a single point of contact for queries*
- *Improve transparency of information, including budget quotations and network capacity*

In recent years we have made progress in all of these areas by:

- *Improving our business processes to make them as efficient as possible; and*
- *Introducing new systems and technology to give the customer better information at each stage of the process*

Our approach to the provision of new connections can be articulated around the following themes:

- *Connecting customers faster;*
- *Providing first class customer service; and*
- *Facilitating the competitive market.*

Connecting Customers Faster

We recognise that it is very important for us to help customers to progress through our connection process. At the first point of contact we explain our process and provide all the necessary information to help customers progress through each stage quickly. We ensure they are kept fully informed and that there is no uncertainty as we progress the work.

We are developing a range of online tools to improve the application and design process. We have developed on-line detailed 11kV heat maps to provide up to date information on potential connection capacity and our future plans. This enables our customers to quickly assess their connection requirements at the very earliest stages of the planning process.

Our network is expanding to accommodate renewable generation more quickly than any other DNO

Providing First Class Customer Service

Our goal is to become one of the leading DNOs for the delivery of excellent customer service. We describe our approach to Customer Service across all aspects of our business in the next chapter.

In the twelve months since January 2013 our Connections Broader Measure of Customer Satisfaction (BMCS) scores increased by 11% (SPD) and 4% (SPM)[4]

This positive trend highlights our continued focus on improvements in the service we provide for our customers.

We continually seek feedback from our customers to enable us to work together to improve our processes, shorten delivery timescales and meet their expectations.

For example, we hold monthly 'Customer Surgeries'. At these surgeries we have experts on hand that are able

3. Our licence areas contain the highest volumes of independently registered meter points in GB (SPD 1st, SPM 3rd).

4. In January 2013 the YTD score was 7.29 SPD and 7.62 SPM. In January 2014 the YTD score was 8.07 SPD and 7.95 SPM

to answer questions regarding current or future projects.

Our experts are able to answer a range of queries from understanding the timescales involved in getting connected, to the information required for a competent application to technical specifications.

Our processes for new connections ensure that the customer always has the name of someone in our business who they can contact if they have any questions about their connection. In addition, we have minimised the number of people that customers will have to speak to during the course of designing and building their connection. The names and individual contact numbers of our account managers, designers, delivery managers and competition in connections managers are all published on our website.

Our staff are proactive in their approach to keeping the customers informed about the status of their connection and any other relevant information.

"The projects completed with SP Networks have been complex but they have been delivered on time and within the budget/quotation values. The individuals we have dealt with seem to have a genuine, personal interest in delivery success and contributing to the overall team effort."

Director, Hannan Associates

"I am very happy with the communication and the interaction I receive. I find the staff very approachable and are always happy to help."

Managing Director , Green Earth Hydro

Facilitating the competitive market

Competition in the connections market provides customers with a choice of companies who can provide some or all elements of the connection process. These can either be provided by ourselves, Independent Connection Providers (ICPs) or Independent Distribution Network Operators (IDNOs). We recognise that a customer has the choice of service provider and we offer the same commitment to customer service whichever option is chosen.

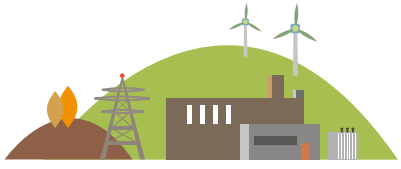
Over many years we have engaged with our customers and stakeholders to remove any perceived barriers to competition and to improve understanding of our processes and the connection options available.

- *We make ongoing enhancements to our information systems to make it easier for ICPs and IDNOs to participate in the competitive connections market.*
- *We engage in regular ICP/ IDNO workshops with monthly interface meetings to continually build, develop and improve our relationships.*
- *We publish regular newsletters which provide up to date information and explain process improvements.*
- *We encourage feedback to enable our service to be continually improved.*
- *Annual surveys are completed and used to gauge the level of customer awareness.*

As industry leaders in the development of competition in the connections market, we collaborate with Ofgem, other distribution network operators and ICPs to extend the boundaries of competition which can be carried out by ICPs and IDNOs. For example we have already trialled ICPs carrying out metered and unmetered jointing on our existing networks (closing joints).

Ofgem has established a formal process for all DNOs to demonstrate they have fulfilled all of their requirements in relation to competition in connections. This is a multi-staged process and SP Energy Networks is making good progress through the various competition tests. In December 2013 Ofgem confirmed that SPEN successfully passed the competition test in four different market segments across our two licence areas.

We are the only DNO to have passed the competition test in the LV Demand segment [5]



5. As at February 2014, SPD licence area

Our Connections Outputs

Our comprehensive outputs package – delivering what our customers want

Our commitments for faster connections

We recognise that it is very important for us to help our customer to fully understand the connection process. This will bring about a far better experience and offers a mutually beneficial outcome for both us and our customers.

At the first point of contact we will explain our process, and provide all the necessary information to progress to the next stage. By proactive communication with our customers we will ensure they are kept fully informed and that there is no uncertainty throughout the process.

We will provide a more efficient, effective and comprehensive connections service meeting the Guaranteed Standards of Performance which set out the minimum service standards. We will meet these standards 100% of the time.

In addition we will:

- *Contact the customer within 1 working day of receiving their application to provide a single point of contact to manage their project through our quotation process.*
- *Ask our Customers when they want their quote and work with them to deliver a fast-track quotation and connection when they need it*
- *Reduce the average time taken to issue quotations year on year*
- *Contact the customer within 2 working days of receiving their payment to provide a single point of contact to manage their project through our delivery process and where possible provide a date for connection*
- *We recognise that the time to connect is very important to our customers and is often critical to the success of a project, we will engage and proactively work with our customers to meet their preferred completion and "power on" date*
- *Reduce the average time to deliver connections year on year*
- *Continually develop and improve our processes, based on our customers' expectations and customer feedback*
- *A 'Process Explained' leaflet will be issued to all customers at initial enquiry stage and is available on the website*
- *Our processes and internet site will be continually developed and improved, based on our customer expectations and feedback, to enable year on year improvements to be made.*
- *We will ensure our average time to deliver connections is in the top group of DNOs*

We are developing a range of online tools to make the application and design process better for our customers. We will continue to develop and expand our online cost calculators and introduce online quoting. All of these will ultimately allow our customers to generate their own network design to allow them to estimate the most economic design solution.

The customer self-serve portal will give the customers the ability to log on as a Network Connections customer and utilise self-service functionality:

- *Building their own quote,*
- *Payment transactions on-line,*
- *Manage work scheduling,*
- *Job tracking,*
- *View quote letters, site plans and other documents related to the works and upload photos and documents from the web or a mobile device*

Online quoting for small projects will enable customers to obtain faster quotations. The overall time taken from customer completing their initial application to issuing a quotation for online quoting could be reduced to 1 day.

Faster completions from quotation acceptance to connection completion can be achieved by enabling customers to accept and pay for their connection offer on-line and for the smaller projects schedule their works on-line

Through the introduction of a standard UK network load measure and recent connections charging decisions by Ofgem, it has become apparent that we have operated our networks differently to other companies, which in some

cases will have impeded the provision of new connections in a timely manner.

Throughout ED1 we will reduce our network reinforcement trigger by 20%, in order that our customers benefit from being treated the same way as other customers across the UK.

Innovation in Connections

We have a proven track record in providing innovative design solutions for our customers and we will continue with this approach to enable faster more economical connections:

- *Our dynamic thermal rating (DTR) project in North Wales and our Accelerating Renewable Connections (ARC) project in the Scottish Borders will allow greater penetration of low-carbon electricity in a timely and lower cost manner.*
- *Our Active Network Management (ANM) solutions will negate the need for costly network reinforcement. ANM uses network measurements, communications and network control algorithms to manage network configurations and generator outputs in order to get the most out of the installed plant.*
- *Promotion of shared excavations and cable tracks.*

Providing First Class Customer Service

Our goal is to become one of the leading DNOs for the delivery of excellent customer service, we explain our approach in **Chapter C5f – Customer Satisfaction** and the significant improvements we have delivered in recent years.

Specifically, in the area of Connections, we will continue to seek feedback from our customers to enable us to improve our processes, timescales and continue to exceed their expectations.

We use our ongoing customer engagement plan to support our targeted improvements in customer satisfaction.

Our ambitions are reflected in our Broader Measure of Customer Satisfaction (BMCS) targets for ED1. We aim to ensure that we support our customers throughout their journey by improving ease of contact, ensuring that our processes are clearly explained, increasing communication and upon acceptance to ensure the smooth installation of the new connections.

This dedicated engagement approach will ensure that we continually work with our customers to understand where improvements can be made throughout the connections process.

Engagement takes a number of forms including:

- *1:1 interviews*
- *direct marketing*
- *events*
- *monthly surgeries*
- *seminars*
- *Dedicated Account Management*
- *Business Development*

The engagement will also include:

- *clearly defined strategies on how we work with our repeat, high value customers*
- *structured customer contact, initiated by SP Network Connections,*
- *understanding our customer needs and building key relationships*
- *Obtaining customer feedback on how we can improve our service.*

"We will be industry leaders in customer service, delivering faster connections through excellence in customer service, quality and workmanship"

Paul Brown
Connections Director

In the output category 'Providing First Class Customer Service' we will:

- *Continue to make improvements to our web site to simplify the language used and to further advance the navigation and retrieval of information.*
- *Develop a facility to allow our customers to obtain quotations via web quoting, make online payments and track the progress of their project from enquiry through to final connection. We will engage fully with our online community and our stakeholders during its development.*
- *Provide a dedicated Customer Account Manager to our Major Customers. This will be a single point of contact to ensure that every project is delivered in excess of our customers' expectations. Future projects will be discussed at the early planning stage.*
- *Provide clear communication throughout every stage of the process. Our teams will agree, at the time of first contact, each Customer's preferred communication channel. Our teams will be trained to meet the following key Customer communication milestones:*
- *Contact the customer within 1 working day of receiving their application to provide a single point of contact to manage their project through our quotation process.*
- *Contact the customer within 2 working days of receiving their payment to provide a single point of contact to manage their project through our delivery process and where possible provide a date for connection.*

Upon completion of a connection project we will contact our Customers to ensure they are fully satisfied with the service we have provided. We will use this feedback to identify areas where we can further improve in the future.

We will target zero failures in our guaranteed standards of service, if we do fail we will pay double the compensation required by Ofgem

Tailoring Our Approach to Major Connection Customers

For connections at higher voltages and generation/unmetered connections we recognise customer requirements are often more complex. The RIIO-ED1 Incentive framework provides a new mechanism - Incentive on Connection Engagement (ICE) targeted at engagement with major connections customers.

We have taken this complexity into account in how we deliver a connections service to these customers. We will produce and publish detailed work plans representing the different types of new connection e.g. metered demand, Distributed Generation, and unmetered supplies.

We will develop and produce the work plans for the relevant market Segments.

- *We will consult and meet with the relevant Customers & Stakeholder to develop and set the objectives for our work plans*
- *The work plans will have objectives of improving customer service with targeted initiatives shaped by our Customers & Stakeholders from the relevant market segments*
- *The work plans will show the actions we are already taking, or intend to take, to improve the connections processes and service for our Customers & Stakeholders*
- *We will encourage discussion and undertake regular engagement with our Customers & Stakeholder, by holding regular regional Customer Surgeries and Forums for the relevant connection types and different market Segments*
- *We will continually seek and respond to feedback from our Customers & Stakeholder on the work plans to allow continual improvement.*

Facilitating the competitive market

Competition in the connections market provides customers with a choice of options or companies who can provide some or all elements of the connection process. These can either be provided by ourselves, Independent Connection Providers (ICPs) or Independent Distribution Network Operators (IDNOs).

We recognise that a customer has the choice of service provider and we will offer the same commitment to customer service whichever option is chosen.

Ofgem has established a formal process for all DNOs to demonstrate they have fulfilled all of their requirements in relation to competition in connections.

This is a multi-staged process and SP Energy Networks is making good progress through the various competition tests. In December 2013 Ofgem confirmed that SPEN successfully passed the competition test in four different market segments across our two licence areas.

As a recognised leader in facilitating competition in the connections market, we will continue to work and build relationships with all 3rd party groups wishing to connect to our network, to provide an efficient, effective and comprehensive service.

We will continue to engage with our customers and stakeholders to remove any perceived barriers to competition and to improve understanding of our processes and the connection options available.

We will engage in regular ICP/IDNO workshops with monthly interface meetings to continually build, develop and improve our relationships. We will publish regular newsletters which provide up to date information and explain process improvements. We encourage feedback to enable our service to be continually improved. Annual surveys will be completed and used to gauge the level of customer awareness.

We will continue to collaborate with Ofgem, other distribution network operators and ICPs to extend the boundaries of completion which can be carried out by ICPs and IDNOs.

For example, we have already trialled ICPs carrying out metered and unmetered jointing on our existing networks (closing joints).

We are recognised as a leader in developing Competition in the Connections market

f. Customer Satisfaction

Our goal is to become one of the leading DNOs for the delivery of excellent customer service.

Our stakeholders want us to:

- *Improve customer service experience for a domestic customer reporting a power cut.*
- *Improve awareness of who SP Energy Networks is and how to contact us*
- *Give customers up-to-date information during a power cut*
- *Increase the use of text messaging to keep customers up to date. Make the telephone number to report a power cut easier to find, potentially by posting information to homes*

Incentive scheme:

Broad Measure of Customer Satisfaction (BMCS) – Is an industry wide survey of the views of our customers on our levels of service. It covers customer satisfaction, social obligations, complaint handling and how we engage with our stakeholders. It both rewards and penalises performance against the targets.

Guaranteed Standards of Performance (GSOPs) – Set the minimum level of customer service. They cover a range of activities including, supply interruptions and responses to complaints. We pay compensation to customers if we fail to meet these service levels.

Customer service	Telephone responses	Communicating with customers	Stakeholder engagement	Complaints	GSOP awareness
We will achieve a 20% improvement in our overall scores in the industry measure of customer service (Broader Measure of Customer Satisfaction) by the end of ED1	We will continue to answer calls in less than 10 seconds and will never force disconnect calls. If a customer wants to speak to someone they will always have that option.	We will continue to provide a restoration time for every outage	We will continue our annual customer awareness campaign to raise awareness of who SP Energy Networks are and when and how to contact us.	We will respond to all customer complaints quickly and resolve complaints to the satisfaction of our customers, first time, every time.	We will include information about our guaranteed standards of service in our annual customer awareness campaign
We will compensate you with a £10 payment if we fail to take the agreed action on your enquiry.	We will never transfer you when you call us. If the person you are speaking to can't help, they will always take your details and you will be called back.	We will contact all customers impacted by an outage to keep them informed during the outage, through multi channel options.	We will report our performance against plan and outputs at an annual stakeholder event.		
We will continue to offer hot meals and accommodation to vulnerable customers after 12 hours during exceptional events and within 48 hours to all customers	We will compensate you with a £10 payment if we fail to call you back.	We will write to all customers in advance of planned interruptions and will text them the day before to remind them	We will provide an annual stakeholder communication on our engagement activities and actions.		

Customer service	Telephone responses	Communicating with customers	Stakeholder engagement	Complaints	GSOP awareness
We will continue on our journey with the Institute of Customer Service to benchmark across the service industry, sharing best practice and continually putting the needs of our customers first.	We will ensure abandoned calls are less than 1%	We will use Smart Metering Data proactively to help customers understand what is happening on the network, particularly during fault conditions.	We will further develop our online community to support our stakeholder, customer and employee engagement programmes.	We will continue to reduce the number of complaints we receive by understanding the root cause and minimising our impact on our customers	
			We will introduce an annual programme so stakeholders know what engagement to expect.		
We will invest in our people at every level, developing and motivating them to deliver fantastic service to our customers in line with the Institute of Customer Service quality assurance standards.			We will embrace stakeholder engagement as "business as- usual" and will build on the approach of more focused and centralised engagement.		

Key:

- What our customers will experience
- Our supporting initiatives

Our approach

Excellent customer service is at the core of everything we do

As a customer driven organisation, the service we provide to our customers is an integral part of who we are and we place the delivery of excellent customer service at the core of everything we do. Our goal is to become one of the leading DNOs for the delivery of customer service and to drive improvements through our organisation to achieve this.

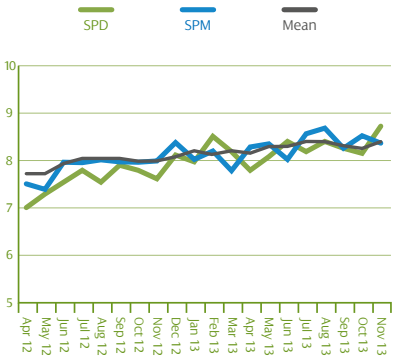
Over the DPCR5 price control period our approach to customer service has seen many changes with the introduction of our ten point improvement plan.

The approach to developing this plan saw the establishment of a new customer service management team sourced from across our wider organisation. The introduction of this team who were chosen based on their vast experience in the customer service arena has brought a renewed energy and has developed a strategy that will ensure we continue to deliver and exceed our customers' expectations.

Our ten point improvement plan has seen the implementation of our customer service governance structure, our customer service cultural programme, and an annual customer awareness campaign. We have also undertaken a restructure of our customer service front office team so we have a multi skilled workforce and have improved our contact strategy, so we now have an abandon rate of less than one percent.

In addition to this we have also undertaken Voice of the Customer research with more than 2000 customers. This has been done in partnership with the research agency Explain as part of our Customer Engagement Plan.

Broad Measure of Customer Service Performance SP Energy Networks



This research is undertaken on an annual basis and has assisted in developing the content of our current and future strategies.

Our recent customer awareness campaign developed to ensure our customers are aware of the critical role we play in the electricity industry has seen more than 150 roadside billboards already in place and SPEN materials now feature in transport hubs, bus shelters and appear on over 1,000 local buses. The early response to our awareness campaign has been encouraging and we have supported all of this activity with a customer focused video that explains what SP Energy Networks does, shows the area we cover and makes important emergency contact information available to customers and stakeholders across our service area.

Click below to view our video.

Together, our SPD and SPM licence areas show the greatest improvement in customer service scores in the industry

Our ten point improvement plan approach has seen an increase in our Broader Measures of Customer Satisfaction for SPM of 11.5% and for SPD an overall increase of 24.8% based on April 2012 to November 2013 figures.

During ED1 we will continue with our ambitious plans and have assessed our ability to deliver this plan based on our current performance improvements and have determined that by 2023 we will have improved our overall performance by 20% from our 2012 position.

Our overall approach is based on the development of our 20% improvement plan and will focus on the following key areas:

1. *Providing first class customer service*
2. *Our commitment for faster connections*
3. *Facilitating the competitive market*
4. *Stakeholder engagement*
5. *Our people*
6. *Technology*
7. *Communication*

8. Customer complaints and guaranteed standards

9. Planned outages and power cuts

10. Business improvement

This approach is supported by our Customer Service Roadmap for Delivery which will closely monitor our implementation and improvements over the ED1 period to ensure we are delivering to our customers' wants, needs and values.

Our supplementary **Annex C5 – Customer Satisfaction Strategy** outlines in greater detail how we established our customer service strategy, our targets for ED1 and our detailed plans to ensure we deliver our ambitious goals.

Our recent awareness campaign was well received by our customers and stakeholders

Our Customer Satisfaction Outputs

Customer service

We will achieve a 20% improvement in our overall scores in the industry measure of customer service (Broader Measure of Customer Satisfaction) by the end of ED1.

In recent years we have introduced greater accountability and a renewed focus on the fundamentals in working to:

- *Improve our performance in reducing the effects of power cuts on customers.*
- *Answer 100% of calls and never force disconnect a customer call.*
- *Give our customers good quality information.*
- *Ensure customers always have a clear route into us ensuring their contact can be progressed to resolution.*

We are driving through further cultural improvements in our organisation to enable us to achieve these aims. We have already engaged with a research agency who as well as delivering our customer research programme will undertake an internal programme of work with our staff to measure how effectively customer service is embedded within our company culture and identify any issues which may be stopping this from happening.

In addition to learning from customer survey results, we have carried out a customer engagement campaign to understand in detail how our customers feel about the service we offer and how we can improve. As a direct result of this feedback, we have brought together the teams delivering customer service for Connections, General Enquiries and Interruptions under our Customer Service team to ensure that we deliver a consistent service to any customer contacting us.

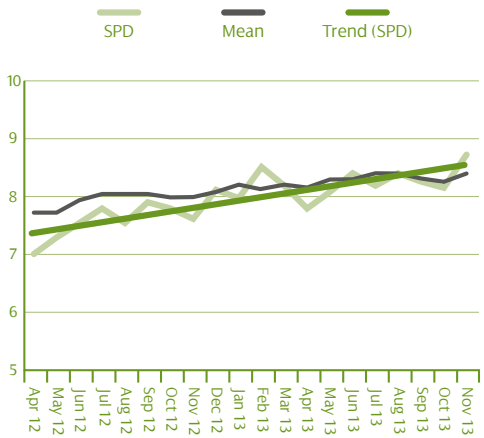
In readiness for ED1, we are implementing a new Customer Relationship Management (CRM) system during 2013/14. This system will allow us to measure our customers' experiences in detail and enable us to track our delivery against the promises we make to our customers more effectively.

Our customer service scores are increasing at the fastest rate of improvement in the industry, showing that our customers are feeling the benefit of our efforts to improve our service.

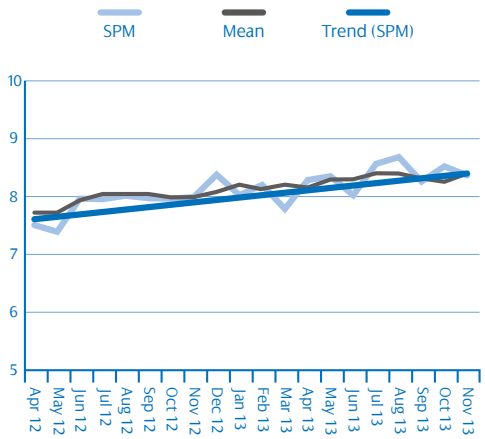
Together, our above–average rate of improvement and our wide ranging improvement initiatives mean that we can be confident that:

- *Our approach is working*
- *Our ambitious target to improve our overall scores by 20% by the end of the ED1 period is achievable.*

Broad Measure of Customer Service Performance SP Distribution



Broad Measure of Customer Service Performance SP Manweb



We are targeting an overall 9 out of 10 rating from our customers by 2023.

Achieving this performance improvement will mean that we are well placed to deliver industry leading performance and demonstrate that our 'customer first every time' culture is truly embedded throughout our business. In short, we will put the customer first every time.

Our aim is to get it right first time every time, and this means that when we promise to take a particular course of action, we will carry it out.

We are acutely aware of the hardships customers experience when they are without electricity as a result of exceptional weather events, and that this is more significant for vulnerable customers. With this in mind, we already provide hot meals and accommodation to vulnerable customers after 12 hours during exceptional events and within 48 hours to all customers voluntarily. We will continue to provide this voluntary service throughout ED1 as part of our commitment to protecting our customers from the hardship of loss of electricity supply.

We've engaged with our customers and worked with the Institute of Customer Service to benchmark across the service industry, sharing best practice on how to improve customer service. As a result of this, we have developed a comprehensive range of Customer Commitments, which cover all aspects of our business and far exceed the minimum guaranteed standards set by Ofgem. We will continue to work with the Institute of Customer Service to ensure that our continued improvements in customer service make our customers happy and make a tangible impact on the performance of our organisation.

Where we identify areas for improvement we will act on these quickly and coach our staff to deliver the service you want. We will regularly take our staff into learning sessions in our Call Centres, our Field Teams and our Control Rooms to look at real examples of the service we have delivered and discuss as a team how we can improve that service. Our teams are encouraged to work together across our business to look for ways of making the experience our customers have when they contact us as good as it possibly can be.

"To demonstrate this commitment, we will pay £10 in any instance where we have failed to take the action we have agreed in response to a customer enquiry."

Vicky Kelsall

Customer Services Director

Telephone responses

We know that when our customers contact us, they want us to answer the phone quickly and they want the option to speak to a real person. We currently answer every call we receive within 10 seconds and all callers have the option to speak to one of our staff. Our enviable 10 second response time is not assisted by the practice of 'force-disconnecting' customers. We will continue to provide this high level of service throughout the ED1 period.

Being transferred from one team to another can be both frustrating and time consuming. We will never transfer you when you call us (unless you ask us to) and if we can't solve your problem immediately, we will take your details and call you back.

To demonstrate our commitment to call back rather than transfer callers, we will pay £10 in any instance where we have failed to call a customer back as agreed.

We believe that no customer should have to wait so long for an answer that they abandon their call and hang up. We currently have one of the lowest rates of abandoned calls in the industry and we will continue to build on this by ensuring that less than 1% of all our calls are abandoned throughout the ED1 period.

Communicating with customers

Effective two-way communication with our customers enables us to identify problems on our network quickly and minimise the impact of power cuts. Recognising this, we have asked our customers about the ways they would like to communicate with us. The graphs below show the responses we received at our workshops when we asked our customers to choose how they would like to receive information from us during a power cut.

It is clear from these responses that our customers value having a range of different communications channels to choose from.

We will continue to provide a restoration time for every outage. Occasionally we need to shut off customers' power supply in order to maintain or replace equipment on our network. We understand the inconvenience that these power outages cause and we know that having clear information about the outage helps our customers to plan effectively to deal with the loss of electricity.

For planned outages, we will continue to provide outage start and restoration times to all customers affected by letter 7-10 days in advance. During the outage, customers in ED1 - as currently - will be able to access the most up-to-date information via our interactive voice response system.

We will contact all customers impacted by an outage to keep them informed during the outage, through multi channel options. When our customers are without electricity, they want to know that we are working to restore their supply as quickly as possible.

We already keep those customers who contact us to report a power cut up to date by providing the most up-to-date restoration time information via an interactive voice response system. We also contact all customers who have registered a mobile number with us by text to update them through the duration of the power outage. Once the power is restored we advise customers again by text message to let them know the restoration is complete.

We know that our customers value choice in terms of the way information is shared with them. When asked to choose the preferred modes of communication during a power cut, a proportion of our customers value receiving outage update information through a range of other means and we expect this proportion to increase as the use of new communications technology such as smart phone apps and social media evolves through the ED1 period.

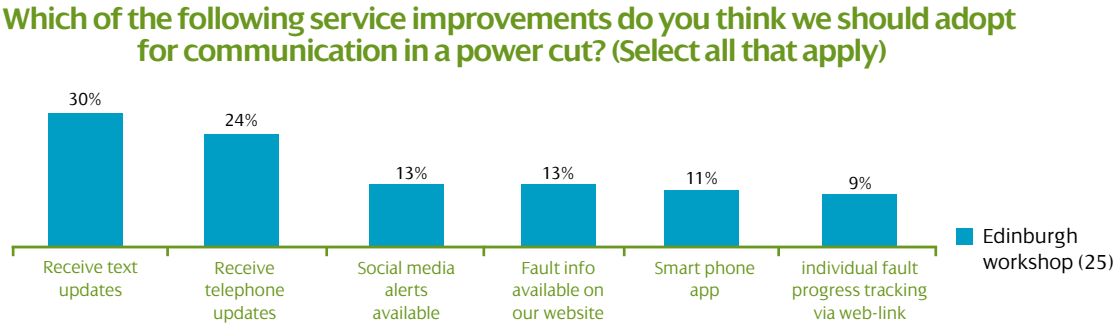
The introduction of our new CRM system will allow us to offer our customers a range of different communication channels, including enhanced web services where customers can access a wider range of services online, social media and web chat. We will continue our efforts to understand how our customers want to interact with us by asking our younger customers about the ways they like to communicate, enabling us to proactively deliver up-to-date services before our customers ask for them.

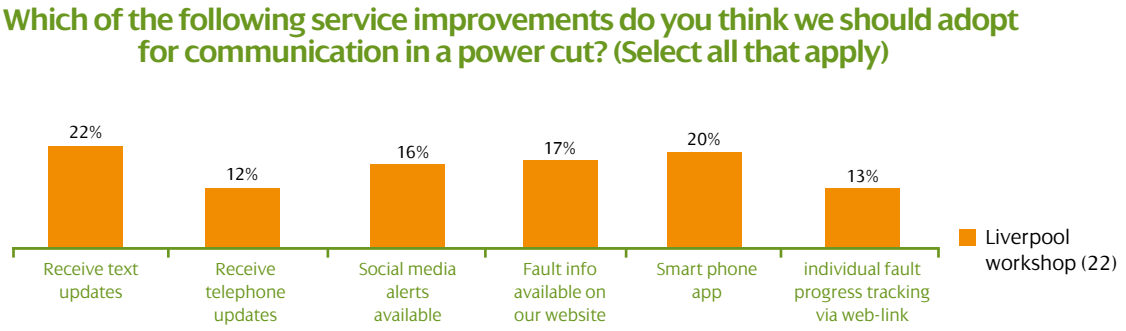
We currently warn all customers affected by a planned interruption by letter seven to ten days in advance. During the ED1 period, we will also text any customers who have registered their phone number with us the day before the outage to remind them.

In addition to this, we will use our new CRM system to enable us to run campaigns to proactively notify customer groups about interruptions to their supply, planned work, and major projects on the network.

The roll-out of smart metering is due to complete during the ED1 period. This means that we will start to receive smart metering data, giving us real-time insights into the performance of our network. This data will allow us to identify what is happening on our network more quickly and to proactively contact our customers to help them understand what is happening during a power cut.

We will invest in our people at every level, developing and motivating them to deliver fantastic service to our customers in line with the Institute of Customer Service quality assurance standards





Stakeholder engagement

The views of our stakeholders are important to us. They provide valuable insight into how we should change our business to improve our performance now and into the future.

We have made a step change in our approach to engagement around how we prepare our plans, engaging with stakeholders early in the process and making the way we present our material much more stakeholder focused. The priorities and needs of a broad range of participants have had a tangible impact upon both what we plan to deliver in the ED1 period and how we plan to deliver it.

For more information on our stakeholder engagement approach refer to B3b. Stakeholder Engagement and B4a Process of Creating Our Business Plan. Our detailed Annex - Learning from Our Stakeholders has more detailed information on our process of engagement and the results.

Our customers and stakeholders have told us that we need to improve awareness of our brand and make sure customers understand the difference between us and their supplier.

In response to this, we have started an annual awareness campaign including a series of leaflet drops, radio and newspaper features to:

- *Communicate our role and ensure that customers know how and when to contact us*
- *Proactively recruit new members to our online community*
- *Lay out clearly what our customers can expect from us*
- *Raise awareness of our priority services register and our guaranteed standards of service (to be included in our 2014 campaign onwards)*

We will continue this annual awareness campaign throughout the ED1 period, acting on further customer and stakeholder feedback to ensure that we continue to improve the initiative. We will report our performance against plan and outputs at an annual stakeholder event.

We recognise that there is a requirement for a regular and centralised programme of stakeholder activities that focus on business priorities identified by stakeholders. Central to this will be an annual event that focuses on our performance against our Business Plan and identifies stakeholder priorities. Three key priorities will be selected for topic-specific stakeholder workshops to be delivered throughout the year.

We will also deliver an annual stakeholder newsletter that sets out the activities we are undertaking with stakeholders and the resulting actions.

We currently conduct stakeholder engagement at a business unit level across our business and we recognise that our programme of engagement can be made more powerful by centrally coordinating these activities.

We will use our CRM system to consolidate the findings of these stakeholder engagement activities, creating opportunities to identify key themes and better target future engagement. We will further develop our online community to support our stakeholder, customer and employee engagement programmes.

Since its launch in 2011, membership of our online community has steadily grown to over 1100 members. It provides us with honest, unfiltered feedback, and includes online focus groups, polls, surveys, and discussions. For this reason, we are keen to extend the community to a wider number of customers. During ED1, we will continue to proactively recruit people to the community and details of how to join are provided on our customer letters and website.

You can find more information about our online community here:

http://www.spenergynetworks.co.uk/serving_our_customers/online_community.asp?NavID=1&SubNavID=5

An enduring programme of focused, regular and robust engagement is vital to our continual improvement. In recent years, we have appointed an experienced Stakeholder Engagement Manager to ensure that stakeholder engagement is fully integrated into our business-as-usual, and we are continually working to further extend and tailor our engagement activities. We will build on this approach during the ED1 period, recognising the relevance and value of the insights our stakeholders can give us.

Complaints

We know mistakes can happen and we understand that both the speed and the way in which we resolve complaints are vital to satisfying our customers. To improve the speed of our complaint resolution, we have improved our ways of working to ensure that the routes to resolving complaints are simpler and more direct.

To improve the quality of our complaint handling, we have conducted an extensive programme of customer service and complaint handling training for staff across our business and we hold regular team sessions to drive improvements in complaint logging, complaint closure and understanding the root causes of customer complaints. We will sustain this training throughout the ED1 period, drawing on experience from the Institute of Customer Service and across the industry to inform our programme of continual improvement.

We are working to reduce the overall number of complaints we receive by understanding the root cause of each complaint in detail. We have updated our business systems to allow us to accurately record the reasons for complaints and this data has been vital in reducing the number of complaints we receive. In addition to training our staff in complaint handling and customer service, we are also training our staff to recognise potential issues earlier to enable us to mitigate problems before they affect our customers. We are also working to minimise our impact upon customers across all of our areas of activity and to give our customers clear and timely information, further reducing the risk of complaint.

GSOP awareness

We are committed to giving our customers the best possible service. For many of our activities we promise our customers a guaranteed level of service, and if we fail, we will pay compensation. While we give clear details of these guaranteed standards on our website, we recognise that customers may not be aware of them. During the ED1 period, we will include information about our guaranteed standards in our annual customer awareness campaign to ensure that all of our customers are aware of the standards of service they can expect.

We will double the compensation for all guaranteed standard failures (excluding exceptional events where we make other arrangements)

Our supplementary **Annex C5 – Customer Satisfaction Strategy – SPEN** contains more detailed information about our approach in this area and how we plan to achieve our ambitious customer service outputs for ED1.

g. Social Obligations

We are a responsible company and work hard to do the right thing for the communities we serve

Our stakeholders want us to:

- *Raise the profile of the Priority Service Register*
- *Identify and support vulnerable customers by working with third parties such as charities, GPs and social services.*
- *Provide regular updates during an extended power cut to vulnerable customers.*
- *The fuel poor were a concern for stakeholders, however they struggled to suggest a specific role for SP Energy Networks in supporting this sector of society.*
- *Continue to be involved with charitable initiatives and raise the profile of this activity.*

Incentive scheme:

Broad Measure of Customer Satisfaction (BMCS) – The Broad Measure of Customer Satisfaction is an independent industry wide survey that takes account of the views of our customers on the levels of service provided by DNOs. It covers customer satisfaction, how we meet our social obligations, complaint handling and how we engage with our stakeholders. Fixed performance targets will be set by Ofgem for ED1. It both rewards outperformance and penalises underperformance against the targets.

Our Priority Services Register for vulnerable customers	Improving the services provided for vulnerable customers	Working in Collaboration with our Communities
We will always ensure our people are trained to recognise and deal with vulnerable customers sensitively	We will send a welcome letter and information pack to every new customer joining the Priority Service Register.	We will ensure our Network is ready for off gas grid customers to transition to new electric heating systems
We will proactively contact all Priority Service Registered customers at least every 2 years	We will contact our vulnerable customers during an unplanned outage at least every 4 hours	We will establish an additional fund within ScottishPower's existing Energy People Trust to target initiatives to help vulnerable customers
We will continue to establish mechanisms to share information on vulnerable customers with other agencies and authorities.	We will contact all vulnerable customers in advance of planned power interruptions and review their individual supply requirements.	We will deliver initiatives that will help the fuel poor by working with agencies such as Energy Action Scotland, National Energy Action, Scottish Government Fuel Poverty Group etc.
We will engage with GP Surgeries, Libraries, Post Offices and Pharmacies to make sure our communities are aware of our Priority Services Register.	We will continue to work in local communities impacted by outages to ensure they have access to hot meals, drinks and company.	We will continue to work with agencies to understand how we can collaborate to best support our customers and communities.
	We will continue to produce winter packs and make them available to all of our vulnerable customers	
	We will make automatic compensation payments to all Priority Service Registered customers should we fail to restore their supply within 12 hours following a fault.	
	We will continue to work with Emergency Planning Officers to provide support to our vulnerable customers during outages	

Key:

- What our customers will experience
- Our supporting initiatives

Our Approach

While we have an established social obligations role as a DNO we have a desire to strengthen our commitment in this area

Society is living longer, our climate is becoming ever more unpredictable and energy prices are increasing, therefore, it has never been more important for us to place a strong focus on our social obligations to the communities we serve.

When we talk about social obligations we focus on the vulnerable members of our community and our customers who depend on the services we deliver on a daily basis; our senior citizens, our new parents, our families with young children, our defined fuel poor customers and our off gas grid customers. We also focus on ways we can help our customers change how they use electricity.

Our licence areas include the central belt and south of Scotland, which includes nine of the ten top most deprived areas in Scotland. We also serve the North West of England, including Liverpool, which ranks in the top three most deprived areas of England. We have set our approach to social obligations to reflect these demographics.

Our role in the changing community has never been more apparent and we believe we can play a role in the social obligations agenda, aligned to the energy industry. We want to facilitate activity in local communities utilising the mechanisms from our industry that are available to us.

While we have an established social obligations role as a DNO we have a desire to strengthen our commitment in this area.

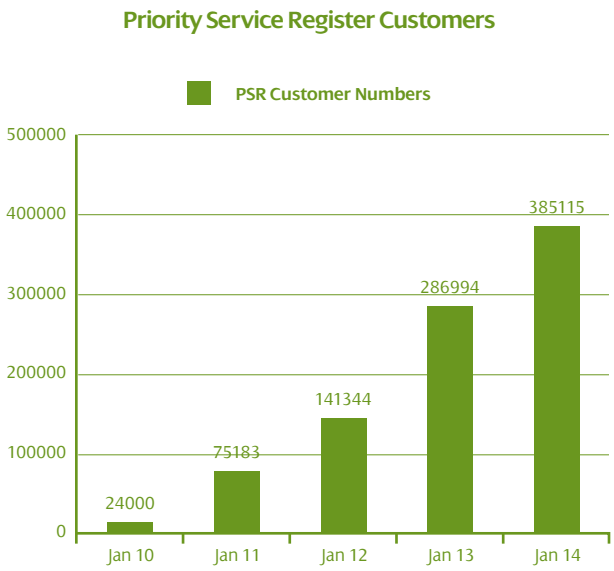
This is not only to provide our vulnerable customers with excellence in customer service but to also develop integrated solutions to improve energy affordability within our fuel poor areas. Our particular focus in the area of affordable warmth is to enhance the use of low-carbon technologies, principally in areas where we have a high percentage of off gas grid customers.

During the building of our plan our customers and stakeholders told us that they want us to:

- *Improve the quality and effectiveness of our Priority Service Register*
- *Work with Local Authorities and other organisations to ensure all measures to alleviate fuel poverty are taken.*
- *Fuel poverty is wider than a DNO. Be effective with what you have, play to your strength.*
- *Continually be aware of what local people need.*
- *Help customers understand energy use.*

From this feedback we have developed a four pillar approach to our social obligation strategy as follows:

- *Contact*
- *Data and Information Sharing*
- *Initiatives*
- *Continual Improvement*



With our proactive approach, we have seen our priority service register increase from 24,000 in Jan 2010 to 385,000 in Jan 2014 which is an increase of sixteen times the original number of customers

Contact

Our approach to utilising our contact pillar is to step up our already proactive contact with our vulnerable and fuel poor customers. Not only during supply interruptions and power cuts but also to provide our communities with advice and guidance on services offered in their community.

We want to use the resources available to give guidance on effective management of energy use with local suppliers.

Data and Information Sharing

Our approach to data and information sharing enables further improvements to our Priority Service Register (PSR) and current partnership working in our communities. With our proactive approach, we have seen our priority service register increase from 24,000 in Jan 2010 to 385,000 in Jan 2014 which is an increase of sixteen times the original number of customers.

Our approach is further supported through sharing services with agencies so we can jointly support the most vulnerable customers in our communities.

Furthermore we will be utilising the data from advances in technology to reduce costs of reinforcements and by doing so reducing energy costs passed on to our customers.

Initiatives

Our approach to delivering initiatives is practical and effective. We are continuing to map our vulnerable and fuel poor customers across the areas we serve to understand our most impacted communities and using this to effectively target initiatives in these areas.

This information will also help us to prioritise the areas most in need of support. We are developing relationships with Energy Action Scotland, National Energy Action and other partners to deliver initiatives most effectively.

Continual Improvement

In order to be aware that the services we are providing to our vulnerable and fuel poor customers are actually making a difference we have adopted an approach based on continual improvement. Working with an independent market research company we continuously obtain customer and stakeholder feedback to understand how we measure up as far as they are concerned.

We are members of the Institute of Customer Service which gives us rich information to benchmark against leading service organisations to understand how our ways of working measure up. This membership also allows us to independently assess the culture within our organisation when considering customers and communities. This gives us clear evidence of where things work and where focus needs to be given.

Our supplementary **Annex C5 – Social Obligations Strategy**, provides more detail on our strategy in this area.

Our Social Obligations Outputs

Our comprehensive social obligations package for ED1 period

Our Priority Service Register for vulnerable customers

We know how difficult it is for anybody during a power loss, but in particular we recognise how especially worrying it must be if you rely on electricity for medical equipment, or have other special needs. We hold a Priority Services Register (PSR) so that we can contact our most vulnerable customers if they do experience a power loss. Customers can be included in our register if they are:

- *Dependent on medical equipment.*
- *Chronically sick.*
- *Disabled.*
- *Or have some other special needs you would like us to consider.*

Being on our register won't necessarily mean we can restore power more quickly, but we will proactively contact our PSR customers if we know of a problem in their area. We will keep our PSR customers informed with regular updates and, if necessary, we can work with external agencies who may be able to assist them.

Our customers and stakeholders tell us that we could improve awareness of our Priority Services Register within our communities and as part of our vulnerable customer strategy. We will roll out an awareness campaign to make sure local agencies and community groups are aware of our register and work with us to direct customers to register so that we can support them throughout a power loss.

"Our online community scored us 9.2 out of 10 for ease of joining our priority services register."

Vicky Kelsall, Customer Services Director

We have planned a programme of work to continue to build on our engagement with agencies already undertaken in DPCR5 and to develop this further to engage with a wider range of agencies supporting vulnerable and fuel poor customers. We will also be targeting community locations such as post offices, libraries, GP surgeries and community centres to promote our "Good Neighbour" campaign to ask people to look out for their neighbours and encourage them to register with us if they are elderly or require priority services. Our customers and stakeholders told us that whilst they expect us to look after our most vulnerable customers they also think that the community themselves have a responsibility and therefore our plan makes sure we have targeting both of these areas.

Our front line staff are a vital link within our communities, therefore we are training our staff to engage with vulnerable customers who are registered for priority services but also to recognise vulnerability within our community which we may not be aware of. A training programme will be rolled our across our employees to make sure our staff know what is expected of them and to enable them to recognise vulnerable customers and offer assistance.

Improving the services provided for vulnerable customers

We recognise that sometimes we cannot restore supplies as quickly as we would like. In ED1 we will provide a guaranteed standard to restore electricity supplies within 12 hours following a fault. If we fail to keep this promise, we will pay double the Ofgem recommended compensation to our customers. For PSR customers, this payment will be made automatically.

We recognise however that as well as compensation it is vital to work closely with our more vulnerable customers during periods of power interruption to offer assistance and engage with other agencies where necessary to offer as much help and support as possible.

Working in collaboration with our communities

The strong and enduring relationships we have with our local communities are a source of great pride to us – and one that we believe is essential to the economic development of our business. Building and maintaining the trust of our communities has been one of our key priorities over many years. We aim to conduct our activities responsibly, in a way that is considerate to local communities and the environment.

We also have a long track record of supporting communities not only financially, but also through the skills, generosity and enthusiasm of our people.

To find out more details on Scottish Power's work in the community click here: *http://www.scottishpower.com/pages/community.asp*

Within our supplementary **Annex C5 – Social Obligations Strategy – SPEN** we have laid out our intention to build on our existing engagement and have detailed how we will engage with agencies supporting vulnerable and fuel poor customers.

To further demonstrate our commitment to communities we will support the Energy People Trust by advising our communities that this programme of assistance is available and actively encourage the generation of ideas from our communities that look to benefit the most vulnerable customers in our communities. To find out more about the Scottish Power Energy People Trust click here: *http://www.energypeopletrust.com*

We have also obtained data on the fuel poor communities within our licence areas and will target specific campaigns in these areas to assist vulnerable and fuel poor customers. We have already engaged with Energy Action Scotland (*http://www.eas.org.uk*) and will be developing a joint initiative called "Community Building Energy Efficiency Fund". We will be investing in the heart of our fuel poor areas for the benefit of the whole community.

Through the 'Community Building Energy Efficiency Fund' we will work with EAS and local parliamentarians to nominate a community building in need of an energy efficiency upgrade, this may include improvements in heating systems, cavity wall insulation and loft insulation. For instance, we may target a community centre used for mother and toddler groups which has inadequate heating and make this a better environment to visit.

Raising awareness of energy issues is a vital addition to complement the practical measures we can deploy. This is an extremely valuable way of taking energy efficiency messages back into the home and into the wider community. Having seen the range of measures installed in a local community building, its users are likely to be more receptive to saving energy and tackling fuel poverty on a personal level. To achieve this, EAS will deliver energy efficiency training to the staff and volunteers using the centre, or to other community representatives where appropriate.

We will use the opportunity to help people understand who they need to call in a power cut and how our role is different from that of an Energy Supplier.

Customers off Gas Grid

To make sure we target our most needy customers we will look at where we have fuel poor communities which are also off gas grid and will target these communities as a priority.

The roll out of new electric heating technology is an enabler of the UK transition to the low-carbon economy and a key consideration in our plans. We anticipate that some of the early adopters of heat pumps will be off gas grid customers because of the savings that could be achieved in comparison to other non-electric heating systems. Within our load related investment plans we have factored in the higher proportion of off gas grid customers present within our network area.

The roll out of the Renewable Heat Incentive, Green Deal, Renewable Heat Premium Payment and other heat related incentive schemes are likely to drive increased interest for off gas grid customers to make the transition to new electric heating systems. Our plans will make sure our Network is ready for this transition.

Quality of Initiatives for Vulnerable and Fuel Poor customers

We intend to engage with our customers and stakeholders before and after each initiative to understand what difference the work has made to them and learn any lessons for future schemes. We recognise the importance of making sure we are delivering the things our customers want and things that make a real difference to their day to day lives. We will engage an independent research company to measure the impact of our work in this area.

These initiatives will help us to target the largest number of customers either directly or indirectly.

Our key outputs in this area:

- *We will establish an additional fund within ScottishPower's existing Energy People Trust to target initiatives to help vulnerable customers*
- *We will ensure our Network is ready for off gas grid customers to transition to new electric heating systems*
- *We will continue to work with agencies to understand how we can collaborate to best support our customers and communities.*
- *We will deliver initiatives that will help the fuel poor by working with agencies such as Energy Action Scotland, National Energy Action, Scottish Government Fuel Poverty Group etc.*

h. Linking our outputs and expenditure

Our outputs will be funded in one of three ways:

Base price control revenues – Costs included in our efficient plans set out in this document paid for by customers through our charges (shown in executive summary).

Out performance of incentives – We can earn additional revenues or receive penalties depending upon how we perform, resulting in increased or reduced customer bills.

Reduced returns/profits – Our regulatory contract sets an agreed level of returns for the investments that our shareholders make. Where we fund customer compensation this will reduce the returns available.

Area	Sub Category	Source of funding
Safety	Reducing Harm	Base revenues (efficient support costs)
	Compliance with Law	
	Operational Integrity	
	Substation Security	
	Educating the Public	
Reliability & Availability	Network Performance	Incentive outperformance
	Enhancing Network Resilience	Base revenues (in overhead line & tree cutting)
	Guaranteed Standards	Additional generators through base revenues. Smart metering data funded by benefits post 2020. Double GS payments from reduced returns
Environment	Facilitating Low-carbon	Base revenues (included in reinforcement costs) and customer funded works. Technology trials through base revenues leveraged with investor funding and external funding sources
	Carbon Footprint	Business as usual (efficient support costs)
	Reduced Leaks	Base revenues (Asset replacement/refurbishment)
	Undergrounding in AONB	Base revenues (AONB & Recreational area)
	Reducing Electrical Losses	Base revenues (Asset replacement costs)
Connections	Faster Connections	Application of technologies with trialling funded through base revenues (see Annex C7 – Our innovation strategy). Efficient customer funded connections. Incentive outperformance. Double GS payments from reduced returns
	First Class Service	
	Competitive Market	
Customer Satisfaction	Customer Service	Base revenues (efficient support costs). Incentive outperformance. Additional compensation through reduced returns
	Telephone response	
	Communication	
	Stakeholder Engagement	
	Complaints	
Social Obligations	Priority Service Customers	Base revenues (efficient support costs)
	Vulnerable Customers	Base revenues (efficient support costs). Incentive outperformance or Reduced returns
	Collaborating with communities	Incentive outperformance

6 Expenditure

Our expenditure forecast and the processes we have used to make our expenditure efficient

In this section we set out our RIIO-ED1 expenditure plans at a high level across all categories of our costs for both of our licences. We describe how we have developed the plans and how we ensured that they are cost efficient.

We believe that this plan represents value-for-money for customers. We have looked at every area in which we incur costs in detail. We have identified where we can build on our strengths to deliver our activities even more efficiently in the future and we have tackled the areas where we were weaker than the 'best in class', committing to transformational change where we see it is necessary to deliver improvement.

To ensure that what we propose to spend is appropriate and efficient, we:

- *sought the views of our stakeholders, and aligned our investment plan to their priorities.*
- *reviewed Ofgem's benchmarking of costs across all DNOs' July 2013 plans and undertook extensive additional benchmarking analysis of our own*
- *critically reviewed all aspects of the expenditure plan that we published in July 2013 using expertise from within our own business, industry consultancies and the Iberdrola Group*
- *carried out a substantially expanded programme of cost benefit analysis (CBA).*

The result is a stronger plan that will allow us to meet all of the primary outputs that we set for ourselves in July 2013 for a total cost of £4740m, representing a further saving of £407m against our July plan, driven by a £450m reduction in our controllable costs.

For further details regarding our plan please see:

- *Our main **Annex C6 – Expenditure** annex, providing detail on our investment plans at a more detailed level*
- *Our **Annex C6c – SP Manweb Company Specific Factors** special case annex, providing detail on the costs and benefits of this network design*
- *Our **Annex C6m – Costs Asessment, Efficiency and Benchmarking**, demonstrating that our plan is efficient*

In addition we have provided a number of detailed supporting engineering annexes to assist stakeholders who may be interested in understanding our plans at a more detailed level.

A full index of our Annexes is contained in **Chapter 11 – Glossary**.

We have used Cost Benefit Analysis (CBA) extensively to inform this plan, building upon the proven process we adopted for our July 2013 plan to demonstrate our programme represents value-for-money for our customers. **We have applied CBA to 70% of our total load and non-load related investment programmes.**

We have concentrated our work in areas where the technique could contribute usefully to our decision making, as there are elements of investment, examples being meeting statutory obligations, customer driven reinforcement investment and undertaking diversions, where CBA is not relevant.

Ofgem used Cambridge Economic Policy Associates to review DNOs use of CBA in July 2013 plans. Their report stated **'SP's analysis presents the most convincing discussion of alternative options for consideration within their CBAs' and 'overall SP's presentation of the CBAs analysis is the clearest of all the Groups.'**

Our approach to cost benefit analysis is proportionate, transparent and compliant with current HM Treasury Green Book guidelines (July 11 update). **The accompanying annex to this document Annex C6m – Cost Benefit Analysis provides a summary of each of the cost benefit analyses we have performed in building our plans.**

a. Expenditure Overview

Including 1% p.a. ongoing efficiency. Controllable costs reduced by £450m (July 13 plan)

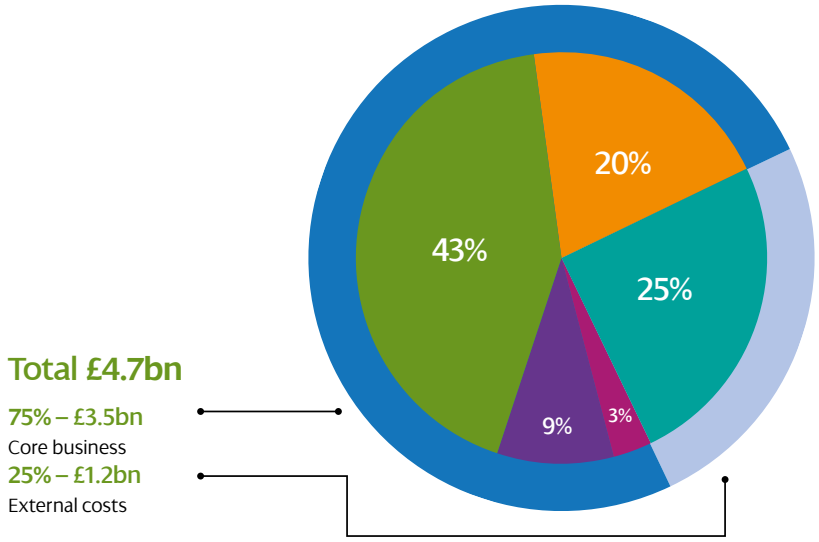
43% – **£2.0bn** of our costs relate directly to managing our ageing network

9% – **£380m** of our costs allow us to accommodate customers' future requirements (including £20m to enable benefits of smart meters)

20% – **£960m** of our costs are engineering and corporate support activities

3% – **£160m** of our forecast costs are a real price effect contingency

25% – **£1.2bn** of our costs are non-core including corporation tax, business rates, transmission charges and legacy pension costs



Controllable costs down 2% from DPCR5 resulting from 26% reduction in support costs whilst delivering 10% more non load and 28% more load investment

The full range of deliverables associated with our investment programmes are set out in this chapter and its associated annexes. The following are examples of these deliverables:

- *Repair more than 180,000 network faults.*
- *Inspect and maintain 30,000 substations, 70,000km of underground cables and 40,000km of overhead lines.*
- *Complete circa 3.5million asset inspections.*
- *Cut trees away from more than 300,000 spans of overhead lines (public safety).*
- *Clear trees away from 5000km of overhead lines (storm resilience).*
- *Maintain around 850,000 items of network equipment.*
- *Replace main equipment at 37 major substations each supplying 19,000 customers (average).*
- *Replace transformers and/or switchgear at over 200 large substations each supplying 3,000 customers (average).*
- *Extend the life of about 190 large substations each supplying 3,000 customers (average).*
- *Replace switchgear at over 3600 small substations each supplying up to 500 customers.*
- *Replace more than 200,000 services inside customers' homes & buildings.*
- *Make 25% of our high voltage network, and an additional 16% of our low voltage network resilient to storms.*
- *Upgrade 98 major substations (each supplying between 1,000 and 20,000 customers) creating up to 500MW of local capacity for future customer needs.*
- *Connect up to 5.5GW of renewable generation.*
- *Connect up to 2.5GW of housing, commercial and industrial customers.*
- *Accommodate load growth (including LCTs) of 1.6% (SPD) and 1.2% (SPM).*

The expenditure section is set out in the following sub sections:

Section	Title	Content
a	Expenditure Overview	High level description of our expenditure plan
b	Asset Stewardship	A description of our approach to Asset Stewardship
c	SPM Manweb Company Specific Factors	Description of the company specific cost implications of the SPM urban interconnected network
d	Load related investment	Costs associated with reinforcing the network and undertaking diversions
e	Non-load related investment	Investment in: • asset replacement and refurbishment • meeting legal obligations • improving safety, environmental and network performance
f	Network operating costs	Expenditure on: • responding to faults and other call-outs • inspection and maintenance • vegetation management • other minor operational costs
g	Closely associated indirect costs	The costs incurred in: • operating control and call centres • managing projects • stores • operational training • other services that support our work programmes
h	Business support costs	The cost of corporate activities including: • human resources • finance • regulation • CEO office • non-operational training • other corporate costs
i	Non Operational Capex	Investment in vehicles, mobile plant, IT, telecoms and property and other minor investments.
j	Non activity based costs	Costs largely beyond our control including transmission exit charges, business rates and licence fees
k	Real Price Effects	The overall cost impact of differences between the index that is used to update our revenues each year and the movements in commodity and specialist labour costs
l	Cost Efficiency and Benchmarking	How we have gone about ensuring that our costs are as efficient as possible and how we benchmark against other DNOs and Ofgem's expert assessments

SP Energy Networks – Expenditure Plan Summary

SP Energy Networks	2010-2015	2010-2015	2015-2023	2015-2023	% Change
Summarised Ofgem Business Plan categories, 2012/13 price basis	DPCR5 Total (£m)	DPCR5 Average (£m)	RIIO-ED1 Total (£m)	RIIO-ED1 Average (£m)	
Inspections, maintenance and vegetation management	144.6	28.9	272.5	34.1	18%
Troublecall & Other Network Operating Costs	245.1	49.0	373.0	46.6	-5%
Total network operating costs	389.6	77.9	645.5	80.7	4%
Asset Replacement and Refurbishment (including Civil Works)	535.2	107.0	940.6	117.6	10%
Operational IT and Telecoms	17.1	3.4	51.7	6.5	89%
ESQCR (Low Ground Clearance)	94.8	19.0	109.0	13.6	-28%
BT 21st Century, Environmental, Legal and Safety	46.9	9.4	128.7	16.1	71%
Black Start, Flooding and Critical National Infrastructure	4.5	0.9	14.4	1.8	97%
Rising & Lateral Mains	74.7	14.9	120.1	15.0	0%
AONB and Worst Served Customer initiatives	2.7	0.5	18.0	2.2	322%
Diversions	26.1	5.2	33.9	4.2	-19%
Total non load-related expenditure (including future-proofing for low-carbon scenarios)	802.0	160.4	1416.4	177.0	10%
Customer driven reinforcements (net of contributions)	28.3	5.7	63.0	7.9	39%
General reinforcement including low-carbon technologies	146.1	29.2	295.5	36.9	26%
Total load-related expenditure (including low-carbon scenario)	174.4	34.9	358.5	44.8	28%
Closely Associated Indirect Costs	504.4	100.9	577.5	72.2	-28%
Business Support Costs	261.4	52.3	282.7	35.3	-32%
Non-operational capex	45.4	9.1	104.1	13.0	43%
Total engineering and corporate support costs	811.2	162.2	964.3	120.5	-26%
Smart metering enabling works	0.0	0.0	17.4	2.2	New
Technology Trials (stand alone funding mechanisms)	–	–	–	–	NA
Total Core Costs (A)	2177.3	435.5	3402.1	425.3	-2%
Non activity-based costs & Streetworks Reopener	651.2	130.2	1179.2	147.4	13%
Real price effects	-0.3	-0.1	158.8	19.9	NA
Total Non-controllable Costs (B)	650.9	130.2	1338.0	167.2	28%
Total A+B	2828.2	565.6	4740.1	592.5	5%

Our annual average expenditure on a like for like basis, excluding costs beyond our control (non-activity based costs such as tax) will be 2% less than we are spending in DPCR5. This reduction is not being made at the expense of outputs. We are planning to invest more in our key work programmes than ever before.

We will increase our investment in our non-load work programmes by 10% and load related programmes by 28%. The increases in the volume of deliverables will be even greater as we will deliver more due to unit cost reductions and the deployment of innovative interventions which will make the money go further.

The impact on customer bills is managed by making significant savings in the costs of operating the non-frontline aspects of our operations, 28% and 32% in our indirect and business support costs respectively. We will continue to reduce our fault costs whilst also meeting the challenge of faster restoration times.

We have increased our investment levels through DPCR5 to the point that our underlying delivery capacity is in place to make a smooth transition into the ED1 expenditure programme.

We have increased our current investment levels to the point that our delivery capacity is in place to make a smooth transition into the ED1 programme. More detail on the profiling investment plans is provided in **Annex C6 Expenditure – SPEN**.

SPD – Expenditure Plan Summary

SP Distribution	2010-2015	2010-2015	2015-2023	2015-2023	% Change
Summarised Ofgem Business Plan categories, 2012/13 price basis	DPCR5 Total (£m)	DPCR5 Average (£m)	RIIO-ED1 Total (£m)	RIIO-ED1 Average (£m)	
Inspections, maintenance and vegetation management	46.8	9.4	114.6	14.3	53%
Troublecall & Other Network Operating Costs	139.8	28.0	197.0	24.6	-12%
Total network operating costs	186.6	37.3	311.6	38.9	4%
Asset Replacement and Refurbishment (including Civil Works)	213.3	42.7	341.0	42.6	0%
Operational IT and Telecoms	6.9	1.4	19.7	2.5	77%
ESQCR (Low Ground Clearance)	33.4	6.7	47.9	6.0	-10%
BT 21st Century, Environmental, Legal and Safety	25.0	5.0	48.2	6.0	21%
Black Start, Flooding and Critical National Infrastructure	1.6	0.3	3.3	0.4	28%
Rising & Lateral Mains	53.7	10.7	81.1	10.1	-6%
AONB and Worst Served Customer initiatives	0.1	0.0	8.3	1.0	New
Diversions	11.0	2.2	11.0	1.4	-37%
Total non load-related expenditure (including future-proofing for low-carbon scenarios)	344.9	69.0	560.5	70.1	2%
Customer driven reinforcements (net of contributions)	4.6	0.9	4.8	0.6	-35%
General reinforcement including low-carbon technologies	66.9	13.4	140.4	17.6	31%
Total load-related expenditure (including low-carbon scenario)	71.5	14.3	145.2	18.2	27%
Closely Associated Indirect Costs	246.5	49.3	273.3	34.2	-31%
Business Support Costs	124.8	25.0	152.2	19.0	-24%
Non-operational capex	23.4	4.7	53.4	6.7	43%
Total engineering and corporate support costs	394.7	78.9	478.9	59.9	-24%
Smart metering enabling works	0.0	0.0	8.7	1.1	New
Technology Trials (stand alone funding mechanisms)	–	–	–	–	NA
Total Core Costs (A)	997.7	199.5	1505.0	188.1	-6%
Non activity-based costs & Streetworks Reopener	376.2	75.2	718.2	89.8	19%
Real price effects	-0.2	0.0	68.5	8.6	NA
Total Non-controllable Costs (B)	376.0	75.2	786.7	98.3	31%
Total A+B	1373.7	274.7	2291.6	286.5	4%

SPM – Expenditure Plan Summary

SP Manweb	2010-2015	2010-2015	2015-2023	2015-2023	% Change
Summarised Ofgem Business Plan categories, 2012/13 price basis	DPCR5 Total (£m)	DPCR5 Average (£m)	RIIO-ED1 Total (£m)	RIIO-ED1 Average (£m)	
Inspections, maintenance and vegetation management	97.8	19.6	158.0	19.7	1%
Troublecall & Other Network Operating Costs	105.3	21.1	176.0	22.0	5%
Total network operating costs	203.0	40.6	334.0	41.7	3%
Asset Replacement and Refurbishment (including Civil Works)	321.9	64.4	599.6	74.9	16%
Operational IT and Telecoms	10.2	2.0	32.0	4.0	97%
ESQCR (Low Ground Clearance)	61.3	12.3	61.1	7.6	-38%
BT 21st Century, Environmental, Legal and Safety	22.0	4.4	80.6	10.1	129%
Black Start, Flooding and Critical National Infrastructure	2.9	0.6	11.0	1.4	136%
Rising & Lateral Mains	21.0	4.2	39.0	4.9	16%
AONB and Worst Served Customer initiatives	2.6	0.5	9.7	1.2	133%
Diversions	15.2	3.0	22.8	2.9	-6%
Total non load-related expenditure (including future-proofing for low-carbon scenarios)	457.1	91.4	855.8	107.0	17%
Customer driven reinforcements (net of contributions)	23.7	4.7	58.2	7.3	54%
General reinforcement including low-carbon technologies	79.2	15.8	155.0	19.4	22%
Total load-related expenditure (including low-carbon scenario)	102.9	20.6	213.3	26.7	30%
Closely Associated Indirect Costs	258.0	51.6	304.2	38.0	-26%
Business Support Costs	136.6	27.3	130.5	16.3	-40%
Non-operational capex	22.0	4.4	50.7	6.3	44%
Total engineering and corporate support costs	416.6	83.3	485.3	60.7	-27%
Smart metering enabling works	0.0	0.0	8.7	1.1	New
Technology Trials (stand alone funding mechanisms)	–	–	–	–	NA
Total Core Costs (A)	1179.6	235.9	1897.2	237.1	1%
Non activity-based costs & Streetworks Reopener	275.0	55.0	461.0	57.6	5%
Real price effects	-0.1	0.0	90.3	11.3	NA
Total Non-controllable Costs (B)	274.9	55.0	551.3	68.9	25%
Total A+B	1454.4	290.9	2448.5	306.1	5%

b. Asset Stewardship

We take a structured and holistic approach to the management of our assets. We drive continuous improvement by regularly reviewing our asset management model

Our Approach

Our approach to asset stewardship is fundamental to the ongoing development and realisation of the vision for our networks.

Asset stewardship encompasses all aspects of managing our assets to meet the variety of the challenges that we face in the most effective way (set out in **Chapter B2 – Our Challenges**).

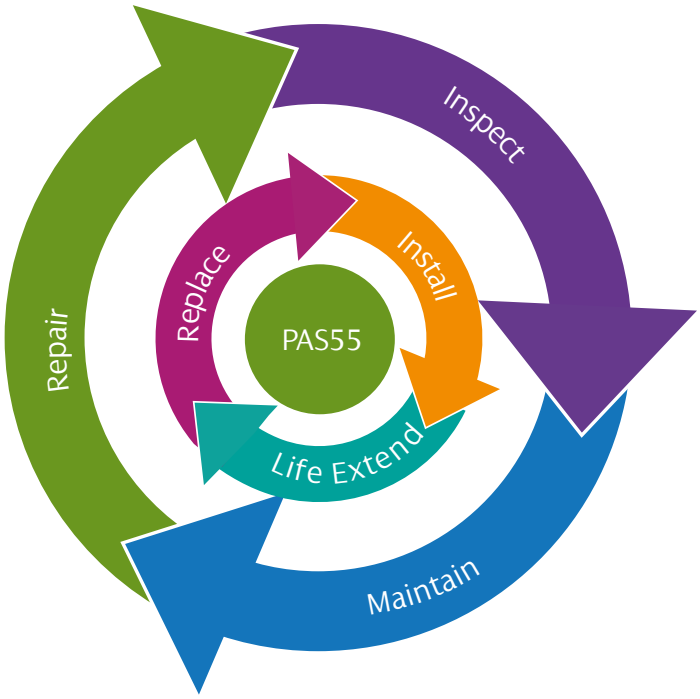
In part this is achieved through rigorous implementation of modern asset management techniques, however, our approach builds upon this to ensure that asset related decisions are informed by inputs from across our organisation, from technical experts to front line operators.

At a fundamental level we manage our network to be legally compliant. On top of this we aim to strike a balance between the cost to serve and the associated benefits. In some areas, such as system performance, regulatory incentives help to quantify the trade-offs between costs and benefits. In other areas, such as public safety, we have taken a proactive stance based on our principles rather than an economic analysis.

Our day-to-day approach to asset stewardship is defined by a suite of policies that define how we operate and maintain existing assets as well as the standards we apply when replacing or extending our network assets. These policies are developed over time by considering a range of factors including:

- *New legislation*
- *Safety related information – e.g. emerging defects associated with particular types of equipment*
- *Innovation – development of new technologies that offer alternative solutions*
- *Performance requirements – e.g. ongoing changes to regulatory requirements*
- *Operating environment – e.g. climate change and associated risks*

We were a founding participant in the development of PAS55, the internationally acknowledged standard for asset management



Our approach to asset management is exemplified by a number of the key improvements that we have advanced over many years:

- *Public safety*
- *Network resilience to severe weather*
- *Innovation*

These initiatives are characterised by a willingness to challenge the status quo, resulting in improved performance of our networks. Some examples include:

Public safety

Safety is at the forefront of everything we do, and we are fully committed to managing public safety and complying with HSE regulations. We work closely with the Health and Safety Executive in order to develop programmes to address areas of increasing risk.

Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002

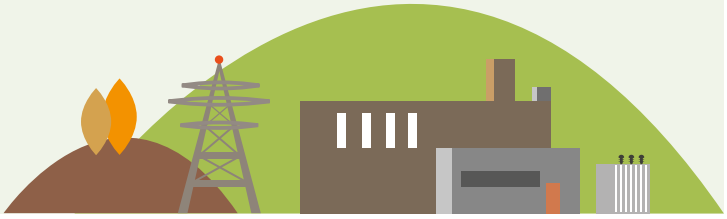
Some time ago we identified that that a number of our older overhead line assets did not comply with current legislation (Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002) that specifies the clearance requirements to the ground. Our response was decisive and positive – we surveyed 100% of our LV and a proportion of our HV overhead line network to assess the extent of the problem and we embarked on a prioritised programme of investment to address the issue. As a result, we lead the industry in addressing the issue of low ground clearances:

- *By 2015 the highest risk ground clearance hazards (mainly road crossings) will be removed*
- *By 2020 our entire network will meet the latest clearance standards.*

Replacing end of life cables in high-rise and tenement flats

Some common areas of high-rise and tenement flats contain very old cables. It's not always clear whether the responsibility for the maintenance and eventual replacement of these cables lies with the building owner or the electricity distributor. We believe that this poses an unacceptable safety risk to the buildings' occupants and we are proactively replacing these cables where no clear ownership can be easily established. In 2010-12 we invested more than £20m to address this public safety risk. We were the only UK distribution company to seek and obtain approval from Ofgem for additional works in the period 2012-2015.

- *We will invest over £30m in this area from 2012-2015.*
- *We will continue this unique approach in ED1, spending in excess of £100m to further address this risk for more than 200,000 of our customers.*

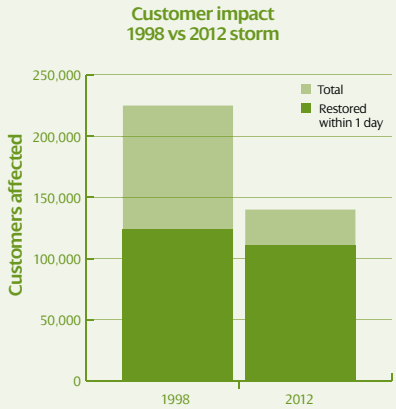


Network resilience to severe weather

Severe weather is a challenge for our networks. Large proportions of our networks are in areas classified by the Met Office (UK's National Weather Service) as particularly at risk of severe weather. Some years ago we committed to a different approach for these parts of our network.

This involved rebuilding lines to a specification that is much stronger than the normal standard. In addition, we introduced a resilience focused tree cutting regime which is now firmly established in a regular cycle. The significant benefits of this strategy are increasingly evident as we can demonstrate a reduction of 75% in the number of faults experienced in severe weather events.

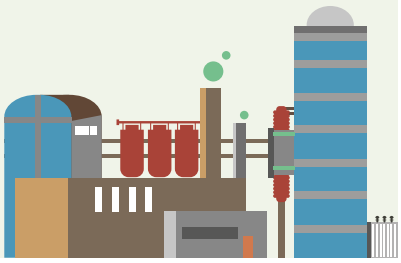
Stakeholders have also identified flood risk as a high priority, so we have accelerated our programme to reduce the risk of disruption at our substations. Our flood resilience programme will be largely completed by 2015, protecting an additional 14 of our strategically important grid substations against a 1 in 1000 year event and up to 59 of our primary substations against at least a 1 in 100 year event.



Innovation

Over the last 10 years, we have progressively rolled out Power Quality monitors across a number of our primary substations. These devices were initially used in response to customer queries related to voltage dips.

As the devices were being rolled out, we identified a number of other features that they could also offer such as fault identification and circuit breaker timing. These features allow us to assess problems with assets before they materialise into failures such as circuit breakers not operating which could result in significant disruption to customers. We have also developed expert systems to process the data we collect so that the devices can be more widely used by staff and provide further benefits. This innovative project has been self-funded through the reliability incentive mechanism and is an example of some of the new technology which we have developed to manage our asset base and provide benefits to customers.



Asset stewardship in practice

Our approach to asset stewardship reflects the mix of assets at various stages of their lifecycle and the external drivers that shape our activities, for example legislation and customer demand. As shown below, a significant proportion of our activities relate to managing our existing asset base. However, we must also cater for changing customer requirements by developing our network in an economic and efficient manner.

Activity option	Overview of approach
Repair and maintenance of existing assets A detailed description of the costs associated with this activity is given in **Chapter C6 – Expenditure**	• Maintenance of assets carried out according to manufacturers' recommendations. • Opportunities taken where possible to apply condition based maintenance rather than time based • Asset information gathered though inspections to inform future analysis and decisions
Replacement or refurbishment of existing assets A detailed description of the costs associated with this activity is given in **Chapter C6 – Expenditure**	•Network assets categorised according to their condition (health index) and criticality (criticality index) • Models of health index deterioration used to forecast investment • Age based modelling used to validate forecasts • Local replacement/refurbishment decisions made using asset specific information • Cost and risk balanced at the local level and overall network level
Adding or extending existing assets to meet customer demand A detailed description of the costs associated with this activity is given in **Chapter C6 – Expenditure**	• Network assets categorised according to how heavily loaded they are (load index) • Heavily loaded parts of the network scrutinised in detail to assess whether reinforcement is required or not • Innovative solutions applied where appropriate to mitigate asset loading as an alternative to investment

The activities summarised above are supported by a number of other functions within our organization, notably:

- *Standards and specifications*
- *Asset data*
- *Innovation*

Standards and specifications

We standardise the assets we procure wherever possible. The main drivers for this are safety, cost efficiency and ease of integration.

We adopt national standards where appropriate and we have developed a number of Iberdrola standards which enable us to gain procurement savings though global contracts

Asset Data

Our asset decisions are underpinned by robust data on our assets. We recognise the importance of asset data and have clearly defined ownership and responsibilities throughout our organisation.

We have invested heavily in our asset data systems and improved our asset records over the last 10 years, including the implementation of market leading systems such as SAP and ESRI to manage our asset data.

We are continually improving the data we hold within our systems and enhancing the mechanisms for gathering new data more effectively. For example we have invested in the latest Toughbook mobile technology for use by our field staff, which provides near real-time data capture and update.

We have processes in place to ensure the quality of our asset data is maintained. This, in our view, is an essential process within the operation of a large asset intensive business. We have undertaken a highly intensive process in recent years that has resulted in a steep rise in the rate of asset data improvement.

We have undertaken a highly intensive process in recent years that has resulted in a steep rise in the rate of asset data improvement

For more detail refer to **Section B4b – Addressing feedback on our 2013 plan**.

Innovation

We run our own innovation programme and we monitor the outcomes from other trials across the industry. Innovative solutions are translated into business as usual through our business change processes. In the remainder of this section we explain in more detail our asset management approach for:

- *Repair and maintenance of existing assets*
- *Replacement or refurbishment of existing assets*
- *Adding or extending existing assets to meet customer demand*

Our approach to repair and maintenance of existing assets

Our inspection processes are designed to ensure compliance with our legal obligations to inspect our assets on a periodic basis, assess risks and identify any hazards or defects that could affect the integrity, safety or performance of our assets.

We generally perform maintenance activities at fixed intervals, however opportunities to introduce condition based maintenance are considered where possible. The work we do to maintain assets, determined by the 'as found' condition, ensures that the asset remains safe and continues to perform adequately until its next planned inspection.

Where appropriate, we monitor and evaluate the in-service performance of our assets to identify any deterioration trends.

We also periodically carry out detailed condition assessments to evaluate the 'health' of each asset and develop plans for refurbishment or replacement where required. We use this information to develop a risk-prioritised programme of interventions including hazard and defect repairs, refurbishment and replacement.

Our approach to replacement or refurbishment of existing assets

Our expenditure on renewing and refurbishing our substations, overhead lines and underground cables is described as non-load related investment. Our decision to invest is based on the condition of an asset and the consequences if it should fail.

Two key techniques are used to support this approach – Asset Health Indices and Asset Criticality Indices.

Asset Health Indices (HI)

We categorise our assets against a scale from 1 to 5 as per the table below, covering asset condition from new to end of life. We outline our asset health index methodology in **Annex C6b – Asset Health and Criticality**.

In addition to physical condition, asset health is influenced by a number of factors:

- *Design Standards – acceptability to the current specification*
- *Operational Issues – operational restrictions, safe working procedures*
- *Vicinity and Location – indoor/ outdoor*
- *Fault Rate – tolerance of rate within the asset base compared with others*
- *Critical Issues – identified critical defect*
- *Maintenance Spares – availability and suitability of parts and expertise*

Asset Health Index

Asset Health Index	1	2	3	4	5
Condition	New	Good	Acceptable	Poor	End of Life

Asset Criticality Indices

Consequence of failure is inherent in our historic asset management processes at an asset class level. However, we are now capturing additional information about the operating environment of individual assets. This allows us to improve the prioritisation of our investments based on the consequence of asset failure.

Criticality scores for each asset take into account 4 types of consequence;

- *Safety*
- *System*
- *Environmental*
- *Financial*

Each of these scores is expressed in a common currency which allows them to be combined to provide an overall criticality score for the asset.

Bringing together the current health index and criticality index information for the asset base allows us to produce a prioritised list of assets that need investment. This approach provides an initial list of assets for our detailed, near-term investment plans which is further refined by considering practical delivery issues such as the need to coordinate investments at a local level.

In order to predict our investments in the longer-term we need to make predictions of the expected deterioration in the health index of assets over time. Deterioration models are informed by industry information as well as local information that we collect as we inspect and maintain our assets over time. By adding the deterioration models to the health index information we can make an assessment of future health index movements. This, in turn, allows us to model the impact of future investments and to choose an investment profile that best manages risk over the long-term. We also use long-term age based modelling to cross-check the results of our health index modelling.

As well as considering when to invest in a particular asset we consider the nature of that investment. Broadly, we can choose to replace with a new asset or extened the life of the existing asset.

In circumstances where it is technically feasible & economic we extend the life of our assets through refurbishment. This involves replacing part of the asset with new components. In some situations it is possible to introduce a new "modern equivalent" component that has additional advantages such as improved functionality or performance.

Where assets have failed or reached the end of their working life, and cannot economically be refurbished or repaired, we replace them with their modern equivalent. This can involve adopting new technology.

We replace "higher criticality" assets before they fail. Although our inspection and condition monitoring regimes are robust, some assets will fail unexpectedly in service and will have to be repaired or replaced. These failures do not necessarily result in a loss of supply, but when they do, and where it is not possible to achieve a repair quickly, we use generators or other temporary arrangements to minimise inconvenience for our customers.

Our approach to accommodating customers' increasing demand

The investment we make to enhance or extend our network in response to customers' changing requirements is called Load Related investment.

Our load related investment is important to stakeholders and customers because:

- *it creates the additional capacity in our network to allow new customers to connect.*
- *it allows existing customers to utilise new, more electricity reliant devices.*
- *it deals with increases in demand before they present a higher risk of power cuts.*

As indicated in **Chapter B2a – Keeping our network fit-for-purpose**, changes in the way customers use our network can present a challenge. **Chapter B2b – Facilitating low-carbon technology**, deals with the specific challenge of facilitating the uptake of low-carbon technologies by customers at the lower voltages in our networks. In addition, at the higher voltages there is the ongoing challenge of ensuring that aggregate demands can be met in all reasonably foreseeable circumstances.

We design and build our networks to national standards, including Engineering Recommendation P2/6 (Security of Supply). This is a requirement of our Licence and it specifies the capacity and security (alternative or backup circuits) that we should provide for particular levels of power demand.

Clearly, when demands change we may have to respond to maintain our compliance with the standard. We continually monitor the situation and propose a response where there is a risk of non-compliance. In some cases we elect to live with a P2/6 non-compliance for a period and would seek

In identifying the future requirements of our networks we consider a number of factors:

Factor	Description
Independent forecasts of economic growth.	These inform both the volumes and types of new customer connections and the future demand of existing business and domestic customers.
Cities' and local authorities' development plans.	These provide local intelligence on specific developments in our large demand centres
The appropriate triggers for us to take action to create additional capacity in our network.	It is important that we create capacity on our network at the appropriate time. We have recently reviewed the trigger points at which other DNOs increase the capacity of their assets and we have revised our own trigger level as a result.
Department of Energy and Climate Change (DECC) scenarios for the uptake of low-carbon technologies (e.g. heat pumps, electric vehicles and photovoltaics) including the more ambitious Welsh and Scottish 2020 carbon reduction targets.	It is important that we create capacity on our network at the appropriate time. We systematically assess the capability of our networks to ensure that equipment is loaded within its capability. As the network usage changes, potentially in localised clusters, we will be able to anticipate additional system requirements in order to meet the requirements and expectations of our customers with respect to supply capacity and security.
Opportunities to use innovation to reduce our costs and charges to customers.	Our design process has a built-in requirement to consider innovative solutions alongside more traditional approaches. In addition, with assistance from Smarter Grid Solutions (recognised as industry experts for their industry-wide work on smart networks projects) we challenged ourselves to create additional network capacity through non-traditional means. This challenge has allowed us to embed the appropriate learning from industry technology trials and significantly reduce our investment plans.

a derogation from Ofgem to enable this.

This approach may be required to allow time to go through the planning process for a new investment such as an overhead line. In some circumstances it may actually avoid the need for investment, for example where local intelligence indicates that the non-compliance will be resolved over time by changes in the local demand or generation patterns.

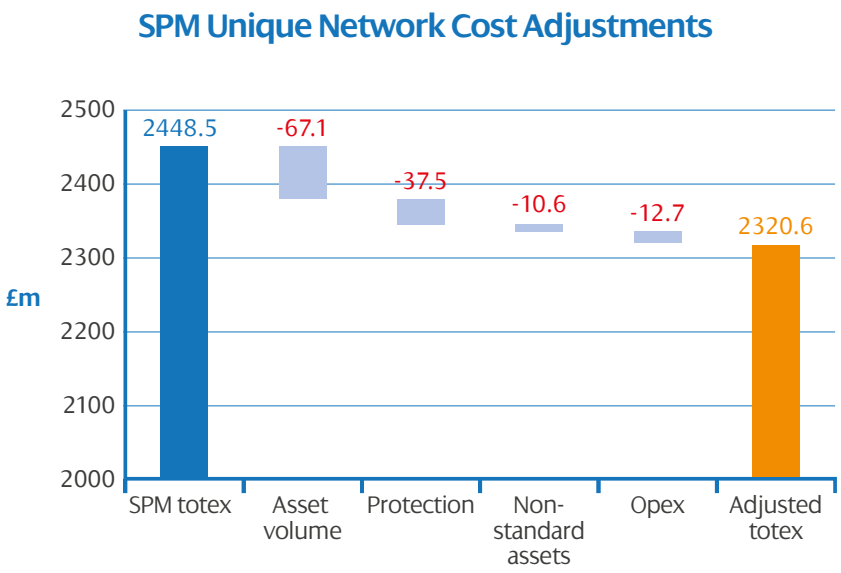
The challenge of balancing investment costs with changing customer requirements is also reflected in the ongoing need to ensure that equipment such as transformers and switchgear is adequately rated for the task. Again, our philosophy is guided by achieving value-for-money for customers. We always consider whether we are able to introduce an operational solution, i.e. operating our network differently to manage the problem, rather than investing to eliminate the problem.

We regularly review the loading of our network assets and make assessments of how this will change in future. For each relevant asset we calculate the nationally agreed "load index" figure. However, our decision on whether or not to upgrade an asset is based on a more refined assessment.

Consequently, we are often able to postpone the upgrading of some assets that are categorised as "fully utilised" in the national load index scale. This approach minimises costs to customers without creating unacceptable loading conditions for assets. Further detail on our load related investment is provided in **Chapter C6d – Load related investment**.


SP ENERGY
NETWORKS

c. SP Manweb Company Specific Factors



Our Manweb network is significantly different to other DNOs networks, including our other network in Scotland. The SPM network delivers better levels of system performance compared to conventional network designs and is generally very flexible in accommodating new customer requirements. However, the downside to this is that it is more expensive to run. Our approach is to minimise the additional cost and maintain the benefits to customers of having this type of network.

We keep the SPM network design under review and for extensions to the network we consider whether we should extend the interconnected design approach or revert to a traditional, radial design. However, there are a number of practical reasons that would make it very difficult to fully convert the SPM interconnected network to a radial network.

Independent reviews undertaken periodically have concluded that large scale conversion is not cost effective.

For ED1 we commissioned two further independent reviews by Parsons Brinckerhoff Power and Mott McDonald. These studies, along with an associated economic analysis undertaken by NERA Economic Consulting, confirm our approach and verify our assessment of the efficient incremental case costs.

We have calculated that our costs in ED1 will be £128m higher as a direct consequence of the unique elements of the SPM network. These additional costs will be incurred across a range of activities, covering both capital expenditure and operating costs and are detailed in **C6c – SP Manweb Company Specific Factors**.

Key incremental costs include :

Higher volume of standard assets: The SPM network is designed in a mesh layout rather than radial. The mesh design has more nodes and more interconnections between these nodes for any given area. These nodes and interconnections equate to assets such as transformers, switchgear and cables. This higher volume means that we will incur costs of £67.1m during RIIO-ED1 that would not be incurred in a radial network.

Protection equipment: The SPM network is much more reliant on unit protection. Unit protection is the most sophisticated form of protection, requiring equipment at all entry or exit points of the protected section of network plus communication links between these. Our expenditure on protection in SPM during RIIO-ED1 will be £37.5m higher as a result of the

SPM incremental costs for RIIO-ED1 period (£m)

Network level	Capex (£m)	Opex (£m)	Total (£m)
33kV	74.40	8.74	83.14
11kV	18.64	2.10	20.74
LV		1.83	1.83
Load related	22.11		22.11
Total	115.15	12.67	127.82

unique protection requirements of the SPM network. For further details see **Annex C6e – Operational IT & Telecoms Strategy**.

Non-standard assets: A secondary substation in the SPM interconnected network is configured to facilitate interconnection and the associated protection and includes non-standard components, including: a circuit breaker on the low voltage side of the transformer; an 11kV ring main unit (RMU) which always requires a circuit breaker and contains additional auxiliary switches; current transformers, pilot wires and batteries for the protection; and a brick/block housing to protect ancillary equipment. Our RIIO-ED1 investment programme for SPM contains £10.6m of costs relating to these non-standard assets.

Operating costs: The higher volume of switchgear, transformers and protection equipment in the SPM network results in higher maintenance costs. Repair and maintenance of substation civils is also substantially higher, partly because of the higher volume of substations but also because of the different construction standard. In addition, the communication links between our protection equipment sometimes develop faults or are damaged by third parties. The cost of these repairs would not be incurred in a conventional network. Finally, faults on the SPM network can be harder to locate and, therefore, fault repair costs are higher. Overall we have calculated that the incremental operating costs for SPM in the RIIO-ED1 period is £12.7m.

Our calculations of the incremental costs for the SPM network have been carried out at a detailed level. The full detail is provided in **Chapter B2d** along with the reports of the independent reviews we commissioned as part of our ED1 preparations.

Our **Annex C6 – Expenditure** to our plan and the **Annex C6c – SP Manweb Company Specific Factors** provides a breakdown of these additional efficient costs at a detailed Ofgem Business Plan Data Table level.

d. Load Related Investment

LRE summary for the RIIO-ED1 period in the SPD & SPM network areas

Load Related Expenditure (£m)						
		£m p.a.			Total	
		DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	General reinforcement	10.3	13.3	29%	51.5	106.4
	Fault Level reinforcement	3.1	3.3	6%	15.4	26.2
	Connections driven reinforcement (DUoS funded)	0.9	0.6	-35%	4.6	4.8
	Transmission Connection Points	0.0	1.0	-	0.0	7.8
	Total	14.3	18.2	27%	71.6	145.2
SPM	General reinforcement	12.8	16.5	29%	64.0	132.2
	Fault Level reinforcement	3.0	2.9	-6%	15.2	22.9
	Connections driven reinforcement (DUoS funded)	4.7	7.3	54%	23.7	58.2
	Transmission Connection Points	0.0	0.0	-	0.0	0.0
	Total	20.6	26.7	30%	102.9	213.3
SPEN	Total	34.9	44.8	28%	174.5	358.5

4.1 Summary

Load Related Expenditure (LRE) is necessary to ensure our networks have sufficient capacity in the long-term, operate safely and comply with relevant technical performance standards. During RIIO-ED1 we expect to invest £358.5m on Load Related Expenditure (LRE). LRE arises from customers' changing usage or demands on our networks.

Additional information on our forecasts and costs are set out in the Expenditure annex and Load Related Strategy annex

This expenditure is supported by 34 separate cost benefit analyses. These cover a cross section of the projects, in particular those with innovative solutions. Where it is economic to do so we adopt innovative solutions as an alternative to traditional reinforcement.

During the RIIO-ED1 period, we will make targeted investments in network expansion and reinforcement to accommodate the needs of customers against a background of increasing peak demand and energy consumption. This will avoid long-term shortfalls in network capacity.

Our plans are underpinned by a number of key assumptions that are outlined in the following: **Annex C6 – Expenditure** and **Annex C6d – Load Related Investment Strategy**.

Demand growth, including low-carbon technologies (LCTs)

We have to accommodate the peak demands that customers require from our networks. These peak demands often occur for a short period and are not well correlated with customers' overall energy consumption. During the economic downturn we observed the number of units (kWh) distributed falling in some years but the peak demands on the network did not change in the same way.

During RIIO-ED1 we expect to see modest demand growth throughout the period. We anticipate that the main driver of demand growth, particularly during the latter half of the RIIO-ED1 period, will be customer uptake of Low-carbon Technologies (LCT). We based our LCT analysis on Department of Energy & Climate Change (DECC) scenarios, each designed to achieve the Fourth Carbon Budget, and used the model developed by the industry (TRANSFORM) to assess the impact on our networks. Our "best view" of LCT uptake is broadly comparable with DECC's "low" uptake. This represents a change from our July 2013 Business Plan which adopted a "low to medium" uptake forecast.

Forecast of Peak Demand Growth in SPD & SPM

Best view demand growth forecast										
		2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Ave
SPD	Background	0.10%	0.15%	0.15%	0.20%	0.20%	0.20%	0.20%	0.20%	0.18%
	LCT	0.40%	0.42%	0.50%	1.37%	2.05%	1.89%	2.24%	2.31%	1.39%
	Total	0.50%	0.57%	0.65%	1.57%	2.25%	2.09%	2.44%	2.51%	1.57%
SPM	Background	0.25%	0.25%	0.25%	0.50%	0.50%	0.50%	0.50%	0.50%	0.41%
	LCT	0.13%	0.16%	0.24%	0.76%	1.18%	1.15%	1.34%	1.47%	0.80%
	Total	0.38%	0.41%	0.49%	1.26%	1.68%	1.65%	1.84%	1.97%	1.21%

Connections driven reinforcement (DUoS funded)

DUoS Expenditure – Total RIIO-ED1 £m Prime Costs			
	SPD	SPM	Total
Total DUoS funded expenditure	5.0	60.3	65.3
% of total connections expenditure	2.4	18.7	12.3

The resulting demand growth assumptions have been used to model our network reinforcement requirements for the RIIO-ED1 (more detail provided on the Load Related Investment Strategy **Annex C6d – Load Related Investment Strategy**). The primary reason for the slight differences between the two areas is that of the LCT uptake in that the SPD network is anticipated to acquire more heat pump installations than the SPM network.

New Connections growth

SP Energy Networks provides a comprehensive connection services to customers for a wide range of projects. We also facilitate competition in the provision of connections by Independent Connection Providers (ICPs) or Independent Distribution Network Operators (IDNOs).

Where we increase the capacity of existing shared infrastructure to facilitate a new connection, the associated costs are apportioned between the connecting customer and the electricity distribution company (DUoS funded reinforcement).

Annex C6 – Expenditure provides a detailed description of all of our forecast connection activity, covering the DUoS funded and customer funded activities. Our forecast of total market connections activity is informed primarily by market research and stakeholder engagement with the major players in the markets we serve.

Our network areas have experienced significant growth in distributed generation during DPCR5 and we forecast that this will continue throughout the RIIO-ED1 period. This is evidenced by an increase in the number of generation connection quotes issued and accepted over the last 18 months.

Energy Efficiency

We commissioned Frontier Economics to carry out an independent review of the energy efficiency gains contained within the TRANSFORM Model. Our review found that actual energy efficiency gains tend to lag behind policy targets. Therefore, we adjusted the starting point for energy efficiency improvements in the TRANSFORM model.

Triggers for investment

Some network assets have an in-built capability to be "overloaded" for short durations and through careful management it is possible to use this to avoid or defer reinforcement expenditure. However, this can increase overall network risk. This risk is measured via a Load Index (LI) which is based on a comparison of the maximum loading of an asset relative to its rating. When this index is exceeded typically (not always) this will be the

General reinforcement

General Reinforcement Expenditure (£m)						
		£m p.a.			Total	
		DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	Primary reinforcement	5.8	7.8	34%	29.1	62.6
	Secondary reinforcement	4.5	5.5	22%	22.4	43.8
	Total	10.3	13.3	29%	51.5	106.4
SPM	Primary reinforcement	10.4	13.1	25%	52.2	104.5
	Secondary reinforcement	2.4	3.5	46%	11.8	27.7
	Total	12.8	16.5	29%	64.0	132.2
SPEN	Total	23.1	29.8	29%	115.5	238.6

Primary network reinforcement expenditure

Primary Network Reinforcement Expenditure (£m)					
	£m p.a.			Total	
	DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	5.8	7.8	34%	29.1	62.6
SPM	10.4	13.1	25%	52.2	104.5
SPEN	16.3	20.9	28%	81.3	167.1

threshold at which a reinforcement expenditure is incurred.

To date our networks have operated at higher levels of asset utilisation (with less capacity headroom) than for other DNO networks, reducing investment costs to consumers. In DPCR5 we are using a 120% loading threshold to trigger reinforcement expenditure, others are using 100% or less. During RIIO-ED1 we will undertake further reinforcement work to bring us more in line with other DNOs. This change is strongly supported by our stakeholders to future-proof our networks and manage risk.

Mid Wales Wind Farms

In Mid Wales we are facilitating a Wind Farm development consisting of eight contracted parties with a total of 631MW of export capacity at a total cost of approximately £60m. SPM have an agreement with National Grid (NG) to establish a new 400/132kV substation (Mid Wales Hub), with the proposed boundary between SPM and NG being the outgoing side of the proposed 132kV switchboard.

To connect the Wind farms to the Hub it is proposed for SPM to establish four new 132kV radial circuits. The project is predominantly customer funded with the costs apportioned between the eight developers on a capacity basis. However, there is uncertainty surrounding the final ownership boundary (initiated by NG) and a risk of one or more developers terminating their agreement which may increase the scope and cost of the SPM works resulting in additional charges being redistributed between the remaining developers and increased proportion of DUoS funded works.

General Reinforcement

We forecast an expenditure of £167.1m on primary network reinforcement, with £115.8m (70%) of this covered by cost benefit analyses.

In the process of developing our individual schemes, we have considered a variety of alternatives which have included different network configurations, the use of innovative/smart alternatives, as well as conventional solutions. An example of a scheme where the CBA approach has highlighted the economic use of an alternative approach is:

- *Crewe 132kV – we have opted to use a phase shifting transformer to allow for the connection of two independent groups which cannot normally be interconnected due to the system phase shift. This is a novel technology which has not been installed on the SPEN*

Secondary network reinforcement

Secondary Network Reinforcement Expenditure (£m)						
		£m p.a.			Total	
		DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	11kV	2.9	3.7	31%	14.3	29.9
	LV	1.6	1.7	7%	8.1	13.9
	Total	4.5	5.5	22%	22.4	43.8
SPM	11kV	1.6	2.5	64%	7.8	20.4
	LV	0.8	0.9	12%	4.1	7.3
	Total	2.4	3.5	46%	11.8	27.7
SPEN	Total	6.8	8.9	31%	34.2	71.5

network and is heavily informed by the 33kV Quad booster trial being undertaken by UKPN LCNF project – Flexible Plug and Play. This approach avoids the need for the normal solution which would be the construction of a new 132kV circuit to connect different groups. Compared to the conventional approach, this offers a NPV of £11.04m benefit over a 45 year period against the baseline.

Using innovative smart alternatives has reduced our primary network load plans by £40m.

Further information on the alternatives considered can be found in our **Annex C7 – Smart Grid Strategy**.

Network reconfiguration

In SP Distribution our plans include two schemes costing £9m to reconfigure our 33kV network to improve the supply arrangements and to provide additional circuit capacity to allow these substations to operate to their full potential to match our future load forecasts.

Voltage uprating

A proportion of our HV distribution network in SPM and SPD is operated at a voltage level of 6.6kV. The 6.6kV system is a legacy from the early development of the distribution system. Modern networks are constructed to operate at 11kV and we are seeking to continue a phased replacement of more of the 6.6 kV network in ED1 to release additional latent capacity with the benefit of also reducing system losses, at a cost of £16m.

System voltage performance

Within the RIIO-ED1 period, we will undertake nine projects at an approximate cost of £22m to resolve unacceptable voltage step conditions at the identified locations. Where practicable, we will be progressing technological solutions as opposed to conventional methods provided the solution provides sufficient headroom for future development.

Reinforcement expenditure on the secondary (HV and LV) networks has tended to be required to meet specific issues identified by single customers such as voltage complaints. Whilst the run-rate of historic expenditure is expected to continue, during the next 10 years we also expect the adoption of LCT will become the main driver for investment in the HV and LV network. The additional LCT related expenditure has been calculated using the TRANSFORM model.

Fault level reinforcement

Fault Level Reinforcement Expenditure (£m)					
	£m p.a.			Total	
	DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	3.1	3.3	6%	15.4	26.2
SPM	3.0	2.9	-6%	15.2	22.9
SPEN	6.1	6.1	0%	30.7	49.1

Transmission Connection Points

Transmission Connection Point Expenditure (£m)					
	£m p.a.			Total	
	DPCR5	RIIO-ED1	% change	DPCR5	RIIO-ED1
SPD	0.0	1.0	-	0.0	7.8
SPM	0.0	0.0	-	0.0	0.0
SPEN	0.0	1.0	-	0.0	7.8

The introduction of Smart Meters and additional network monitoring will help us to identify voltage problems or overloading more accurately than in the past. Our secondary network reinforcement investment includes the provision of 1300 secondary substation monitors. This will allow us to monitor the majority of LCT clusters that we are anticipating in our forecasts.

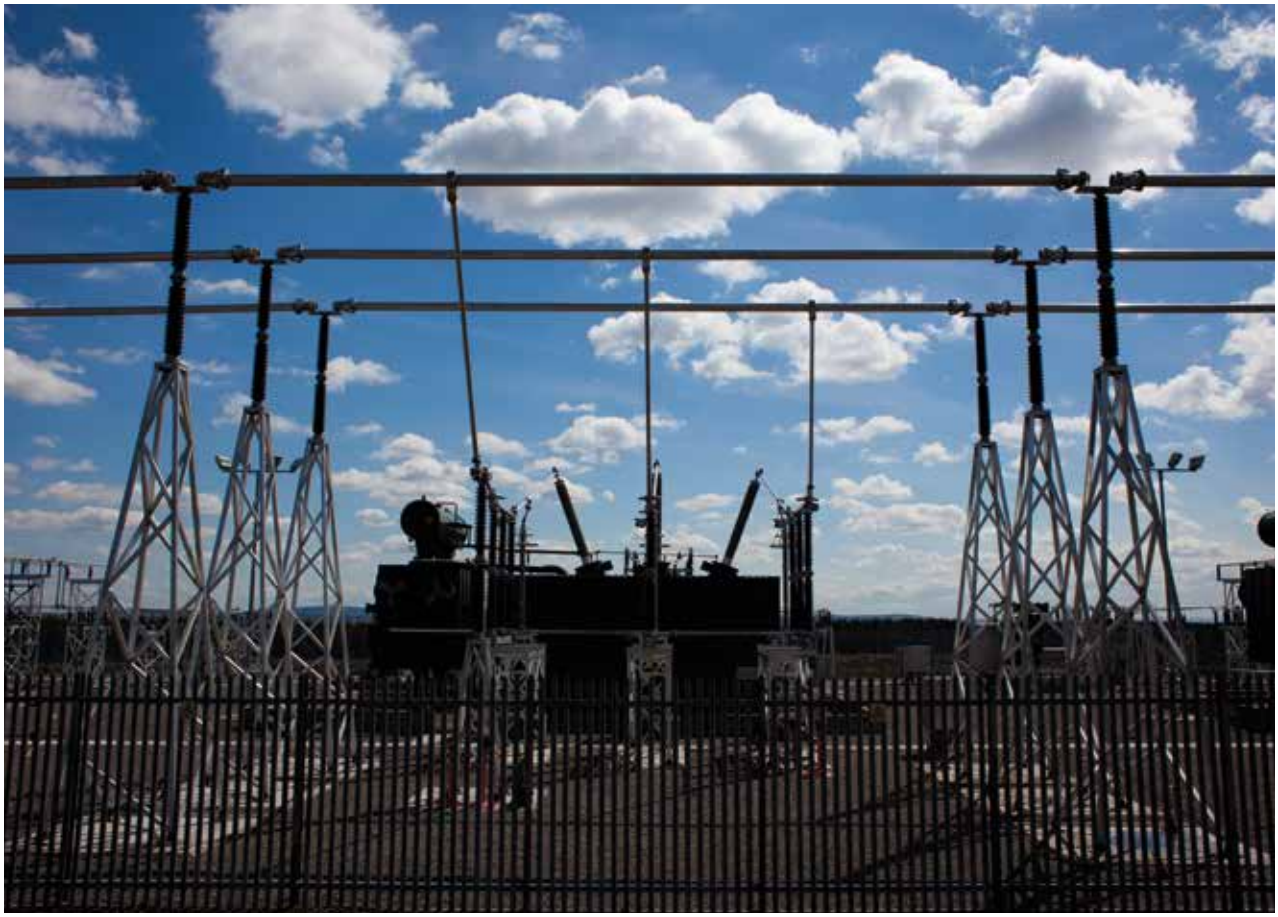
Fault Level Reinforcement

£27.3m of our fault level reinforcement expenditure forecast is covered by cost benefit analysis.

When faults occur in the network it is possible for large amounts of fault current to flow through the system until this is interrupted by switchgear. Whilst the network has been designed to cater for these flows, it is possible from the increase in embedded generation and large motors connecting to the distribution network that the capability of the switchgear can be exceeded. This can lead to an increased risk of catastrophic failure of the switchgear when it operates. SPEN, like other Distribution Network Operators has a duty of care towards our employees and members of the public to ensure that they are not at risk of injury arising from failure of our assets.

Following the successful development of a fault level monitoring device through our innovation trials which commenced in 2010, we will improve our assessment of this risk by deploying a monitor to key in order that we have a robust and justified business case for investment to resolve fault level issues. This initiative is supported by our cost benefit analysis and will enable us to optimise our investment plans by more accurately tracking the development of fault level toward the switchgear rating.

During the ED1 period, we will undertake twenty five projects with an approximate total of £49m to address fault level issues.



Transmission Connection Points

Our distribution networks are connected to the transmission network via Transmission Connection Points (TCPs).

In Scotland, where transmission incorporates the 132kV system, we tend to have more Grid Supply Points with lower capacities. Following work carried out by SP Transmission during RIIO-T1, a number of sites were identified which would require reinforcement to increase capacity. This has been backed up by our more recent analysis and it is proposed that during RIIO-ED1 (and RIIO-T1) the existing grid transformers at Bonnybridge, Cupar, Galashiels, Sighthill and Strathleven will be replaced by higher capacity units. We have also aligned our asset replacement plans with upgrades at Sighthill and Strathleven to minimise overall costs.

Based on analysis for RIIO-ED1, it is our intention to establish additional Connection Points at Tongland, Ecclefechan and Norham due to capacity constraints within the existing distribution network.

Within SPM, two GSPs will be subject to National Grid works within the RIIO-ED1 period (Carrington and Legacy). Neither of these will require investment funding in RIIO-ED1 as the associated costs will be covered by annual transmission exit charges. We are aware of other proposals which may affect TCPs however none of these have sufficient certainty for us to include them within our plan and the timing is likely to be in RIIO-ED2.

Additional detail is provided in **Annex C6 – Expenditure**.

e. Non-Load Related Expenditure (NLRE)

Health and Criticality Index descriptions:

HI Category	Description
HI1	New or as new
HI2	Good or serviceable condition
HI3	Deterioration requires assessment and monitoring
HI4	Material deterioration, intervention requires consideration
HI5	End of serviceable life, intervention required

CI Category	Description
C1	Less than 75% of the average overall consequence of failure
C2	Between 75% and 125% of the average overall consequence of failure
C3	Between 125% and 200% of the average overall consequence of failure
C4	Greater than or equal to 200% of the average overall consequence of failure

Building our plans

Non-load related expenditure (NLRE) refers to the investments required for the replacement, refurbishment and life extension of the assets used on our networks.

The process we have used to develop our non-load related investment involved the following steps.

- *Analysis of the health of our assets and the consequence of failure to quantify risk*
- *Compliance with legal and safety obligations*
- *The opinions of our stakeholders*
- *Deterioration modelling to understand changing asset health and performance over time*
- *Reviewed the intervention options available using Cost Benefit Analysis to assist decisions*

Asset Health and Criticality Indices

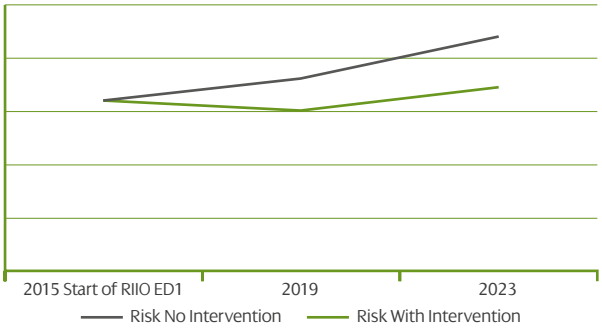
Our investment plans are based on the condition of our assets and the consequences if they should fail. We assess these factors in a structured way, using a comprehensive Health Index methodology to categorise assets based on their condition.

New to the RIIO-ED1 period is the development of a Criticality index to reflect the consequence of failure.

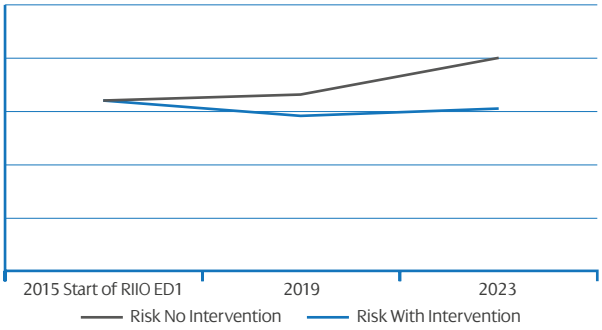
By combining these indices, we are developing a detailed understanding of asset risk across the components that make up our network and this allows us to target our investment programmes on making the most cost-effective risk reduction interventions.

Further details of our approach to Health and Criticality assessment is set out in **Annex C6b – Asset Health & Criticality Approach**.

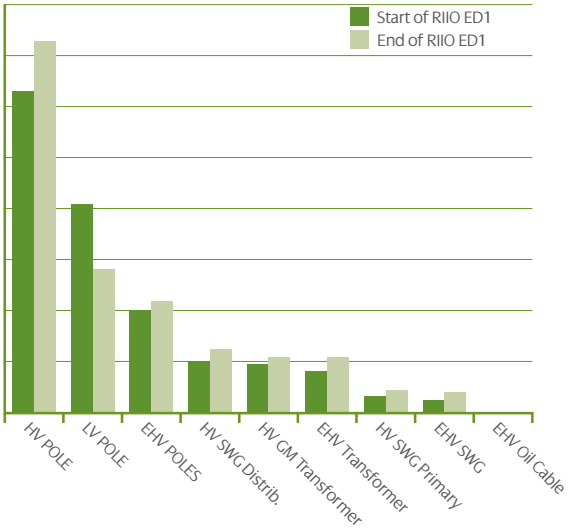
SPD Overall Risk – Reported Assets



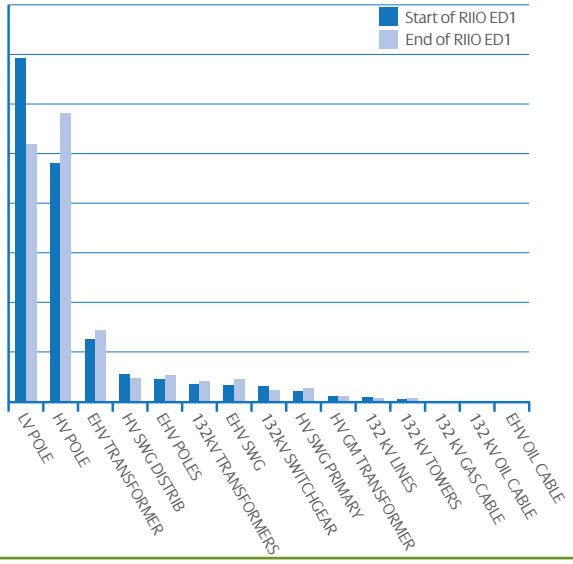
SPM Overall Risk – Reported Assets



SPD Comparative Asset Risk – (Risk x Volume)



SPM Comparative Asset Risk – (Risk x Volume)



Asset Risk

The charts above outline the comparative risk at the start and end of the RIIO ED1 period both with and without investment.

The comparative risk between asset classes uses the same methodology but separates the cumulative risk out by asset class. It can be seen that assets with relatively low individual risk can have a large overall impact where the population is high, for example wood pole assets.

Legal and Safety

Safety is at the forefront of everything we do, and we are fully committed to managing public safety and complying with HSE regulations. We work closely with the Health and Safety Executive in the development of programmes to address areas of increasing risk.

We have assessed our legal and safety risks to ensure that our plan delivers a tolerable level of risk.

Stakeholders

Stakeholders have been engaged from the outset in setting the priorities for our plans and also in calibrating particular investment programmes designed to meet these priorities. We provide more detail on incorporating the views of stakeholders into our plans in the supplementary **Annex B3 –Stakeholder Engagement**.

Deterioration modelling

To determine our network investment needs, we have considered both the current condition and performance of our network assets and how we expect these to deteriorate over time. We have used long-term age-based modelling to develop future capital expenditure volume forecasts and predict potential peaks in workload.

Our age based modelling methodology complements the detailed condition assessment process, enabling immediate and longer-term risks to be adequately managed. The asset replacement model records information relating to age, voltage and circuit parameters for the different categories of assets employed on our networks.

We have modelled age-based deterioration in two ways:

- *We have applied our view of an average asset life to each asset category to determine future long-term replacement volumes. The asset life has been determined using a combination of:*

- *industry available information*
- *knowledge gathered from our own activities*
- *independent reviews by leading industry consultants*
- *We have also used actual historic replacement volumes to provide an inferred asset life which is then used to predict future replacement volumes. This approach provides a view based on the continuation of historical trends and provides a useful comparison with the first approach.*

Techniques and approaches for predicting asset deterioration continue to evolve. During planned interventions such as maintenance and repairs, and through the application of condition monitoring equipment we will continue to enhance our knowledge of asset condition and deterioration.

Selecting intervention options

Manufacturers specify the nominal design life for network assets under typical operating conditions. Within our regions, the environment within which our assets operate can vary significantly from exposed coastal and mountainous areas to relatively benign inland urban areas. The prevailing environmental conditions together with the service duty (e.g. number of operations) placed on an asset can all have an impact on its actual life, meaning that some assets last for either a longer or shorter time than their nominal life expectancy.

In circumstances where it is technically feasible and economic, we extend the life of our assets through refurbishment or retrofit. This involves replacing part of the asset with new components. In some situations, it is possible to introduce a new "modern equivalent" component that has additional advantages such as improved functionality or performance.

Where assets have failed or reached the end of their working life, and cannot economically be refurbished or repaired, we replace them with their modern equivalent. This can involve adopting new technology. Examples of this include replacing oil filled switchgear with SF6 or vacuum types, replacing gas-compression and oil-filled cables with modern cross-linked polyethylene (XLPE) cable, and replacing electro-mechanical control relays with digital equipment, offering significant improvements in functionality and performance.

Identifying investment requirements

We have undertaken an extensive exercise taking account of the current condition and performance of our asset base, its consequences of failure, how it will deteriorate over time, the views of our stakeholders and our legal obligation to identify the most appropriate set of interventions to make during the ED1 period.

Given the long-term nature of our business, this analysis has been conducted over a period spanning a number of price controls in order to ensure that the interventions we are looking to make in ED1 represent the optimal plan.

In undertaking this work, we have used our specialist Asset Stewardship Groups which bring together asset management, design, operational and delivery experts for each asset class to consider all of the relevant factors to determine our plan.

As part of this work, we have also undertaken a comprehensive suite of cost benefit analyses (CBAs) to ensure that we are investing in the right solutions on the right assets at the right time. These are listed in our **Annex C6m – Cost Benefit Analysis**.

Forecasting method for each asset category

The method used to forecast our volumes for the RIIO-ED1 Business Plan for each asset is summarised in the table below.

Forecasting method by asset type	
Asset	Forecasting method
UG- LV main (Consac)	Removal of remaining volume
UG- LV main (Paper)	Forecast on fault rates and replacement run-rate
UG- LV main (Plastic)	Forecast on fault rates
UG- LV service	Forecast on fault rates and replacement run-rate
UG- HV and 33kV cable	Forecast on fault rates and replacement run-rate
UG- 132kV cable	Circuit specific condition and performance
OH- LV Services	Forecast on fault rates and replacement run-rate
OH- LV conductor	Forecast on replacement run-rate
OH- HV and 33kV conductor	Forecast on condition and resilience requirement
132kV conductor	Economic replacement age and condition related forecast
OH- LV, HV, 33kV and 132kV pole	Forecast on condition and resilience requirement
OH- Pole refurbishment	Forecast on fault rate and historic delivery levels
OH- Tower replacement	Circuit specific condition
OH- Tower refurbishment	Circuit specific condition
OH- Tower fitting replacement	Circuit specific condition
OH- Tower painting	Circuit specific condition
OH- Tower foundation	Circuit specific condition
SG- Cut-out replacement	Forecast on fault rates and replacement run-rate
SG- Link boxes and pillars	Forecast on fault rates and replacement run-rate
SG- HV and 33kV switchgear	Forecast on condition
SG- 132kV switchgear	Forecast based on-site specific condition
Tx- HV GM	Forecast linked to RMU replacement and losses reduction requirement
Tx- HV pole mounted	Forecast linked to OH refurbishment
Tx- 33kV and 132kV transformers	Forecast on-site specific condition
PR- Batteries	Forecast on replacement run-rate and black start requirement
Civil driven by Asset replacement	Directly driven from plant asset replacement activity
Civil driven by condition (HV)	Forecast based on historic activity levels
Civil driven by condition (33kV and 132kV)	Forecast based on-site specific condition

Asset replacement and refurbishment

Overview

Many of our assets were installed in the 1950s and 1960s and as a consequence we require to proactively manage an ageing asset base to ensure the safe and reliable operation of our network for all customers. During the current regulatory period we have invested in systems and developed processes to improve our understanding of the health of our asset base.

Condition assessments are carried out through regular inspections and maintenance activities to inform our plans. Network investment is prioritised through consideration of criticality to where it is required most and has the greatest benefit to our customers.

Asset Type	ED1 % Turnover per annum	
	SP Distribution	SP Manweb
Low voltage cut-outs	0.3%	0.2%
Low voltage underground service cable	0.03%	0.07%
Low voltage underground mains cable	0.05%	0.04%
High voltage underground cable	0.1%	0.2%
33kV underground cable	0.3%	0.3%
132kV underground cable	N/A	0.8% fluid filled cable
Low voltage overhead services	0.7%	0.4%
Low Voltage main overhead conductor	2%	2%
High Voltage overhead conductor	1%	1%
LV, HV, 33kV and 132kV wood poles	2%	2%
33kV and 132kV overhead pole conductor	1%	1%
33kV and 132kV overhead tower conductor	14%	5%
33kV and 132kV tower replace/refurbish	13%	8%
Low voltage plant in substations	0.2%	0.1%
Low voltage substation pillars	0.3%	1.2%
Low voltage link boxes and street pillars	1.5%	1.4%
Low voltage link box refurbishment	1.5%	2.8%
HV ground mounted switchgear replace	1.1%	1.8%
HV ground mounted switchgear refurbish	0.6%	0.3%
HV and 33kV Pole mounted switchgear replace	1.6%	1.0%
33kV ground mounted switchgear	2.2%	1.9%
132kV ground mounted switchgear	N/A	2.3%
HV ground mounted transformers	0.6%	0.9%
HV pole mounted transformers	0.6%	0.6%
33kV and 132kV transformers replace	1.0%	1.6%
33kV and 132kV transformers refurbish	1.5%	0.8%
Battery replacement	2.4%	12.1%

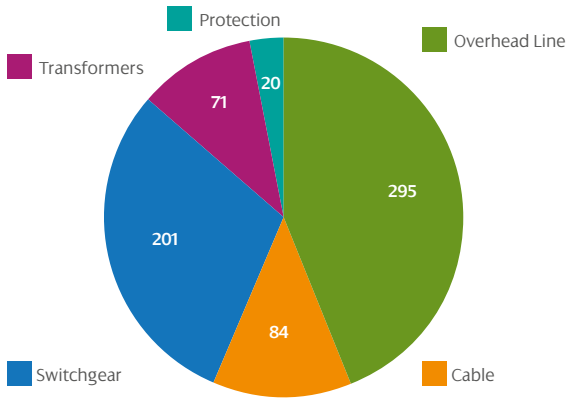
Asset Replacement and Refurbishment Expenditure Forecast Summary

The following charts summarise our investment across the different types of asset for replacement and refurbishment interventions and provides a comparison with DPCR5 investment.

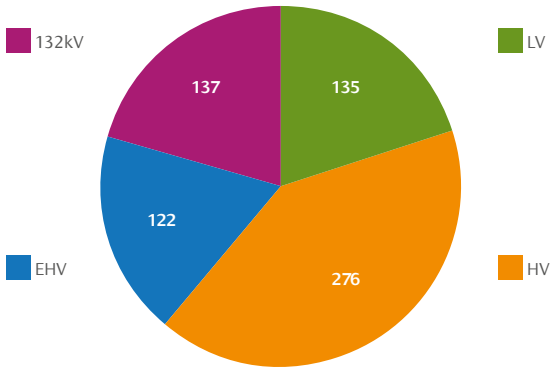
Asset replacement is spread across all voltages with most expenditure on the HV network and overhead lines where the largest impact on reliability and availability is seen by customers.

Asset Replacement Expenditure	DPCR5		RIIO -ED1				% Change Per Annum	
	Per Annum		Total		Per Annum			
	SPD	SPM	SPD	SPM	SPD	SPM	SPD	SPM
LV Overhead Pole line	2.339	5.268	21.74	41.82	2.72	5.23	16%	-1%
LV Main and service (UG)	1.21	2.67	11.47	17.20	1.43	2.15	18%	-19%
LV Plant	2.51	1.79	16.28	13.88	2.03	1.74	-19%	-3%
Cut-out (Metered)	1.20	0.63	7.58	4.99	0.95	0.62	-21%	-2%
HV Overhead Pole line	7.10	6.41	73.37	67.88	9.17	8.48	29%	32%
HV UG Cable	0.88	1.19	10.25	13.65	1.28	1.71	45%	43%
HV Switchgear	5.07	9.25	32.43	49.41	4.05	6.18	-20%	-33%
HV Transformer	0.997	1.480	5.42	6.58	0.68	0.82	-32%	-44%
33kV Overhead Pole line	2.89	0.84	14.08	9.59	1.76	1.20	-39%	42%
33kV Overhead Tower line	0.02	-	5.32	4.96	0.66	0.62	4091%	
33kV UG Cable	0.98	0.89	6.85	5.83	0.86	0.73	-13%	-18%
33kV Switchgear	1.91	2.30	13.25	29.01	1.66	3.63	-13%	58%
33kV Transformer (GM)	2.37	1.96	15.59	15.41	1.95	1.93	-18%	-2%
132kV Overhead Pole line	-	0.602	-	11.45	-	1.43		138%
132kV OH Tower line	-	1.34	-	44.35	-	5.54		315%
132kV UG Cable	-	3.75	-	18.54	-	2.32		-38%
132kV Switchgear	-	7.27	-	33.84	-	4.23		-42%
132kV Transformer	-	2.647	-	27.83	-	3.48		31%
Batteries	0.12	0.46	1.01	3.48	0.13	0.43	3%	-5%
Pilots	1.19	0.96	6.59	8.89	0.82	1.11	-31%	15%
Total	**30.8**	**51.7**	**241.2**	**428.6**	**30.2**	**53.6**	**-2%**	**4%**

Asset Replacement expenditure £m by Asset

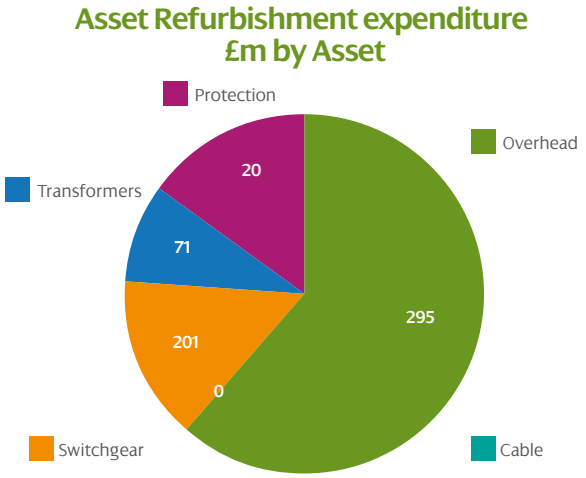


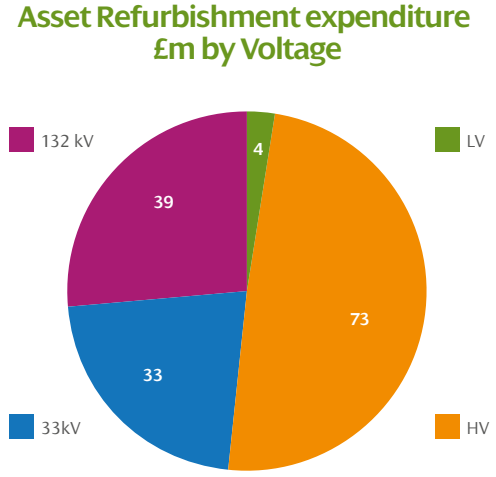
Asset Replacement expenditure £m by Voltage



Asset refurbishment is spread across the higher voltage assets with most expenditure on the HV network (switchgear and pole refurbishment) and overhead lines (towers and pole refurbishment).

Asset Refurbishment Expenditure	DPCR5		RIIO -ED1				% Difference Per Annum	
	Per Annum (£m)		Total (£m)		Per Annum (£m)			
	SPD	SPM	SPD	SPM	SPD	SPM	SPD	SPM
LV Poles	-	-	0.66	1.36	0.08	0.17		
6.6/11 kV Poles	4.02	3.58	20.19	19.07	2.52	2.38	-37%	-33%
HV Transformer (GM)	-	0.11	-	6.30	-	0.79		635%
6.6/11kV CB (GM) Primary	0.02	0.04	9.22	9.27	1.15	1.16		
6.6/11kV RMU	-	-	1.15	0.14	0.14	0.02		
33kV Pole	0.39	0.43	3.38	2.25	0.42	0.28	8%	-34%
33kV Tower	-	-	1.47	1.35	0.18	0.17		
33kV Tower Painting	-	-	1.10	1.77	0.14	0.22		
33kV Tower Foundation	-	-	2.52	3.07	0.32	0.38		
33kV Transformer (GM)	0.24	-	3.67	1.74	0.46	0.22	92%	
33kV UG Cable (Oil)	-	-	0.08	-	0.01	-		
132kV Tower	-	2.25	-	8.03	-	1.00		-55%
132kV Tower Painting	-	0.47	-	8.34	-	1.04		120%
132kV Tower Foundation	-	0.03	-	16.21	-	2.03		
132kV Transformer	-	-	-	1.53	-	0.19		
132kV UG Cable (Oil)	-	-	-	0.08	-	0.01		
HV Protection	-	0.00	3.10	4.17	0.39	0.52		
EHV Protection	0.17	0.27	4.96	5.54	0.62	0.69	267%	157%
132kV Protection	-	0.21	-	4.42	-	0.55		158%
LV Plant	0.04	0.34	0.38	1.52	0.05	0.19	26%	-44%
Total	**4.9**	**7.7**	**51.9**	**96.2**	**6.5**	**12.0**	**33%**	**56%**





Long-Term Strategy

Our long-term strategy to manage our assets takes account of the following likely outcomes:

- *Increasing requirement to manage asset degradation arising from ageing of our asset bases*
- *Higher expectations for network reliability and availability as customers become more dependent on electricity for heating and transport*
- *Continued downward pressure on customer bills*
- *Increasing frequency of extreme weather events and the consequent need to make the networks more storm resilient*
- *Availability of increasing amounts of smart metering and network data (end ED1/ ED2)*
- *More stringent environmental requirements*

Our **Annex C6 – Expenditure** provides a longer-term view of our forecast asset replacement over the next 30 year period.

Further detail including age profiles, comparison to historic and future asset replacement levels, and impact on asset health and criticality can be found in our **Annex C6 – Expenditure** and the associated supplementary annexes.

Detail of Asset Replacement and Refurbishment Expenditure

Detail of the expenditure, volumes and relevant information for each asset category is provided below. Further detail including age profiles, comparison to historic and future asset replacement levels, and impact on asset health and criticality can be found in our **Annex C6 – Expenditure** and the associated supplementary annexes, which are referred to where appropriate.

We are responding in the following ways:

Investment	Deploying more asset life extension through refurbishment as an alternative to replacement Rationalising legacy network issues, for example uprating our 6.6kV networks to 11kV Developing enhanced resilience to natural (storms, floods) and man-made events (cyber security) Increasing standardisation of assets within the Iberdrola Group and broadening the supply chain to increase competition between our suppliers and enlarge delivery capacity Implementing stringent energy loss reduction, oil and SF6 leakage requirements in our specifications
Skills/ Resources	Retaining core delivery capability in-house which will be supplemented by contractor resources to meet peak periods of workload Levering the benefits of access to resources and knowledge across an international group (for example, on smart meter deployment) Strongly supporting learning and implementing best practice from external sources or from within the Iberdrola Group
Innovation Priorities	Developing enhanced condition monitoring and network automation Integrating data management and analysis tools for large data sets into existing and new corporate systems (e.g. smart meter data for enhanced network planning processes and quantification of losses) Developing new approaches to maximise asset lives and defer asset replacement

LV Main (UG Consac) (Mean implied life on asset turnover 59 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure £m
SPD	8km	12.5%	0	0.0

LV Main (UG Paper) (Mean implied life on asset turnover 101 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	64km	0.05%	0	0.0
SPM	32km	0.04%	0	0.0

LV Main (UG Plastic) (Mean life on asset turnover 101 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	0	0%	109km*	8.0
SPM	0	0%	128km*	9.5

** Includes undergrounding of low voltage overhead lines and replacement of Consac and Paper cable types*

LV Service (UG) (Mean implied life on asset turnover 99 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	3,200	0.03%	3,200	3.4
SPM	7,192	0.07%	7,192	7.7

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
LV Cable	SPD	0.5	2.7	1.0	8.0	88%
	SPM	0.7	3.5	1.2	9.5	70%
LV UG Services	SPD	0.7	3.4	0.4	3.4	-37%
	SPM	1.8	9.2	1.0	7.7	-48%
Total		3.8	18.8	3.6	26.7	-5%

Underground Cables

LV Underground Cables

At the end of DPCR5, we will have 8km of Consac cable left in service in SPD, which was installed in the 1970s across the industry and due to poor performance, is being progressively removed. We will remove the remaining 8km of this cable type and replace it with modern plastic insulated cables.

We have 14,953km of paper insulated cable installed in SPD and 10,988km in SPM.

We replace this cable type with modern plastic insulated cable only when we experience multiple failures and identify poor condition cable sections.

We have 8698km of plastic insulated cable installed in SPD and 6,039km in SPM. This cable type has been installed since the late 1970s and operates reliably. When we replace other LV cable types described above, or underground LV overhead lines described later, we will install this type of cable.

LV service cables connect individual properties to the LV main cables to supply individual customers. We have 1.38 million properties supplied with an underground service in SPD and 1.32 million in SPM. When we identify that a service cable is in poor condition, we will replace the service. The volume replaced is a very small percentage of the population. We are forecasting an upturn in volume required as the cable ages. A proportion of new underground cable associated with our LV overhead line modernisation programme is also included. Investment in replacing LV underground services is forecast to continue at historic average rates, the difference below relates to improved reporting to separate LV overhead service modernisation.

6.6/11kV UG Cable				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	96	0.1%	96	10.3
SPM	128	0.2%	128	13.6

Asset Replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
11kV Cable	SPD	0.9	4.4	1.3	10.3	45%
	SPM	1.2	6.0	1.7	13.6	43%
Total		2.1	10.4	3.0	23.9	44%

HV Underground Cables

We have 12,361km of HV cable in SPD and 7,180km in SPM. We have found that around 40% of cable faults occur on 10% of our 11kV cable circuits. Replacement of entire circuits is costly. Through analysis of historical faults we target replacement of poorly performing parts of these circuits to manage overall failure rates near national average. Investment increases from historic rates to maintain our cable fault rate as the asset deteriorates.

33kV UG Cable (Non Pressurised)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	48	0.2%	48	6.9
SPM	41	0.3%	41	5.8

Asset Replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
33kV Cable	SPD	1.0	4.9	0.9	6.9	-12%
	SPM	0.9	4.4	0.7	5.8	-18%
Total		1.9	9.3	1.6	12.8	-15%

33kV Underground Cables

We have 2,276km of non-pressurised 33kV cable installed in SPD and 1,790km in SPM. This type of cable has been widely used across the industry and installed for many years. We have found that around 40% of cable faults occur on 10% of our 33kV cable circuits. Replacement of entire circuits is costly. Through analysis of historical faults we target replacement of poorly performing parts of these circuits to manage overall failure rates near national average. SPEN has 29km of fluid filled 33kV cable installed in SPD and 1km in SPM. The 29km of cable is performing well so no replacement of this type of cable is planned for ED1. Volumes of 33kV cable replacement continue at DPCR5 levels and investment reduces marginally in ED1.

132kV UG Cable (Non-pressurised) (Mean implied life 59 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure £m
SPM	0km	0	19km	18.5

132kV UG Cable (Oil) (Mean implied life 61 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	11km	0.8	0	0

132kV UG Cable (Gas) (Mean life 45 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	5	0	5%	0

Asset Replacement, Refurbishment		DPRC5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV Cable	SPM	3.8	19.0	2.3	18.6	-39%

132kV Underground Cables

SPEN has 50km of non-pressurised 132kV cable installed in SPM. This cable type has been installed since the 1990s and operates reliably. When we replace other 132kV cable types we install this type of cable. Within the volume added, there are 3km as a consequence of 132kV plant replacement.

We have 170km of fluid filled 132kV cable installed in SPM. This cable type was installed from 1950 to the early 1990s. This cable is generally reliable. The Kirkby/Gillmoss/Fazakerley/Bootle circuit (10.8km in length) has an oil leakage rate that is 10 times the average and accounts for 50% of the total oil leakage from our 132kV cables and will be replaced with a modern non fluid filled cable.

SPEN has 27km of gas compression 132kV cable installed in SPM, 19km of British manufactured gas compression cable installed in 1967 that is extremely unreliable and 7.5km of German manufactured gas compression cable installed in 1991 that is reliable. By 2015 we will have replaced 14km of the British cable type and the remaining 5km will be replaced in ED1.

Overall the annual spend on 132kV cable reduces from DPCR5 levels.

Rising Mains		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Rising Mains	SPD	10.7	53.7	10.1	81.1	-6%
	SPM	4.2	21.0	4.9	39.0	16%
Total		14.9	74.7	15.0	120.1	0%

Rising Mains and Laterals

The Rising and Lateral Mains (RLM) modernisation programme is specifically targeted at an ageing legacy asset installed within multi-occupied properties in both licensed areas. Our ED1 submission represents a continuation of our established programme, reducing the public safety risk associated with equipment situated in all areas of the customer's property.

The relative size of these programmes differs between our licences significantly due to the higher proportion of properties in the SPD network area served by RLMs.

LV Service (OHL) (Mean life 70 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure
SPD	2,400	0.7%	2,400	2.8
SPM	4,000	0.4%	4,000	4.7

LV, HV, 33kv and 132kV Poles Replacement (mean life 60 years)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure
SPD	44,040	2%	43,144	61.2
SPM	49,347	2%	47,662	67.7

LV, HV, 33kV Pole refurbishment			
Licence	Average Population Refurbished (% per annum)	RIIO-ED1 Assets Refurbished	RIIO-ED1 Expenditure (£m)
SPD	3%	63,136	24.2
SPM	3%	58,512	22.7

Overhead Lines

Further detail including age profiles, Cost Benefit Analysis, comparison to historic and future asset replacement levels, and impact on asset health and criticality can be found in our **Annex C6 – Expenditure** and the associated supplementary annexes, which are referred to where appropriate.

LV Service (overhead)

Overhead line services connect individual properties to the LV network to supply individual customers. We have around 123,000 properties supplied with an overhead service in SPD and around 45,000 in SPM. When we identify that a service is in poor condition we will replace the service. The volume replaced is a very small percentage of the population.

LV, HV, 33kV and 132kV OHL Poles

We have around 288,000 wooden poles in SPD and 317,000 in SPM. We inspect our poles regularly to assess their condition and suitability for purpose and replace them for the following reasons:

- *Condition has deteriorated and the pole is a Health Index 5*
- *The height of the pole is not adequate to meet latest minimum statutory clearances*
- *The overhead line is not adequately robust for the local weather conditions*

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV Pole Replacement	SPM	0.0	0.0	0.7	5.4	N/A
33kV Pole Replacement	SPD	1.0	5.2	1.1	8.6	3%
	SPM	0.2	1.2	0.7	5.7	195%
11kV Pole Replacement	SPD	3.7	18.6	5.5	43.8	47%
	SPM	4.1	20.7	5.1	40.4	22%
LV Pole Replacement	SPD	1.1	5.5	1.1	8.9	0%
	SPM	2.7	13.3	2.0	16.1	-24%
Total	SPEN	12.9	64.6	16.1	128.9	25%

To maximise life, it is sometimes possible to treat a wooden pole with Boron which extends the life of the pole for around 10 years

When poles are replaced the fittings at the top of the pole are also replaced and this is included in the cost of the pole replacement. We also replace poor condition fittings on poles that do not need replacing and in this case we include the costs in our pole refurbishment plans.

LV Main (OHL) Conductor				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	505	2%	460	10.0
SPM	1,060	2%	964	20.9

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
LV Pole Line Conductor Replacement	SPD	1.2	6.2	1.3	10.0	2%
	SPM	2.6	12.9	2.6	20.9	1%
Total	SPEN	3.8	19.1	3.9	30.9	1%

6.6/11kV OHL (Conventional Conductor)				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	1,521	1%	1,521	29.6
SPM	1,414	1%	1,414	27.4

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
11kV Pole Line Conductor Replacement	SPD	3.4	16.8	3.7	29.6	10%
	SPM	2.3	11.3	3.4	27.4	51%
Total	SPEN	5.6	28.2	7.1	57.1	27%

LV Main OHL conductor

Much of our LV overhead line network was originally installed following electrification in the 1940s and 1950s. In our SPD license area we have 3,067km of main lines at LV and in SPM this is almost double, at 6,601km. The vast majority of our LV overhead line network is constructed to an open wire design. Some conductors were fabric and/or rubber insulated but this has deteriorated (for example, due to exposure to daylight/UV) and cannot be relied upon for safety and is also prone to damage from trees and windborne debris.

ABC (Aerial Bundled Conductor) is now our standard installation for new and modernised LV overhead lines, as the wires are fully insulated making it a safer and more weather resilient option. Due to physical restrictions and the visual improvement offered, in about 8% of cases, we remove the OHL in villages and replace it with underground cables. This is not feasible everywhere because of the cost but does provide performance benefits for some rural customers.

Investment in LV OHL mains conductor and poles continues at a consistent rate of 2% per annum.

HV Main OHL conductor

In our SPD licence area we have 13,691km of main lines at LV and in SPM this is almost double, at 12,218km. HV conductor is generally reliable and will remain in service for many years.

We replace conductor when we rebuild a circuit which was not originally designed and built to modern resilient specifications. We have a small population of particularly poor performing and non-standard conductors. Removing poorly performing Steel and Simalec (aluminium) conductors of which we have 150km in SPD and 153km in SPM will provide more reliable supplies to rural customers.

33kV and 132kV OHL (Pole Line) Conductor				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	216	1%	216	5.5
SPM	152	1%	194	10

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV & 33kV Pole Line Replacement	SPD	1.8	9.2	0.7	5.5	-63%
	SPM	1.2	6.0	1.2	9.9	3%
Total	SPEN	3.1	15.3	1.9	15.4	-37%

33kV and 132kV OHL (Tower line) Conductor				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	160	12.5%	160	3.8
SPM	516	5%	472	32.4

33kV and 132kV OHL pole line conductor

33kV and 132kV conductor on pole lines is generally reliable and will remain in service for many years. We replace conductor when we rebuild a circuit which was not originally designed and built to an adequate resilient specification or when the condition of the conductor has deteriorated. We have no existing 132kV pole lines that require investment in the ED1 period but we will be rebuilding a poor condition 45km 132kV steel tower line as a pole line.

33kV and 132kV overhead tower line conductor

Aluminium conductor with galvanised steel reinforced core (ACSR) has been utilised on 33kV and 132kV high voltage overhead lines for over 80 years. The design of this type of conductor, with its differing metallic elements, is susceptible to galvanic corrosion (attacking the galvanising on the steel core) which is heavily influenced by the weather and atmospheric pollutants.

The majority of the 132kV distribution overhead network was constructed from the 1930s through to the 1970s with the bulk of the network constructed in the 1950s & 60s. Our CBA analysis shows that the most economic time to replace conductor is before it degrades to a point where tension stringing can no longer be achieved.

To address this aging asset SPEN has built or rebuilt 40% of its 132kV overhead line network in the last 20 years, however the age profile of our asset base requires increased investment.

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV & 33kV Tower Line Conductor Replacement	SPD	0.0	0.1	0.5	3.8	N/A
	SPM	0.9	4.3	4.1	32.4	368%
Total	SPEN	0.9	4.4	4.5	32.4	N/A

In both our licence areas we have invested little in 33kV tower line conductor and investment in this asset is forecast to increase over the RIIO-ED1 period and then reduce. In SPM the 132kV tower line conductor investment will increase in RIIO-ED1 to replace health index 5 conductor and investment will continue into the next period to complete replacement. More detail on our investment in 132kV and 33kV steel towers can be found in our **Annex C6e – 132kV Overhead Lines Strategy**.

33kV and 132kV Tower Refurbishment			
Licence	Average Population Refurbished (% per annum)	RIIO-ED1 Assets Refurbished	RIIO-ED1 Expenditure (£m)
SPD	13%	272	1.1
SPM	8%	779	9.4

33kV and 132kV Tower Painting			
Licence	Average Population Refurbished (% per annum)	RIIO-ED1 Assets Refurbished	RIIO-ED1 Expenditure (£m)
SPD	13%	272	0.8
SPM	6%	1,339	10.1

33kV and 132kV Tower Foundations			
Licence	Average Population Refurbished (% per annum)	RIIO-ED1 Assets Refurbished	RIIO-ED1 Expenditure (£m)
SPD	13%	272	1.9
SPM	9%	902	19.3

Asset Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
33kV & 132kV Tower Painting	SPD	0.0	0.0	0.1	0.8	N/A
	SPM	0.5	2.4	1.3	10.1	160%
33kV & 132kV Tower Refurbishment Foundations	SPD	0.0	0.0	0.3	3.0	N/A
	SPM	2.3	11.4	3.6	28.7	57%
Total	SPEN	2.8	13.8	5.3	42.4	54%

33kV and 132kV overhead tower replacement and refurbishment

Tower steelwork has a life span of circa 70 years, however this may be extended by up to 15 years if painted whilst the galvanising is intact or up to 8 years if painted after steelwork has started to corrode. Steelwork which has corroded beyond economic repair will be replaced. Foundations are considered for repair or replacement when work to replace conductors or towers is proposed.

33kV and 132kV Tower Line Fittings				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPD	544	12.5%	544	1.2
SPM	2,108	4%	1,857	16.9

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV & 33kV Tower Line Fittings	SPD	0.0	0.0	0.2	1.2	
	SPM	0.5	2.4	2.1	16.9	349%
Total	SPEN	0.5	2.4	2.3	18.4	389%

33kV and 132kV tower insulators and fittings

Glass or porcelain insulators generally deteriorate, with a life expectancy of approximately 40 years and due to the age of our tower lines, many insulators are now in poor condition.

We replace insulators alongside reconductoring works. We have invested little in 33kV tower line conductor so investment in this asset is forecast to increase over the RIIO-ED1 period. In SPM the 132kV tower fittings investment will increase in RIIO-ED1 and reduce in future years alongside conductor replacement. More detail on our investment in steel towers can be found in our **Annex C6 – Expenditure**.

LV cut-out replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	27,200	0.2%	27,200	5.0
SPD	41,072	0.3%	41,072	7.6

Cut-outs		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Cut-outs	SPD	1.2	6.0	0.9	7.6	-25%
	SPM	0.8	3.8	0.6	5.0	-25%
Total		2.0	9.8	1.5	12.6	-25%

LV Cut-outs

Every customer has a point at which the network cable terminates and the customer's installation connects to the network. In domestic properties this is generally where the electricity meter is situated, and is referred to as the Customer's Service Position and normally contains a LV cut-out. Customer safety is the primary driver for our modernisation programme, and a higher risk priority will be assigned to properties where customer access and egress may be affected by equipment failure. Our ED1 modernisation works are targeted at LV cut-outs which have been identified as having reached or is approaching end of life.

LV substation board replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	80	0.1%	80	0.8
SPD	64	0.2%	64	0.6

LV substation pillar replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	160	1.2%	160	0.7
SPD	336	0.3%	336	1.9

Asset replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
LV Substation Boards and Pillars	SPD	0.7	3.5	0.3	2.6	-55%
	SPM	0.0	0.2	0.2	1.5	N/A
Total	SPEN	0.7	3.7	0.5	4.1	-32%

Low Voltage (LV) Plant in Substations

Our substations contain exposed LV indoor boards and enclosed LV indoor and outdoor pillars which carry fuses to protect the LV cable network and distribute electricity to the street pillars and link boxes.

Currently we have 10,758 LV boards in SPM and 4,850 in SPD and we intend to replace 0.7% and 1.3% during ED1 respectively.

Currently we have 1,623 LV substation pillars in SPM and 15,611 in SPD and we intend to replace 9.9% and 2.2% during ED1 respectively.

LV underground link box and street pillar replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	2,352	1.4%	2,352	12.4
SPD	2,512	1.5%	2,512	13.7

LV underground link box refurbishment			
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Expenditure (£m)
SPM	4,560	2.75%	1.5
SPD	1,136	1.5%	0.4

Asset Replacement Expenditure	DPCR5		RIIO -ED1				% Difference Per Annum	
	Per Annum (£m)		Total (£m)		Per Annum (£m)			
	SPD	SPM	SPD	SPM	SPD	SPM	SPD	SPM
LV UGB & LV Pillars (OD not at Substation)	1.80	1.76	13.71	12.39	1.71	1.55	-5%	-12%

LV Underground Link Boxes and Street Pillars

These low voltage assets, the vast majority in public areas, are used to minimise disruption to customers when we are working on the network and are used to help restore supplies expediently after a fault.

Due to their location, public proximity and vulnerability to physical damage and interference, above ground low voltage street pillars and underground link boxes are inspected on a regular basis and poor condition assets are repaired, refurbished or replaced as appropriate. LV street pillars are given a high priority as damage can expose live parts that present a risk to members of the public. The programme in this area is a continuation of our strategy over the last five years and will continue at a steady run-rate in the longer-term.

As link boxes are normally under public footpaths, the lid or cover can become damaged and cause a public hazard. Therefore we have a refurbishment programme in ED1 to replace any covers in this condition.

Currently we have 21,448 LV link boxes and LV street pillars in SPM and 21,019 in SPD and we intend to replace 11% and 12% during ED1 respectively.

We also plan to refurbish 22% link boxes in SPM and 12% in SPD.

Ground Mounted HV Switchgear				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	2,779	1.8%	2,779	46.9
SPD	2,403	1.1%	2,403	29.8

Ground mounted HV switchgear refurbishment			
Licence	RIIO-ED1 Assets Refurbished	Average Population Refurbished (% per annum)	RIIO-ED1 Expenditure (£m)
SPM	466	0.3%	9.4
SPD	1,340	0.6%	10.4

Our ED1 plan targets the replacement and refurbishment of HV circuit breakers, HV ring main units and HV switches that have type based operational restrictions, are performing poorly or are in poor condition. Our strategy is to replace end of life assets based on an assessment of operational adequacy and on-site condition information gathered during inspections and maintenance. In addition to complete replacement we will replace the moving portion of life expired oil filled circuit breakers to be replaced ("retrofitted") with a modern low maintenance equivalent where this has a positive cost benefit analysis. We plan to refurbish circuit breakers categorised as Health Index 4 to extend their serviceable life.

Also, we have a high dependency on the reliability of ring main unit (RMU) assets and many of these were installed in the 1970s and are deteriorating at a similar rate. In order to effectively manage these high volume assets we are introducing a targeted refurbishment programme.

Currently we have 8,106 HV circuit breakers in SPM and 9,557 in SPD and we intend to replace 5.9% and 10.2% during ED1 respectively. We also plan to refurbish 4.5% in SPM and 5.7% in SPD. Currently we have 11,021 HV RMUs in SPM and 13,637 in SPD and we intend to replace 21% and 8.1% during ED1 respectively. The higher costs in this area associated with the SPM network are set out in the our **Annex C6c – SP Manweb Company Specific Factors**.

Asset replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
11kV Primary Switchgear Replacement	SPD	1.5	7.7	1.4	11.5	-7%
	SPM	3.8	19.2	1.3	10.3	-66%
11kV Primary Switchgear Refurbishment	SPD	0.0	0.1	1.2	9.2	N/A
	SPM	0.0	0.2	1.2	9.3	N/A
Total	SPEN	5.4	27.1	5.0	40.3	-7%

Asset replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
11kV Secondary Switchgear Replacement	SPD	2.9	14.7	2.3	18.3	-22%
	SPM	5.2	26.0	4.6	36.6	-12%
11kV Secondary Switchgear Refurbishment	SPD	0.0	0.0	0.1	1.2	N/A
	SPM	0.0	0.0	0.0	0.1	N/A
Total	SPEN	8.1	40.6	7.0	56.3	-14%

HV pole mounted switchgear replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	1,376	1%	1,376	2.5
SPD	1,448	1.6%	1,448	2.6

Asset Replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Pole Mounted Equipment	SPD	1.1	5.6	0.7	5.7	-37%
	SPM	0.5	2.5	0.8	6.6	67%
Total	SPEN	1.6	8.1	1.5	12.2	-5%

33kV and HV Pole Mounted Switchgear

Our 33kV and HV overhead line networks contain switchgear mounted on our poles that assist in the protection and efficient operation of our network. We plan to replace end of life assets with new modern equipment during ED1.

Although these assets are relatively new they have electronic components that have a shorter life than the switchgear asset and as such the complete unit needs replaced when these components fail. Currently we have 17,132 pole mounted switchgear units in SPM and 11,048 in SPD and we intend to replace 8% and 13% during ED1 respectively.

33kV switchgear replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	643	1.9%	453	29.0
SPD	417	2.2%	153	13.2

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
33kV Switchgear Replacement	SPD	2.3	11.5	1.7	13.2	-28%
	SPM	2.3	11.6	3.6	29.0	57%
Total	SPEN	4.6	23.0	5.3	42.3	15%

33kV Switchgear

Switchgear deteriorates over time as a result of environmental exposure and mechanical wear. We have a considerable population of ageing 33kV bulk oil circuit breakers and RMUs on our network, installed in the 1950s and 60s. Some of these are now subject to operational restrictions following failures in the industry and our condition surveys have identified other issues. Given their complexity and obsolescence, where we do not have economic refurbishment options available to extend the lives of this type of equipment we will continue to replace them with modern equivalent circuit breakers.

Currently we have 1784 33kV circuit breakers in SPM and 1036 in SPD and we intend to replace 8.5% and 11.5% during ED1 respectively. Our replacement plan from DPCR5 to the end of ED2 is summarised in the charts below.

The variation in assets replaced or refurbished each year over DR5 and ED1 is driven by our continuing assessment of asset health. Volumes proposed are aligned to current delivery in DPCR5.

Currently we have 361 33kV RMUs in SPM and we intend to replace 9.1% during ED1. These plant items are unique to SPM and the additional costs are detailed in our **Annex C6c – SP Manweb Company Specific Factors**.

132kV switchgear replacement			
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	263	2.3%	121	33.8

Asset Replacement		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV Switchgear	SPM	7.3	36.3	4.2	33.8	-42%
Total	SPEN	7	36	4	34	-42%

132kV Switchgear

Our SPM licence area has a 132kV distribution network with nearly 50% of circuit breaker assets being greater than 40 years old, among the oldest remaining in the industry. In DPCR5, we began to replace particular types of circuit breakers which are now obsolete and cannot be efficiently repaired. Following replacement of 24 units in DPCR5, we have 80 units of this type and we plan to replace 48 units of our 132kV air blast and bulk oil circuit breakers in our substations by 2023, with the remaining 32 units being replaced by 2031.

Our plans include utilising air insulated switchgear (AIS) and gas insulated switchgear (GIS) to achieve the most efficient replacement option for each individual site. We are able to achieve industry leading unit costs for our GIS switchgear through our global procurement initiatives. Where appropriate we have rationalised substation designs to deliver a more efficient outcome.

Currently we have 219 132kV circuit breakers in SPM and we intend to replace 22.8% during ED1. Our replacement plan from DPCR5 to the end of ED2 is summarised in the chart above.

HV ground mounted transformer replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	845	0.9%	845	9.0
SPD	714	0.6%	714	6.9

HV ground mounted transformer refurbishment			
Licence	RIIO-ED1 Assets Refurbished	Average Population Refurbished (% per annum)	RIIO-ED1 Expenditure (£m)
SPM	1,272	1.4%	6.3

HV pole mounted transformer replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	1,536	0.6%	1,536	4.1
SPD	1,144	0.6%	1,144	3.0

Asset Replacement, Refurbishment		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
11kV Secondary Transformer Replacement	SPD	1.0	5.0	1.2	9.9	24%
	SPM	1.5	7.4	1.6	13.1	10%
11kV Secondary Transformer Refurbishment	SPM	0.1	0.5	0.8	6.3	N/A
Total	SPEN	2.6	12.9	3.6	29.3	38%

HV Transformers (ground and pole mounted)

We have around 85,000 ground mounted and pole mounted transformers. Ground Mounted (GM) HV transformers are replaced as determined through condition assessment although RMU replacement in SPM may require refurbishment of the associated HV transformer. Pole Mounted (PM) HV transformers are only replaced on failure or during HV overhead line replacement work.

Also, as part of our drive to reduce system losses and our carbon footprint, we are targeting high loss HV transformers and replacing them with modern low loss equivalents.

This is discussed further in **Annex C5 – Losses Strategy.**

Currently we have 11,290 ground mounted units in SPM and 16,268 in SPD and we intend to replace 7.5% and 4.4% during ED1 respectively. Currently we have 33,105 pole mounted units in SPM and 25,060 in SPD and we intend to replace 4.6% in both licences during ED1 respectively.

The additional costs of replacing some transformer types on the unique SPM network are detailed in our **Annex C6c – SP Manweb Company Specific Factors.**

33kV and 132kV transformer replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	110	1.5%	110	43.2
SPD (33kV only)	61	1%	61	15.6

33kV and 132kV transformer refurbishment			
Licence	RIIO-ED1 Assets Refurbished	Average Population Refurbished (% per annum)	RIIO-ED1 Expenditure (£m)
SPM	64	0.8%	3.3
SPD (33kV only)	85	1.5%	3.7

Grid/Primary Transformers		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
132kV Transformer Replacement	SPM	2.6	13.2	3.5	27.8	31%
132kV Transformer Refurbishment	SPM	0.0	0.0	0.2	1.5	N/A
33kV Transformer Replacement	SPD	2.4	11.8	1.9	15.6	-18%
	SPM	2.0	9.8	1.9	15.4	-2%
33kV Transformer Refurbishment	SPD	0.2	1.2	0.5	3.7	N/A
	SPM	0.0	0.0	0.2	1.7	N/A
Total	SPEN	7	36	8	66	14%

33kV and 132kV Transformers

Although grid & primary transformers are generally reliable the consequence of failure is significant as they supply large numbers of customers and replacement timescales are typically very long. The lead time on the manufacture of one of these large transformers can be up to 12 months. Our strategy is to identify end of life transformers and replace them before they fail.

Our transformer population is ageing, and our modelling indicates a peak in replacement investment will be required in the next 10-15 years. To manage this over the longer-term and to extract maximum value from our existing assets, we have introduced a programme of mid-life refurbishment targeted with a life extension of up to 20 years.

Our refurbishment and replacement plans have been prioritised through site surveys, extensive chemical analysis of the insulation oil (which provides information on the internal condition, potential insulation degradation or electrical discharges) and through condition assessment.

Currently we have 809 33kV transformers in SPM and 756 in SPD and we intend to replace 11% and 8.1% during ED1 respectively. We also intend to refurbish 5.9% in SPM and 11.8% in SPD during ED1. Currently we have 144 132kV transformers in SPM and we intend to replace 14.6% during ED1 and refurbish 11.1%.

The combination of replacement and refurbishment plans allows us to effectively manage network risk and smooth the profile of transformer investment over ED1and ED2 periods. Our transformer replacement and refurbishment plan is consistent with delivery volumes achieved during DPCR5.

The additional costs in this area associated with our unique SPM network are detailed in our **Annex C5 – Losses Strategy.**

Battery replacement				
Licence	RIIO-ED1 Assets Removed	Average Population Removed (% per annum)	RIIO-ED1 Assets Added	RIIO-ED1 Expenditure (£m)
SPM	7,517	12.1%	7,517	3.5
SPD	756	2.4%	756	1.0

Batteries		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Batteries Replacement	SPD	0.1	0.6	0.1	1.0	3%
	SPM	0.5	2.3	0.4	3.5	-5%

Batteries at HV, 33kV and 132kV substations

Battery Systems are a critical component of the protective equipment used to promptly disconnect faults from the network. If batteries are not in good working order, the operation (tripping) of devices used to disconnect faults from the network cannot be completed, causing equipment damage and potentially danger to staff and the public.

Battery performance deteriorates rapidly as they reach end of life, therefore they will be replaced before end of life due to their criticality.

Investment will also be made to replace obsolete, unsupportable battery chargers and to modernise chargers to ensure continued performance where possible.

Investment in battery modernisation will continue in ED1 and upgrading of many of the Primary and Grid batteries will also be achieved through the Black Start resilience initiative.

Currently we have 7,715 batteries in SPM and 3,918 in SPD and we intend to replace 97% and 19.3% during ED1 respectively. The high figure in SPM is due to the life of the batteries at HV substations being typically only 6 years and we will therefore replace all during ED1.

The additional costs in this area associated with our unique SPM network are detailed in our **Annex C6c – SP Manweb Company Specific Factors.**

Civil works driven by condition of civil items		
Licence	RIIO-ED1 Activity volume	RIIO-ED1 Expenditure (£m)
SPM	6,204	48.6
SPD	4,535	35.3

Civil works driven by condition of civil items

Ensuring our civil structures and buildings are kept in good condition is of vital importance, they are key to maintaining safe and secure sites to protect both our staff, and members of the public.

A majority of our electrical assets are designed for indoor use and therefore are susceptible to poor environmental conditions, which can reduce performance, cause failures and lead to excessive life time costs. Ensuring the substation environment is kept warm and dry will maximize the life expectancy of our electrical asset base, providing value-for-money for our customers.

In DPCR5 we carried out a comprehensive programme of detailed civil surveys to catalogue the condition and necessary remedial costs associated with our grid and primary substations. The surveys were carried out by civil engineering specialists and the results have been used to introduce a health index for our civil assets. We provided Ofgem with details of this civils Health Index methodology in July 2013 and have published this as an **Annex C6e – Civil Strategy and Plans**.

Secondary substation civil investment is based on our understanding of historical investment in the main components including doors, roofs and fences and clearance of civil defects. We plan to extend our HI approach to secondary substations in line with our Grid and Primary methodology.

The volume of civil assets refurbished has risen during DPCR5 to a level that continues through ED1 and ED2 reflecting the condition of these assets.

Supported by CBAs in our **Annex C6m – Cost Benefit Analysis** and additional cost detail in our **Annex C6c – SP Manweb Company Specific Factors**.

Expenditure (£m)			
Licence	Substation RTUs, Marshalling Kiosks, Receivers	Communications for Switching and Monitoring	Control Centre Hardware and Software
SPD	7.7	8.8	3.2
SPM	14.8	13.8	3.4

Operational IT & Telecoms		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Substation RTU's, Marshalling Kiosks and Receivers	SPD	0.2	0.9	1.0	7.7	409%
	SPM	0.3	1.6	1.8	14.8	484%

Operational IT & Telecoms		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	£m
Communications for Switching and Monitoring	SPD	0.3	1.7	1.1	8.8	231%
	SPM	1.2	5.8	1.7	13.8	49%

Operational IT & Telecoms		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	£m
Control Centre Hardware and Software	SPD	0.9	4.3	0.4	3.2	-54%
	SPM	0.6	2.8	0.4	3.4	-24%

Operational Information Technology and Telecoms

This Investment area relates to real time control systems and telecommunications equipment which have become a fundamental aid to our operation of the power network.

This Investment area is detailed in annexes, CBAs and also has some SPM special case costs.

Investment activities in the ED1 period will include replacement programmes for end of life Grid and Primary Substation Remote Terminal Units (RTUs), Secondary Control Systems and monitoring equipment. Replacement of Grid (SPM only) and Primary RTUs represents 87% of the Operational and IT investment in SPM and 71% in SPD. The majority of these essential assets were installed in the early to mid 1990s with a 15-20 year asset life expectancy. We will far surpass that with replacement beginning in ED1 and completing in the early years of ED2.

The central control system gathers data from RTUs and presents this information to operators. The central control system also allows operators to send requests to all remotely controllable equipment connected to the systems. These systems are of high strategic importance and require regular investment to remain both current and supportable.

All the benefits SCADA systems afford to our customers are only possible with effectively managed telecoms infrastructure. Parts of the same communications infrastructure which are used for protection are critical to maintaining network performance levels and limiting danger to the public. Increasing network service requirements are the main driver for an extensive communication networks update commencing in ED1 and completing in ED2. The telecoms network update will greatly aid the Smart Grid transition.

Expenditure (£m)	
Licence	BT21CN
SPM	28.3
SPD	5.0

BT21CN Mitigation		DPCR5		RIIO-ED1		% change
		D5 pa	Total	ED1 pa	Total	
		£m	£m	£m	£m	
BT21CN	SPD	0.4	1.9	0.6	5.0	62%
	SPM	2.0	9.9	3.5	28.3	79%
Total		2.4	11.8	4.2	33.2	76%

BT 21st Century (BT21CN)

SPM, and to a lesser extent SPD, currently have a high reliance upon leased copper BT services for critical protection applications. These services will be made obsolete by 2018 as part of BT's 21CN development and will be migrated to the new BT platform where the communications paths will no longer be suitable for protection applications.

Investment in BT21CN mitigation activity is set to ramp up significantly from DPCR5 spend in the first 3 years of ED1 in line with the closure of the BT21CN lease lines platforms in 2018. We have 192 circuits remaining in SPM and 34 circuits remaining in SPD which will require alternative solutions. SPM is the DNO worst affected by BT21CN historically having the highest reliance upon leased line services of any of the UK DNOs, a cost recognised in our SPM regional factors case.

We have targeted mitigation of the lowest cost SPM and SPD BT21CN circuits in DPCR5. This strategy was deployed to minimise early investment should the BT leased line platform closure time be further extended and to safeguard against wasted investment should suitable cost effective alternatives emerge. Currently, OFCOM publications on this subject confirm the transition to BT21CN platform will be complete in 2018.

For more information refer to **Annexes C6e – Operational IT and Telecoms Strategy** and **C6e – BT21CN Mitigation Strategy**.

Black Start		
Licence	RIIO-ED1 Activity volume	RIIO-ED1 Expenditure (£m)
SPM	0.0	7.5
SPD	0.0	1.6

	Generators 72hr run time	Batteries 72 hr capacity installed	Dc load disconnection & monitoring	Airwave Fixed & Mobile	Expenditure (£m)
SPD	0	86	169	33	1.6
SPM	51	191	271	64	7.5

Substation resilience		DPCR5		RIIO-ED1		% change
		D5 pa	Total	ED1 pa	Total	
		£m	£m	£m	£m	
Black Start	SPD			0.2	1.6	
	SPM			0.9	7.5	
Total		0.0	0.0	1.1	9.0	100%

Black Start

This Investment area is detailed in annexes and CBAs. SPM special case costs are set out in our **Annex C6c – SP Manweb Company Specific Factors.**

The UK power network is designed and operated to deliver an extremely robust power supply to all connected customers. There are however circumstances through which the normal balance between connected generation and connected load can become disturbed, which left unchecked can in the most extreme case result in the cascade loss of the entire or large portions of the UK power network. Whilst considered rare, recent experience in both the USA and Europe have demonstrated that this is a credible risk. The recovery from this kind of event is termed 'Black Start'.

The Government and the UK Electricity Industry consider that full restoration of the network to its normal operating state will take up to 72 hours. It is a key requirement that all equipment on which the recovery process relies is made resilient for a period of 72hours, with the main considerations being remote control facilities, voice and data communications, and protection systems.

In order to accommodate the required level of Black Start resilience, we will invest to upgrade the battery systems in our major sub stations necessary for communications and remote operation. Black Start expenditure in the SPD area is less than SPM due to the 132kV network in Scotland being covered by the SP Transmission licence.

To supplement the communications network improvements above, we will enhance our existing Airwave voice communications with a further 80 hand portable units distributed at operational locations and 14 additional fixed terminals at operational muster locations.

Expenditure (£m)	
Licence	Flood mitigation
SPM	0.8
SPD	0.8

Flood Mitigation		DPCR5		RIIO-ED1		% change
		D5 pa	Total	ED1 pa	Total	
		£m	£m	£m	£m	
Flooding	SPD	0.3	1.6	0.1	0.8	-70%
	SPM	0.6	2.9	0.1	0.8	-83%
Total		0.9	4.5	0.2	1.6	-363%

Flood Mitigation

This Investment area is detailed in annexes and CBAs. There are no SPM special costs in this area.

Over recent years across the UK there have been incidents of flooding impacting on substations and resulting in loss of electricity supplies and our stakeholders have asked us to do more to try and mitigate the risk of flooding. The mitigation measures designed or installed to date have been to cater for a fluvial (rivers) or coastal risk as this was the only information available from EA and SEPA at that time.

Following on from fluvial & coastal flooding, both the EA and SEPA have recently published detailed pluvial (surface water) maps and we have plans to start mitigating this risk at a number of primary substation sites within DPCR5. This work will continue in ED1 for identified grid/primary substations and £1m is required.

In response to recent events where a small number of secondary substations were flooded, and have a high risk of repeat flooding, we have taken steps to mitigate the risk at these sites. During ED1 we will continue with the work to protect those secondary substations at a high risk of flooding and £0.5m has been identified for this.

Additional Investment Supported by Stakeholders

In response to feedback, we substantially accelerated our investment plans to reduce the risk of flood related disruption to an additional 168,000 customers within the DPCR5 period. By the end of April all of our primary sites will be capable of withstanding at least a '1 in 100 year' flood event.

Expenditure (£m)		
Licence	Substation security	Cyber security
SPM	1.9	1.0
SPD	-	1.0

Critical National Infrastructure

Some of our assets in SPM are critical to national security and we liaise with Government agencies to ensure that any potential threats and risks are assessed and mitigated. In circumstances where potential risks are identified we will enhance the security of our asset. SCADA systems form part of the UK Critical National Infrastructure and access to them must be guarded carefully. Further investment will be needed in the ED1 period to meet and maintain best practice in this area.

This Investment area is detailed in annexes, there are no SPM special costs in this area

Legal & Safety		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
General Security	SPD	0.2	0.9	0.4	3.1	106%
	SPM	0.6	2.9	0.4	3.5	-24%
Metal Theft	SPD	0.1	0.6	0.8	6.1	573%
	SPM	0.2	0.8	0.5	4.3	247%
Total		1.0	5.2	2.1	17.1	51%

Substation Security and Metal Theft

This Investment area is detailed in annexes and CBAs.

Site security is key to the safety of the public and to the continued safe operation of our network.

The increase in metal theft seen over the last few years, from virtually zero to a peak of 509 incidents in a year, has made securing our substations ever more critical. We are investing in security solutions on a targeted geographical basis to defend against metal theft and interference.

Legal & Safety		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
ESQCR LV	SPD	6.6	33.0	5.2	41.5	-21%
	SPM	11.8	59.0	5.9	47.5	-50%
ESQR 33kV & 11kV	SPD	0.1	0.5	0.8	6.4	781%
	SPM	0.5	2.3	1.7	13.7	268%
Total		19.0	94.8	13.6	109.1	-28%

ESQCR regulations

This Investment area is detailed in annexes and CBAs.

The Electricity Supply, Quality and Continuity Regulations (ESQCR) 2002 introduced a number of new obligations in relation to our existing overhead lines. This expenditure category relates to our undertakings to the Health and Safety Executive (HSE) to comply with Regulations 17 and 18. Regulation 17 refers to the minimum ground clearance of overhead lines over roads and other locations. Regulation 18 stipulates minimum clearance of overhead lines to structures and other obstacles.

We have measured 100% of our network to establish the precise number of non-compliances and cost effective rectifications. This has been the basis of our necessary prioritised work programme. We have provided a schedule for these remedial actions to the HSE and are committed to completion by FY 2020/21.

AONB		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
AONB	SPD	0.0	0.1	0.5	3.7	N/A
	SPM	0.5	2.6	1.0	7.6	84%
Total		0.5	2.7	1.5	11.3	

Undergrounding in National Parks and AONB

Our service areas include a number of National Parks, Areas of Outstanding Natural Beauty (AONB) in England and Wales and National Scenic Areas in Scotland. In SPM this encompasses stakeholders such as Snowdonia National Park, Anglesey, Llyn Peninsula, and Denbighshire AONBs and in SPD includes Loch Lomond and The Trossachs National Park.

Electricity distribution in rural areas is predominantly provided by overhead networks that can sometimes impair the visual amenity of important sites or popular tourist areas. These overhead lines have been in place for many years and, where considered to be intrusive, the selective replacement of some lines with underground cable can enhance visual amenity in these areas.

SP Energy Networks will continue to consult with our stakeholders and other appropriate interest groups to identify the areas that would most benefit from the undergrounding of overhead lines.

Regular discussions will be held with established groups to maintain our positive relationships and to identify and prioritise such undergrounding projects.

Our relationship with Snowdonia National Park is particularly strong through the implementation of a signed 'accord' that ensures our collaborative working.

Leakage of SF6 (Sulphur Hexafluoride)

SF6 is a synthetic insulating gas present in electrical switchgear and is considered the most potent of all GHGs. Fugitive emissions of SF6 can escape from gas-insulated substations and switchgear through seals, especially from older equipment. It can also be released during equipment installation and when equipment is opened for servicing.

We are prepared for the possibility of increased external obligations and reporting on SF6 emissions, such as the proposed amendments to the Gas Regulations 2009 and Greenhouse Gas Emissions Regulations 2013, by working closely with switchgear manufacturers, procuring market

leading technology and improving data collection techniques, to ensure that the opportunity for SF6 losses is strictly managed and avoided.

We will reduce the rate of SF6 leakage from our substations by procuring best available switchgear technology and by specifiying switchgear with lower leakage rates (typically 0.05%) than the International Electrotechnical Commission (IEC) specification (which is typically 0.1%).

Our objective for ED1 is to achieve a 12% reduction in the SF6 leakage rate from substations in SPM and 15% in SPD by specifying better performing switchgear when compared against the typical IEC specification.

Oil Pollution Mitigation

Fluid Filled Cables (FFCs) have been used in the UK since the 1960s; the fluid in the cables acts as an electrical insulator. FFCs have proved to be extremely reliable electrically. However, there are environmental risks associated with leakage from old cables. We identify the need to reduce oil leaks of poorly performing 132kV cable. Therefore, we plan to replace 10.8km of the 132kV cables by 2017, with solid polymeric alternatives, which should result in a 50% reduction in leakages over the duration of the RIIO-ED1 price control period.

Oil is used within transformers for insulation and cooling, with the volume of oil increasing with the operating voltage. For all new 132kV & 33kV transformers we install an oil containment bund so any oil leaks are captured within it. In terms of our existing transformer fleet, all our 132kV transformers are bunded with a proportion of our 33kV transformers bunded in SPM and in SPD.

During ED1 we plan to install oil containment bunds on 152 33kV transformers in SPM and 224 in SPD. This will be a risk based plan and will be delivered depending on the proximity of the transformer to water courses etc.

Reducing Technical Losses

We will implement a number of technical loss mitigation initiatives during the ED1 regulatory period. We are also committed to evaluating a range of innovative new measures for potential implementation later in the period.

Our philosophy for technical loss reduction is to adopt a holistic approach which considers a range of factors to maximise overall benefits to customers. This is detailed in losses strategy **Annex C5 – Losses Strategy** and backed up by CBAs.

Our initiatives in this area are spelled out in more detail in our **Annex C6 – Expenditure**, and include:

- *Proactive replacement of pre 1962 high loss secondary transformers*
- *Using larger OHL conductor than necessary for local weather conditions*
- *Upgrading 6.6kV sections of network to 11kV*
- *More proactive management of substation energy needs*
- *Potential future initiatives that merit further investigation*

All loss reduction initiatives will also be subject to rigorous cost-benefit analysis to ensure each is economically justified.

Noise mitigation measures		
Licence	RIIO-ED1 Units Added	RIIO-ED1 Expenditure (£m)
SPM	24	1.8
SPD	24	1.8

Noise mitigation measures (£m) – Percentage change from DR5			
Licence	DPCR5	ED1	% change from DPCR5
SPM	0.0	0.2	N/A
SPD	0.1	0.2	100%

Protection refurbishment		
Licence	RIIO-ED1 volume refurbished	RIIO-ED1 Expenditure (£m)
SPM	1,846	14.1
SPD	1,021	8.1

Protection		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
Protection Modernisation	SPD	0.2	0.8	1.0	8.1	400%
	SPM	0.5	2.4	1.8	14.1	265%
Total	SPEN	0.7	3.2	2.8	22.2	300%

Noise mitigation measures

All transformers transmit noise and on occasion, due to their proximity to customers' properties, they can cause a disturbance. Any reported noise nuisances are investigated using accurate monitoring equipment and any that breach the industry agreed threshold will have mitigation measures fitted. These can take the form of noise shields which deflect noise way from the customer's property or, complete noise enclosures which surround the transformer. If these mitigation measures are not sufficient to reduce the noise level to acceptable levels, then the decision can be taken to replace the transformer for a new quieter unit.

Protection Refurbishment

Protection equipment installed in our substations is necessary to ensure compliance with our legal obligations and maintain the integrity and safety of the main electrical plant and circuits. The preferred and most efficient approach, wherever possible, is to align all protection modernisation with plant modernisation works. Protection equipment assets targeted for replacement are based on type of the main protection relay and focuses on key factors such as reliability, supportability, compliance with policy and maintenance requirements.

Overhead line safety defects		
Licence	RIIO-ED1 Defects Removed	RIIO-ED1 Expenditure (£m)
SPM	37,408	10.7
SPD	36,952	10.6

Mural wiring (SPM only)		
Licence	RIIO-ED1 Properties modernised	RIIO-ED1 Expenditure (£m)
SPM	10,800	11.6

Safety around recreational sites		
Licence	RIIO-ED1 sites	RIIO-ED1 Expenditure (£m)
SPM	112	2.4
SPD	112	2.3

Provision of earthing – Rise of Earth Potential		
Licence	RIIO-ED1 sites upgraded	RIIO-ED1 Expenditure (£m)
SPM	324	1.8
SPD	160	0.6

Legal & Safety

Overhead line safety defects

As part of ESQCR, we are required to deal with safety related defects on our overhead line network. This includes the repair of stays, signage, insulators and anti-climbing guards. The programme to modify or renew air break switches to allow them to operate with a hookstick continues. This follows a fatality associated with this type of switchgear on another DNO's network.

Mural wiring (SPM only)

Urban mural wiring is a system of wiring employed in SPM where cables are fixed to the external fabric of the property in towns and cities. The nature of the original installation of these particular systems has resulted in significant public safety issues and as a consequence, a programme to replace Mural Wiring is underway. We have undertaken condition-based audits and all end of life (HI5) properties will be modernised in RIIO-ED1.

Safety around recreational sites

Protecting the public from the dangers of inadvertent contact with overhead lines at fishing sites, caravan parks and recreational areas is also a priority public safety concern. The solutions range from providing adequate warning signs to removing the hazard altogether through deviating the line out of the site or undergrounding the overhead line through the site.

Provision of earthing – Rise of Earth Potential

Schedule 4 of the Electricity Act 1989 sets out the obligations the Electricity Industry and Telecommunications Operators have to avoid interference between electrical plant and telecommunications apparatus. We will routinely test earthing systems in ED1 in line with engineering recommendations. Earthing will be improved where necessary and we project that only a small percentage of sites need works.

Fire protection		
Licence	RIIO-ED1 sites	RIIO-ED1 Expenditure (£m)
SPM	204	1.2
SPD	208	1.2

Asbestos management		
Licence	RIIO-ED1 sites	RIIO-ED1 Expenditure (£m)
SPM	80	0.4
SPD	80	0.4

Legal & Safety		DPCR5		RIIO-ED1		
		D5 pa	Total	ED1 pa	Total	% change
		£m	£m	£m	£m	
General Security	SPD	0.2	0.9	0.4	3.1	106%
	SPM	0.6	2.9	0.4	3.5	-24%
Mural Wiring	SPM	1.1	5.3	1.5	11.6	37%
Fire Protection	SPD			0.1	1.2	
	SPM			0.1	1.2	
OHL Defects	SPD	0.4	2.1	1.3	10.6	224%
	SPM	1.8	8.8	1.3	10.7	-24%
Metal Theft	SPD	0.1	0.6	0.8	6.1	573%
	SPM	0.2	0.8	0.5	4.3	247%
Asbestos Management	SPD	0.0	0.1	0.0	0.4	147%
	SPM	0.1	0.5	0.0	0.4	-48%
Air Break Switches	SPD	0.2	0.8	0.1	0.4	-67%
	SPM	0.1	0.3			
Recreational Sites	SPD	0.3	1.7	0.3	2.3	-14%
	SPM	0.1	0.3	0.3	2.4	368%
Earthing Upgrades	SPD	0.2	0.8	0.1	0.6	-53%
	SPM	0.4	1.8	0.2	1.8	-39%
Total		5.6	27.8	7.6	60.8	27%

Fire protection

Understanding fire risk in our substations and implementing appropriate solutions are essential in ensuring public safety. Our fire protection policy defines the mitigation measures necessary to ensure compliance with our legal obligations to minimise public safety risk. One of the key areas of risk is basement and embedded substations where transformers and switchgear are housed below or adjacent to occupied offices or public buildings. Our proposals to mitigate risk include installing fire doors, provision of adequate ventilation, installation of low smoke zero halogen (LSZH) cables and retro filling transformers with an insulating medium less flammable than oil.

Considerable consultation has taken place with independent fire protection experts and local fire services to understand the risks and potential mitigation measures.

Asbestos management

Asbestos in substations remains an issue for us as it does across the electricity industry. We have a continuing need to deal with asbestos safely for the protection of our staff and contractors. We have mapped all our substations containing asbestos and signage has been erected. We will continue to deal appropriately with any exposed asbestos or any requirement to deal with it during our network investment programme. It is the policy of SPEN to comply with the requirements of ScottishPower's Framework Policy SP/H&S/2007-01 for Management of Asbestos Containing Materials and in doing so its statutory legal duties.

We need to inspect, maintain and repair the asset base to ensure it continues to provide a safe, secure and reliable electricity supply to our customers. More detail on our plans and how we developed them is set out in detail in our **Annex C6 – Expenditure**.

f. Network Operating Costs

Incident Response	DPCR5	RIIO-ED1												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	RIIO-ED1 Total
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
SPD	27.7	26.7	23.2	23.4	22.6	23.3	23.1	22.8	22.5	22.2	22	21.9	21.7	179.6
SPM	21.9	17.2	19.5	20.1	19.9	20.7	20.3	20.1	19.7	19.4	19.3	19.1	18.8	157.3
SPEN	49.6	43.9	42.7	43.4	42.5	44	43.3	42.9	42.2	41.6	41.3	41	40.5	336.8

Incident Response

Trouble Call

When faults happen, our priority is to restore customers' supplies as quickly as possible. Where we cannot undertake a permanent repair quickly, we also consider the options of temporary repair and deployment of mobile generation.

Within the industry, the term 'Trouble call' is used to describe situations where our staff respond to incidents on our network including:

- *Restoring customer supplies after a fault*
- *Making repairs to our network after a fault*
- *Responding to other types of incidents which do not affect supplies, for example public safety incidents*

We subdivide our Trouble call incidents into 2 types, in line with regulatory reporting guidance:

- *Quality of Supply (QOS) Incidents: Unplanned Incidents that result in a loss of supply to customers or the inability of a component of the network operating at power system voltage to carry load or fault current for more than 3 minutes, excluding incidents that result from failures at or after cut-outs. These incidents are covered by the Interruption Incentive Scheme (IIS).*
- *Non-Quality of Supply (Non-QOS) Incidents: All other incidents that require a response from us, also known as Occurrences Not Incentivised (ONIs).*

Responding to 1 in 20 Year Storms

Within our cost projections, we also take account separately of the cost of responding to infrequent severe storms, known as 1 in 20 year storms. The costs of more frequent smaller storms are included in our normal fault costs.

As shown in the table above, incident response costs across both of our licence areas are forecast to remain relatively stable over the RIIO-ED1. Within this forecast, we have assumed a slight increase in the frequency of severe weather events over DPCR5. Our costs provide for the repair of more than 180,000 faults and attendance at around 470,000 other incidents.

Inspections & Maintenance		DPCR5	RIIO-ED1		
		£m pa	£m pa	Total	% change
Inspections	SPD	2.1	1.8	14.4	-16%
	SPM	1.7	2.2	18.0	23%
Maintenance	SPD	4.9	4.8	38.2	-2%
	SPM	7.2	6.2	49.4	-16%
Total		15.9	15.0	119.9	-6%

Inspection and Maintenance

The purpose of our inspection programmes is to identify safety, security or asset condition issues that need to be addressed in order to maintain the integrity of our network. Our maintenance programmes aim to ensure that our equipment remains in a safe and operable condition for the duration of its useful life. Effective inspection and maintenance programmes are essential elements of our approach to meeting our legal obligation under the Electrcity Safety, Quality and Continuity Regulations (ESQCR 2002) to maintain the safety and reliability of our network.

A large proportion of our network assets were installed in the period 1950-1970. This means that we are renewing increasing volumes and managing higher proportions of assets that are near the end of their useful lives. As any asset ages then typically the costs of ensuring they continue to perform adequately increase, networks are no different. We seek to limit this pressure to increase expenditure through advancing our understanding of asset condition and deploying new, more cost effective techniques.

Our inspection and maintenance (I&M) requirements are set out in our comprehensive suite of asset management policies, which form part of our fully accredited PAS55 management system. We keep these policies under regular review to ensure that we capture feedback from implementation, incorporate new techniques and address any emerging issues. This process is informed by the results of a structured asset risk assessment methodology which forms part of our Business management reporting system.

More detail on our plans and how we developed them is set out in detail in our **Annex C6 – Expenditure**.

Vegetation Management		DPCR5	RIIO-ED1		
		£m pa	£m pa	Total	% change
Vegetation Management	SPD	4.1	7.8	62.3	48%
	SPM	11.9	11.3	90.5	-6%
Total		16.0	19.1	152.9	19%

Vegetation Management

Managing vegetation growth in and around our assets is an important aspect of maintaining the safe and reliable operation of our system. The key activities we undertake are:

- *Tree cutting to ensure safety distance clearances are maintained around our overhead lines - this work is done in compliance with an industry standard known as ENATS 43-8*
- *Tree cutting and management within falling distance of our overhead lines to enhance storm resilience - this work is also covered by an industry standard known as ETR132*
- *Vegetation control at our substation sites*

Tree cutting for safety clearance (ENATS 43-8):

Trees in close proximity to overhead lines can present numerous problems. From a safety perspective, trees that can be climbed introduce the risk of contact with the live conductors. Reliability can be affected by impingement from tree growth and in storm conditions, falling trees and wind borne vegetation can result in damage. The purpose of our safety clearance programme is to manage the public safety risk and maintain the reliability of our overhead line network. We have developed detailed databases of trees growing in proximity to our overhead lines and use this data to estimate the volume of work that is required. Through experience, we have found that the optimum frequency for undertaking cuts at each location is 3 years.

Falling Distance Tree Cutting (ETR132):

We were instrumental in the development of an industry standard for storm resilient tree management. This standard, referred to in the industry as ETR 132, is a risk based approach to managing trees within falling distance of overhead lines. This came from our experience of dealing with high impact storms in the late 1990s and our pioneering 'Rural Care' programme through which we achieved falling distance clearance for over 5,600 km of our high criticality 33kV and 11kV circuits

Our experience has shown that where possible, the most efficient mechanism to deliver this severe weather resilience is by undertaking the tree clearance work in combination with our line rebuilding and refurbishment programmes. This has been our approach in DPCR5 and will continue through ED1.

For ED1, we have also added in a new activity of ETR132 maintenance in order to ensure that we manage regrowth to retain compliance on circuits that have been previously made compliant to the standard.

Vegetation Control at substations:

We have a well-established programme for managing the growth of weeds, grass and hedges associated with our substations. In developing our ED1 plan, we have reviewed the costs of undertaking this work and plan to retain this programme throughout the price control period.

Other Network Operating Costs	DPCR5	RIIO-ED1												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	RIIO-ED1 Total
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
SPD	3.9	4.1	3.9	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	17.4
SPM	0.5	0.7	0.7	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	18.8
SPEN	4.4	4.8	4.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	36.2

Other Network Operating Costs

We also have other Network operating costs associated with dismantlement of assets which are no longer required and purchase of electricity that we use in our substations for heating and operation of equipment such as battery systems.

Our current electricity purchases are based upon estimates of consumption (as this is more cost effective than metering all substations). Historically in SPM, we have estimated lower energy consumption than SPD as many substations have lower energy dehumidifier units instead of heaters, although this is offset by the greater population of substation buildings in SPM.

We have installed metering at a number of substations in both our network areas to provide more up to date estimates for our modern substation equipment, and are also following a programme of reducing energy consumption where this is cost effective.

We incur additional network operating costs in operating the Manweb urban interconnected network compared to a traditional radial network design – refer to our **Annex C6c – SP Manweb company Specific Factors**.

g. Closely Associated Indirect Costs

Closely Associated Indirect (CAI) costs are those expenditures which are essential to ensuring the Business' direct (investment and maintenance, labour, contractor and materials) activities are targeted in the right areas in a cost effective way, such that operational and key business risks are understood and that the direct activities of the Business can progress effectively on a daily basis.

Ofgem Regulatory Reporting Rules and Guidance define this category as consisting of eleven separate activities, which can be arranged into two categories:

A. CAIs that vary dependent on investment and operational workload and volumes including: network design and engineering; project management; vehicles and transport; operational training; small tools, equipment, plant and machinery

B. CAIs that are essentially a fixed cost of running a network Business and do not typically vary with workload: engineering management and clerical support (including Wayleaves); control centre; contact centre; stores; network policy; system mapping - cartographical

Across all of our expenditure activities we have conducted an extensive benchmarking and cost assessment exercise, and propose a net reduction of £30 million pounds per annum against DR5 levels of expenditure. Details of our benchmarking work are outlined in our **Annex C6 – Costs Assessment, Efficiency and Benchmarking**.

The following table summarises our closely associated indirect costs forecast for RIIO-ED1.

The following pages provide more detail about each of the relevant CAI costs:

Closely Associated Indirect expenditure RIIO-ED1 (£m)					
	DR5 Total (£m)	DR5 Average (£m)	ED1 Total (£m)	ED1 Average (£m)	% Change
Network design and engineering	50	10	40.5	5.1	-49%
Project management	75.5	15.1	62.4	7.8	-48%
Engineering management and clerical support	206	41.2	229.3	28.7	-30%
System Mapping	13.5	2.7	15.7	2	-26%
Control Centre	42.5	8.5	48.3	6	-29%
Call Centre	17.5	3.5	21.8	2.7	-23%
Stores	19	3.8	15.7	2	-47%
Network Policy	11	2.2	10.8	1.3	-41%
Operational Training	37.5	7.5	75.4	9.4	25%
Vehicles	44	8.8	57.6	7.2	-18%
Total	516.5	103.3	577.5	72.2	-30%

Network design and engineering expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	4.9	5.0	10.0
RIIO-ED1 Annual Average	3.0	2.0	5.1
Difference	-1.9	-3.0	-4.9
RIIO-ED1 Total (8 years)	24.2	16.4	40.5

Project management expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	6.7	8.4	15.1
RIIO-ED1 Annual Average	2.3	5.5	7.8
Difference	-4.4	-2.9	-7.3
RIIO-ED1 Total (8 years)	18.2	44.1	62.4

Network Design and Engineering

The Network Design and Engineering area covers high level planning for the development of our network as well as detailed project planning, scheme development and project authorisation.

Detailed engineering planning and design for specific individual projects is the primary cost driver within this activity. Such projects relate to specific engineering activities such as asset replacement, load reinforcement, quality of supply improvements and new connections.

Network design and engineering activity costs are forecast to reduce by £4.9m pa across our two Licensees as part of our drive for efficiency.

Project Management

Our work programmes from 132kV major projects to simple defect clearance programmes rely upon dedicated project managers and coordinators to manage delivery of our plans. Project management activities cover the life cycle of projects after authorisation including work preparation, construction and system connection through to accurate data capture and the application of technical and financial controls.

Project Management costs are forecast to reduce by £7.3m pa across our two Licensees as part of our efficiency drive in ED1.

Engineering management and clerical support expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	20.6	20.6	41.2
RIIO-ED1 Annual Average	13.1	15.5	28.7
Difference	-7.4	-5.1	-12.5
RIIO-ED1 Total (8 years)	105.1	124.2	229.3

System mapping expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	1.2	1.5	2.7
RIIO-ED1 Annual Average	0.8	1.2	2.0
Difference	-0.4	-0.3	-0.7
RIIO-ED1 Total (8 years)	6.4	9.3	15.7

Engineering Management and Clerical Support

Engineering management and clerical support (EM&CS) relates to a variety of office based activities that support employees delivering direct activities but is not involved with either the planning of projects or project management.

The (EM&CS) category captures costs associated with executive managers, engineering managers, work programmers, resource planners, clerical staff, streetworks administration, wayleave payments and administration.

Overall our Engineering Management and Clerical Support costs are forecast to reduce by £12.5m pa across our two Licensees.

System Mapping – Cartographical

System mapping – cartographical are the costs associated with updating our network geographical records. The task is volume driven and relates directly to the levels of network investment in overhead, underground, ground mounted apparatus and load related new connections or network alterations.

A small reduction of £0.7m pa across our two Licensees is forecast in RIIO-ED1.

Control centre expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	4.2	4.3	8.5
RIIO-ED1 Annual Average	3.1	2.9	6.0
Difference	-1.1	-1.4	-2.4
RIIO-ED1 Total (8 years)	25.0	23.3	48.3

Call Centre expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	1.7	1.8	3.5
RIIO-ED1 Annual Average	1.5	1.2	2.7
Difference	-0.2	-0.6	-0.7
RIIO-ED1 Total (8 years)	11.8	10.0	21.8

Control Centre

Control centre activities include our real time operational control and system monitoring of the distribution network. Activities also include outage planning and management, dispatching of resources in response to network emergencies and safety issues, dressing and updating of network control diagrams, completion of reports for fault recording data, major incident emergency planning.

It is anticipated that our overall costs within the control centre environment will fall through RIIO-ED1 due to enhancements in our operational IT platform and associated processes including fully automated logic sequence switching and remote updating within our SCADA system. We also plan to roll out efficiency improvements in relation to LV fault management through the implementation of remote customer messaging updates and auto dispatch.

Our Control Centre costs are forecast to reduce by £2.4m pa across our two Licensees.

Call Centre

Scottish Power Networks business has 3.5 million customers. It is vital that these customers have a clear route to contact our company whenever they go off supply, are affected by planned outages, wish to complain or are looking for information in relation to any general enquiry.

We operate two call centres each with the ability to support the other through times of high call volumes. Our call centre activities are focused on managing the main incoming call lines used by our customers, handling initial calls, recording and handling customer information, providing information in relation to customer enquiries and handling customer complaints and ensuring our customers are passed to relevant departments within the business correctly.

Smart Meters have the potential to change our customer interactions from being reactive to proactive and our business is preparing to move to a model where we are taking action on the information provided from the data flows from the smart meters. For example this technology will see us notifying customers proactively during fault incidents to inform them of their expected restoration times rather than waiting on customers to call us. It will also allow us to conduct early interventions to protect customers against quality of supply issues.

Call Centre costs are forecast to reduce modestly by £0.7m pa across our two Licensees.

Stores expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	1.8	1.9	3.8
RIIO-ED1 Annual Average	1.2	0.8	2.0
Difference	-0.6	-1.1	-1.8
RIIO-ED1 Total (8 years)	9.5	6.2	15.7

Network Policy expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	1.1	1.1	2.2
RIIO-ED1 Annual Average	0.9	0.4	1.3
Difference	-0.2	-0.7	-0.9
RIIO-ED1 Total (8 years)	7.6	3.2	10.8

Operational Training expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	3.9	3.6	7.5
RIIO-ED1 Annual Average	4.8	4.6	9.4
Difference	0.9	1.0	1.9
RIIO-ED1 Total (8 years)	38.6	36.8	75.4

Stores

Work on our network can only effectively be carried out with the support of the logistics team providing the necessary materials for renewing, repairing and maintaining our networks. Our logistics function manage large items of plant (switchgear and transformers), underground cable, overhead line conductors and poles as well as smaller items such as joints, overhead components and consumables.

Our Stores costs are forecast to reduce by £1.8m pa across our two licenses.

Network Policy

Network Policy relates to the development and review of environmental, technical and engineering policies in light of engineering defects, investigations, changes in legislature, deployment of new technology and innovation ultimately setting out what needs to be done and what procedures need to be followed across our business in light of these.

Network Policy costs are forecast to reduce by £0.9m pa across our two Licensees.

Operational Training / Workforce Renewal

Our business, operating and working on an electrical system, requires all staff to have the adequate skills, technical knowledge and experience to carry out their activities. Our staff must be trained and fully competent to undertake their work activities in line with agreed business processes and procedures. Our plans for operational training also take account of our needs across RIIO-ED1 and into the early years of RIIO-ED2 (to 2026). Across this period it is anticipated some 1700 members of staff will be retiring or leaving our business which will require a very significant effort and clear resourcing strategy to recruit, train and retain staff going forward. This work has already begun in DPCR5 and was previously acknowledged by Ofgem. SPEN has recruited 180 apprentices and 50 graduates over the last two years alone as part of its workforce renewal commitment.

As a result of our workforce renewal requirements Operational Training costs are forecast to increase by £1.9m pa across our two Licensees. We believe this increased expenditure is fully justified ensuring our business retains the skills and expertise to effectively and efficiently manage and develop our network and represent best value for our customers. For a more detailed discussion on this see **Chapter C7f – Resourcing and Training**.

Vehicle expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	4.2	4.5	8.8
RIIO-ED1 Annual Average	3.4	3.8	7.2
Difference	-0.9	-0.7	-1.6
RIIO-ED1 Total (8 years)	27.0	30.6	57.6

Vehicles and Transport

SPEN requires a significant fleet of vehicles and mobile plant to assist manage, operate, maintain and build our network. The activities and costs associated with managing, operating and maintaining this commercial fleet are associated in this section.

Vehicle and Transport costs are forecast to reduce by £1.6m pa across our two Licensees.

h. Business Support Costs

Business Support expenditure RIIO-ED1 (£m)			
	SPD	SPM	SPEN Total
HR and Non Operational	8.0	7.9	15.9
Finance and Regulation	47.1	41.1	88.3
CEO	11.9	9.6	21.5
IT and Telecoms	60.8	53.2	114.0
Property Management	24.3	18.6	43.0
RIIO-ED1 Total (8 years)	152.2	130.5	282.7

Business support (BS) costs include activities that are provided centrally that our front line staff and contractors rely upon. These may be centralised within SP Energy Networks, within ScottishPower, or in some cases within the Iberdrola Group.

These costs include the following cost categories: Human Resources, Non-Operational Training, Finance & Regulation, CEO, IT & Telecoms, and Property Management.

The table above summarises our business support costs forecast for RIIO-ED1

In developing our July 2013 Business Plan submission we completed a detailed benchmarking exercise across GB DNOs that identified our existing business support costs as being comparable with the average of other network operators.

However, our focus on delivering value-for-money means that we have targeted efficiency amongst the best in the industry, an average £17m lower per annum than our average cost in the period 2010-15.

Ofgem's December 2013 fast track assessment stated "SPEN's business support expenditure appears to be efficient when compared against the DNO group benchmark and is sufficiently well justified."

Our subsequent benchmarking analysis has indicated that our proposed business support costs remain in line with our original target to be amongst the most efficient companies in the industry.

More detail on each of the sub cost categories and the cost movements is provided over the page:

HR and non OP expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	2.0	2.2	4.2
RIIO-ED1 Annual Average	1.0	1.0	2.0
Difference	-1.0	-1.2	-2.2
RIIO-ED1 Total (8 years)	8.0	7.9	15.9

Finance and Regulation expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	7.8	7.9	15.6
RIIO-ED1 Annual Average	5.9	5.1	11.0
Difference	-1.9	-2.7	-4.6
RIIO-ED1 Total (8 years)	47.1	41.1	88.3

Human resources and non-operational training

Non-operational training costs represent preparation and delivery of courses other than training of field staff, including IT and telecoms training. During ED1 we will increase significantly the recruitment and training of operational field staff and refocus our organisation to become closer to our clients. The effect of these changes will be to significantly reduce our non-operational training costs.

Human Resources costs include development of HR policy and procedures, employee relations, recruitment of non-operational staff, payroll management, staff support, and costs of staff communications.

The challenges we have set our business for the RIIO-ED1 period, and the support that these functions will provide, means that we expect these costs to remain broadly similar to our DPCR5 costs but with 1% per annum ongoing efficiency similar to our other costs.

Our total RIIO-ED1 forecast is £2.2m p.a. lower than DPCR5.

Finance and Regulation

Finance and regulation expenditure covers a wide range of activities grouped into five main categories: Finance; Insurance*; Network Regulation; Procurement; Fines and Penalties

Additional detail on our insurance strategy is included in **Annex C9 – Insurance Strategy**.

In addition to the efficiencies that will be delivered by the initiatives set out our costs in this area as subject to 1% per annum ongoing efficiency in line with the rest of our plan.

Our forecast costs in this area are £4.6m p.a. lower than DPCR5.

CEO expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	2.2	2.2	4.3
RIIO-ED1 Annual Average	1.5	1.2	2.7
Difference	-0.7	-1.0	-1.6
RIIO-ED1 Total (8 years)	11.9	9.6	21.5

IT and Telecoms expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	8.4	10.1	18.5
RIIO-ED1 Annual Average	7.6	6.7	14.3
Difference	-0.8	-3.4	-4.2
RIIO-ED1 Total (8 years)	60.8	53.2	114.0

Property Management expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	3.6	3.9	7.5
RIIO-ED1 Annual Average	3.0	2.3	5.4
Difference	-0.5	-1.6	-2.1
RIIO-ED1 Total (8 years)	24.3	18.6	43.0

CEO, group directors and corporate communication

The expenditure classed as CEO costs includes costs of directors, board meeting costs, corporate communications, legal costs, company secretarial costs, and community awareness.

IT and Telecoms

Costs in this area include all the operating and maintenance costs of the IT infrastructure (servers, data and telephony networks, PCs and printers) including management and applications software costs. It excludes the IT and communications systems that are used to control the network and collect data from operational sites as these are classified as operation IT & Telecoms.

Our non-operational IT & Telecoms strategy is set out in a separate detailed annex that accompanies this document **Annex C6h – Non Operational IT and Telecoms Strategy**.

Property

Our property portfolio

Costs attributed to this category include rent, security, general repair and routine maintenance, utility costs, cleaning and catering services associated with our 34 offices serving our 2 million customers in Central and Southern Scotland and Berwickshire, and our 1.5 million customers in Merseyside, Cheshire, and North and Mid Wales.

Our forecast costs in this area are £2.1m p.a. lower than DPCR5.

i. Non Operational Expenditure

Non Operational expenditure (£m)			
	SPD	SPM	SPEN Total
DPCR5 Annual Average	4.7	4.4	9.1
RIIO-ED1 Annual Average	6.7	6.3	13.0
Difference	2.0	1.9	3.9
RIIO-ED1 Total (8 years)	53.4	50.7	104.1

Costs captured within this category include:

- *the purchase of vehicles and mobile plant including generators*
- *purchase of IT and telecoms systems*, and*
- *capital investments on buildings.*

Annex C6 – IT & Telecoms Strategy provides more details of the projects, which are categorised as:

- *Infrastructure & Application Refurbishment*
- *Enhancements to existing applications*
- *New applications*
- *Technology enablers*
- *Future Innovation - Smart Meter & Smart Grid*

This IT & Telecoms component is included as part of the overall Non-operational Capex figures in **Annex C6 – IT & Telecoms Strategy**.

j. Non Activity Based Costs

Non-activity based costs include:

- *Corporation tax*
- *Business rates paid to local government*
- *Transmission charges paid to National Grid*
- *Central smart metering system costs*
- *Legacy pension costs.*

Within our plans we have included £1168m including latest pension cost updates to cover these costs.

These are all external costs that we do not control. For more information please see **Chapter 8 – Risk and Uncertainty**.

k. Real Price Effects

Indices

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20 to 2022/23
Labour – general (%)	(0.2)	0.3	0.7	0.7	0.4	0.85
Labour – specialist (%)	1.1	1.6	1.9	1.9	1.6	2.1
Materials – general/civils (%)	1.5	1.1	0.9	0.7	0.5	1.1
Materials – electrical (%)	2.0	1.6	1.4	1.2	1.0	1.6
Plant and equipment (%)	(0.5)	(0.9)	(1.1)	(1.3)	(1.5)	(0.9)
IT (%)	(2.25)	(2.65)	(2.85)	(3.05)	(3.25)	(2.65)
Property rentals (%)	(0.5)	0.0	0.0	(0.1)	(0.3)	0.85

Real Price Effects (RPEs) are the difference between the index that is used to update our revenues each year (the Retail Prices Index, RPI) and the movements in the costs of materials (for example, copper cables) or specialist labour (for example, engineers). Applying the percentages indicated above results in an adjustment £159m in our plans.

We engaged First Economics to update their forecasts of real price effects (Annex 3.2). First Economics' previous forecasts were used by WPD in their RIIO-ED1 Business Plan, which Ofgem have proposed for fast-tracking. First Economics have taken into account comments made by Ofgem in their November 2013 assessment of DNOs' RIIO-ED1 Business Plans and by the Competition Commission (CC) in its provisional findings in the Northern Ireland Electricity (NIE) price control inquiry.

First Economics' RPE estimates are summarised in the table above:

On-going efficiency

The ongoing efficiency assumption within our Business Plan is 1% per annum. As set out throughout this chapter, we have reviewed in detail direct and indirect costs to ensure our plan is efficient. In addition to establishing our base costs, a 1% year on year on-going efficiency challenge is embedded across labour, contractor and material costs in our Business Plan. We believe this is an aggressive assumption and the independent report from economic consultants Reckon supports this view.

Reckon LLP independently reviewed historical data on comparable efficiency gains and the results of their review are presented in **Annex C6m – RIIO-ED1 Ongoing Efficiency Gains**.

I. Cost Assessment, Efficiency and Benchmarking

We are acutely aware of the financial pressures on our customers, particularly in the current economic climate. Consequently we have sought to make our plan amongst the most efficient in the industry in order to mitigate the impact on our customers' bills.

As part of the Fast Track Assessment Process, Ofgem considered our July 2013 Business Plan as being potentially inefficient in a number of areas. In total, Ofgem's analysis showed that the gap between our submission and their fast track assessment of efficiency was £755m. Working with Economic Consultants NERA we have reviewed this Fast Track Assessment and have identified a number of issues with the Ofgem Analysis including:

- *Very poor statistical fit*
- *Arbitrary choice of drivers*
- *Unclear model selection process*

Notwithstanding this we have used the model to direct our slow track assessment

The graph below identifies the areas of 'potential inefficiency' where we needed to refocus our efforts in our cost and volume assessments, or to provide or direct Ofgem to additional information to support our investment requirements. This graph reflects the output of Ofgem's 'activity based analysis', which was the most significant of the 3 analytical techniques that they used to assess our plan as its output was given a 75% weighting in combining the results.

The main areas of expenditure where we needed to undertake further analysis or provide additional evidence were as follows:

- *Asset replacement and refurbishment*
- *BT21CN*
- *Technical Losses and Environment*
- *I&M*
- *Trouble call/ONIS*
- *Load related expenditure*
- *Closely Associated Indirect costs.*

We have completed a comprehensive review of all of our expenditure.

We believe that our July 2013 submission was an efficient Business Plan. However, we have acted on the feedback from Ofgem and carried out a comprehensive review of all areas of our plan including:

- *Volumes of activity*
- *Costs of activities – where we reviewed unit costs of individual activities or undertook econometric or statistical analyses to assess costs of activity groups. (e.g. indirect or back office costs)*

Ofgem Analysis – SPEN Business Plan

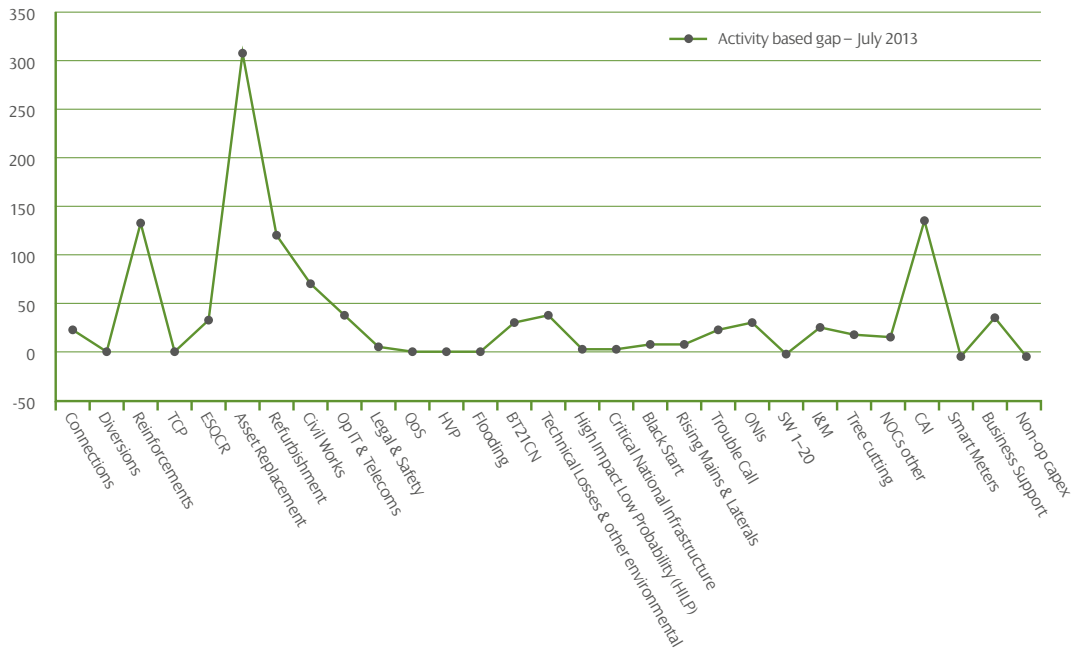


Figure 1: 6.6/11kV Poles

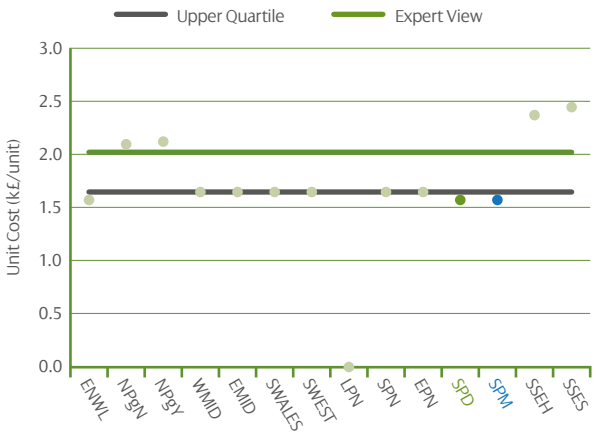
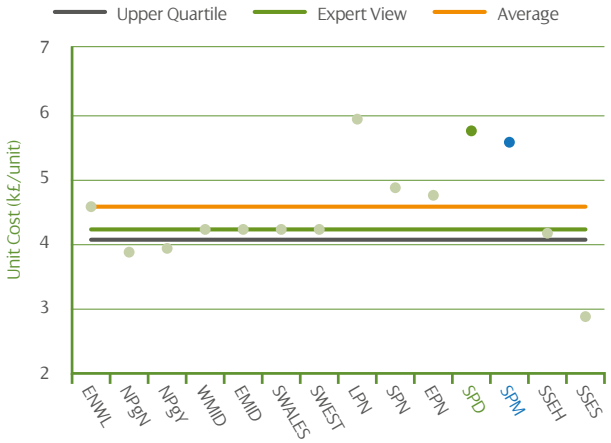


Figure 2: LV UGB and LV Pillars (OD not a Substation)



This has resulted in a revised Business Plan that is £450m more efficient whilst allowing us to:

- *Manage our ageing network to maintain public, staff and contractor safety*
- *Improve customer service*
- *Reduce the number and length of power cuts (including during major storms)*
- *Prepare the network for low-carbon technology.*
- *Deliver a high quality outcome for all of SPEN's stakeholders*

Cost Assessment Approach

The two main building blocks of our cost base are:

- *Unit Costs - the cost of carrying out work (e.g. the cost of replacing a transformer).*
- *Indirect Costs (e.g. the cost of supporting and managing our work programmes).*

We set our costs throughout our July 2013 Business Plan to be amongst the most efficient in the industry. Our updated plan has this same goal taking account of the latest information.

Unit costs

Ofgem stated in their assessment of our July 2013 Business Plan:

"SPD is efficient on asset replacement and refurbishment unit costs across the majority of assets. SPM is relatively high on unit costs across the majority of assets."

Where the activities in SPM and SPD are comparable the costs are identical. Accordingly we and Ofgem believe these costs are efficient. There are individual costs specific to SPM however e.g. 132kV and plant associated with the interconnected network. These are identified in **Annex C6c – SP Manweb Company Specific Factors**. We believe the Ofgem view of our efficient unit costs reflects the considerable effort we spent in our July Business Plan submission where we reviewed:

- *Every activity we undertake on our networks, including cost of installation, cost of refurbishment and cost of restoration.*
- *The costs associated with the supply of plant and equipment.*
- *The contracts associated with the supply of installation or service contractors.*
- *Our own internal costs.*
- *The time we spend on our activities.*
- *Best practice across our two network areas so that the same unit costs were applied across both licences for the majority of assets (unless there was a clear technical and economic argument for higher costs)*

We have now taken this further following the feedback from Ofgem and we've compared our unit costs against the unit cost benchmarks provided by Ofgem's Expert (KEMA) and those of the proposed fast tracked DNO, WPD. Figure 1 is an example of this analysis.

The chart shows that our unit cost for HV Pole replacement is £1.6K – the frontier cost for UK DNOs. The Ofgem expert view was set at £2K and WPD's unit cost is £1.72K. Through this level of detailed assessment we have ensured that our unit costs, where comparable to the other DNOs, are amongst the most efficient in the industry for the activities we undertake.

There are a number of areas where our unit costs would appear greater than Upper Quartile or the expert view. As an example consider LV pillars shown in figure 2.

Figure 3: Asset replacement and refurbishment unit cost analysis

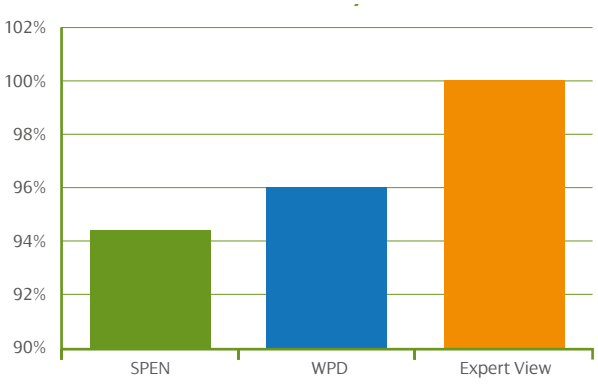
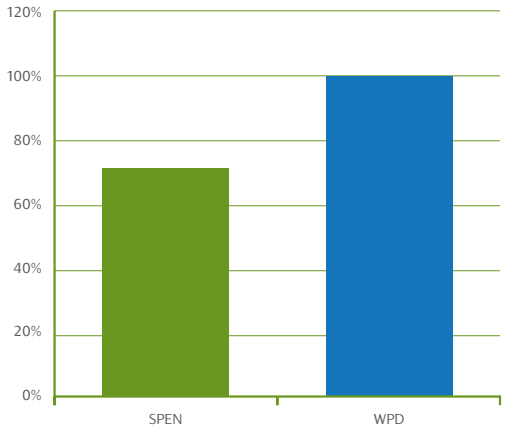


Figure 4: Faults – Unit cost analysis



There are 8 different variations of this activity (2 way to 8 way pillar or link box) each with a different cost. Our unit cost reflects the average cost of replacing these. If a DNO replaces a greater volume of smaller pillars their average unit cost would be lower. We have ensured that our unit cost for all activities is efficient and reflects current competitively tendered rates.

A full review of all the unit costs is presented in our **Annex C6m – Cost Assessment, Efficiency and Benchmarking.**

It should be noted that there are areas where it is difficult to use the unit cost approach to assess cost efficiency. If innovative solutions require expenditure with a unit cost that is greater than Upper Quartile or Ofgem's expert view, they could be disallowed. We have ensured that such instances are supported by Cost Benefit Analysis.

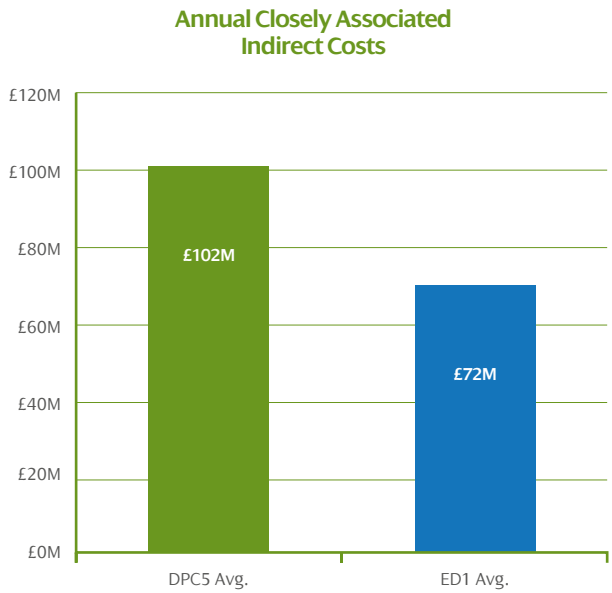
Figure 3 and 4 show how we perform in terms of unit cost. These charts exclude unit costs associated with our SPM 132kV programmes for which we provide a separate **Annex C6c – SP Manweb Company Specific Factors**.

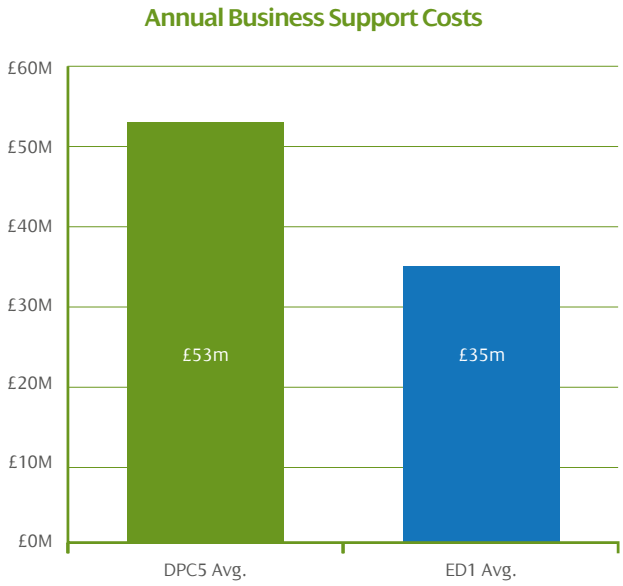
In comparing our fault costs in Figure 3 we see that SPEN are almost 30% more efficient than WPD, the benchmark company.

This may reflect the practice WPD employs of undertaking an average of 30 metres of cable replacement on each low voltage fault compared with an industry average of 5-6 metres.

In summary the unit costs in our July 2013 Business Plan were amongst the most efficient in the industry. They are £450m more efficient in our revised Business Plan. Our unit costs are more efficient than WPD the benchmark company.

In summary the unit costs in our July 2013 Business Plan were amongst the most efficient in the industry. They are £450m more efficient in our revised Business Plan. Our unit costs are more efficient than WPD the benchmark company.





Indirect Costs

Our indirect costs include Project Management, Design, HR, Finance, Engineering Management, Clerical Support, Control and Call centres, training, vehicles and transport. They are known as Closely Associated Indirect and Business Support Costs. These are the back office support for our front line activities and are covered in detail in sections g and h of this chapter. The assessment of these costs is normally undertaken using statistical or econometric analysis.

We know that our current level of indirect costs is considerably higher than those of the frontier or Upper Quartile DNOs.

As a consequence, for our Fast Track Submission we:

- *Ensured that all our costs are categorised in accordance with the RIGs guidance.*
- *Undertook a comprehensive review of all of our costs in each area of our support activities.*
- *Ensured that the costs are recorded correctly and have been allocated accordingly.*
- *Set a challenge for our business that we should only ask customers to fund efficient levels of cost in RIIO-ED1, with our shareholders carrying the risk of achieving this ambitious goal.*

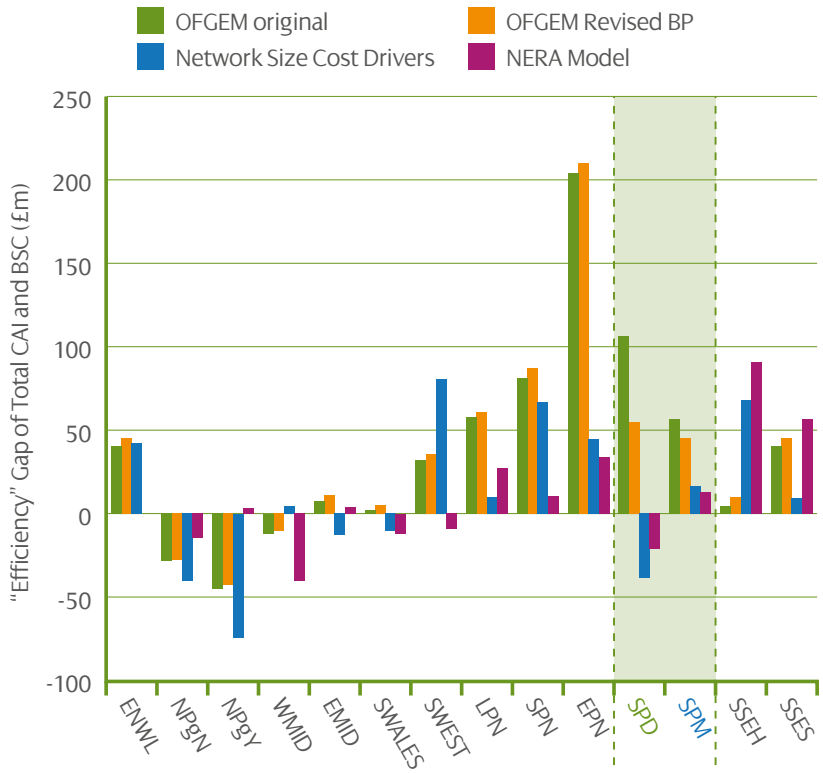
We then set our total indirect costs at a level that is amongst the most efficient in the industry. This requires a reduction on our indirect costs of 25% across our two licences.

To deliver the scale of this challenge, we have established a business implementation team and have started to reduce our costs to meet the targets set through this cost assessment process. The scale of this challenge is shown graphically above and described in **Chapter 7 – Business Readiness**.

In their response to our July 2013 submission, Ofgem stated:

"For closely associated indirects, SPEN's expenditure appears less justifiable than other DNOs and both its DNOs benchmark poorly, with SPD benchmarked as the least efficient company for the regressed CAI activities."

NERA Regression Analysis on Indirect Costs



The benchmarking was undertaken by Ofgem using weighted MEAV as a dominant factor in assessing allowances. We have worked closely with Ofgem and have retained the services of NERA Economic Consulting to review the assessment process and to recommend alternative models to allow the assessment of indirect costs. (a copy of NERA's reports can be found in our Cost Assessment Efficiency and Benchmarking Annex).

The models produced by Ofgem for CAI and BSC analysis, as per the Totex Models, had a poor explanatory value, unclear selection criteria, arbitrary and illogical driver choice and assumes that variations are attributable to DNO efficiency.

NERA has produced an alternative set of models to assess on a regression basis that:

- *Have a higher explanatory value*
- *Leave less cost variations attributed to inefficiency*
- *Pass the series of statistical tests*
- *Have been subject to formal model selection techniques*

The model for CAI and Business Support Costs makes use of employee numbers and CSV as drivers. It produces an assessment of SPEN's indirect costs as depicted above:

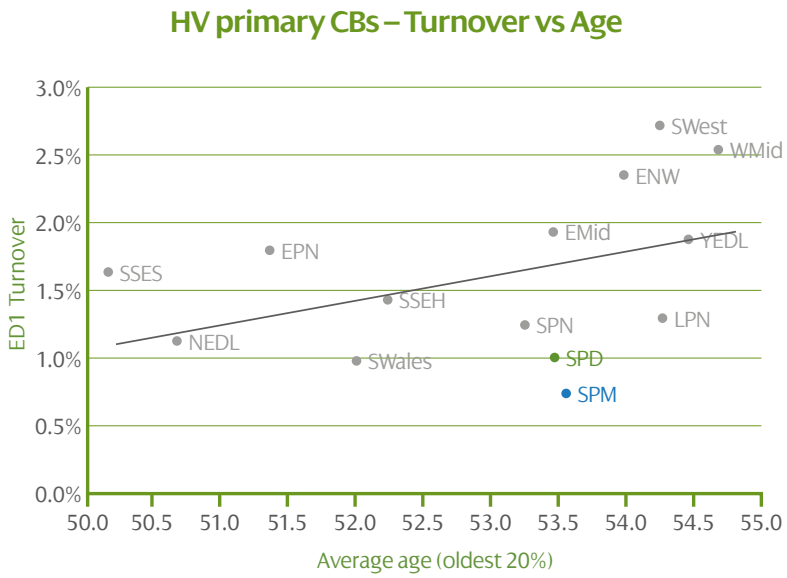
This model shows:

- *Ofgem's Fast Track analysis of SPEN indirect costs had an efficiency gap of £165M*
- *With our proposed revisions to the Business Plan, this gap reduces to £100M using the same Ofgem model.*
- *Using the NERA proposed model, SPEN's indirect costs are assessed as being amongst the most efficient in the industry, completely removing the gap and indicating an outperformance of £10M relative to our peers.*

However, NERA conclude that similar models can provide greatly differing results and that these models alone should not be used to reduce allowances without first considering why there is a perceived efficiency gap.

We have removed an additional £82m from our CAI costs, predominantly through changes to our Workforce Renewal Programmes and through a further efficiency stretch across our Closely Associated Indirect and Business Support costs. We have reviewed in detail each area of our CAI and BS costs in our **Annex C6m – Cost Efficiency and Benchmarking Analysis.**

In summary, the indirect costs in our July 2013 Business Plan were amongst the most efficient in the industry. They are £85m more efficient in our revised Business Plan.



Volumes

Ofgem stated the following in their assessment of our July 2013 Business Plan:

SPD's replacement and refurbishment volumes are high compared to our modelling. SPMW's asset replacement volumes are extremely high compared to our modelling and its refurbishment volumes are also high.

A considerable amount of Ofgem's modelling for the fast track process was based on industry average, median volumes or implied asset life (not however in a conventional form) which deemed any increase over historic asset replacement run-rates for the 3 years 2010-2013 to be inefficient. It did not consider differences in DNOs' plans arising from differences in asset health or actual age profiles. This modelling indicated a volume gap of £397M value between our July 2013 estimate of the required workload and Ofgem's analysis for asset replacement, refurbishment and civils alone. In assessing our volumes, we believe that we can justify the need for investment. Unfortunately the Fast Track Process did not afford us the opportunity to take Ofgem through the detailed Engineering case we had prepared. To do so we have prepared detailed engineering justifications based on-site inspections, fault history and condition reports. Every substation has been surveyed and 83% of our 603,000 poles inspected to ensure that the need for investment is based on physical evidence.

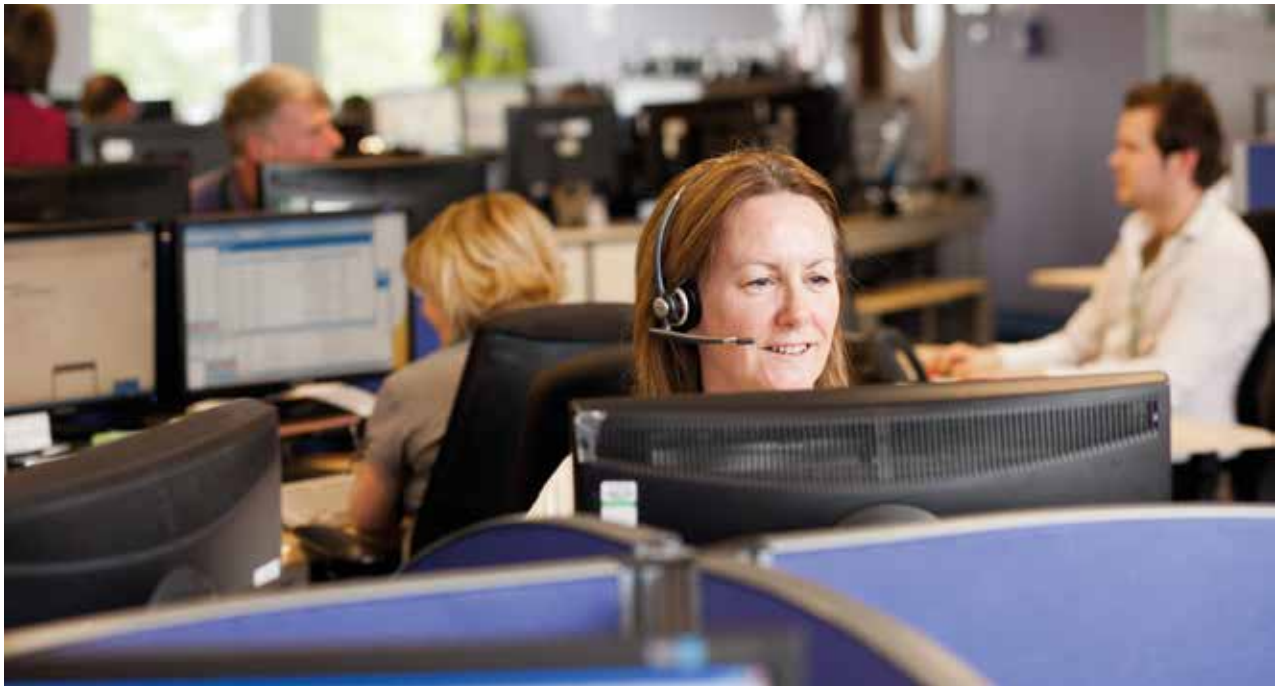
We also use the relative age of our equipment compared to that for other DNOS to ascertain if our volumes of activity reflect industry averages. The diagram shown above illustrates this principle. The Y axis shows the expenditure proposed for ED1 on Primary CB replacement expressed as a percentage of the total replacement value for each DNO, the X axis being the average age of the oldest 20% of Primary CBs. From this, we can see that these CBs are amongst the oldest in the UK. We would expect that the expenditure would be higher than the other DNOS if age is taken as a proxy for condition and the need for replacement. Using our site condition data, however, we do not need to undertake the expected levels of investment that DNOs of a similar age are undertaking. We have carried out this level of robust checking for every area of our expenditure.

Volume Changes

From our benchmarking, we have reviewed the engineering cases and assumed, where possible, a higher level of risk whilst not compromising our ability to deliver our primary outputs.

There are a number of areas where we cannot reduce volumes, as we would be faced with an increase in risk to intolerable levels:

- *Where the level of risk to staff or the public is too high.*
- *Where there is a legislative or government requirement – e.g. ESQCR or Black Start.*



- *Where there is a definitive cessation of service provision e.g. BT21CN.*
- *Where stakeholders have asked us to do more, e.g. storm resilience and poorly served customers*

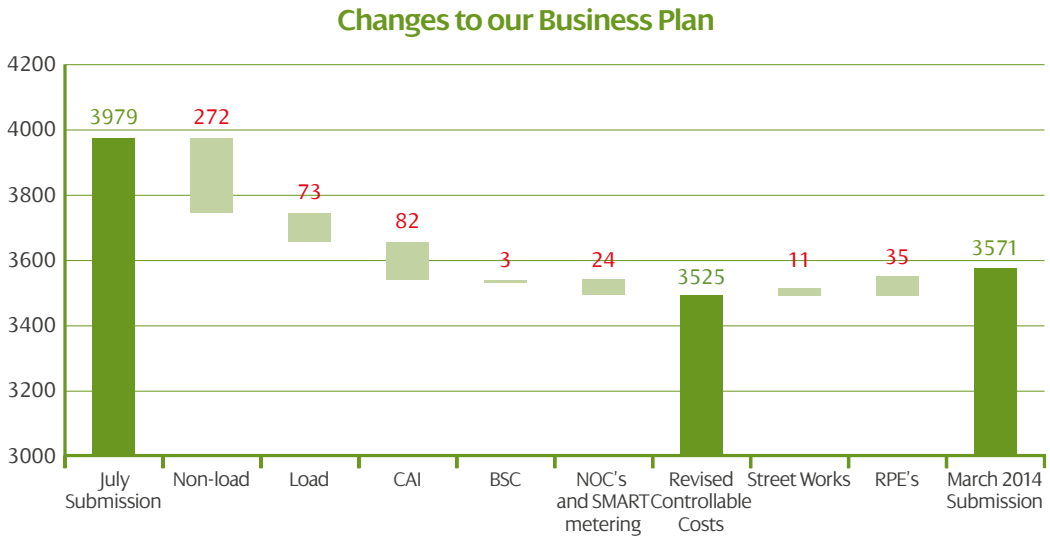
The vast majority of our July 2013 planned volumes remain in our updated plan, but we have identified volume reductions in the following areas:

- *Pole replacement and refurbishment*
- *Overhead line conductor*
- *Civils*
- *LV Boards*
- *11kV cable*

In addition, we have rescheduled our SCADA programmes to spread the expenditure into ED2, creating a smoother investment profile over a longer period. We have also made a change to the methodology of replacing 132kV switchgear at our Rainhill substation in Merseyside, which delivers a significant cost reduction in expenditure at that site in ED1.

We have also reviewed our reinforcement activity levels and have taken account of additional information on LCT uptake rates which has resulted in reductions in our load related programmes.

In total, these volume reductions represent a reduction of £350m in our expenditure plan.



Summary

When assessed more comprehensively than the Fast Track timetables allowed, much of our July 2013 plan can be demonstrated to be more efficient than the proposed fast track DNO, WPD. However, we have taken into account the feedback from Ofgem's assessment of our July 2013 Business Plan. In a number of areas, we have accepted an increase in risk and in doing so, made reductions in a number of our load related and non-load related volumes. In many more areas, we will point Ofgem to engineering and econometric evidence backed by cost benefit analysis to justify the need for our investments and the efficiency of our costs.

Our volumes are now those required to ensure we have a strong stewardship of our assets and deliver tolerable network risk.

We have further reduced our unit costs in areas where we were not amongst the most efficient and further reduced our indirect costs.

We are confident that the costs in our July 2013 Business Plan were amongst the most efficient in the industry. They are £450m more efficient in our revised Business Plan.

The net effect of our work since receiving the feedback on our July plan is that we have reduced our costs by £450m from that previously submitted. The chart above shows the attribution of this reduction to the main cost categories.

We have a Business Plan where our comparable costs are 13% more efficient than that of the proposed Fast Track DNO, WPD.

This review of our investment plan through the use of engineering assessment, cost assessment and econometric modelling with industry leading efficiency as a guiding principle has ensured that we can operate our networks in a safe and effective manner whilst minimising the cost to our customers.

7 Business Readiness

Our preparations to deliver our commitments

In this section we explain how we have made thorough preparations to ensure we deliver our outputs and the commitments we have made in our Business Plan.

In **Overview**, we describe our preparations which include the establishment of an ED1 Business Readiness Programme, engagement with our contractor and supplier community, our internal functions and the third parties on whom we depend.

In **Innovation and future networks** we explain how we apply innovation across all aspects of our business to deliver value-for-money.

In **Preparing our Organisation**, we introduce Our ED1 Business Readiness Programme which focuses on the evolution of our organisation and processes to increase efficiency and performance and realign our resources to get closer to our customers.

In **Preparing to Deliver Our Investments**, we describe our advanced preparations to ensure we are ready to deliver as soon as the ED1 period begins. A large volume of our contracts will be renewed ahead of the ED1 period. With this in mind, we have reviewed our **purchasing** strategy and looked at how we can secure a balanced range of contracts that reflect the needs of all interested parties.

We have carried out a comprehensive review of our **resourcing and training** strategy for ED1 and in this section we outline the scale of our recruitment plans and how we plan to bridge the industry skills gap by investing in a comprehensive training and development programme.

The result is that we are in a strong state of readiness to meet the challenges of delivering our ED1 outputs efficiently and effectively.

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Overview	
b. Innovation and future networks	Annex C7 – Innovation strategy Annex C6 – Cost benefit analysis
c. Preparing our Organisation	
d. Preparing to deliver our investments	
e. Purchasing	
f. Resourcing and training	

a. Overview

Preparing to deliver

We have made thorough preparations to ensure we are able to deliver our outputs and commitments as we transition from the current price control period, into ED1 and beyond. We have instigated a Business Readiness Programme with a remit to look at all areas within our organisation, we have carried out a comprehensive review of our resourcing strategy, engaged with our contracting community, looked at our purchasing requirements with our supply chain and completed pre-project planning on a zone by zone basis across all our operational areas.

Innovation & Future Networks

The future is going to bring greater uncertainties for demand and generation. In times of change, innovation is vital to maximising the network's capabilities and delivering value-for-money to customers. Over the course of ED1 we will make the transition to towards a Distribution System Operator (DSO) model, whereby we will actively manage the power flows on our network through commercial as well as technical means, resulting in lower costs to operate the system and greater agility to respond to customers' requirements. Our Think Big, Start Small, Scale Fast approach to innovation enables us to be at the forefront of innovative practice.

Our ED1 Business Plan is designed with innovation at its core, a strategy that was developed in conjunction with our stakeholders and influenced using extensive knowledge and experience of the worldwide Iberdrola Group. Innovation embedded within our Business Plan delivers £70m benefits to our customers and stakeholders.

Preparing our organisation to deliver

Our Business Readiness Programme was established with a broad remit to review the suitability of all elements of our organisation to deliver our ED1 targets. The project team was made up of a number of our senior managers, and as part of its work has reviewed organisational structures and practices within other similar organisations in the UK and sister companies within the Iberdrola Group.

This team has now concluded its work and has recommended a range of changes to our organisation and processes that will enhance our performance. At the heart of the proposed changes is a philosophy of moving the centre of our operations closer to our customers and we are convinced that this will deliver significant benefits In terms of customer service whilst also improving cost efficiency. As part of this project, we have tested the proposed changes against the primary objectives that we are committing to deliver in ED1 to ensure that the changes we make will allow us to deliver successfully across all of our commitments.

Preparing to deliver our investments

We have engaged with our suppliers and contractors at dedicated stakeholder events. We shared our plans for ED1 and engaged on how we will work together. 60% of attendees agreed that SP Energy Networks are either good or very good to work with. We are working to increase this percentage by:

- *Supporting our contractors to develop sustainable recruitment and training plans.*
- *Looking at different contractual relationships to most efficiently deliver our investment plans and meet our customer service targets.*

Preparing to deliver zone by zone

To ensure we have a deliverable plan, we have:

- *Engaged with our internal and contracting staff to make sure our plans are viable and achievable.*
- *Undertaken comprehensive surveys and engineering studies.*
- *Prepared individual project engineering schemes and outage plans to ensure efficient delivery.*
- *Mapped all activities on a geographic basis to enable co-ordination of works and minimise disruption for Customers.*
- *Created Operational Zonal Maps to help our workforce and stakeholders understand the scale, timing and benefits of our plans throughout the ED1 period.*

Innovation embedded within our Business Plan delivers £70m benefits to our customers and stakeholders[1]

1. *Down from £100m July 13 plan as a result of lower low-carbon technology uptake and £73m reduction in overall load plans.*

In creating our plans, we have made the most of being part of the global Iberdrola Group:

- *Our engineering plans have undergone a robust peer review by engineers within Iberdrola and have been compared with similar approaches in both Spain and USA.*
- *We have applied Iberdrola's global purchasing expertise to ensure that the costs underpinning our programme are efficient.*

Iberdrola's global purchasing expertise means that the costs underpinning our programme are efficient

Preparing our purchasing strategies

A large number of our contracts will be renewed ahead of the start of ED1 in April 2015. This affords us an opportunity to review our purchasing strategies to make sure we secure a balanced range of contracts that are of mutual benefit to us, our contractors & suppliers, customers and stakeholders.

- *As part of the worldwide Iberdrola Group we can purchase goods and services at competitive costs, and deliver real value-for-money for our customers.*
- *We recognise that during the period 2010-2012 we made a slow start to our investments, due to a high proportion of contract renewal. Our robust ED1 preparations will avoid this happening again.*
- *We are reviewing all of our major contracts to ensure that they are in place for the start of RIIO-ED1 and that they fully meet our requirements in terms of customer service and productivity.*

Resourcing and training

We have carried out a comprehensive review of our resourcing strategy for the ED1 period and beyond to provide us with a highly skilled and well-trained workforce for the future. We know that having the right people, with the right skills, in the right place is essential for efficient and effective delivery. We need highly skilled, suitably authorised employees, with the specialist skills to deliver our investments. With the growth of our industry and the new challenges associated with the low-carbon future, it's clear that we need to recruit and train new staff.

Our current workforce

We employ a wide range of highly trained and specialist staff to operate and maintain our network, deliver our investment programme and respond to our customers' needs 24/7. We also have support functions to assist in managing our business. Our staff can be categorised as follows:

- *1050 Field Staff – linespersons, jointers, fitters & support staff.*
- *980 Engineers and technical specialists.*
- *390 customer service staff, central support staff and managers.*
- *180 trainees – engineers and field staff.*
- *We also utilise approximately 2,500 contracting staff.*

The outcome of our comprehensive resourcing review has shown:

Between now and 2023, over 1400 of our employees and 1000 of our contractors will leave mainly through retirement or changing jobs, and these trends will continue into the following decade.

We are embarking upon an ambitious programme to invest up to £75m in the recruitment & training of highly skilled people to deliver our investment plans and meet our customer service targets.

This training and recruitment programme represents an unprecedented opportunity for us to shape our business to meet the challenges of the ED1 period and beyond.

Our programme will include:

- *Recruiting from a variety of sources including:*
  - *Graduate Trainees.*
  - *Engineering Apprentices.*
  - *Craft Apprentices.*
  - *Skilled individuals direct from the market.*
- *Collaboration with colleges and universities to bridge the industry skills gap more quickly.*

We are one of the few DNOs that have retained our own operational and technical training centres

- *We plan to further invest in our training centres in Cumbernauld in Central Scotland and Hoylake in Merseyside*
- *These centres provide essential training and authorisations for both direct and contracting staff and are a key part of our deliverability strategy for the future.*

Preparing to deliver

We have made thorough preparations to ensure we are ready to deliver our commitments as we move from the current price control period into ED1 and beyond.

We have thoroughly reviewed our current costs and organisational capabilities against the best in the industry and understand what we need to do to deliver our plan.

We have carried out a comprehensive review of our resourcing strategy and purchasing requirements, engaged with our contracting community and completed pre-project planning on a zone by zone basis across all our operational areas.

Our plans are built from a strong belief that good customer service is integral to any efficient organisation.

Our range of preparations include:

- *Detailed site surveys for our main programmes of work.*
- *Comprehensive engineering studies looking at alternative approaches.*
- *Programme and project planning activities.*
- *A thorough review of our contracting strategies.*
- *The development of a revised resourcing strategy.*

Preparing to deliver zone by zone

To ensure we have a deliverable plan, we have:

- *Engaged with our experienced internal delivery teams to make sure our plans are viable and achievable.*
- *Undertaken comprehensive surveys and engineering studies.*
- *Prepared individual project engineering schemes and outage plans to ensure efficient delivery.*
- *Mapped all activities on a geographic basis to co-ordinate works and minimise disruption for Customers.*
- *Created Operational Zonal Maps to help our workforce and stakeholders understand the scale, timing and benefits of our plans throughout the ED1 period.*

Preparing to deliver through our supplier & contracting community

We have engaged with our suppliers and contractors at dedicated stakeholder events. We shared our plans for ED1 and engaged on how we will work together. Our ongoing work in this area includes:

- *Supporting our contractors to develop plans to bridge the industry skills gap.*
- *Considering the reflection of reward and penalty incentives contained within our contract with Ofgem with that of our suppliers and contractors.*

A large proportion of our contracts will be renewed ahead of the start of ED1 in April 2015. This affords us an opportunity to review our purchasing strategies to make sure we secure a balanced range of contracts that are of mutual benefit to us, our contractors & suppliers, customers and stakeholders.

- *As part of the worldwide Iberdrola Group we can purchase goods and services at more competitive costs, and deliver real value-for-money for our customers.*
- *We recognise that during the period 2010-2012 we made a slow start to our investments, due to a high proportion of contract renewal. Our robust ED1 preparations will avoid this happening again.*
- *We are reviewing all of our major contracts to ensure that they are in place for the start of RIIO-ED1 and that they fully meet our requirements in terms of customer service and productivity.*

Our resourcing strategy

We know that having the right people, with the right skills, in the right place is essential for efficient and effective delivery. We need highly skilled, suitably authorised employees to deliver our investments. With the growth of our industry and the new challenges associated with the low-carbon future, it's clear that we need to recruit and train new staff. We have carried out a comprehensive review of our resourcing strategy for the ED1 period and beyond to provide us with a highly skilled and well-trained workforce for the future.

We have made thorough preparations to ensure we are ready to deliver our commitments as we move from the current price control period into ED1 and beyond.

b. Innovation and Future Networks

We are committed to applying innovation to deliver value-for-money for our customers

The future is going to bring greater uncertainties for demand and generation, and innovation is an important element to ensuring that we have the flexibility to adapt in a timely and cost-effective way.

In times of change, innovation is vital to maximising the network's capabilities and delivering value-for-money to customers

Over the course of ED1 we will make the transition to towards a Distribution System Operator (DSO) model, whereby we will actively manage the power flows on our network through commercial as well as technical means, resulting in lower costs to operate the system and greater agility to respond to customers' requirements.

Our Think Big, Start Small, Scale Fast approach to innovation enables us to be at the forefront of innovative practice. This has been the approach we have developed in DPCR5 and successful examples include Real Time Thermal ratings for overhead lines, Accelerating Renewable Connections (ARC) and Flexible Networks, all of which have started through a carefully focussed trial and are now being scaled up for application in our ED1 plan. We will continue to use this approach to the DSO transition, and as detailed in our Innovation Strategy, we will build on our experience from projects in DPCR5 as well as initiating new projects to develop novel approaches for demand side response, using smart meters and community led solutions.

We will begin the transition to distribution system operator during ED1

Innovation throughout our business

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 use innovation to keep a downward pressure on 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.*

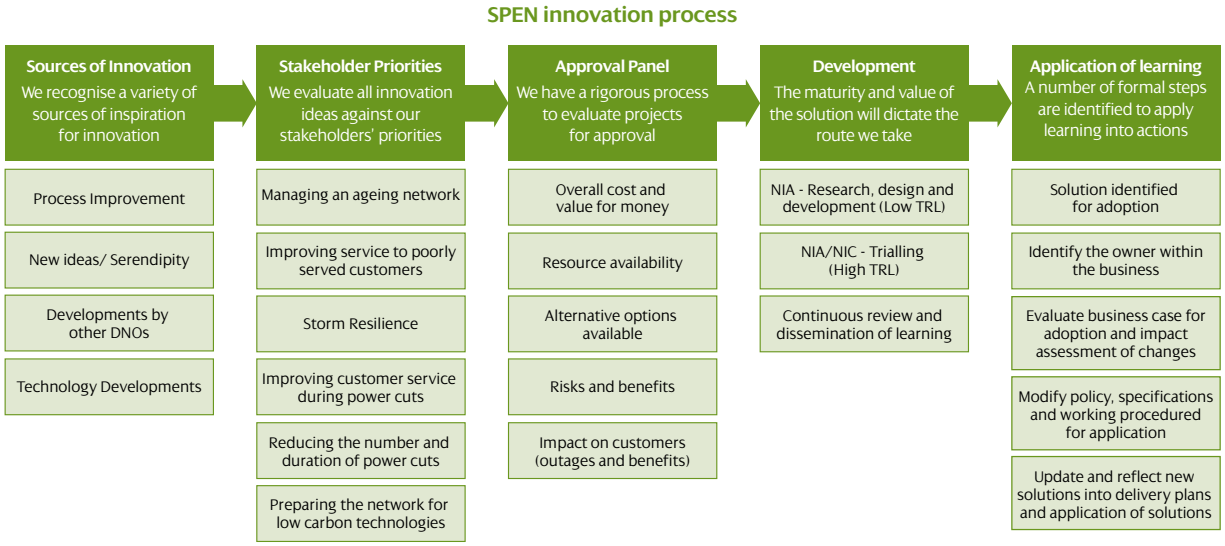
The Innovation Funding Incentive (IFI) and Low-Carbon Network Fund (LCNF) were the key innovation funding mechanisms within the DPCR5 period. Additionally we have also undertaken other initiatives to promote innovation and embed it within the business. Throughout DPCR5 we have:

- *Created a Business Change team:*
This team oversee innovative process improvement and new commercial arrangements. We now use Lean Sigma methods to drive new ways of working and have a number of fully accredited business change practitioners (black belts) leading change projects across the business.

- *Created a Future Networks team:*
This team are responsible for the portfolio of LCNF and IFI projects. We empower the Future Networks team with flexibility to explore new opportunities while still being part of our Engineering Department where they work alongside our Design and Asset Management teams who can learn and implement new solutions.

- *Ensured that learning is shared effectively:*

Learning is shared internally and externally proactively between network operators and other interested parties. We have hosted our own dissemination events as well as presenting at a wide variety of conferences.



In the first two years of DPCR5 we have invested over £5m through the IFI and 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 and commitment within the business, a number of our projects have been developed into solutions that are already being deployed as part of business as usual, and we have further projects that will be applied in ED1 including network automation, active network management and the Power Network Demonstration Centre.

Network automation is being developed in collaboration with various companies to ensure we have a robust communication infrastructure to support enhanced system intelligence. This has helped significantly to improve our response to faults and storms.

We have developed **active network management** solutions to connect renewable generation faster and at lower cost through managing the power flows on the network in real time and providing two-way control to generation that impacts upon network flows. Through the ARC LCNF project we are implementing active network management across a large part of the East of Scotland, an area with over 500MW of DG in the application process, which we are confident we will be able to connect faster, and at lower cost than by traditional means.

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. The PNDC provides us with a platform to develop technology faster by creating an environment to test it without risk to customers and the wider system. This includes projects focussing on telecoms, protection and automation which may not otherwise be possible on the live network.

As we make the move to a DSO, we will engage with both demand and generation customers to incentivise participation in balancing the system through demand side response, active network management, generator support and other services. This transition will require innovation throughout SP Energy Networks, and collaboration with the wider industry to realise this vision. Through our involvement in the Smart Grid Forum, we are helping to define what a DSO will look like and the services which a DSO model will need to offer.

As part of our appraisal process for new investment, consideration of innovation is a pre-requisite to ensure that new learning is adopted and commercial approaches are considered. For example, each step in the process of developing of our load related expenditure has a requirement to consider innovation.

As new solutions are developed, we will reflect this learning into our policies and specifications, as it is through embedding the learning from innovation into the way that we operate that we can realise the benefits that it offers. More information on the process which we apply to managing innovation can be found in our **Annex C7 – Innovation strategy**.

Developing our innovation strategy

In developing our plans we consulted with a range of internal and external stakeholders. We have taken the priorities that stakeholders identified and the associated output measures into account in our innovation plans. Our innovation strategy is focused around six top priorities:

- *Managing an ageing network.*
- *Improving service to poorly served customers.*
- *Investing in storm resilience.*
- *Improving customer service during power cuts.*
- *Reducing the number and duration of power cuts.*
- *Preparing the network for low-carbon technologies.*

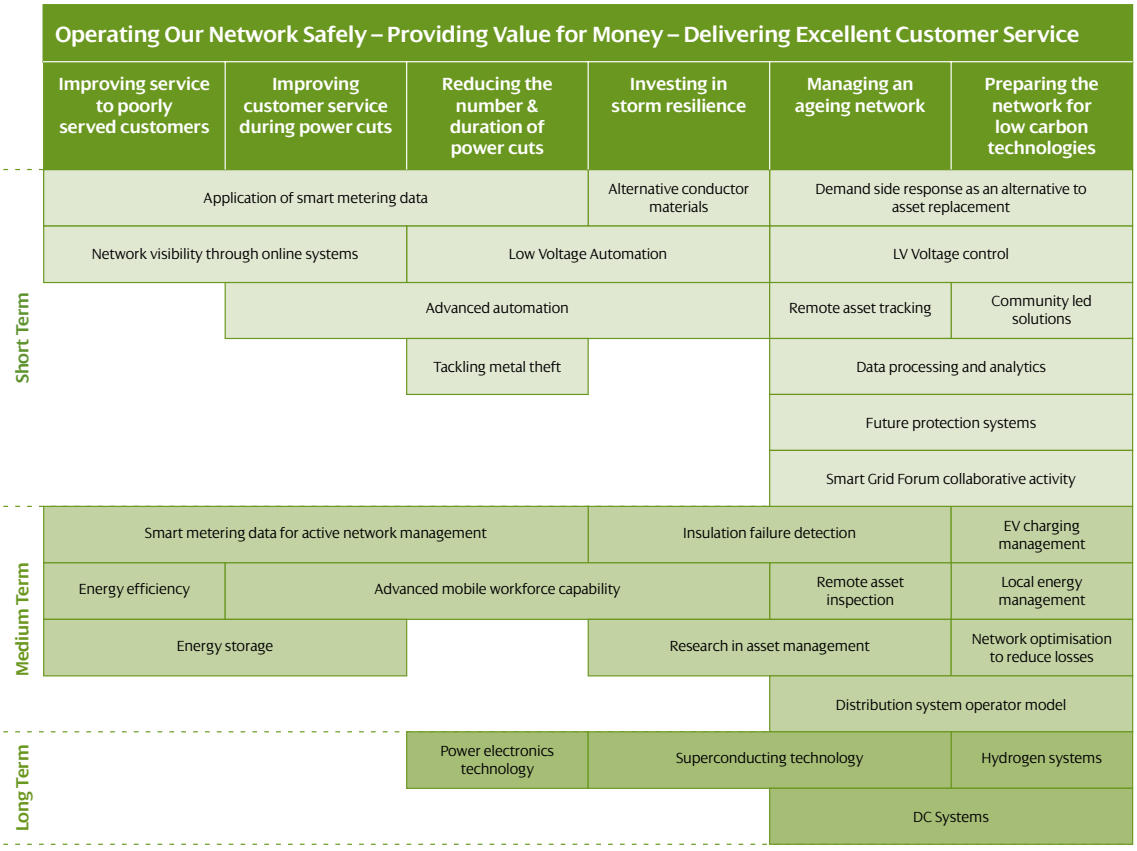
We also talked to stakeholders and customers about their willingness to pay for further innovation trials through the Network Innovation Allowance (NIA). Through this allowance Ofgem allow us to invest between £3m and £6m of customers money each year in technology trials. Within the engagement process we presented a variety of options around the level of funding that we should have access to.

These options were based on a number of different strategies, each with a different timescale:

- *A lowest cost strategy focused on short term challenges only.*
- *A highest cost strategy looking at a broad spectrum of long and short term challenges.*
- *A combination of these approaches with different levels of funding.*

This process helped to establish customers' willingness to pay for these activities, and the scope of innovation activity that stakeholders supported.

We have also benchmarked our management approach against a range of highly innovative companies. This included a knowledge exchange with 3M, a leading technology company, who are regularly identified as being one of the most innovative companies in the world. We undertake regular reviews with the wider Iberdrola Group to ensure that our learning and innovation processes are fully embraced across the group.



Innovation within our Business Plan

We designed our Business Plan with innovation at its core, using not only what we have learned from our formal innovation trials (Low-Carbon Networks and Innovation Funding) , but the application of innovation to our operations, our processes and our commercial activities. We have benefited from the knowledge of the wider Iberdrola Group, in particular in the areas of Smart Metering and Smart Grids (outlined In **Chapter B1d – Our Business**). We have also shared information with other network companies to adopt technology they have trialled for the benefit of our customers.

- *The actual and anticipated outcomes from previous innovation projects were considered as part of the development of our engineering plans.*

- *We commissioned an independent review by Smarter Grid Solutions (SGS), to review our conventional projects that create additional network capacity for customers, to identify where lower cost and quicker smart solutions could be deployed. SGS have assisted in other industry-wide sponsored work (through the Smart Grid Forum) of a similar nature, which allowed us to compare our plans with a broad range of solutions at the forefront of the industry.*

In developing our innovation plans we have balanced the risk associated with adopting new approaches against the overall costs and benefits they may achieve. For our larger projects we have captured this in a formal cost benefit analysis.

Further details on our approach to innovation can be found in our detailed **Annex C7 – Our Innovation Strategy**.

Further details of our approach to Cost Benefit Analysis can be found in **Chapter 6m Expenditure** and in our more detailed **Annex C6m – Cost Benefit Analysis**.

Innovation embedded in our Business Plan delivers £70m benefits to our customers and stakeholders

c. Preparing our Organisation

Our vision for ED1 is to evolve our organisation to be "Closer To Our Customers". Our ED1 Plan draws upon our experience, track record of performance improvement and ambition to deliver on this objective. The work undertaken by our Business Readiness Programme Team has resulted in a plan to introduce improvements across our operations which includes:

Organisational Design

Further development of our geographic operational model but with a greater emphasis on integrated delivery, local control and accountability.

Central Design and Engineering

Development of standard engineering and design solutions for routine projects, reducing the amount of repeat work and allowing expertise to be concentrated on specific projects which require a high degree of support.

Work Management and Allocation

Optimising the balance of work between the Direct Labour Organisation ("DLO") and our supply chain to provide a wider footprint of resources in the field and reduce the average time to site for faults.

People

Leveraging the combination of workforce renewal and our projected staff attrition rate (predominantly though retirement) to redefine our workforce for the networks of the future. The key principles are multi-skilling, up-skilling, responsiveness and agility.

Culture

Continuing to develop a customer-focussed rather than asset-focussed culture across our entire business.

Keeping Customers Informed

Developing the CRM platform to automate communication between field, incident control and dispatch functions and provide restoration estimates in real time.

Connections

Providing a competitive Connections service and encouraging further competition across the nine market segments.

Innovation

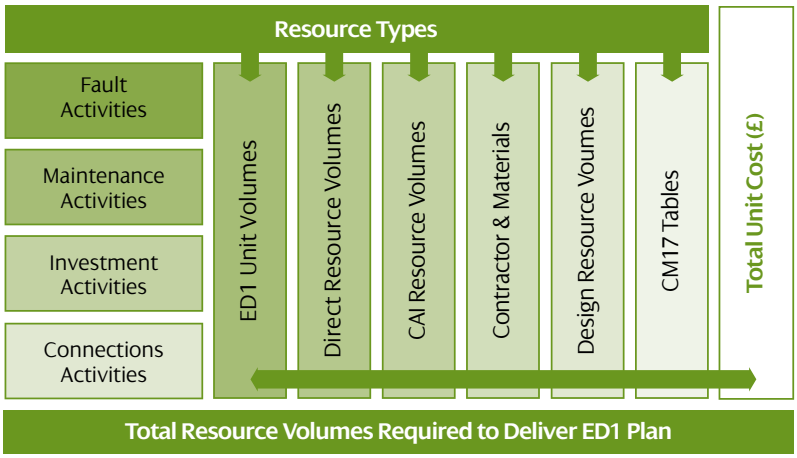
Continued investment in system automation, our "Smart Cities" initiative and our control system (PowerOn) which will, among other things, integrate Smart Meter data to allow greater automatic identification of faults across the Low Voltage network.

Governance and Control

A robust framework which supports and reconciles the differing needs of operational, regulatory and statutory reporting.

The project team has built a robust resource capacity planning tool to forecast our geographical manpower requirements on a year by year basis for the ED1 period. This provides us with the ability to understand how our work patterns move across the years and allows us to match our resources to need. Our ability to understand resource profiles at this level of detail allows us to coordinate effectively across our organisation, interface with contractors early in the planning process and ensure our work balance for DLO staff reflects what is best for our customers.

Resource Capacity Planning Tool



d. Preparing to deliver our investments

Introduction

We want our customers to receive the benefits of our comprehensive outputs package promptly. For this to happen, we need to be ready to start delivering our investments as soon as the ED1 period begins in April 2015. Here we describe the plans and preparations we have made to ensure that we are ready to deliver our outputs as we transition from DPCR5 into ED1.

Our preparations include:

- *comprehensive on-site surveys.*
- *detailed engineering studies, considering alternative solutions.*
- *project and outage planning, including coordination with third parties.*
- *a thorough review of our purchasing strategies.*

We have significantly increased the level of detail in our early deliverability plans for the ED1 period. We have shared our plans with our key suppliers and the contractor community through dedicated events, one-to-one meetings and small group sessions. We have examined the critical aspects of our Business Plan and established a robust business readiness programme.

Preparing to deliver our 132kV investments

The 132kV network construction programme in our SPM licence area provides the most complex planning challenge of our ED1 investments. We are working in close liaison with National Grid Transmission, Electricity North West, Western Power Distribution and our own operational control team to ensure we have the necessary outages secured to allow us to undertake our programme of work.

Our design, delivery and operational staff have worked in conjunction to complete detailed surveys of all 57 132kV projects proposed for ED1. We have completed civil surveys at all of the proposed substations and reviewed the proposed OHL routes.

From this preparatory work we have individually designed, costed and planned each of our 132kV projects, building a 12 year delivery programme aligned with our current programme for 2010 to 2015.

Sharing our programme of work with all of those involved in network access has allowed us to optimise our programme, making sure we have the best possible plan for delivery over the ED1 period. Sharing our planned programme with our supplier and contractor community has enabled us to confirm that it is well planned and deliverable.

Preparing to deliver our other investments

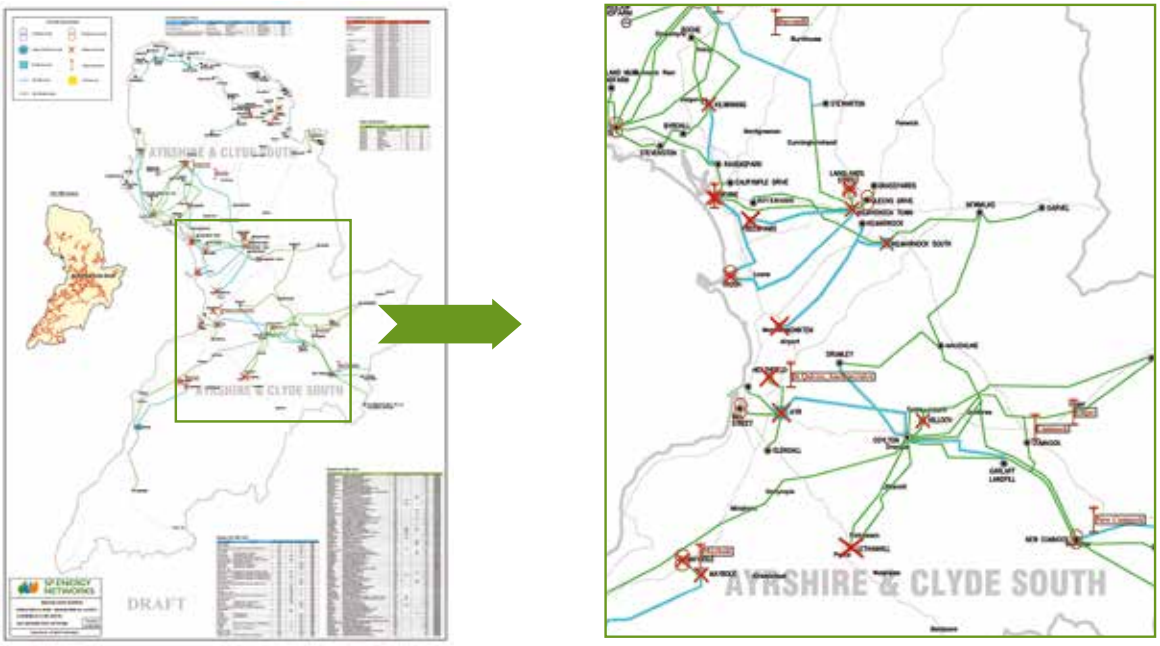
We have taken a similar approach in preparing to deliver our planned investments at 33kV and at our primary substations. We have surveyed each of the 150 sites proposed for investment over the ED1 period, confirmed the scope of the work required at each site and individually costed and designed each project. We have developed programmes of work for each of our 12 work 'zones', enabling us to take a complete view of all of the work required in an area to minimise costs and disruption.

We have shared these programmes of work with our outage planners to ensure that we can achieve the necessary access to the network. While this outage planning is less complex than at 132kV, it is an equally important part of our business readiness process.

Programmes of work at lower voltages do not required the same level of pre-planning as they are less complex to deliver. We have compared the volumes of work and the geographical areas in which we will be working in order to co-ordinate work packages and ensure that there is an effective transition into ED1 in April 2015.

We believe that this robust and proportionate approach to planning our workload will enable us to deliver results right from the outset of the ED1 period.

Our zonal maps help our stakeholders, contractors, suppliers and workforce visualise the scale and sequence of our planned investments



Preparing to deliver zone by zone

We have created visual aids in the form of 'Zonal Maps' to help our stakeholders, contractors, suppliers and workforce visualise the scale and sequence of our planned investments. For each zone, we have plotted all of our proposed projects onto a single map. The zonal maps include both our work to replace or refurbish equipment that has reached the end of its operating life (non-load related investment), and work to upgrade our system to accommodate future load (load related investment).

Our zonal maps deliver a number of very important benefits, from customer and stakeholder engagement to project co-ordination.

We are coordinating all our work

We can see at a glance what work we'll be doing, when, and where. This coordination will help us deliver our outputs in the most efficient and cost-effective way possible.

We are minimizing customer disruption

Our customers and local communities have specifically asked us to review the way we coordinate our work, to make sure that they are not off supply several times for different types of work that could have been done at the one time. We have listened to this feedback and changed our approach, coordinating our work to make sure that we avoid repeated outages. This is a significant change in our approach and ensures that disruption will be kept to an absolute minimum.

We are helping our workforce

Our zonal maps are a powerful visual aid for our workforce. Available in office locations, depots and via our electronic workforce tablet devices, the scale of our investment plans can be easily understood allowing staff, contractors and suppliers to see exactly what we plan to deliver over the eight year period.

We are talking to local communities

We are sharing our zonal maps with our local communities and a wide range of stakeholders via our stakeholder events and website. During the delivery of our investment plans we will regularly encourage our stakeholders to provide feedback on our plans and maintain our maps to visually demonstrate our progress against our Business Plan.

Preparing to deliver improved network performance

We are committed to improving the reliability of supply to our customers. We are already amongst the industry leaders in terms of customer interruptions with our customers experiencing 30% fewer power cuts than the UK average. Our plan aims to improve this position further through our ongoing inspection, maintenance and asset modernisation programmes, including using our analysis of failure patterns to drive targeted refurbishment of our overhead lines and the replacement of poorly performing underground cable sections.

e. Purchasing

Our purchasing strategy

We regard our suppliers as strategic stakeholders and we manage our purchasing activities closely to ensure that our supply chain is fair, transparent and ethical. When interacting with our supply chain, we

- *Use selection and award processes designed to ensure fairness, transparency, equal opportunities, integrity and mutual interest*
- *Promote among our suppliers principles of responsible behaviour from social, economic and environmental perspectives.*

We have developed a Global Supplier Management Model (including a Total Supplier Management System) that enables us to register and classify our suppliers.

Amongst other criteria, we assess the technical and production capacity of our suppliers and we weight their credentials in the following areas:

- *Quality*
- *Safety and occupational risk prevention*
- *Environment*
- *Social responsibility with special emphasis on respect for human rights*
- *Economic-financial situation*

We need to achieve value-for-money in the goods and services that we purchase and these must be produced or delivered in line with our aims of environmental sustainability and social justice.

We use a series of measures to ensure compliance with the Anti-Bribery Act and to assess the potential risk of corruption and bribery when entering into a new relationship or renewing an existing contract with a supplier.

We continue to use our purchasing power to achieve win-win solutions by building supply chains that provide responsibly sourced products and services and balance the benefits of globalisation with the health of our local and national economies.

As a regulated business, we adhere to the EU Public Procurement Directive and all our purchases above the thresholds it prescribes comply with the legislation and its fundamentals of openness, transparency and fairness. We strive to deliver the best value-for-money through competitive testing of the marketplace via our online tendering tool, thorough negotiations, and where practicable, the use of e-auctions.

Preparing for ED1

We have reviewed our contract renewal plan and ensured that all of our bought-in goods and services will be in place ready for us to deliver our ED1 commitments. This includes service contracts and equipment (such as cables, switchgear, and transformers).

We purchase all of our services and supplies at the most competitive price that we can achieve through effective use of our group global buying power, participation in the Selectusonline Purchasing Consortium and best-in-class procurement processes.

Contract renewal

We consider and recognise the benefits and risks associated with the renewal process of our contracts. We are actively mitigating the risks by reviewing our key contract renewal plan, current market conditions, contractor resource availability, and approved equipment availability to drive a seamless transition into ED1 with the most suitable contracts in place. Where the market conditions are appropriate, we are seeking to establish longer-term agreements to support our interaction with our supply chain. Where appropriate, our contracts with suppliers and contractors will share the incentives and penalties agreed by Ofgem. Adopting this approach, these incentive mechanisms will reach our whole supply chain, driving sustainable performance and bringing improved benefits to our customers.

Stakeholder engagement

As part of our Stakeholder Engagement process we have held workshops with former, current and potential contractors and suppliers. Of the 88 representatives at our events in Liverpool and Glasgow, 80% of our contractors by value and 78% of our direct activity was represented, totalling 42% of our annual total expenditure (totex).

At these events, 60% of attendees agreed that we are either good or very good to work with, and we are working

to increase this percentage by:

- *Sharing our ED1 plans with our contractors early in the process.*
- *Working together to train and recruit new staff for the industry.*
- *Implementing a simpler process for authorising staff to work on our network.*

Contractors have told us that they need longer contracts to allow them to invest in people, plant and premises.

- *78% of contractors favoured contracts of more than 4 years.*
- *48% of suppliers favoured contracts of 3 years' duration.*

We are currently reviewing our purchasing strategy to build in this feedback.

Event feedback – 100% of attendees stated the sessions were useful, worked well and that they would like to attend future SPEN engagement events.

Suppliers

Our purchasing policy ensures that we secure our goods and services at the very best price. We capitalise on being part of the Iberdrola Group by aggregating a number of our purchases and negotiating our contracts via our global purchasing group to leverage additional benefits, delivering real value-for-money for our customers and stakeholders.

Our outlook is not solely global, but also local. Wherever possible, we seek local recruitment for our contracts. Wherever possible we encourage our contractors to engage local resources for their contracts, supporting local communities.

f. Resourcing and training

We have carried out a comprehensive review of our resourcing strategy for the ED1 period and beyond to provide us with a highly skilled and well-trained workforce for the future. We know that having the right people, with the right skills, in the right place is essential for efficient and effective delivery. We need highly skilled, suitably authorised employees, with the specialist skills to deliver our investments. With the growth of our industry and the new challenges associated with the low-carbon future, it's clear that we need to recruit and train new staff.

We require all staff to have the adequate skills, technical knowledge and experience to carry out their activities. Staff need to be trained and fully competent to undertake their work activities in line with agreed business processes and procedures.

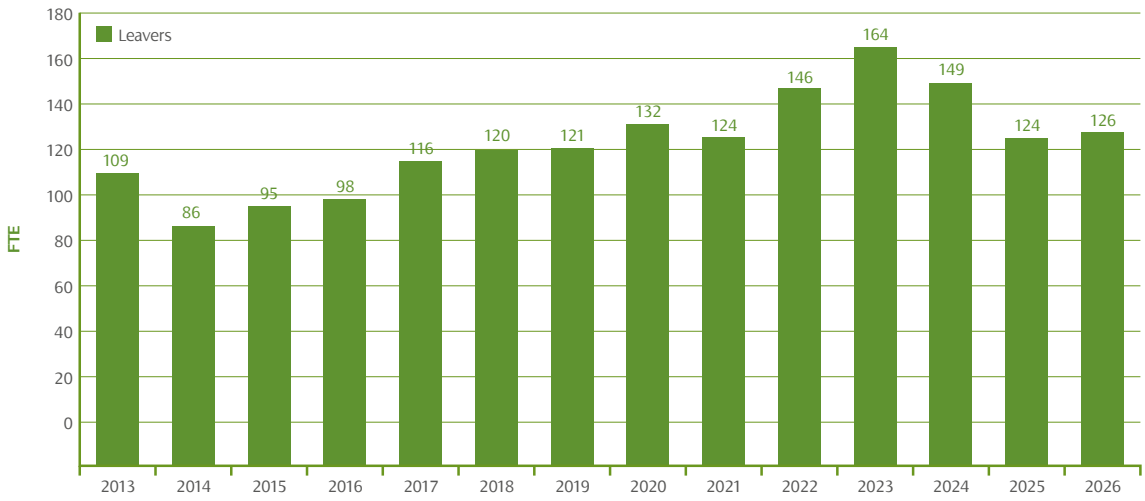
Following initial training our staff receive regular updates on documentation changes, procedural changes and the introduction of new equipment through safety stand-downs and on-site/off-site supplementary training. All staff must also attend safety refresher training in line with company procedures.

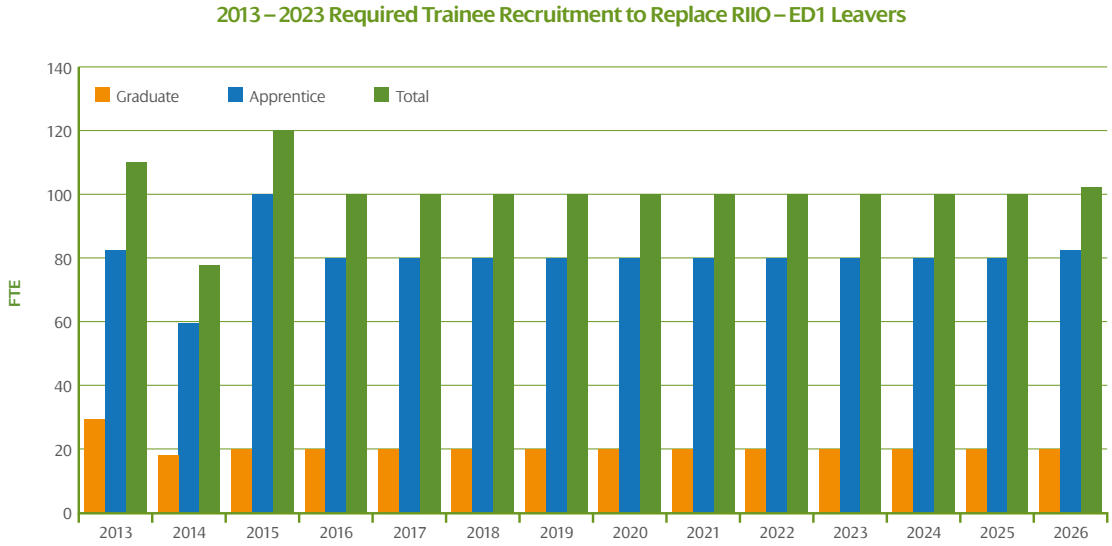
Our resourcing plan looks through both RIIO-ED1 and into the early years of RIIO-ED2 (to 2026). Across this period it is anticipated some 1700 members of staff will leave our business (as detailed in leavers table below). Critical to the success of our resourcing strategy is ensuring we recruit sufficient numbers of new staff through RIIO-ED1 and train them in order that we have the right people with the right skills in the right place ready for efficient and effective delivery of our business outputs. It is also essential to retain balance between new and existing staff within our organisation to maximise transfer of skills.

Ensuring Business Plan outputs are maintained and balanced with the need to alter our resourcing landscape we need to ensure both suitably experienced employees with current specialist skills are developed further as well as introducing new intakes of staff. Our business also requires our resource strategy to match the resource requirements for the future as our network evolves and the expectations of our customers increase. The skills of our staff and contractors will need to continually adapt to accommodate new solutions and new ways of working on our system. An increase in smart grid enablers such as IT, telecoms and control systems will require staff to have greater knowledge of what was previously limited to standard protection and SCADA departmental staff.

Taking account of the challenges associated with the growth of our industry and the changing landscape of a low-carbon future, it is imperative that our resourcing strategy is fit-for-purpose. This may lead to recruiting

Total ED1 Leavers 2013 – 2026





and training new staff to support technology advancements, however with the resourcing challenges being faced by SPEN through attrition and retirement across this period we are provided with an unprecedented opportunity to create a recruitment training and deployment model focused for a 21st century network.

Our plans are already in motion, we have recruited 180 apprentices and 50 graduates over the last two years.

We also recognise the need for ongoing development opportunities for our staff members. Through training schemes such as our Technical Craft Person (TCP) and Industrial Staff Trainee (IST) we provide the opportunity to develop strong succession plans and career paths for our staff. Details of our programmes are covered later in this section.

Planning the future

Within our current workforce we employ a wide range of trained staff to operate and maintain our network, deliver our investment programmes and respond to the needs of our customers 24/7. Our workforce also includes staff to support these functions. Our workforce can be categorised as follows:

- *1050 field staff – linespersons, jointers, fitters and support staff*
- *980 engineers and technical specialists*
- *390 customer service staff, central support staff and managers*
- *180 trainees – engineers and field staff*
- *We also utilise approximately 2,500 contracting staff.*

Our future resource requirements have been established both from a retirement/attrition forecast as well as the resource needs and capacity perspective to support our Business Plan from a volumes and skills perspective

Working with EU Skills and the other DNOs we have identified that the ageing profile of staff is a UK wide issue across the energy sector. Although our attrition level (the rate at which people leave the business for reasons other than retirement) of 1.82% is among the lowest in the UK, the large numbers required to replace those who are leaving means we need to recruit and train a whole new generation of highly skilled staff.

This analysis has allowed us to determine a picture of resource replenishment from a technical perspective of approximately 1100 over the period to 2023 as detailed in recruitment table above.

What we need to do

We have reviewed our recruitment and training programmes to ensure that we are ready to replace 1400 staff through RIIO-ED1 and into RIIO-ED2 and make the required changes to support the future landscape of our investment plans and service plans.

We are changing our working practices and organisational design to ensure that we are ready to meet all of our business outputs from delivery of investment plan, delivery of our network performance IIS targets as well as delivery of our Broader Customer Service targets.

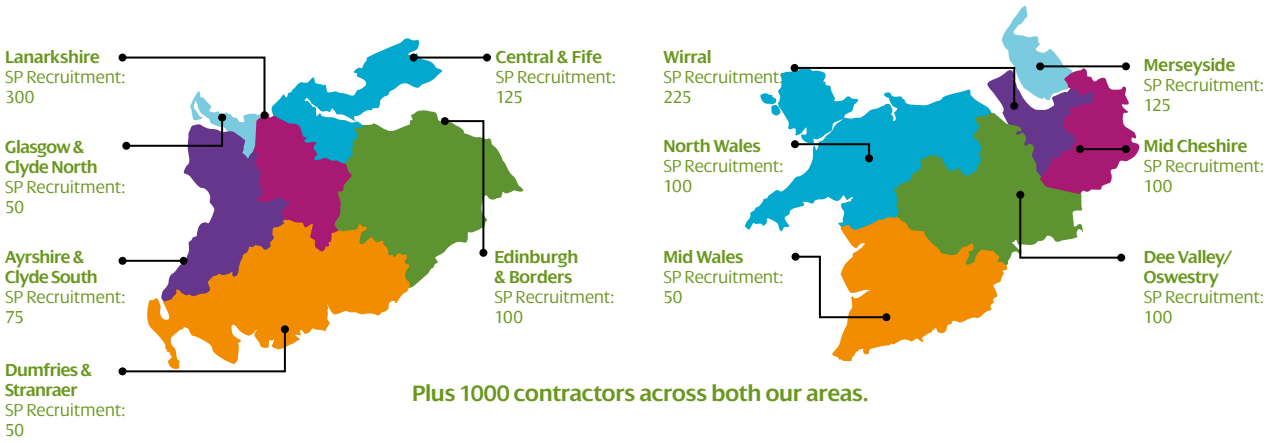
We aim to be "Closer to our Customers", deliver industry leading customer service and improved restoration of supply standards (restoration target in normal weather improved from within 18 hours to within 12 hours). In addition reducing time customers are affected by faults (average time off supply) by 25% has challenged our operational model both in and out of hours. In addition to this, we are changing our working practices to meet our improved time to connect targets, therefore our ability to operate efficiently across our geographical areas will be pivotal to success.

Resourcing our operations as we do at present will not provide the diversity and skill-base required for delivery of RIIO-ED1, nor position our business for the future challenges of RIIO-ED2. SPEN has placed significant focus on development of staff over the course of DPCR5 breaking down the compartmentalised traditional skill groups. It is of paramount importance we build on our platform of skill transfer and multi-skilling to maximise efficiencies through our delivery model and return value to our customers.

The table below provides an insight to expected skills development:

Example of skills transfer and multi-skilling in SPEN:

	DPCR4	DPCR5	ED1 and beyond
Fitter	Predominantly assigned to completing maintenance tasks under the control of an engineering resource. Limited numbers completing operational tasks, supporting investment and load growth projects.	Roll out of operational duties to majority of fitting craftpersons, recognised now as technical craftperson (TCP). Removing the requirement for engineering resource involvement in 11kv maintenance activities. Introduction of TCP allows fault switching (overhead and underground). Introduction of multi-disciplined teams to complete fitting and jointing duties associated with investment and load growth projects. Training of all craftpersons to mate alternative trade groups.	Skills to include technical based maintenance activities i.e. automation telecoms units, major refurbishment activities inclusive of protection units. Continuation of multi-skilling and operational responsibilities to deliver all 33kV and 11kV maintenance activities. Delivery of 11kv switchgear projects without on-site engineering input. Ability to utilise all fault locating technology. Ability for all to connect mobile generation. All fitters available to climb and mate both jointing and lines activities. Provision of exceptional customer service.
Jointer	Predominantly undertaken tasks of jointing under live and not live conditions at LV and permit conditions for HV work. Limited fault location responsibilities	Roll out of operational duties to a number of jointers, (recognised as technical craftpersons), creating increased resource for fault switching and support to 11kv maintenance programmes. Training of all craftperson to mate alternative trade group. Diversification of skills to complete such activities as battery maintenance. Roll out of LV fault location training and technology to improve fault performance.	Continued development of jointer/fitter responsibilities and TCPs to improve delivery of switchgear projects and system performance. Authorisation to be extended to complete cable fault repairs without the need for engineering staff, resulting in reduced unit costs. Ongoing improvements to fault location capabilities through TPXX and smart fuse technology. All lines resource available to climb and mate lines or fitter activities. Ability for all to connect mobile generation. Provision of exceptional customer service.



Plus 1000 contractors across both our areas.

Our geographic spread of future training requirements out to 2026 can be seen in the regional maps above.

How we plan to achieve it

Our preparations have already begun. In 2011 we implemented a workforce renewal programme and this dedicated programme team has taken on the responsibility for the recruitment, training and development of graduate trainees, engineering apprentices, craft apprentices and the up-skilling of existing staff to support our delivery in ED1.

Training programmes

Our training and recruitment programme for ED1 represents an unprecedented opportunity for us to shape our business to meet the challenges of the coming decades.

The majority of our recruits will begin as apprentices and graduates chosen from the local communities we serve. With this in mind, all of our training programmes are delivered in partnership with local colleges and through our in-house training centres, with trainees gaining practical experience through working within our business operations.

Our in-house training centre offering includes formal classroom sessions and practical workshop activities followed by field-based training and assessment. Using our innovative toughbook tablet devices, our trainees are able to build up electronic portfolios of their experience, which are assessed and externally verified.

Our training programmes include:

- *Graduate trainees – a 2 year programme providing graduates with on-the-job experience, a variety of work placements and technical/behavioural training, followed by a training year in post.*
- *Engineering apprentices – a 3 year pilot programme for school leavers with A levels or Highers. The programme aim is to develop and train engineering apprentices to operational engineering level through a combination of technical and behavioural learning.*
- *Craft apprentices – a 3 year programme. Apprentices work towards achieving industry recognised City & Guilds and NVQ qualifications in engineering as well as gaining on-the-job experience and taking part in behavioural learning.*
- *Adult craft trainees – an external programme developed to recruit semi- skilled individuals from other industries and up-skill them to become qualified craftspersons within our industry. The programme provides a balance of academia (Diploma L2 in Electrical Power Engineering) and vocational skills through on-the-job training.*

These training programmes are supported by our collaboration with colleges and universities, ensuring that we are recruiting from our local communities. We participate in large-scale STEM (Science, Technology, Engineering and Mathematics) events that raise our profile within our local communities. We train our graduate and apprentice populations to become STEM ambassadors, giving them the necessary skills to engage with event attendees varying from primary school children to those changing careers, encouraging them to view a career in engineering as an exciting and valuable choice.

We also deliver programmes to attract young people into our industry, including:

- *Career Academies*

A UK based programme which selects pupils with engineering aspirations, giving pupils taster sessions in engineering activities and four weeks' paid summer work. We work in partnership with Career Academy UK in our SPD licence area and Fazakerley Engineering Specialist School in our SPM license area.

- *Power Skills Programme*

A Glasgow-based partnership between ScottishPower and The Scottish Government, aimed at young people who have underachieved through traditional routes. Students work towards National Certificate level in Engineering Craft Skills.

We sponsor further education programmes including:

- *Engineering Foundation Programme*

A pre-apprentice programme delivered across 3 locations – Glasgow, North West England and Edinburgh. Students gain level two electrical engineering qualification over one year. We deliver overhead lines, cable jointing, basic hand skills, fitting and first aid training. This programme acts as a technical feeder for our craft apprenticeship programme.

- *Scholarship Programmes*

We currently invest in scholarship programmes to attract new candidates to the power sector by sponsoring students through their studies, including the Iberdrola Foundation programme where students are sponsored to complete a Post graduate course in a relevant Engineering discipline and our Power Academy scholarship programme in Scotland which is run in conjunction with the IET. We provide financial support to students and work placements with industry training.

Up-skilling and multi-skilling our workforce

We recognise the need to have a highly skilled, suitably authorised workforce, with the specialist skills to deliver more efficiently across our operational, maintenance and investment programmes.

We are continuing our up-skilling and multi-skilling programmes where we teach Craftsperson skills in secondary trade. In these programmes linespersons are taught jointing techniques whilst jointers are taught climbing practices. We have also included fitting activities in all of our Craftspersons training. This allows us to form smaller teams of staff who can effectively multi-skill to deliver shorter restoration and repair times and more effectively deliver our work programmes.

We have further developed these teams through increasing the levels of authorisation the Craftspersons have. This up-skilling activity has already seen considerable benefits in the delivery of our current work programmes and it is our plan to extend this into RIIO-ED1 at the end of which we will have both multi-skilled and up-skilled over 1,000 of our staff.

Our training centres

We are one of the few DNOs to have retained our own operational and technical training centres. These centres provide essential training and authorisations for both our direct and contracting staff and are a key part of our delivery strategy for the future. Our increased programme of recruitment and up-skilling in ED1 brings an increased need for training across our multi-disciplined workforce and we need to invest in upgrading our training facilities to meet this need.

We are aiming to invest up to £400K in each of our two training centres in Cumbernauld outside Glasgow, and Hoylake outside Liverpool, to upgrade facilities and provide new training apparatus and classrooms.

These improvements mean that the increased numbers of trainees recruited will attend training facilities offering an outstanding range of equipment and opportunities. Proposals for enhanced facilities and training provision include:

- *Altering our workshops to enable increased class sizes.*
- *Recruiting five additional technical trainers.*
- *Recruiting 2 staff to support new trainees in their first-year residential period*
- *Providing additional locker rooms, shower rooms and drying areas*
- *Setting up an IT platform to enable trainees access to an e-library as a source of reference materials and record keeping.*
- *Acquiring additional and replacement resources to support training (climbing poles, substation equipment and MEWPS)*

We recruit from a wide geographic area to support operations across the breadth of our two license areas, but our recruits are initially trained in our central training centres. To reduce daily travel, protect the environment and minimize road risks, we provide accommodation for trainees while they attend our training centres and partner colleges.

Our contracting partners

We deliver our work programmes using a combination of our own workforce and a network of contracting partners, through which we utilise approximately 2,500 contracting staff. This approach ensures we have the correct balance of in-sourced and outsourced resources available to deliver work efficiently and cost effectively.

Through our stakeholder engagement process we have recognised that our contractor partners are facing the same resourcing challenges we do. It is important that we work together to train and recruit new staff to replace those employees leaving the industry and support future investment and the achievement of improved customer service.

We are actively involved in the National Skills Academy for Power (NSAP) and through this relationship we have been a major influence in developing and supporting the Talent Bank initiative. Talent Bank is a UK wide pilot working in partnership with NSAP and

We are actively involved in the National Skills Academy for Power (NSAP) and through this relationship we have been a major influence in developing and supporting the Talent Bank initiative

Image:
Angela Constance MSP, Minister for Youth Employment
Joan McAlpine MSP, South Scotland
Frank Mitchell, CEO, SP Energy Networks

ScottishPower's contractor population to train additional apprentices. Apprentices are trained and developed over two years before joining the industry either as direct staff or as a member of our contractor community.

Candidates work towards achieving industry recognised City and Guilds and NVQ qualifications in engineering.

Recognising that our contractor base performs a key role in the delivery of our programmes, we support colleges located in Dumfries and Bangor, North Wales to deliver training to contracting staff trainees. Working in partnership with these colleges, we have delivered two pilot programmes to enable them to offer this training as part of their curriculum activities, helping to mitigate the wider workforce shortfalls that our contractors are experiencing.

Our people matter

We are, and always will be, a business where people matter. At the end of 2012 we launched the Employee Deal. The Deal outlines a new approach to improving the ways that our employees interact with each other and with the business.

The Deal is as simple as a handshake, and just as powerful. It provides us with clarity about how we do things. It applies to everyone, at every level, and helps us ensure that we are able to offer employees the best value we can – for their career, their family and their community.

At the heart of The Deal is a single shared commitment:

"We will all work together to make a world of difference"

By improving how we work together, The Deal is designed to improve the performance of the business.

Underlining this single shared commitment, The Deal is built upon a series of shared expectations that help our organisation and workforce to work better together to deliver more for our customers. These expectations are shared between the company and the individual.


No
oking

8 Risk and Uncertainty

Our plans to manage areas of risk and uncertainty, such as the uptake of low-carbon technologies

In this chapter we explain the key risks and uncertainties of the ED1 period and how we manage and mitigate these.

Our **introduction** section provides an outline of the key risks and our assessment.

In **SPEN's approach to risk assessment and management**, we describe our overall risk management process. We then describe **SPEN's key business processes and approaches** in relation to risk management.

The key risks and uncertainties that may impact on our delivery of this Business Plan are discussed in Section **RIIO-ED1 risks and uncertainties**.

We complete this section by explaining the **risks shared with our customers via RIIO-ED1 uncertainty mechanisms**.

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Introduction	Annex C8 – Risk and Uncertainty Annex C8 – Risk modelling for RIIO-ED1
b. SPEN's approach to risk assessment and management	
c. SPEN's key business processes and approaches	
d. RIIO-ED1 risks and uncertainties	
e. Risks shared with customers via RIIO-ED1 uncertainty mechanisms	

a. Introduction

All successful businesses must be able to identify key risks and uncertainties and wherever possible mitigate the potential impacts. In developing our RIIO-ED1 Business Plan we have utilised the SPEN framework for risk management to:

- *identify key risks and uncertainties affecting our Business Plan over 2015-23 and the scale of their impact,*
- *determine what controls are, or can be put in place, to manage these risks and uncertainties.*

SPEN is best placed to manage the majority of risks to the delivery to the Business Plan in RIIO-ED1, this includes most business as usual risks and new risks emerging during 2015-23. There are however, a few exceptions where risks are either partially or completely outside SPEN's control. In these instances it is necessary to make an allowance for these risks within the regulatory framework. Ofgem has considered the risks likely to fall into this category during RIIO-ED1 and included a number of uncertainty mechanisms, these were set out in its March 2013 decision document[1]. The table below summarises the risks we have given particular consideration in our assessment.

Having undertaken a holistic assessment of risk in RIIO-ED1 we have concluded that

- *no additional uncertainty mechanisms are required nor amendments to existing ones; and*
- *based on this we believe a post tax, cost of equity of 6.4% , as a minimum is commensurate with the level of risk borne by SPEN in RIIO-ED1.*

Further details on risk and uncertainty can be found in our detailed **Annex Risk and Uncertainty.** In **Section d – RIIO-ED1 Risk and Uncertainty** we

1 Strategy decision for the RIIO-ED1 electricity distribution price control: Uncertainty mechanisms, March 2013 https://www.ofgem.gov.uk/ofgem-publications/47070/riioed1decuncertaintymechanisms.pdf

Risk	Uncontrolled Risk Rating	Mitigation	Risk Bearer	Controlled Risk Rating*
Major system/asset failure	Very High	SPEN's Asset Management approach	SPEN	Low^
Safety	High	SPEN's Health and Safety approach	SPEN	Low^
Extreme Weather Resilience	High	OHL upgrades, vegetation, remote control switching, management, flood protection	SPEN	Low
Poor Customer Service	Medium	SPEN's Customer Satisfaction approach	SPEN	Low
Adoption of New Technologies	Medium	SPEN's Innovation Strategy, cost benefit analysis and engineering approvals process	SPEN	Low
Real Price Effects (RPEs)	High	SPEN's purchasing and contracting strategies	SPEN and consumers	Low
Load Related Expenditure	Medium	Flexibility in baseline expenditure, monitoring of leading indicators of significant change	SPEN and consumers	Low
Streetworks	High	SPEN's Streetworks Approach	SPEN and consumers	Low-Medium
Smart Meters	High	SPEN's Smart Meter Strategy	SPEN and consumers	Very Low

*after application of identified mitigation and uncertainty mechanism where applicable

^within tolerable risk

b. SPEN's approach to risk assessment and management

summarise the risks listed below:

The diagram below represents the risk management process that is applied within Iberdrola and ScottishPower including SPEN.

Risk identification

All business units within SPEN and key ScottishPower Group functions, review new projects, activities, contracts, legal requirements, new technologies in addition to recorded risks.

Risk Analysis

The relevant business functions assess factors such as frequency of event and severity of impact, ScottishPower's insurance function is also able to access research from the wider insurance market.

Risk Response

Having assessed the risk, SPEN allocates it either to be retained, passed onto third parties or insured. SPEN is required to develop effective mitigation responses to manage retained or insured risks.

Risk Monitoring and Control

Identified risks and mitigations are recorded within SPEN's Key Risk Reporting (KRR) system. This is reviewed regularly by all levels of management and subject to robust assurance. The KRR uses a five point scale (very low to very high) to evaluate both the likelihood and impact of a risk. These scores are combined to produce the overall risk score. This is reflected in the summary assessment at the beginning of this chapter.

SPEN's approach to risk allocation

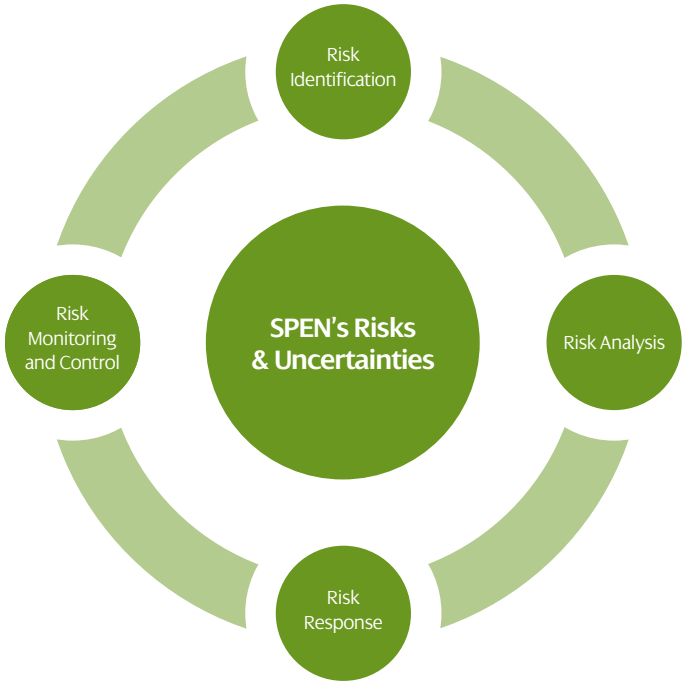
SPEN's approach to allocating risk for those risks that can't be eliminated is driven by Iberdrola's group approach, the key features of which are:

- *attritional losses are retained by the business and only major, unforeseeable losses are insured;*
- *we pass on all risks to contracted parties that are reasonable for them to bear; and*
- *insurance is sought in the final instance. Wherever possible we use Iberdrola's global policies to obtain lower cost insurance premiums.*

Allocation of risk between SPEN and customers

Where risks are judged to be uninsurable and wholly or partially outside of SPEN's control, we believe the best solution is to accommodate these risks in the regulatory framework, via uncertainty mechanisms. This approach is better than pricing the risk into our Business Plan or displacing it to investors, both outcomes would have disproportionate cost to customers.

Our risk management process



c. SPEN's key business processes and approaches

SPEN's key business approaches are central to its management of the key RIIO-ED1 risks. These are summarised below.

Asset Management

Our asset management strategy is designed around the concept of "whole life" management of network assets. Our approach prioritises assets on their determined criticality, based on asset health data and our assessment of asset risk. Based on their criticality we can determine whether to replace, refurbish or maintain assets. Using this approach we are able to maintain system and asset integrity and manage the associated risk to within tolerable levels. Further detail can be found in **Chapter C6b – Asset stewardship**.

Health and Safety

Health & Safety is at the heart of SPEN's business, in particular minimising the risk of harm to our employees and members of the public. We adopt UK and international best practice by following the principle of reducing risks to people to "as low a level as is reasonably practicable" (ALARP). In practice this means that we seek to ensure we are proportionately investing to manage risks within the range that is considered tolerable. Further detail can be found in **Chapter C5b – Safety**.

Operational Management

This covers important functions such as inspections, maintenance and our response to faults and interruptions including those caused by severe weather. Operations have a number of drivers including asset management and network resilience. Our approach seeks to deliver these objectives efficiently whilst retaining the flexibility to respond to sudden changes such as the weather.

Customer Satisfaction

We have a multifaceted approach that has been successful in delivering sustained improvements in our customer satisfaction scores from 2012. Our approach utilises stakeholder engagement, investment in our staff in customer service and relevant business operations. A key part of our approach is to ensure we have sufficient resources at times of increased volumes of enquires such as severe weather events. Further detail can be found in **Chapter C5f – Customer Satisfaction**.

Purchasing and contract management

Our purchasing strategy is driven by the objective of achieving efficient and sustainable costs including the use of Iberdrola's global purchasing power. Our contract management approach is aimed at securing sufficient resources to deliver our RIIO-ED1 plan at the best prices possible, our contract renewal is already underway so we can achieve this. Further detail can be found in **Chapter C7e – Purchasing**.

Governance and Monitoring

Our assurance framework ensures SPEN's key business processes and data are robust and effective. We have utilised this in developing our Business Plan so that our stakeholders can have confidence in what we are aiming to deliver in RIIO-ED1. Further details can be found in **Chapter B4c – Governance, assurance and approval.**

d. RIIO-ED1 Risks and Uncertainties

Based on our risk assessment and management framework, we have identified the key risks and uncertainties that may impact SPEN's delivery of this Business Plan in RIIO-ED1. Further detail on all these risks can be found in **Annex C8 – Risk & Uncertainty.**

Major system or asset failure

Our highest priority is to ensure that the risk of system or critical asset failure is managed to within what is considered tolerable risk. The consequences of such failures are significant i.e. very high. SPEN's asset management approach is central to managing this risk. This is manifest in our Business Plan in terms of our forecast expenditure on asset replacement, refurbishment, maintenance and inspections. Our asset health and criticality indices in **Annex C6b – Asset Health and Criticality** show how this expenditure reduces this risk in RIIO-ED1.

Safety

One of SPEN's key corporate objectives is minimising risks of harm to its employees and members of the public. SPEN's H&S framework discussed above is driving a number of initiatives in RIIO-ED1 this includes; substation modernisation, upgrades of OHL clearances, vegetation management, replacement of rising mains and laterals and other hazardous wiring.

Extreme weather resilience (storms and floods)

SPEN has a strong record in improving the resilience of its networks to severe weather conditions and restoring supplies to customers when they are cut off by such events. SPEN's response to the storms over Christmas 2013 and February 2014 illustrate how seriously we take this risk. Flooding can adversely impact substations causing associated loss of supply. SPEN's strategy for improving network resilience in RIIO-ED1 includes; vegetation management, black start capability, upgrading rural OHL networks and substation flood defence.

Adverse Customer service

One of the key deliverables of SPEN's RIIO-ED1 baseline plan is continued improvement in customer experience. Our customer satisfaction approach will minimise the potential of adverse impacts on our customer service, this includes; a proven plan for responding to severe weather events, robust corporate governance, a new customer relationship management (CRM) system and targeted staff training.

Adopting new technologies and solutions

SPEN has a track record of trialling and adopting innovative solutions on its networks. Our Business Plan includes a number of "smart grid" and commercial solutions. The adoption of new technology has a number of associated risks given its immaturity. SPEN's approach to managing such risks, include; use of robust cost benefit analysis incorporating potential risks, learning from innovation trials and our engineering approval process.

Real Price Effects (RPEs) and productivity

Detail on RPEs is set out in **Chapter C6k – Real price effects.** RPEs are incorporated into this plan but are offset by our productivity assumption of 1.0% p.a. Our purchasing strategy is crucial to our ability to withstand price increases over our assumed RPEs. Our contracting and management strategies will ensure our productivity targets are achieved during RIIO-ED1.

e. Risks shared with customers via RIIO-ED1 Uncertainty Mechanisms

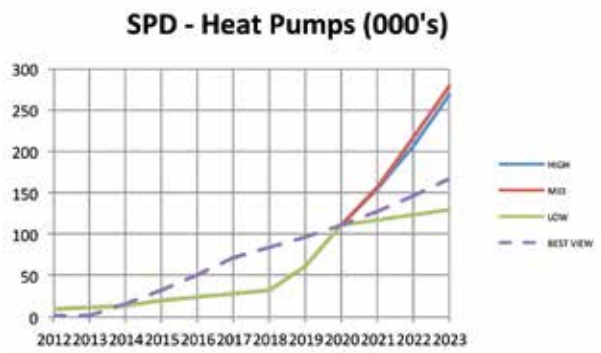
Annex C8 – Risk & Uncertainty provides a comprehensive assessment of the uncertainty mechanisms and the relevant risks. We have reviewed these mechanisms to ensure they afford customers appropriate protection and provide sufficient incentives on SPEN. We have concluded that the mechanisms are appropriate and we have not proposed any amendments or additional mechanisms. Below we discuss the more significant risks.

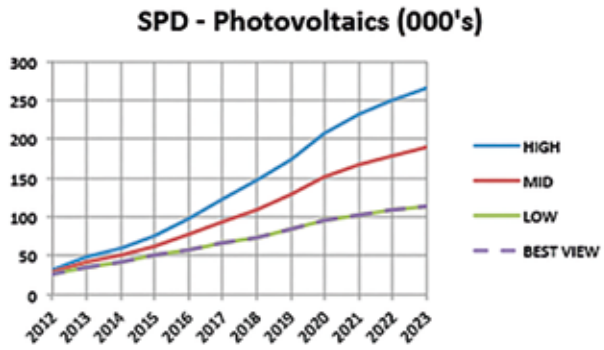
Load related expenditure (LRE)

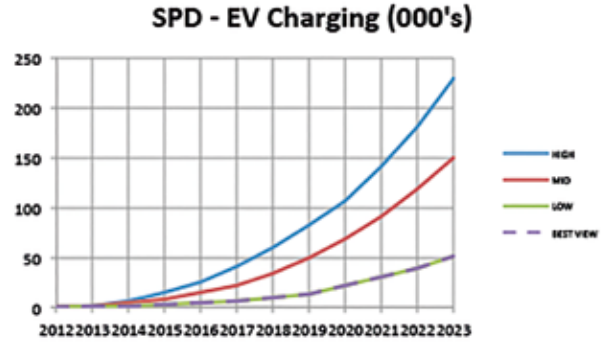
Details of our LRE projections for 2015-23, are set out in **Chapter C6d – Load related investment** and the supporting annexes. Key factors driving such expenditure are low-carbon technologies (LCTs) i.e. heat pumps, electric vehicles and solar panels, and underlying demand or load growth. There is a degree of uncertainty regarding these factors. We have addressed this risk by taking a pragmatic view of LCT uptake and underlying load growth. Our baseline expenditure provides some flexibility for variance in RIIO-ED1 and we will also monitor key indicators to anticipate any significant changes.

The Department of Energy and Climate Change (DECC) has laid out four scenarios which would allow the UK to meet the Government's carbon reduction targets, as described in the table below.

Scenario 1	High emissions abatement in low-carbon heat
Medium levels of fuel efficiency High levels of low-carbon heat High levels of solid wall insulation	High level of emissions reductions from uptake of low-carbon heat in buildings and industry (8 million installations) with significant emission reductions from transport (60g CO2/km) and significant thermal insulation of buildings (5 million solid wall insulation).
Scenario 2	**High emissions abatement in transport**
High levels of fuel efficiency Medium levels of low-carbon heat High levels of solid wall insulation	High level of emissions reductions from transport (50g CO2/km), with comparatively lower reductions from low-carbon heat (7 million installations) and significant thermal insulation of buildings (5 million solid wall insulation).
Scenario 3	**High electrification of heat and transport**
High levels of fuel efficiency High levels of low-carbon heat Low levels of solid wall insulation	High electrification in heat and transport, with significant uptake of Electric Vehicles and heat pumps (as in scenario 1 and scenario 2) and lower comparative levels of insulation (2.5 million).
Scenario 4	**Credit purchase**
Low levels of fuel efficiency Low levels of low-carbon heat Medium levels of solid wall insulation	More than one key technology under-delivers, and carbon credits are purchased. It assumes 1.6 million low-carbon heat installations, medium levels of insulation (4.5 million) and fuel efficiency of 70g CO2/km.







Technology by Household (SPD)	LOW	MED	HIGH	BEST VIEW
Heat Pumps	6.2%	13.5%	13.0%	8.3%
Electric Vehicles	1.8%	5.2%	7.8%	1.8%
Photovoltaics	5.7%	9.5%	13.4%	5.7%

Scenarios 1 to 3 will have an impact on our electricity distribution network and we need to be ready to deal with each of these scenarios should they occur.

Each scenario has a potential by significant impact on our related investments and our resourcing requirements.

We have carried out extensive analysis and engaged with stakeholders and recognised industry experts to identify our 'best view' of the future. We have used this as the basis of our Business Plan. We have also worked with industry-developed techno-economic models to assess the impact on our networks. We have provided details of this work and how it has shaped our investment plans in **Chapter C6 – Expenditure**.

At our Phase 2 stakeholder events, we engaged with stakeholders to discuss DECC's low-carbon future scenarios for the uptake of electric heating, electric vehicles and photovoltaics in order to identify our stakeholders' plans for the low-carbon future. Our stakeholders considered that the electrification of heating had more potential than the electrification of transport. We commissioned recognised industry experts to consider potential growth scenarios for heat pumps, combining this with a consideration of general energy efficiency improvements. This expert view provided us with a conclusion that the likely uptake in heat pumps would be slightly higher than the DECC low scenario by the end of the ED1 period and that, based on historical trends, energy efficiency improvements would follow the trajectory of DECC energy efficiency policy targets, but would probably continue to lag behind them in terms of absolute values by a couple of years.

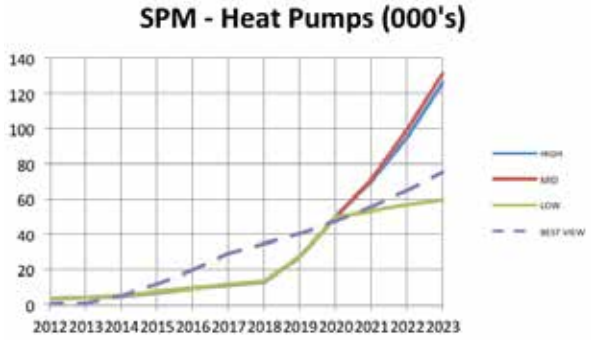
The Feed-In Tariff has been with us for a few years now. The biggest impact of this has been the growth in PV generation, especially at the domestic level. We have analysed the growth of PV over the past three years and our best view is that the growth trajectory is closest to the DECC "low" scenario .

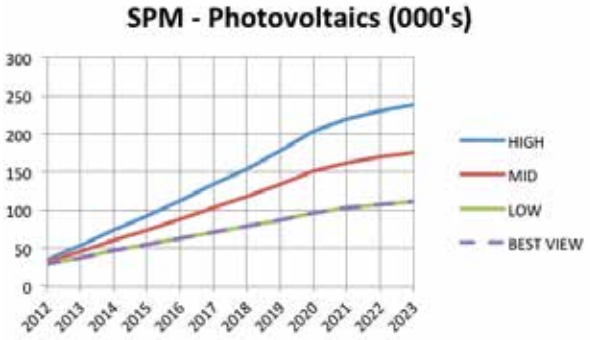
We are also beginning to see significant growth in PV solar farms. When we combine this with the already significant levels of wind generation, we have assumed the National Grid "Gone Green" scenario for the growth of larger scale renewable generation.

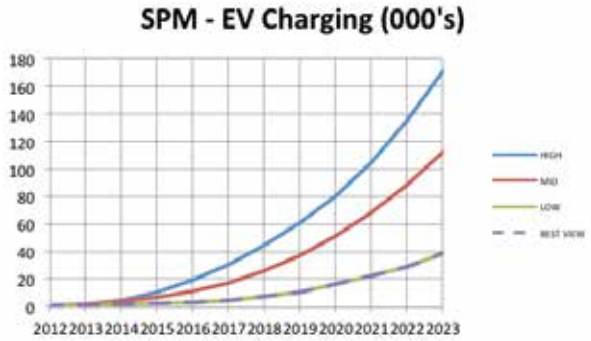
Our plan includes a domestic customer uptake of low-carbon technologies as follows (by 2023):

- *539,000 kilowatt solar panels (photovoltaics) (6.5% of households)*
- *242,000 heat pumps (6.9% of households)*
- *90,000 EV chargers (1.8% of households)*
- *130,000 electric vehicles (4% of households)*

Included within our plans are around £100m of investment to allow customers to use these new electrical devices, however if the highest scenario was to become reality we would need to invest over £300m.







Technology by Household (SPMW)	LOW	MED	HIGH	BEST VIEW
Heat Pumps	3.7%	8.5%	8.2%	5.0%
Electric Vehicles	1.8%	5.2%	7.8%	1.8%
Photovoltaics	7.5%	11.8%	16.1%	7.5%

Ofgem has proposed a 'reopener' mechanism for load related investments that provides protection to both investors and customers if our investment needs vary materially from our forecasts, and we agree that this provides an appropriate balance of risks.

We believe that the most efficient way to manage this uncertainty is through a balance of using contracting resources (to minimise costs and maximise flexibility) and applying technical and commercial innovation to minimise the physical works that are both time consuming and expensive.

Our innovation strategy has been developed with this requirement clearly in mind. Refer to **Chapter C7b – Innovation & Future networks** and our supplementary **Annex C7 – Innovation Strategy – SPEN**.

Our assumptions on energy efficiency improvements are an important factor within our Business Plan. We have assumed a degree of general electrical appliance energy efficiency improvements throughout the ED1 period. We will monitor Government policy on energy efficiency and will take the opportunity to promote general energy efficiency improvement measures with our stakeholders as part of our future stakeholder engagement activities.

Streetworks

Authorities can utilise powers under various legislation, notably the New Roads and Street Works Act (NRSWA), the Traffic Management Act (TMA) and the Transport Scotland Act (TSA), to operate schemes to assist their road management. In general these street work schemes, constrain SPEN's access to roads for example to repair cable faults or install connections. SPEN has developed an effective approach to minimise associated costs, this includes; effective scheme management e.g. efficient noticing, scheduling and planning works to minimise such costs, effective management of road works, stakeholder engagement to prevent unduly onerous schemes being introduced. Against this we expect a significant number of new schemes to be introduced in RIIO-ED1 notably TMA permit schemes for SPM and a Long-Term Damage scheme for SPD.

Smart Meters

The government has mandated the Smart Meter Implementation Programme (SMIP) by suppliers to be completed by 2020. The SMIP will result in callouts on SPEN to resolve problems at a proportion of smart meter installations. Our smart meter strategy in **Annex C7** sets out how we will manage this effectively, this includes effective co-ordination with suppliers on their rollout plans, development of joint working protocols, charging suppliers for aborted callouts, capex projects in DPCR 5 and RIIO-ED1 targeted to removing rollout obstacles. Post rollout i.e. 2020-23 we're expecting to realise some benefits of smart meters in improved alarm information and resultant efficiencies in our callout performance. In order to maximise the potential benefits we have trialled alarm messaging from smart meters.

Modelling of Financial Risk

In assessing the financial risk around our RII0-ED1 Business Plan, we looked at the likely impacts on financability with reference to credit ratings. We commissioned economic consultants (NERA) to develop a financability risk model to enable us to undertake this assessment. NERA's report, describing their modelling methodology is included in **Annex C8 – Risk Modelling for RIIO ED1**. The results of this modelling show that the median credit rating achieved by SPM and SPD were in broad terms, consistently within the target range.

Conclusions

The purpose of this Chapter has been to demonstrate SPEN has identified and understands the risks it is facing in delivering this Business Plan in RIIO-ED1 on a holistic basis. The risks that a company is perceived to face is a key factor in determining its equity risk premium (ERP) which in turn is part of the cost of equity. We have clearly identified that SPEN is managing a substantial level of risk. We recognise that the RIIO-ED1 uncertainty mechanism mitigates some of this risk but the majority of risk is borne and managed by SPEN. We believe this level of residual risk is appropriate to be placed on SPEN but requires a post tax cost of equity of 6.4% as a minimum to finance the delivery of this Business Plan.

9 Financing

We require a cost of equity of 6.4% to enable us to attract and retain sufficient equity finance

Our financial **overview** section considers the overall financeability proposal within our Business Plan. We propose a financing plan for each of SP Distribution and SP Manweb that is efficient and adheres to Ofgem policies laid out in its Strategy Decision document, that is consistent with RIIO principles and, in particular, ensures financeability at a comfortable investment grade credit rating but no higher.

In **allowed return** we assess the financial levers that are required to deliver the appropriate cash flows for the businesses and return to shareholders; and ensure financeability at a comfortable investment grade credit rating but no higher.

We set out our Business Plan assumptions impacting the **evolution of the Regulatory Asset Value (RAV).** In all cases our assumptions are consistent with RIIO principles and fully adhere to Ofgem's strategy decisions.

We complete this chapter by outlining our **financial policies**.

In this chapter we explain:

Topic	Annexes and Supporting Documents
a. Overview	Annex C9 – Financing our plans
b. Allowed Return	
c. Evolution of the regulatory asset value (RAV)	
d. Financial policies	

Table of Contents

Overview

	SP Distribution	SP Manweb
Cost of equity	6.4%	6.4%
Cost of debt	iBoxx 10 year trailing average	iBoxx 10 year trailing average
Notional gearing	65%	65%
Financeability adjustment	1 period transition	1 period transition
Capitalisation rate	80%	80%
Dividend yield	5%	5%
Credit rating	A3/Baa1	A3/Baa1
Other policies	Per Ofgem	Per Ofgem

Given that much of our evidence is relatively technical, we provide our full detail and analysis within the **Annex C9 – Financing.** To fully understand the justification of our financing plan, the **Annex C9 – Financing** should be read in full. This chapter (also a standalone document) is a summary of that detail and should be accessible to a wider range of stakeholders.

This chapter considers the overall financeability proposal within our Business Plan. We propose a financing plan for each of SP Distribution and SP Manweb that is efficient and adheres to Ofgem policies laid out in its Strategy Decision document, that is consistent with RIIO principles and, in particular, ensures financeability at a comfortable investment grade credit rating but no higher. This chapter also addresses the questions of what are the appropriate cash flows for the businesses and return to shareholders.

1. Key assumptions and headline proposals

We have also taken into consideration the views of customers, investors and other stakeholders in preparing our plan. In addition, to support the process of assessing financeability we have engaged economic consultants including NERA, First Economics, OXERA and clearly reference throughout the section the other guidance to which we have referred.

Ofgem have a statutory duty to ensure that DNOs are financeable, meaning that they are allowed sufficient cash flow to pay interest and dividends to the providers of finance. It is the DNO's responsibility to demonstrate that their financing plan is 'efficient' i.e. requiring no greater cash flow than is necessary to be 'financeable'.

Our base financial plan gives a credit rating of Baa1 which is at the lower end of the range that underpins Ofgem's cost of debt index and is lower than the A3 rating at fast track. We then considered further external risks which, if they were to materialise, yield a base rating one notch lower for SP Manweb and material downside risk for SP Distribution.

1.a. Key conclusions

We conclude that we require a cost of equity of 6.4% to enable us to attract and retain sufficient equity finance to provide, in our view, the necessary investment to maintain network reliability and absorb the forecast expenditure volatility as we facilitate the transition to a low-carbon economy. Our risk assessment in section 'h' demonstrates that there is a significant chance, although dependent on the calibration / strength of the IQI incentive, due to be set out in

Ofgem's July 2014 initial proposals, that our investors may have to provide a substantial equity injection during RIIO-ED1 to maintain an investment grade credit rating.

In our financial modelling, we assume that the cost of debt is 2.72% which is the value of the iBoxx ten year trailing average, as at 31 October 2013. However, the allowed cost of debt is set in real terms and our debt is primarily nominal (i.e. the coupon includes an inflation component). Our financeability analysis indicates that this mis-match contributes to declining financial ratios. In October 2013 Moody's issued an announcement relating to the impact of persistent low interest rates and a potential need for companies to deleverage to maintain key credit metrics.

We assume 65% notional gearing, which reflects Ofgem's guidelines, however as detailed in our risk assessment section 'h' , a lower gearing of 60% is considered for SP Manweb, after consideration of uncertainty around incentives that will be detailed in the July 2014 initial proposals.

Our financeability analysis demonstrates that, following removal of the 2.5% fast track additional income, of SP Distribution £44m and SP Manweb £55m, which was included in our fast track financeability assessment, we need a one period transition to longer depreciation lives.

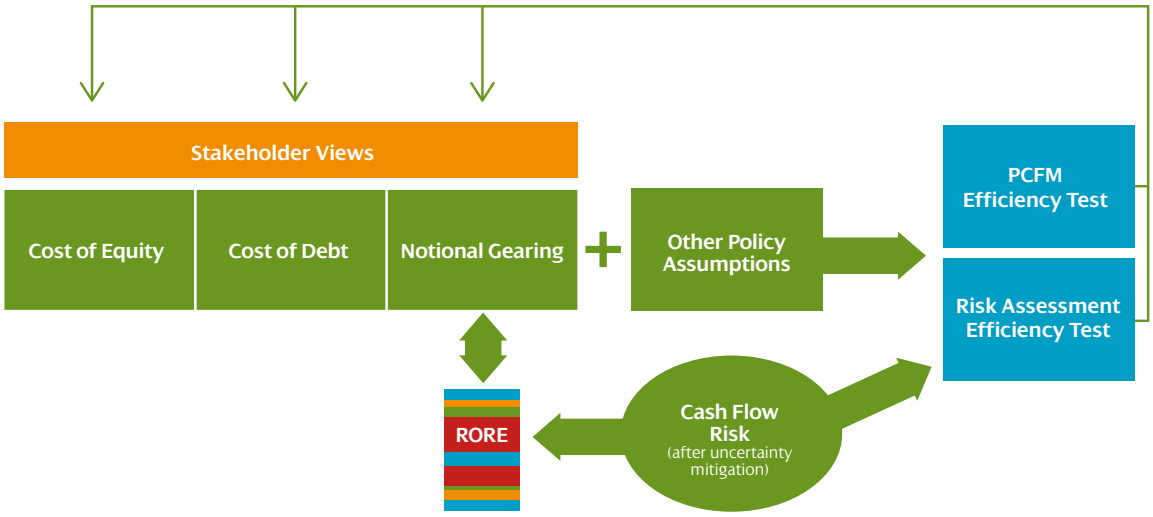
2. Structure and Objectives of this chapter

In **Section 3** we provide justification for the allowed return used in our Business Plan. This takes up the bulk of this chapter.

- *First, we assess the relative risk of SP Distribution and SP Manweb in comparison with the fast tracked DNOs. We consider differences in the range of Regulatory Return on Equity (RoRE), Real Price Effects (RPEs), financial ratios and other components of risk and the differential impact of the IQI mechanism.*
- *Second, we respond to Ofgem's recent review of the methodology for assessing the total equity market return*
- *Third, we present a range of stakeholder views around the topic on financing costs to provide context for our other analysis.*
- *Fourth, we consider the cost of equity based on economic and financial principles.*
- *On the cost of debt we have adopted Ofgem's policy of indexation using the 10 year trailing iBoxx average.*
- *Next, we consider notional gearing. At this stage we introduce cash flow risk and test that our proposal delivers acceptable upside and downside potential from the price control package using Return on Regulatory Equity (RoRE) analysis.*
- *Then, we test that our plan is financeable. Here we carry out 'static' (or, in other words, non-probabilistic) testing to ensure an expectation of a comfortable investment grade credit rating – but no higher.*
- *Finally, we further test the efficiency and financeability of our plan by conducting a comprehensive probabilistic risk analysis using a framework developed in conjunction with our advisers NERA to test our plan against external shocks.*

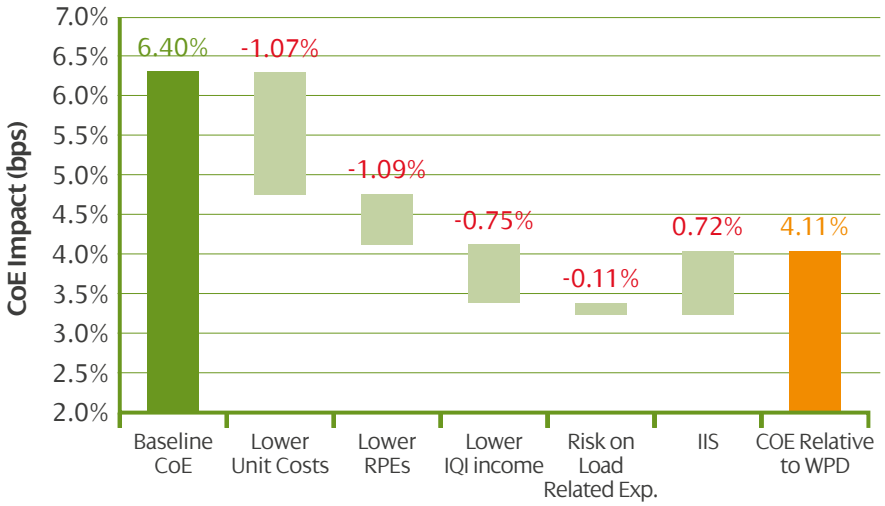
In **Section 4** we present our plan assumptions around capitalisation and regulatory depreciation.

In **Section 5** we discuss how we have adopted Ofgem's financial policies concerning the treatment of taxation and pension costs.



3. Allowed Return

Figure 1: We Assume Greater Risk for Lower Reward Than WPD: Our Relative Return on Equity is Around 230bps Lower Than WPDs



In this section, we set out the key financing components of allowed return in our Business Plan. We then take these out alongside other financing assumptions and present the results alongside our efficiency tests. In other words, against a backdrop of stakeholder opinion we move in stages from economic and financial principles through to a full probabilistic risk assessment.

We have replicated Moody's approach[1] to credit ratings to ensure that our overall proposal is financeable and efficiently so.

3.a. Comparison with risk of fast tracked DNOs

We have assessed the relative risk of SP Distribution and SP Manweb in comparison with the fast tracked DNOs.

We set out that, overall, our equity holders are bearing considerably more risk than WPD and therefore our cost of equity, at a minimum, should be 6.4% identical to WPD's. After consideration of the inherent higher risk in the standard track process we consider a CoE higher than 6.4% would not be inconsistent with proportionate regulation. However, we have limited our proposed baseline CoE, to 6.4%, the fast track level, as our equity holders at this level but not below, will absorb this additional risk, to the benefit of customers and stakeholders.

In our value-for-money section in Chapter 10 we present how our overall set of proposals delivers value-for-money for the customer. We show that we assume greater risk for a lower expected reward than WPD's fast-tracked plan. As illustrated in figure 1 above our effective return on equity is around 230bps lower relative to WPDs fast-track plan, or closer to 4%, reflecting our more challenging unit costs, lower real price effects (RPEs), zero IQI income reward, and greater risk in relation to investment to accommodate changing patterns of demand.

As summarised in the our value-for-money section in Chapter 10, we consider that our plan offers value-for-money for consumers.

We set out below additional evidence to support our statement that our equity holders are adopting considerably more risk than the fast track companies.

Unlike the notional standard track DNO, the fast track DNOs are protected from their RoRE falling significantly below the cost of debt, which is the normal guide

1. *Moody's Investors Service (2009) "Rating Methodology – Regulated Electric and Gas Networks", August*

Figure 2 Minimum post tax real return on regulatory equity

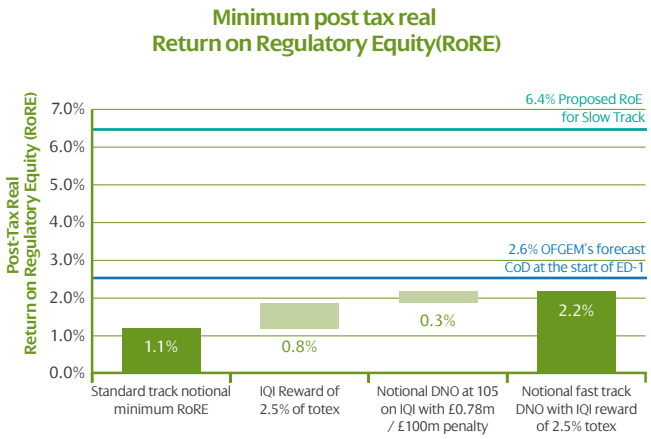
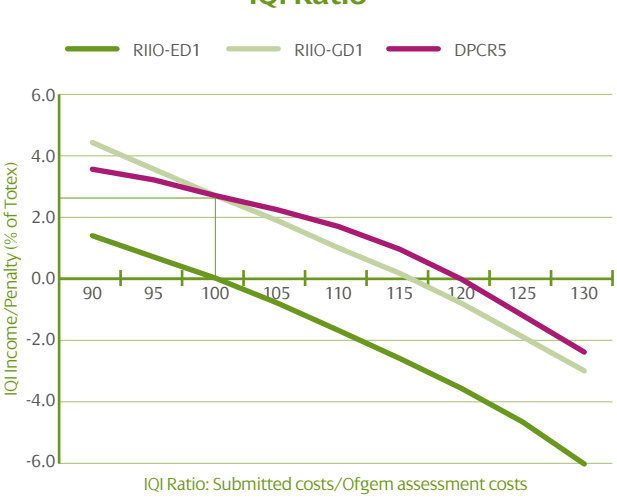


Figure 3 RIIO-ED1 Matrix provides lower income/higher penalty than previous reviews



to the acceptable minimum of the RoRE range. We estimate a minimum of c.1.1% for the notional standard track DNO's RoRE range. As illustrated above, in figure 2, this is considerably lower than the 2.6% cost of debt Ofgem forecast for the start of ED-1 and the minimum we calculate for a notional fast track DNO. Figure 2 illustrates our view of the considerably greater downside risk the notional standard track equity holders are exposed to compared to a fast track DNO.

Totex income allowance is lower than all previous reviews.

Ofgem proposes to set a totex income allowance of zero for those companies where it agrees the submitted costs are efficient: all other companies will receive a totex penalty [2]. This proposed calibration of the IQI menus provides a much lower income/ higher penalty than that adopted by Ofgem at recent price reviews, and much lower than the totex income received by WPD equivalent to 2.5%. For example, at both RIIO-GD1 and DPCR5, the companies considered by Ofgem to have submitted efficient expenditure plans received an income reward of 2.5%, and companies continued to receive a positive totex income with IQI ratios of up to 120. (See figure 3). In section 'g.7' we present the income component of the IQI calibration for previous standard track companies. This shows that, as part of the IQI calibration, in ET1 and GD1, companies with an IQI ratio of c.112 received additional income.

There is therefore a far higher risk, under the proposed IQI calibration, that Ofgem's view of the efficiency of a standard track DNO's totex proposals may result in a penalty with a resultant risk to our financeability (in addition to the penalty applying under the totex incentive mechanism if they do have to spend in excess of the allowance in order to deliver their outputs and, importantly, ensure that they meet their licence obligations regarding continuity of electricity supply). For SP Distribution and SP Manweb this is despite those costs being more efficient by 8%, at 33kV and below, in 76% of the cost we appraised in comparison to the fast track DNOs. In section 'h' we set out the material impact on financeability of the IQI assessment.

The IQI assessment is determined by Ofgem's view of the efficiency of a DNO's totex forecast. Therefore the robustness of the benchmarking methodology applied, which will underpin the efficiency assessment, is of even greater importance than in the past. Benchmarking by its nature is subjective therefore it is essential

2. Source: Ofgem (March 2013) Strategy decision for the RIIO-ED1 electricity distribution price control : Outputs, incentives and innovation, p. 92 Link: https://www.ofgem.gov.uk/ofgem-publications/47068/riioed1decoutputsincentives.pdf

Ofgem ensure the assessment is transparent, objective and statistically robust. The fast track assessment included regressions with R-Squared of only 0.24, indicating that on average the model only explains 24% of cost variation. This suggests the regression models used in the fast track assessment had poor explanatory power, and supports the hypothesis that the regressions omit factors that would explain differences between DNOs' costs for reasons besides "inefficiency".

A standard track DNO's RoRE and financeability is now much more sensitive than in the past to this efficiency assessment. Equity holders of DNOs in the standard track are therefore exposed to significant uncertainty around the cost benchmarking process compared to equity holders of the fast track DNOs who have certainty of IQI additional income. An error in the standard track benchmarking which may result from placing reliance on regressions with very low R-Squared, or omitted variables, or other mis-specifications, would likely lead to a systematic difference which equity holders will be exposed to for a period of eight years.

This is of considerable risk to standard track equity holders who would be called upon to inject equity if the IQI penalty impacts financeability.

Real Price Effects (RPEs)

WPD derived its RPE forecasts of commodity prices from First Economics in January 2013. We have asked First Economics to update these forecast and they are now significantly lower. If we had adopted WPD's RPE estimates which were based on a First Economics' January 2013 view our RPE allowance would be £104m higher (SPM £56m plus SPD £48m), equivalent to a c.3% increase in totex, to manage commodity price increases.

Financial ratios

Our credit rating analysis demonstrates that our equity holder will need to raise debt with financial ratios, especially PMICR, weaker than WPD's (section g.5).

Other components of risk

We have identified we bear more risk than WPD in relation to Load indices where WPD triggers reinforcement at more conservative levels.

Conclusion

As set out above, our equity holders bear considerably more risk than the fast track DNO's, and therefore our cost of equity, at a minimum, is 6.4%, and provides an efficient level of financing to customers.

3.b. Ofgem's review of the methodology for assessing total equity market returns

Ofgem undertook a consultation[3] on their methodology for assessing the equity market return. Our response was supported by a report[4] from NERA. Ofgem are minded to give greater weight to the influence of current market conditions in relation to the equity market return.

Ofgem have proposed a cost of equity of 6.0% as the reference point for assessing DNO's Business Plans. We asked NERA to review[5] Ofgem's arguments. They conclude:

- *Ofgem overstates the impact of the RPI effect relative to its consultants' recommendations and the empirical evidence;*
- *Ofgem's beta estimate is inconsistent with the risks faced by SPEN's DNOs because it fails to account for the pro-cyclicality of risk introduced by its cost of debt index and the relative size of the different capex programmes for the energy networks it regulates*

Adjusting for these issues, NERA find that a more plausible range for the cost of capital within the constraints imposed by Ofgem's framework for determining the cost of capital (use of short-run / forward-looking risk-free rates) would have been 6.5% to 7.2% after having adjusted for the RPI effect.

In our view, a wider consideration of contemporary market data would support a significantly higher cost of equity than now proposed by Ofgem but certainly not less than 6.4%. Moreover, our financeability and risk analyses support at least 6.4% as our required cost of equity.

Furthermore, we note that the CC provisional determination for NIE is not yet final and, in recent reports, the CC has selected a point estimate towards the top end of its estimated range.

3.c Stakeholder Views

In formulating our proposals around the allowed return, we have taken into account the views of both investors and other stakeholders. Our stakeholder engagement has included the investor community and also stakeholder views expressed via Ofgem's "Consultation on strategy for the next electricity distribution price controls – RIIO-ED1 – Financial Issues". Other stakeholders have expressed interest in the absolute level of the resultant customer bill, as well as predictability and volatility of charges rather than the specific financial policy decisions.

Our stakeholder engagement has included:

- *A careful review of responses to Ofgem's RIIO-ED1 Strategy Consultation.*

3. *Ofgem (2013) "Consultation on our methodology for assessing the equity market return for the purposes of setting RIIO price controls", 6 December*

4. *NERA (2014) "Response to Ofgem's consultation on its methodology for assessing the equity market return for the purpose of setting RIIO price controls", 9 January 2014*

5. *NERA (2014) "The Cost of Equity for Scottish Power's Distribution Network Operators at RIIO-ED1", Appendix F, March*

- *A further review of responses to Ofgem's consultation on the methodology for assessing the equity market return for the purposes of the RIIO price controls, which included responses from:*
  - *NERA*
  - *Oxera*
  - *Frontier Economics*
  - *CEPA*
  - *Consumer Futures*
- *An investor survey targeted at both equity and debt investors and brokers.*
- *A review of broker comments at the time of the publication of the RIIO-GD1 and RIIO-T1 initial proposals (this was the point at which the gearing and allowed Cost of Equity were announced and did not change for the final proposals).*
- *We also analysed the market's reaction by reviewing National Grid's share price performance versus the FTSE-100 and the Dow Jones STOXX Utilities index for the days immediately after the publication of these initial proposals.*
- *Monitoring of credit rating agencies' comments on regulated network sectors*

This engagement has identified that stakeholders are in broad agreement on the identified credit metrics and, where opinions have been given, generally stakeholders believed that a low single A credit rating should be targeted. There was also broad support for Ofgem's approach to calculating the cost of debt however in our investor survey one broker raised the point that debt efficiently incurred more than 10 years ago would not be captured under Ofgem's policy. One supplier suggested that consideration should be given as to whether the depreciation timescale for existing as well as new assets should also be 45 years.

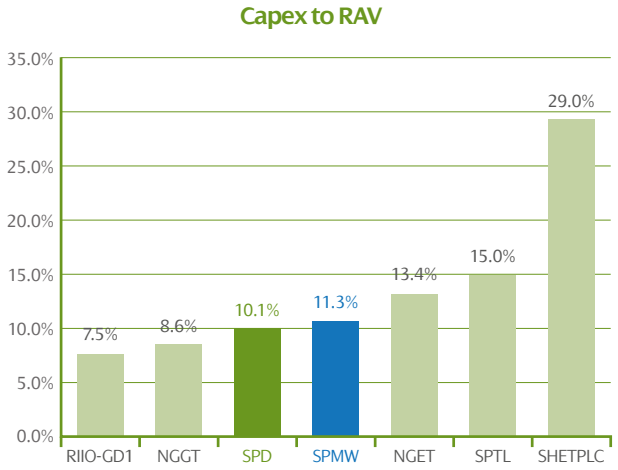
Our stakeholder engagement identified two areas where stakeholders' views differ significantly: Cost of Equity and Notional Gearing.

However our investor survey results indicated that the investor community believe that an appropriate gearing level would be in the 60-65% range and that an appropriate cost of equity would be in the top half of Ofgem's indicated range of 6% to 7.2%.

Consumer Futures believes that contemporary market data is more likely to represent plausible investor expectations as investors will base decisions on alternative investments at the prevailing time rather than on the long run average.

On the whole and after careful consideration of all of our stakeholders' opinions, we consider that our base assumptions included within this Business Plan strike an appropriate balance for all stakeholders while ensuring our business is financeable under a range of assumptions.

Figure 4: Capex to RAV ratios



Source: Ofgem Final Proposals for RIIO-T1 and GD1 and NERA calculation based on data from SPEN's financial model.

	SP Distribution	SP Manweb
Cost of Equity	6.4%	6.4%
Dividend	5.0%	5.0%

3.d Cost of equity

The cost of equity is the return required by shareholders for bearing the residual risk, after the operation of risk sharing and uncertainty mechanisms. It is the minimum return needed to attract and retain equity finance for our distribution businesses, which is essential to fund the necessary investment to deliver the outputs that our customers require and to facilitate the transition to a low-carbon economy. In addition, there is likely need to attract additional equity investment to maintain an investment grade credit rating. We estimate the minimum appropriate cost of equity to be 6.4% real, post-tax.

In estimating the cost of equity, we have taken into account:

- *Theoretical asset pricing models*
- *Forward looking estimates*
- *Contemporary market data*
- *Market Evidence*
- *Regulatory precedents*
- *Views of stakeholders*

We also reflect on the views of and evidence from Ofgem's advisors.

3.d.1 Asset pricing models

Ofgem's preferred framework is the Capital Asset Pricing Model (CAPM).

For the purposes of our CAPM estimate, we have taken the real risk free rate, adjusted for the recent increase in the RPI "formula effect", to be 1.7%.

The equity market risk premium is assumed to be 5%, which is consistent with the long run arithmetic average for the UK.

The equity beta is estimated to be 0.94 which is within Ofgem's proposed range for RIIO-ED1 and implies an asset beta of 0.33 at 65% gearing.

In their assessment of relative risk, Oxera conclude[6] that asset risk may be higher in RIIO-ED1 and suggest a beta range of 0.95 to 1.20 at 65% gearing. However, consistent with RIIO-T1 and GD1, we use the capex/RAV ratio and the potential spread of return on regulatory equity (RoRE) as our primary indicators of relative risk.

Similarly, in their assessment of relative riskiness, First Economics conclude[7]:

"the DNOs are likely to be among the more risky regulated networks from the perspective of equity investors."

Nevertheless, we note that, unlike the water and sewerage sector, electricity DNOs are not traded as separate entities. Furthermore, there is evidence that beta estimates are not stable over time. It is therefore a matter of judgement as how best to estimate and interpret betas obtained from larger groups and comparators.

6. Oxera (2013), "RIIO-ED1 Risk assessment framework", April 10th. http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=12&refer=NETWORKS/PRICECONTROLS/WEBFORUM

7. First Economics (2012), "The Riskiness of the Electricity DNOs under RIIO Relative to Other Regulated Networks", August. http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riio-ed1/consultations/Documents1/ENA_ED1StratResponse_First%20Economics_relative%20risk.pdf

Table 1: ERP estimates over different time horizons (%)

	Spot	1Y	2Y	5Y	10Y	Long-Run (DMS)
Bloomberg	8.1	8.8	9.3	9.8	n/a	5.0
Bank of England	c.5.3	c.5.5	c.6.0	c.5.5	c.5.0	

Source: Bloomberg and Bank of England Financial Stability Report, January 2014.

Note: Underlying data for BoE not publicly available (averages estimated).

No provider publishes the exact calculation behind its model.

Combining these CAPM components, we calculate the cost of equity to be 1.7% + (0.94 x 5%) = 6.4% real, post-tax.

We have cross checked this against other approaches, including:

- *Forward looking estimates (see the Financing Our Plan Annex, section 3.d.2)*
- *Dividend Growth Model (DGM) (see the Financing Our Plan Annex, section 3.d.3)*
- *Total market return(see the Financing Our Plan Annex, section 3.d.5)*

3.d.2 Forward Looking estimates

The onset of the financial crisis in 2008 brought an end to the period of 'Great Stability', making prospects for UK and global economic growth appear not just weaker, but more uncertain. This elevated uncertainty is likely to have adversely affected spending decisions and contributed to the depth of the recent recession and the weakness of the recovery.

KPMG derives the equity market risk premium by assessing current income, growth expectations and current prices. The general Discounted Cash Flow (DCF) formula is then used to solve for the implied discount rate that reconciles these parameters. Deducting the risk-free rate from this implied discount rate will yield an implied equity market risk premium. KPMG recommends[8] use of an equity market risk premium of 6.0% as per 30 September 2013 (down from 6.5%).

Table 1 sets out the ERP estimates from different sources over different time frames.

On a forward looking basis, the average estimate of the ERP offsets the currently low real interest rates to give the same estimate of the cost of equity of 0.1% + 0.94 x 6.7%= 6.4% real, post-tax.

8. KPMG (2013), "Equity Market Risk Premium – Research Summary", 13 October. https://www.kpmg.com/NL/nl/IssuesAndInsights/ArticlesPublications/Documents/PDF/Financial-Services/EMRP-Summary-Oct2013.pdf

3.d.3 Dividend Growth Model

An alternative approach is to use the Dividend Growth Model (DGM). This is the alternative to the CAPM, for calculating the cost of equity, which is widely used in US regulatory proceedings.

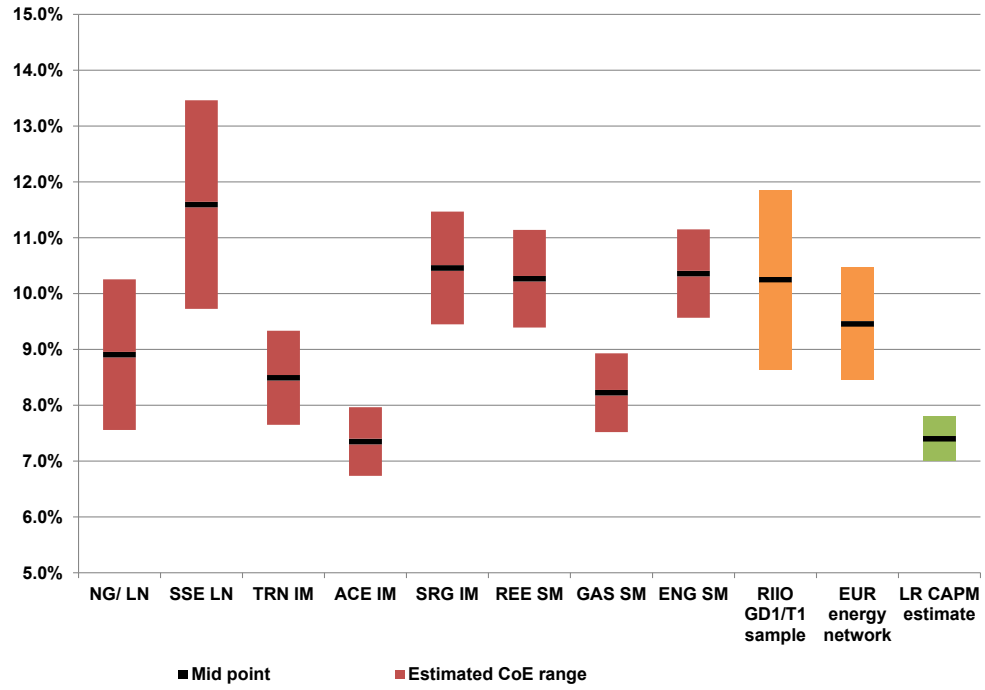
Figure 5 presents NERA's estimated range of the real post-tax cost of equity for a sample of European energy network companies, re-levered to a notional gearing level of 65%.

In its report[9] for Ofgem, FTI Consulting undertook its own analysis using the DGM and concluded:

"As a cross-check using the DGM, we estimated a reasonable range for the cost of equity for National Grid PLC to be 6.8% to 8.6%, and a reasonable range for SSE to be 6.3% to 8.1%. These estimates are for the listed companies. We have not attempted to use these to develop specific estimates of the network companies' cost of equity. We conclude that the range of estimates using a DGM is consistent with Ofgem's range of estimates of the cost of equity using the CAPM."

We conclude that our 6.4% cost of equity is at the bottom of the range of estimates produced by the DGM for comparator companies.

Figure 5: NERA Cost of Equity estimates based on DGM



Source: NERA analysis based on Bloomberg data.

9. FTI Consulting (2012), "Cost of capital study for the RIIO-T1 and GD1 price controls", 24 July. http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/RIIO%20T1%20Cost%20of%20capital%20study%20for%20RIIO%20T1%20and%20GD1.pdf

3.d.4 Comparison with US return on equity

Table 2 shows that the average real cost of equity for US electric utilities is 8.0% at 50% gearing.

Table 2: US Electric Utility Return on Equity

Utility	S&P LT Credit Rating	Authorised Return on Equity (%)	Debt/Total Cap (%)
Maui Electric Company, Limited	BBB-	9.0	42
United Illuminating Company	BBB	9.15	49
Niagara Mohawk Power Corporation	N/A	9.3	40
Potomac Electric Power Company	BBB+	9.36	51
Cross Texas	N/A	9.6	N/A
Wind Energy Transmission Texas	N/A	9.6	N/A
Baltimore Gas and Electric Company	BBB	9.75	51
Atlantic City Electric Company	BBB+	9.75	57
Avista Corporation	BBB	9.8	51
Puget Sound Energy, Inc.	N/A	9.8	53
Tucson Electric Power Company	N/A	10.0	59
Consumers Energy Company	BBB	10.3	48
Average		9.6%	50%
Real Cost of Equity		8.0%	

Source: NERA analysis of Bloomberg and US utility company data, Consensus Economics (October 2013); Note: To calculate the real cost of equity, we assume an inflation assumption of 1.5%, from the Consensus Economics estimate for the US for 2013. We apply the Fisher formula to calculate the real cost of equity from the nominal return on equity. In our analysis, we exclude all companies with generation assets accounting for more than 50% of total assets, in order to compare with the CC NIE and Ofgem RIIO-ED1 determinations.

Figure 6: Relative stability of total equity market returns

3.d.5 Total market return

As Smithers & Co noted[10] , the overall market return is more stable than the individual components of the CAPM.

Stephen Wright, a joint author of the Smithers' reports, has recently again endorsed this approach in evidence[11] to the Australian Energy Regulator (AER).

Stephen Wright has produced an updated chart, figure 6, from the Smither's report (commissioned by the UK economic regulators and the OFT), which demonstrates the relative stability of total equity market returns over two centuries.

In their recent[12] report for Ofgem, Wright and Smithers conclude:

"Thus both historical and more recent evidence point to the same conclusion: in contrast to the stock return there is no evidence of stability in the risk-free rate, at any maturity. As a direct implication, there is no evidence of stability of the market equity premium. Without such evidence, there is no empirical basis for the assumption that falls in risk-free rates should translate to falls in expected market returns."

Alan Gregory (formerly reporting panel member of the UK Competition Commission, from 2001-2009, and an External Advisor to the UK Competition Commission's Finance and Regulation Group) in his own recent evidence[13] to the AER also supports this approach.

The arithmetic average total market return is 7.1%, which is calculated from UK data from the Credit Suisse Global Investment Returns Sourcebook 2013.

For TPCR4, Smithers' estimated[14] the implied arithmetic mean for total market returns using an adjustment to the geometric mean to reflect the volatility of market returns:

Arithmetic Total Market Return = Geometric Total Market Return + ½ Equity Market Variance

Updating Smithers' approach with UK data from the Credit Suisse Global Investment Returns Yearbook 2013 gives:

A	Geometric Mean returns (1900-2012)	5.2%
B	Standard Deviation of returns (1900-2012)	20%
C	Variance of returns (=B2)	4.0%
D	½ Variance (=C/2)	2.0%
E	Implied Arithmetic mean return (=A+D)	7.2%

10. Smithers & Co. Ltd.(2003),., "A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K"., 13 February. http://ofwat.gov.uk/publications/commissioned/rpt_com_costofcapital130203.pdf

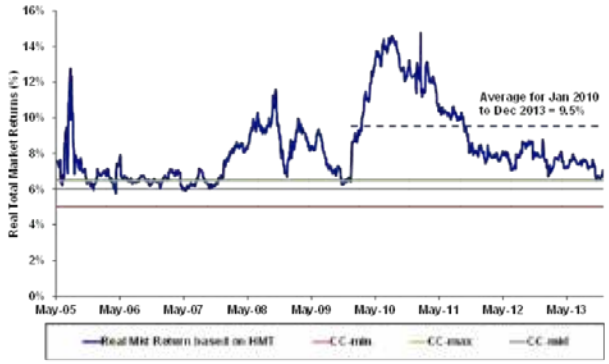
11. Wright, S (2012), "Review of Risk Free Rate and Cost of Equity Estimates: A Comparison of UK Approaches with the AER", 25 October. http://www.aer.gov.au/sites/default/files/Attachment%209.15%20Professor%20Stephen%20Wright%20Review%20of%20risk%20free%20rate%20and%20cost%20of%20equity%20estimates%20A%20comparison%20of%-20UK%20approaches%20with%20the%20AER_0.PDF

12. Wright, S and Smithers A (2014)The Cost of Equity Capital for Regulated Companies: A Review for Ofgem, February

13. Gregory, A (2012) ,"The AER Approach to Establishing the Cost of Equity – Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium", 5th November. http://www.aer.gov.au/sites/default/files/5%204%20Gregory%20A.,%20The%20AER%20Approach%20to%20Establishing%20the%20Cost%20of%20Equity%20%E2%80%93%20Analysis%20of%20the%20Method%20%20Used%20to%20Establish%20the%20Risk%20-1.pdf

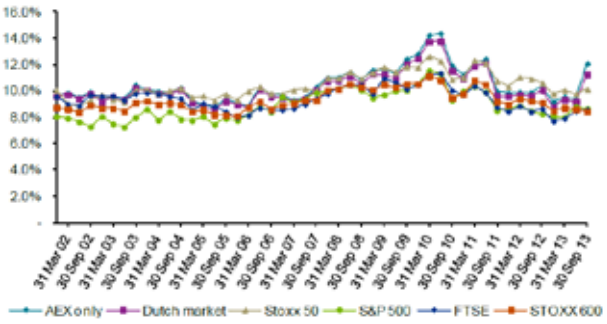
14. Smithers & Co. Ltd., "Report on the Cost of Capital – provided to Ofgem", 1 September 2006. http://www.ofgem.gov.uk/Networks/Trans/Archive/TPCR4/ConsultantReports/Documents1/15576-smithers_co.pdf

Figure 7: Bloomberg estimates of real market returns



Source: NERA analysis of Bloomberg and HMT data and CC decision

Figure 8: KPMG estimates of implied equity return



Source: KPMG, Equity Market Risk Premium – Research Summary, p4, 16 October 2013

Wright and Smithers have recently again endorsed[15] this approach:

"In light of the distortions introduced by direct arithmetic averaging, we continue to advocate deriving return estimates from compound average returns. A deliberate decision then needs to be made on how much to adjust for the impact of return volatility on the arithmetic average. In MMR we argued for an adjustment of 1 to 2 percentage points, depending on how much account regulators wish to take on predictability of returns. We see no reason to change this recommendation."

3.d.6 Contemporary market data

Recently, it has been suggested that greater weight should be given to contemporary market data. Ofgem undertook a consultation[16] on their methodology for assessing the equity market return. Our response was supported by a report[17] from NERA. Ofgem are minded to give greater weight to the influence of current market conditions in relation to the equity market return.

Nevertheless, in their advice to Ofgem, Wright and Smithers warned of the difficulties in trying to use recent evidence.

"Thus even while there is evidence of predictability (albeit extremely limited) and hence variation over time in econometric predictions of market returns, this does not necessarily translate to market expectations of the market return, which is what we should be seeking to measure. There is thus no straightforward, systematic, transparent and replicable way of incorporating "recent evidence" into estimates of the market cost of equity."

Based on the last four years of data, Bloomberg evidence on the total market return shows an average level of 9.5%, way above the CC's provisional estimate of 6%.

Likewise, KPMG's estimates of the implied equity return peaked during 2010 but have increased again during 2013.

3.d.7 Market evidence

We are aware that some commentators attempt to draw conclusions from the relation between market values and the regulatory value attributed to the RAV. Although a few water and sewerage companies are still quoted on the London Stock Exchange and it is possible to track the Market to Asset Ratio (MAR) i.e. market capitalisation value relative to the RCV: this fluctuates markedly.

From April 2010 onwards, MARs have been between 1.0 and 1.25 for the average of the listed network companies with the top end of this range reflecting the May 2013 spike in valuations following the announcement of a takeover approach for Severn Trent that, temporarily, also pushed up the price for other network companies.

The use of market transaction evidence as a basis for estimating the market

15. *Wright, S and Smithers A (2014)The Cost of Equity Capital for Regulated Companies: A Review for Ofgem, February*

16. *Ofgem (2013) "Consultation on our methodology for assessing the equity market return for the purposes of setting RIIO price controls", 6 December*

17. *NERA (2014) "Response to Ofgem's consultation on its methodology for assessing the equity market return for the purpose of setting RIIO price controls", 9 January 2014*

Table 3: Real risk-free rates used in recent price controls

Decision year	2006	2007	2007	2008	2008	2009	2009	2010	2011	2011	2011	2012	2013	2014	2014
Price control	Ofgem: TPCR4	CAA: Heathrow	Ofgem: GDPCR	ORR: PR08	CAA: Stansted	Ofwat: PR09	Ofgem: DPCR5	CAA: NATS	Ofcom: MCT	Ofcom: WBA	Ofgem: TPCR4	Ofgem: RIIO T1/ GD1	ORR: PR13	CAA: Heathrow &Gatwick	Ofwat : PR14
Risk-free rate	2.5%	2.5%	2.5%	1.8%	2.0%	2.0%	2.0%	1.75%	1.5%	1.4%	2.0%	2.0%	1.75%	0.5%	1.25%

Source: Joint Regulators' Group[20] , ORR[21] , CAA[22] , and Ofwat[23]

Table 4: Market risk premia used in recent price controls

Decision year	2006	2007	2007	2008	2008	2009	2009	2010	2011	2011	2011	2012	2013	2014	2014
Price control	Ofgem: TPCR4	CAA: Heathrow	Ofgem: GDPCR	ORR: PR08	CAA: Stansted	Ofwat: PR09	Ofgem: DPCR5	CAA: NATS	Ofcom: MCT	Ofcom: WBA	Ofgem: TPCR4	Ofgem: RIIO T1/ GD1	ORR: PR13	CAA: Heathrow &Gatwick	Ofwat : PR14
Market risk premia	4.5%	4.24%	4.75%	5.0%	4.67%	5.4%	5.25%	5.25%	5.0%	5.0%	5.0%	5.25%	5.0%	5.075%	5.5%

Source: Joint Regulators' Group[20] , ORR[21], CAA[22] , and Ofwat[24]

WACC presents additional problems over the ones presented by MARs. In particular, there is generally limited information in relation to the value assigned to non-regulated businesses, as well as outperformance assumptions. One important consideration and source of value may be outperformance in relation to tax.

Furthermore, the highest bid premiums have been associated with highly leveraged transactions at a time of exuberance in the credit markets and these now face substantial refinancing risks. The Bank of England[18] has outlined the risks around such deals.

We note that Imrecon, in their financeability study[19] for Ofgem concluded:

"We consider that high equity valuations provide some corroborating, but not primary, evidence for the cost of capital. We do not believe it is appropriate to place significant weight on them."

We conclude that the past premia paid for electricity DNOs are not a reliable indicator of the forward looking cost of capital.

3.d.8 Regulatory precedents

The risk-free rates and market risk premia used by regulators are set out in Tables 3 and 4 above.

As regards the real risk free rate, there is broad consistency across sectorial regulators, although Ofcom takes a slightly different approach due to factors that specifically affect the telecommunications sector. Unlike other regulators, Ofcom sets price controls using nominal returns and of shorter length – typically three years – so it places more weight on shorter term averages and forward rates.

Most regulators take a long-term view on the appropriate market risk premium, although recently some allowance has been made for the impact of the Credit Crisis.

18. *Gregory, D (2013) "Private equity and financial stability", Bank of England Quarterly Bulletin, Q1, March*

19. *Imrecon (2012) "RIIO reviews – Financeability study", November, page 24. http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/GD1_FinanceabilityStudy_DEC12.pdf*

20. *Joint Regulators Group (JRG), (2013), Cost of Capital and Financeability, Table 3.1, March. http://www.ofgem.gov.uk/About%20us/BetterReg/JointReg/Documents1/JRG%20Report%20on%20Cost%20of%20Capital%20and%20Financeability%20-%20Final%20March%202013.pdf*

21. *ORR (2013) Periodic Review 2013: Final determination of Network Rail's outputs and funding for 2014-19, Table 13.1, p491,October*

22. *CAA (2014) Estimating the cost of capital: a technical appendix for the economic regulation of Heathrow and Gatwick from April 2014: Notices of the proposed licences, CAP 1140, Figure 7.1, p52, January*

23. *Ofwat (2014) Setting price controls for 2015-20 – risk and reward guidance, Table 8, p24, January*

24. *JRG(2013), Table 3.2, ORR(2013), Table 13.1, CAA(2014), Figure 7.1 and Ofwat (2014), Table 8*

3.d.9 Dividend Yield

We have assumed a dividend yield of 5% on the notional equity proportion of the RAV. This is consistent with Ofgem's assumptions for DPCR5 and RIIO-GD1.

Observed dividend yields for UK network comparators lie within the range 4.19% to 6.34%.

Table 5: Dividend yields for UK network comparators

Company	Dividend Yield
National Grid	5.22%
SSE	6.34%
Pennon	4.19%
Severn Trent	4.65%
United Utilities	4.81%
Average	5.04%

3.d.10 Conclusion

Following detailed modelling and consideration of advice from economic consultants we estimate the cost of equity to be 6.4% real, post-tax. We have cross-checked this estimate using a variety of approaches that also support 6.4%.

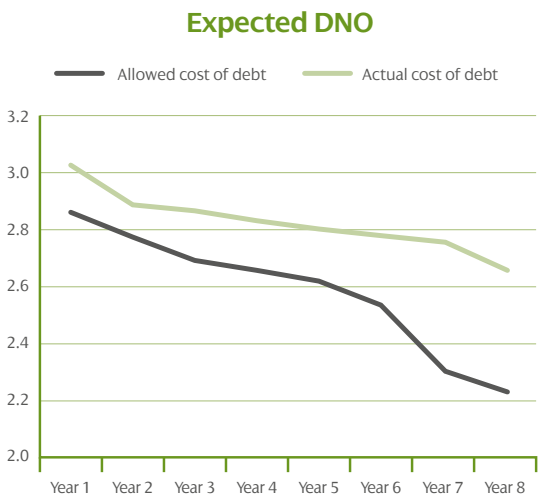
In addition, in the financeability section, we set out why 6.4%, which is used for the fast-track decision for WPD, is proportionate and necessary for financeability. Our assessment of relative risk demonstrates that we bear significantly more risk, arising from differences in:

- *the range of Return on Regulatory Equity (RoRE),*
- *Real Price Effects (RPEs),*
- *financial ratios,*
- *other components of risk, and*
- *the differential impact of the IQI mechanism.*

Nevertheless, our analysis of Return on Regulatory Equity (RoRE) shows that we do not have the opportunity to earn double digit returns.

Our cost of equity of 6.4% strikes a balance between the financing requirements of SP Manweb and SP Distribution and the need to provide investment to meet our customers' requirements for safe and reliable electricity supplies from our networks. This is 30bps below Ofgem's determinations of 6.7% for DPCR5 and RIIO-GD1, in December 2012, reflecting the reduction in the risk free rate. However, our analysis of financeability and Return on Regulatory Equity (RoRE) leads us to conclude that Ofgem's recent proposal of 6.0%, which is at the bottom of the range that they published in the strategy decision for RIIO-ED1, would not provide a sufficient return to persuade investors to finance an equity injection, which will likely be necessary to maintain an investment grade credit rating, after the consideration of risk (section 'h'). In particular, such risks arise from the IQI mechanism, volatility in load expenditure as we facilitate the move to a low-carbon economy, the mis-match between actual debt costs, in nominal terms, and those allowed through indexation of the real cost of debt.

Figure 9: Expected DNO cost of debt versus the allowance



	SP Distribution	SP Manweb
Cost of Debt	iBoxx 10 year trailing average	iBoxx 10 year trailing average

Source: Dealogic, Oxera analysis. Notes: The allowed cost of debt is estimated assuming that the annual average yield that goes into Ofgem's index remains unchanged from current levels throughout the price control period.

3.e.1 Cost of Debt

Cost of debt index

We use Ofgem's proposed index for the cost of debt. This is calculated from the ten year rolling average of the yields on iBoxx A and BBB rated sterling non-financial bond indices, with a maturity of more than ten years, less the "break even inflation rate", calculated from UK index linked gilts.

In our Business Plan we have based our 'static' modelling (section 'g') on a cost of debt of 2.72% per annum, which is the value of the iBoxx ten year trailing average, as at 31 October 2013, as prescribed by Ofgem for comparability reasons. Nevertheless, the cost of debt index is expected to continue to fall, at least until 2020/21, and remain below 2.72% throughout RIIO-ED1. However, Ofgem use a projected cost of debt of 2.6% in their fast track financial model for WPD, which reflects their forecast for the first year of RIIO-ED1. This will reduce the vanilla WACC to 3.9%.

Furthermore, we believe that a longer trailing average period would be more reflective of DNOs' actual cost of debt, as bonds issued more than ten years ago will drop out of the cost of debt index.

Consequently, there will be risk of a significant mismatch between the cost of debt index and the actual cost of debt. DNOs are obliged to continue to pay the coupon on bonds which they have issued until they are redeemed, which in many cases extend beyond ten years. Ofgem's analysis of the cost of debt index has focused on the comparison of the coupon on DNO debt with the cost of debt index, as at the date of issue. However, this ignores subsequent movements in the cost of debt index relative to the fixed coupon. The allowed cost of debt index is forecast to continue to decline for the foreseeable future, whereas DNOs will continue to pay the same fixed coupon until the bond matures.

Oxera have identified a number of ways in which a DNO remains exposed to the risk that the cost of debt index does not match that incurred by the DNO. These include:

- *Frequency of debt issuance*
- *Re-financing profile*
- *RAV growth*
- *Intra-year volatility of yields*
- *Time varying inflation risk premium*

Similarly, First Economics have advised that:

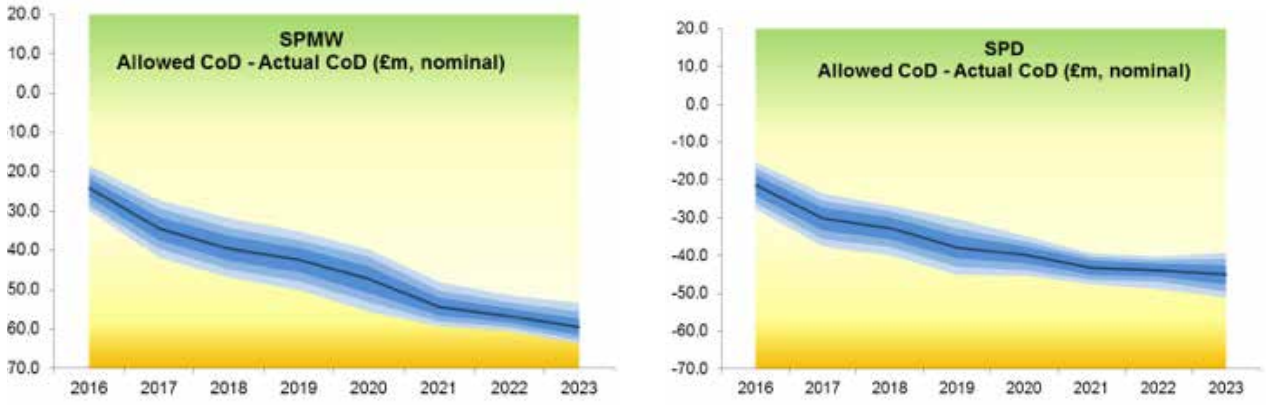
- *For DNOs, the cost of debt index is likely to over-react to changes in market interest rates* [25]
- *"Break-even inflation" is not a sufficiently robust or accurate measure to calculate the real cost of debt* [26]
- *DNOs' recent experience of debt issuances calls into question the extent to which 'headroom' will exist in future to pay for items that are missing from Ofgem's cost of debt formula* [27]

25. *First Economics (2012), "Ofgem's Cost of Debt Index and the Cost of Equity" 8th June. http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riio-ed1/consultations/Documents1/ENA_ED1StratResponse_First%20Economics_Paper3_Debtindex.pdf*

26. *First Economics (2012). "Indexation of the Cost of Debt and Inflation", 8th June. http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riio-ed1/consultations/Documents1/ENA_ED1StratResponse_First%20Economics_Paper2_Indexation.pdf*

27. *First Economics (2012), "Benchmark vs Actual Cost of Debt in 2011", 8th June*

Figure 10: Shortfall in cost of debt allowance



3.e.2 Risk assessment of cost of debt

Previous analyses by First Economics[28] and Moody's[29] have highlighted the mismatch between the allowed cost of debt, which is set in real terms, and the nominal interest rate payments which arise from the majority of DNO debt. First Economics conclude that financing difficulties arise when regulators fund only part of companies' nominal interest payments in price controls.

Moody's warns that persistent low real interest rates could increase credit risk for UK regulated utilities. The combination of low real interest rates and the UK regulatory framework has a potentially negative effect on companies' liquidity. This risk arises because regulated firms earn an allowed rate of return calculated in real prices but fund themselves predominantly through vanilla fixed-rate bonds that include an inflation component leading to a mis-match.

This mis-match leads to a substantial and growing shortfall in the cost of debt allowance relative to the nominal interest rate payments which will have to be made to lenders by SP Manweb and SP Distribution as presented in the distribution graphs above. These show that the annual shortfall grows year by year and the cumulative shortfall in the funding of nominal interest payments, at the median, reaches £360m for SP Manweb and £290m for SP Distribution, by the end of RIIO-ED1.

Shareholders will be required to fund this mis-match by reinvesting funds and accepting lower dividends or providing an equity injection. Although shareholders benefit from a corresponding increase in the value of the RAV, through RPI indexation, they will require a higher return on such reinvested funds, as receipt of their return is delayed beyond the end of RIIO-ED1.

The distributions above have been calculated using an approach developed by NERA, which is a simplified version of the widely used Heath-Jarrow-Morton (HJM) framework for modelling interest rate uncertainty. We have included the cost of debt in our risk assessment in section 'h'. In this approach the cost of debt is determined by the interest rate of embedded and new debt and the amounts of debt outstanding. The Financial Risk Model accounts for uncertainty around both the interest rate and the amount of debt issued over ED1.

- *The cost of SP's embedded debt reflects the terms on which it was issued.*
- *For new debt, we assume it is issued at the cost of debt prevailing at the time of issuance. This means we assume SP issues GBP-denominated debt, rated at A/BBB with a maturity of 10 years.*

We note that Ofgem has considered these issues and concluded that the methodology for calculating the cost of debt utilised in RIIO-GD1 and RIIO-T1 remains appropriate for RIIO-ED1.

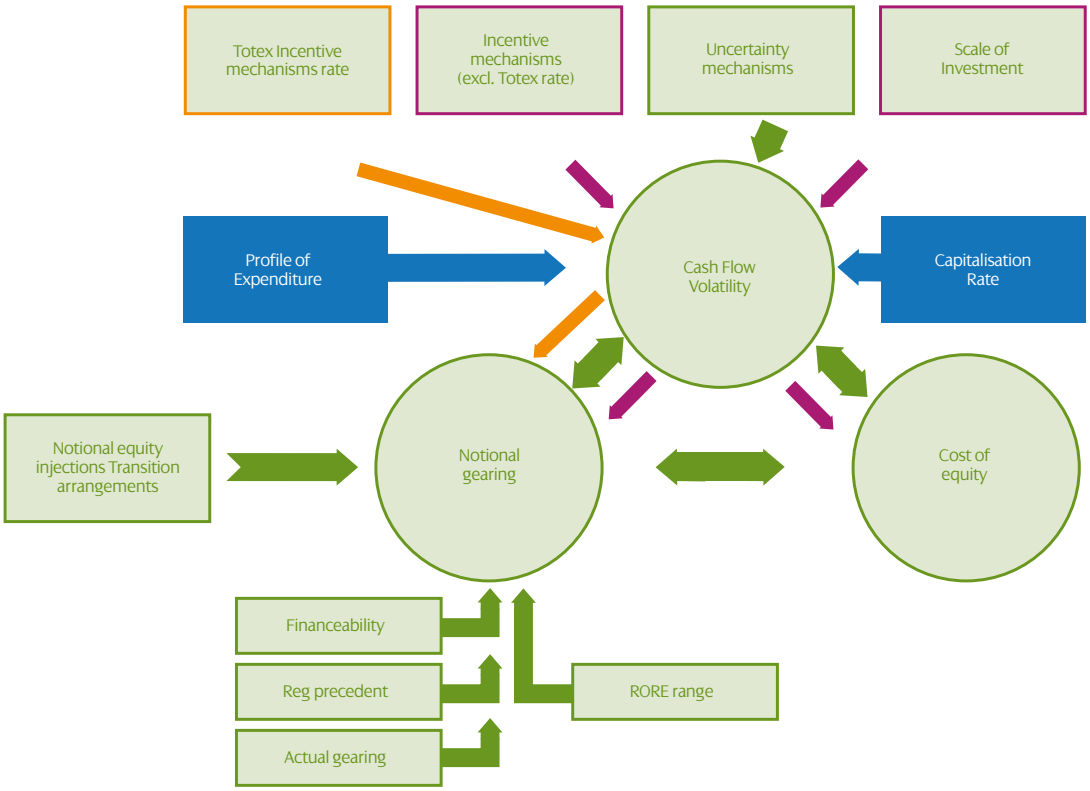
Conclusion

We have implemented the iBoxx 10 year trailing average, in accordance with Ofgem's guidance, but reflected the resulting risks in our financeability and RoRE analyses. Nevertheless, shareholders will have to finance the shortfall in the funding of nominal interest payments, which arise during RIIO-ED1 from the mis-match with the allowed real return, by reinvesting funds and accepting lower dividends or providing an equity injection, to maintain an investment grade credit rating. This results in a delayed return to shareholders, which exposes them to greater political risk.

28. *First Economics (2010), "Financeability: An Update", April, and (2013), "Equity Finance ability: A report prepared for water utilities" March.*

29. *Moody's (2013) "Low Real Interest Rates Reveal Risks of Funding Choices of UK Regulated Utilities", Special Comment, October 9, and "UK Regulated Utilities: Cash Flow Vulnerable to Low Real Interest Rates", Special Comment, October 9*

Setting notional gearing



3f. Notional Gearing & Return on Regulatory Equity (RoRE)

	SP Distribution	SP Manweb
Notional gearing	65%	65%

In this section we assess notional gearing in the context of the financial benefits and penalties that are available to the network companies in RIIO-ED1 from outperforming or underperforming the price control assumptions.

The issues and interactions in setting notional gearing are many. The diagram above expands on Ofgem's RIIO-ED1 Strategy Decision[30] methodology diagram to show the wider range of interactions.

3.f.1 Notional Gearing

In this section we introduce a central base scenario for gearing of 65% along with an alternative of 60%, which may be necessary to alleviate adverse credit ratios. Our assumption of 65% gearing is based on a cost of equity of 6.4%.

Precedent has demonstrated that, at least in the recent past, gearing of 65% was broadly consistent with the target credit rating of A – Baa for a typical UK Distribution business

A notional gearing of 65% was accepted by DNOs at DPCR5. This level was also accepted by Gas distributors at the recent RIIO-GD1 review. Moody's saw no appreciable increase in risk in the transition to the RIIO-GD1 regulatory framework. However, Ofgem have indicated that their proposed lower cost of equity, which is below 6.4%, would reduce cash flows and adversely impact credit metrics. Ofgem have suggested that companies may wish to adopt lower gearing levels that would enable them to maintain appropriate credit metrics under a wide range of market conditions. We explore this further in our financeability and risk assessments.

The scale of investment during RIIO-ED1 is not materially different to that at DPCR5. Had it been higher we would have placed greater emphasis on the consideration of an initial gearing below 65%.

Taking these factors into account, 65% is the obvious base scenario around which to carry out our detailed overall

30. *RIIO-ED1 Strategy Decision Supplementary Annex: Financial Issues http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riio-ed1/consultations/Documents1/RIIOED1DecFinancialIssues.pdf*

For an average DNO:			
	SP Manweb	SP Distribution	
Base Revenue (average p.a.)	£320m	£343m	As calculated by PCFM
Equity RAV (annual average)	£616m	£547m	As calculated by PCFM
Gearing	65%	65%	Base Scenario
Efficiency Incentive Rate	58%	58%	
Totex (average p.a.)	£250m	£197m	Plan Totex
IQI additional income	-0.78% of Totex for an average DNO with IQI ratio of 105	-0.78% of Totex for an average DNO with IQI ratio of 105	Fixed. Subject to tax.
Totex Incentive	+10%/- 5% of Plan Totex	+10%/- 5% of Plan Totex	Includes RPE and risk associated with Load-related Reopener and Health Index. Asymmetry reflects both output pressure on expenditure and the extent to which efficiency is already built into quartile benchmark.
BMCS – Broad Measure of Customer Satisfaction	+/- 1.5% of base revenue	+/- 1.5% of base revenue	Regulatory cap and collar
IIS	+/- 250 basis points (before tax & sharing)	+/- 250 basis points (before tax & sharing)	Regulatory cap and collar
Guaranteed standards	-£1m p.a. -13bps	-£1m p.a. -13bps	Connections Reliability
Taxation Trigger Deadband	20 bps	20 bps	Worst case 0.33% of total base revenue
Connections	+0.4%/-0.9% of Base Revenue	+0.4%/-0.9% of Base Revenue	Regulatory cap and collar
Losses	0-7 bps	0-7 bps	Discretionary Award - upside only. Model upper limit set at 1/14th of total fund.

financeability testing in sections '3g', '3h' and the **Annex C9 – Financing Our Plans**.

Having identified a starting range for our gearing assessment, we then introduce a range of plausible out- or under-performance outcomes, arising from the most material of the package of RIIO-ED1 incentives.

This allows us to stress test our proposed level of notional gearing by examining the overall range of returns to which DNOs will be exposed. Consistent with the RIIO principle, we aim for moderate double digit returns at the maximum and returns around the level of the Cost of Debt index at the minimum.

We later further validate our conclusion on Notional Gearing by simulating the external risks to cash flows and the resulting impact on business financeability (by Monte Carlo simulation using Moody's credit rating methodology). This further credit rating test is described fully in section 'h' and the **Annex C9 – Financing Our Plans**.

3.f.2 Return on Regulatory Equity

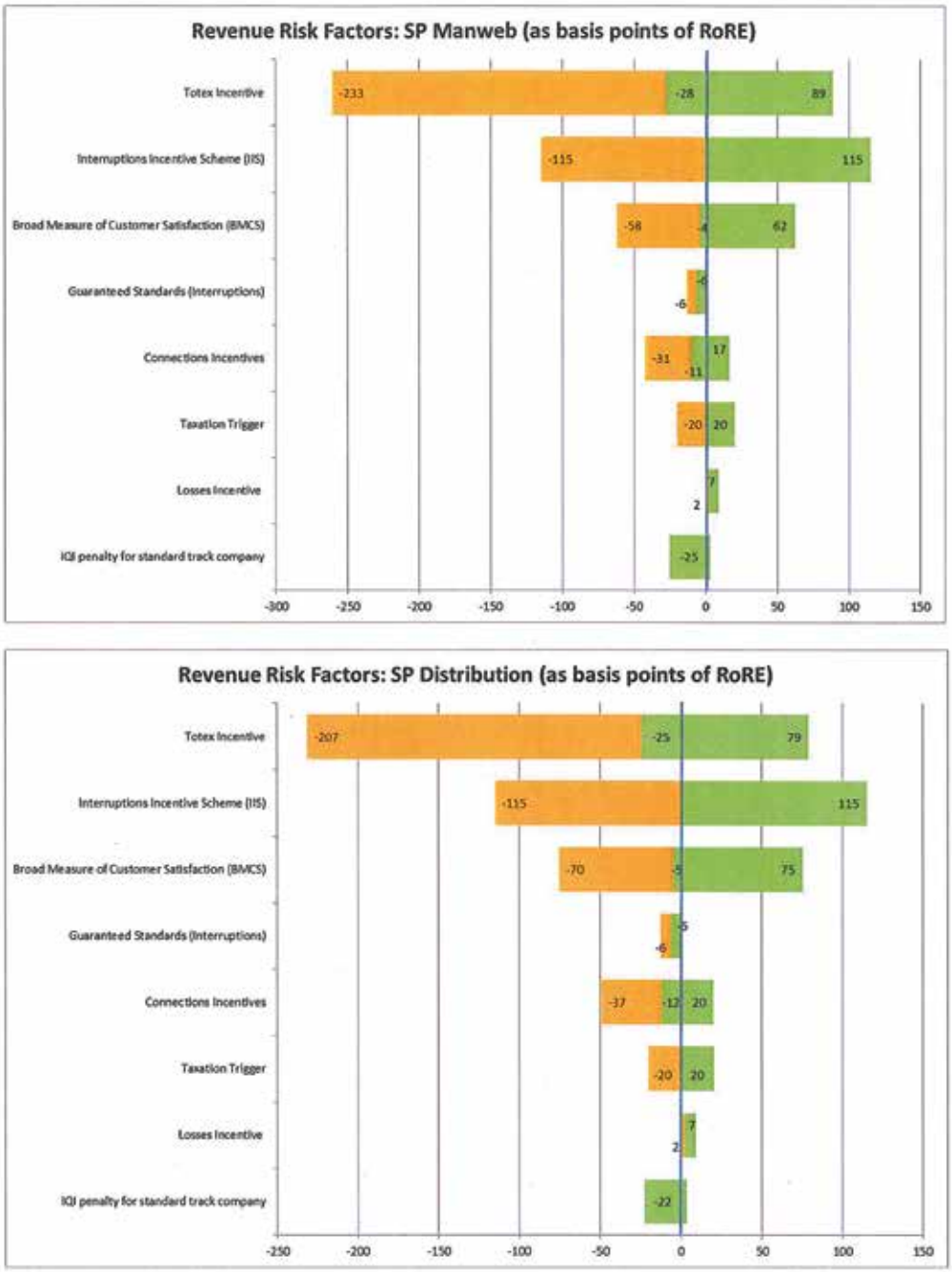
At this stage we conduct RoRE analysis to estimate the financial benefits and penalties that are available to the notional network company in RIIO-ED1 from outperforming or underperforming the price control assumptions.

In accordance with Ofgem's Strategy Decision for RIIO-ED1 and the RIIO principle, the overall financial package should ensure a moderate possibility of low double-digit returns for shareholders (as measured by the return on the notional proportion of the RAV that is financed by equity), with a minimum return around the cost of debt. The RoRE calculated is forward-looking. We use RIIO-ED1 average RAV values and average allowed revenue determined by the Business Plan Financial Model in our calculation.

The assumptions underlying our RoRE analysis are summarised above.

We show the relative impact of the most material RIIO-ED1 risks as basis points of RoRE in Tornado Charts figure 11.

Figure 11



In aggregate these individual risks determine the overall range of feasible RoRE performance in RIIO-ED1. We present this as a 'layer cake' in figure 12.

3.f.3 Offset in Return on Regulatory Equity

Our calibration of the effect of the incentive and penalty mechanisms for RIIO-ED1 results in an offset to the allowed return of around 70bps.

These reduce the expected Return on Regulatory Equity by 70bps from 6.4% to 5.7% for an average DNO.

Table 6: Offset in Return on Regulatory Equity

Incentive mechanisms	Standard Track	Fast track
IQI income adjustment Based on the average DNO with an IQI ratio of 105	22bps	–
Difference between the allowed expenditure set at an IQI ratio of 101.25 but with the DNOs planned expenditure of 105	25bps	–
Guaranteed standard penalties	13bps	4bps
Other incentives	10bps	8bps
Total offset	70bps	11bps

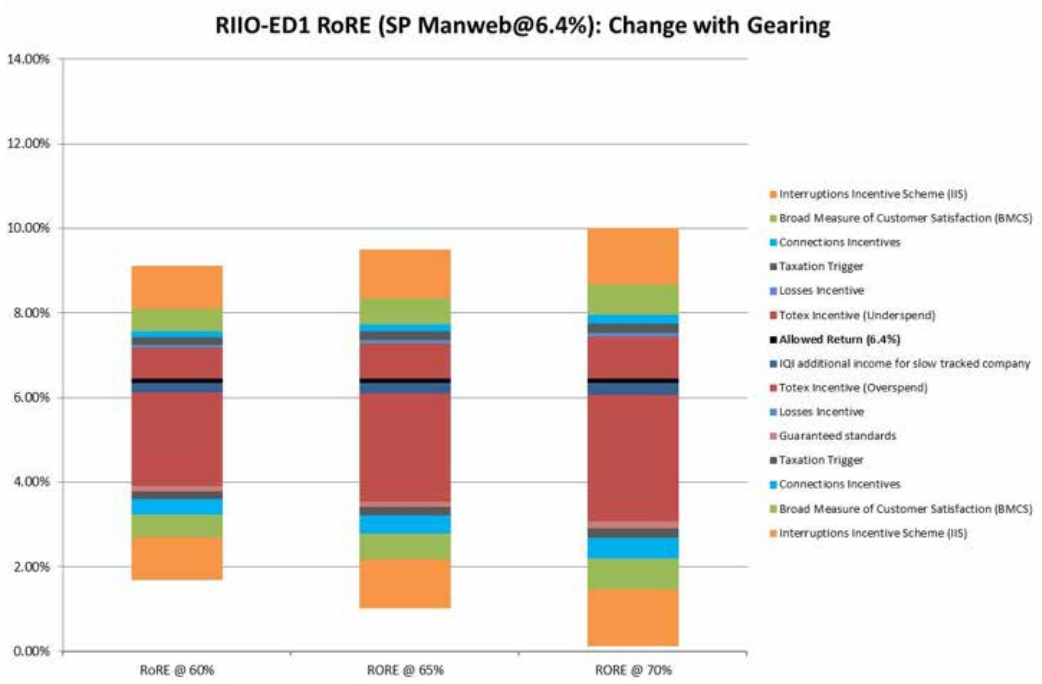
3.f.4 Comparison to fast-track Return on Regulatory Equity

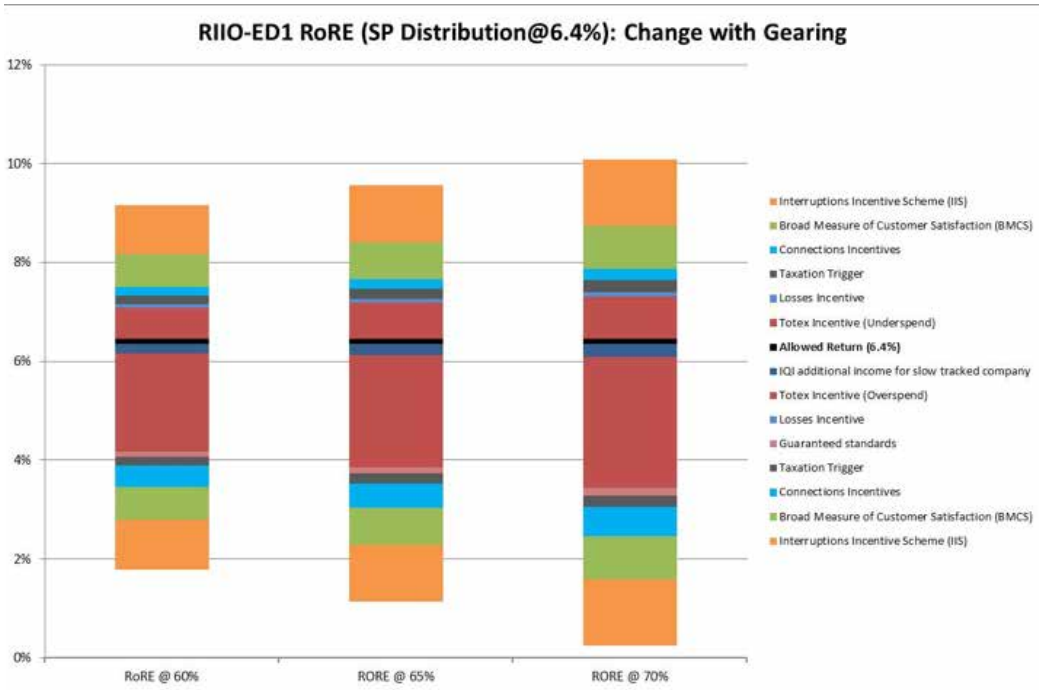
The range of feasible RoRE at 65% gearing extends to a maximum of 9.2% for SP Manweb and 9.3% for SP Distribution. These are well below the returns of 13.2% to 14.7% available to WPD's DNOs, even when adjusted for their fast-track reward of around 100bps. They are also significantly below the returns of 10.5% to 10.8% available to the best performing companies in RIIO-GD1. On the downside, RoRE could fall to a minimum of 1.0% for SP Manweb and 1.1% for SP Distribution (compared with a Cost of Debt likely to fall from 2.6% at the start of RIIO-ED1.)

3.f.5 Conclusions for optimal level of gearing

This indicates that our required Cost of Equity of at least 6.4%, with Gearing of 65%, is consistent with the level of risk in our RIIO-ED1 Business Plan. To determine whether we have identified the optimal level of gearing we have examined the effect of varying the gearing either upwards or downwards. We adjust the gearing in increments of 5%. The impact of these changes in gearing is shown in Figure 12.

Figure 12





The conclusions are similar for both SP Distribution and SP Manweb.

At 60% gearing, the potential for RoRE outperformance is constrained. The absolute maximum achievable is only 8.9% for SP Manweb and 9.0% for SP Distribution. This indicates that 60% gearing would not provide SPEN with even the remotest chance of earning double-digit returns, contrary to all previous RIIO settlements.

At 70% gearing, the minimum of the RoRE range is around 250bps below the present level of the Cost of Debt Index, at 0.1% for SP Manweb and 0.25% for SP Distribution. We conclude that 70% gearing would result in excessive risk of financial distress.

We conclude that a cost of equity below 6.4%, at 65% gearing, would result in excessive risk of financial distress.


SP ENERGY NETWORKS
DY61 VHU

3.g. Financeability

	SP Distribution	SP Manweb
Financeability Adjustment	Single period depreciation transition	Single period depreciation transition
Capitalisation rate	80%	80%
Target Credit rating	A3/Baa1	A3/Baa1

Guide to section:

Financial Policy Issue	Adherence with Ofgem Policy?	Comment
Cost of Debt Index	Yes	'Vanilla' Indexation
Cost of Equity & Gearing	Yes	Within range & reflecting cash flow risk
Asset Lives	Yes	To 45 years with one period transition
Capitalisation	Yes	Inferred per Ofgem guidance on approach
Taxation	Yes	Well established approach
Pensions	Yes	Well established approach
Dividends	Yes	'Vanilla' PCFM approach

In summary the following financial parameters have been adopted in our best view standard track Business Plan submission.

	SP Distribution	SP Manweb
Cost of Equity	6.4%	6.4%
Cost of Debt	2.72%	2.72%
Gearing	65%	65%
Vanilla WACC	4.0%	4.0%
Depreciation of asset lives additions from 20 years to 45 years post 1.4.2015	Transition over ED1	Transition over ED1
Capitalisation rate	80%	80%
IQI Additional Income	Zero	Zero
Equity Injection threshold	5%	5%
Dividend % of Notional Equity	5%	5%

3.g.1. Target Credit Rating

We have assessed the credit ratings for each of SP Distribution and SP Manweb against our target overall rating of A3 or Baa1 before risk. This makes sure that our financeability criteria are fully consistent with credit quality underpinning the allowed cost of debt index, which equally weights A and BBB (S&P) rated non-financial sterling bonds. This is also consistent with our licence obligation to maintain an investment grade credit rating.

SP Distribution and SP Manweb are competing in the financial markets with other electricity and gas network companies; in order to be able to compete on equal terms it needs to be ensured that the implied credit ratings for SP Distribution and SP Manweb in the final proposals are no worse than the implied credit ratings afforded to other electricity and gas networks in recent RIIO price control settlements, which are allowed the same cost of debt index.

Based on Moody's rating methodology[31] for regulated electric and gas networks the recent RIIO price control final proposals result in an implied rating of comfortable Baa1/A3 – this is explained below in section g.6 on RIIO regulatory precedent; therefore the ED1 final proposals for SP Distribution and SP Manweb need to achieve an implied credit rating of at least comfortable Baa1.

Ofgem's economic model assesses an individual standalone company and Ofgem have a statutory duty to ensure that DNOs are financeable, meaning that they are allowed sufficient cash flow to pay interest and dividends to the providers of finance. Financeable also means that a company needs to be able to raise the required financing in the financial markets in order to deliver its licence commitments and expected expenditure resulting from the ED1 price control settlement.

31. Moody's Investors Service (2009), "Regulated Electric and Gas Networks", Rating Methodology, August

3.g.2 Financeability summary

The financeability analysis in section g.5. "asset lives and depreciation" justifies the need for a one period transition in respect of depreciation lives for both SP Distribution and SP Manweb in order to maintain investment grade credit rating pre risk. However the ratios are severely stretched, particularly in SP Manweb, and it needs to be ensured that the final proposals ensure comfortable investment grade credit rating after assessing for risk including the impact on revenues of the information quality incentive settlement. The calibration / strength of the IQI incentive will not be known until the initial proposals are published in July 2014. This may mean additional financial levers need to be considered at final proposals e.g. gearing or the capitalisation rate.

3.g.3 Ensuring Efficient Financing Costs – Price Control Financial Model ('Static') Analysis

In this section we present our financing plan and primary analysis; we refer to this as our 'static' analysis in contrast to our further 'probabilistic' risk assessment, presented later in this section, which evaluates the likely impact of external risks upon our financeability ratios by applying Monte Carlo analysis to the model. In this section we generate and test our regulatory credit ratios.

By 'static' we mean that we introduce a number of financing components and assumptions and test the outcomes to ensure that an efficient, financeable plan can be demonstrated using Ofgem's Price Control Financial Model (PCFM).

Our over-riding objective has been to deliver an efficiently financeable plan that will offer an adequate return to investors at the lowest possible cost to customers.

This results in the following credit rating based on Moody's August 2009 rating methodology for regulated electric and gas networks

	SP Distribution	SP Manweb
Moody's notional credit rating	Baa1	Baa1

The key ratios forming these results are detailed below in table 8 of Section 3.g.5 in the comparison of credit ratios to WPD's fast-track DNOs.

For the above 'static' analysis that informed the credit rating above we have assumed IQI additional income of zero. There is currently extreme uncertainty regarding this as Ofgem have not concluded how they will calculate this for the standard track companies.

There is a possibility that Ofgem's view of the efficiency of our totex proposals may result in a penalty with a resultant risk to our financeability (in addition to the penalty applying under the totex incentive mechanism if we do have to spend in excess of the allowance in order to deliver our outputs and, importantly, ensure that we meet our licence obligations regarding continuity of electricity supply).

Standard track companies in ET1, GT1 and GD1 all received additional income as part of final proposals base revenue reflecting how close the companies totex proposals were to Ofgem's view of their totex requirements as set out in table 17 in Section 3g.7.

3.g.4 Capitalisation rate

Consistent with Ofgem's guidelines the capitalisation rate that we have adopted in this Business Plan is consistent with historic levels. The capitalisation rate for each business is set out in the table below (more detail on these is set out in the "Evolution of the Regulatory Asset Value (RAV)" in Section 4).

	SP Distribution	SP Manweb
Capitalisation rate	80%	80%

3.g.5 Asset lives and depreciation

Under our 'fast track' proposal we found that the inclusion of the additional income of 2.5% of total expenditure meant that we could deliver an efficient financing plan for each of SP Distribution and SP Manweb and maintain an investment grade credit rating without the need to employ any financial levers i.e. without the need for any transitional arrangements in respect of RAV asset lives or other financeability adjustments.

Table 7

Additional Income revenues (£m 12/13 prices)	Fast track	Standard track
SP Distribution	43.5	0.0
SP Manweb	55.5	0.0
Total	99.0	0.0

The impact on revenues is set out in the above table:

The additional income total of £99.0m had a significant impact on the overall upper quartile A3 implied credit ratings for both SP Distribution and SP Manweb in our fast track proposals.

However, under our 'standard track' proposal we do not include the additional income of 2.5% of total expenditure. In arriving at our Moody's notional credit rating score we have maintained the non-credit metric ratio factors at the same level as in our 'fast track' proposal. The credit metric ratios account for around a third of rating agencies' rating assessment therefore these will have a significant impact on the overall rating; we found that these moved appreciably when the additional income was removed.

Compared with WPD, adjusted interest cover for SP Distribution looks stretched and declines over the course of ED1, even with transition, although this ratio is calibrated to be neutral to changes in depreciation profile. A better indicator of the impact of transition is shown by FFO/Net Debt which improves for SP Distribution with transition to a comfortable A rating across the ED1 period and comparable levels to our fast track proposals.

SP Distribution

Figure 13

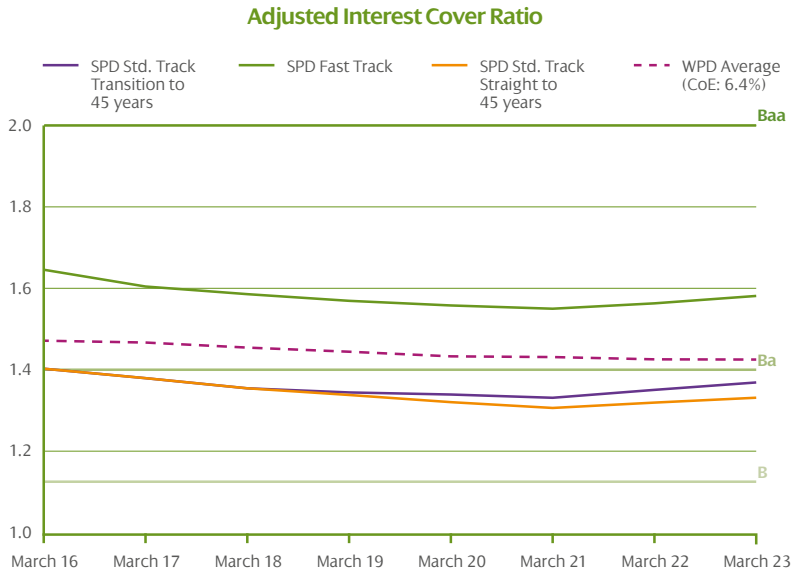
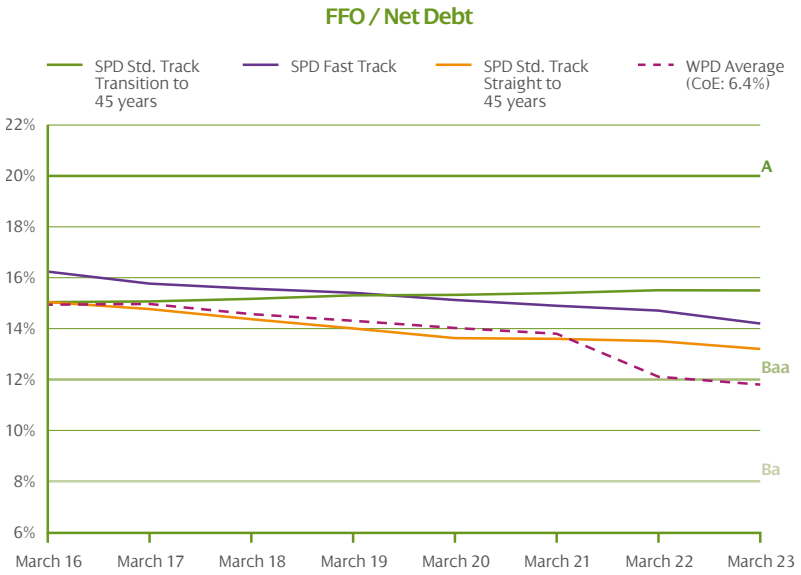


Figure 14



The following table compares the 4 key credit metrics for SP Distribution used by Moody's in their rating assessment:

Table 8

SP Distribution	Fast track			WPD			Straight to 45			Transition		
	A	Baa	Ba	A	Baa	Ba	A	Baa	Ba	A	Baa	Ba
Factor 4: Key Credit Metrics (40%)												
a) Adjusted Interest Cover Ratio (3 Year Avg) – 15%		1.56			1.43				1.30			1.32
b) Net Debt / RAV (3 Year Avg) – 15%		61.6%			65.5%			63.5%			62.3%	
c) FFO / Net Debt (3 Year Avg) – 5%	14.4%			12.6%			13.3%			15.0%		
d) RCF / CAPEX (3 Year Avg) – 5%			0.78			0.62			0.77			0.81
Rating Indicated Rating from Grid factors 1-4	A3			A3				Baa1			Baa1	
Credit rating score	6.65			6.65				7.62			7.62	

The table suggests that SP Distribution achieves a lower overall rating than the WPD companies pre-risk after the inclusion of transition. Therefore transition for SP Distribution, consistent with WPD, is justified to give the company security against potential risk shocks to financeability. The fast track companies have far greater protection as, in addition to transition, they have much greater RPE allowances of c.3.0% of totex and additional income equivalent to 2.5% of totex.

For SP Manweb both adjusted interest cover and FFO/Net Debt deteriorate progressively over the course of ED1 and both are significantly lower than WPD even after including transition. Adjusted interest cover is borderline B rating by the end of the period compared with comfortable Baa for fast track.

In the straight to 45 years scenario an equity injection of £110.6m is required in 2022/23 which is the reason for the improvement in the adjusted interest cover and FFO/Net Debt ratios in that year.

SP Manweb

Figure 15

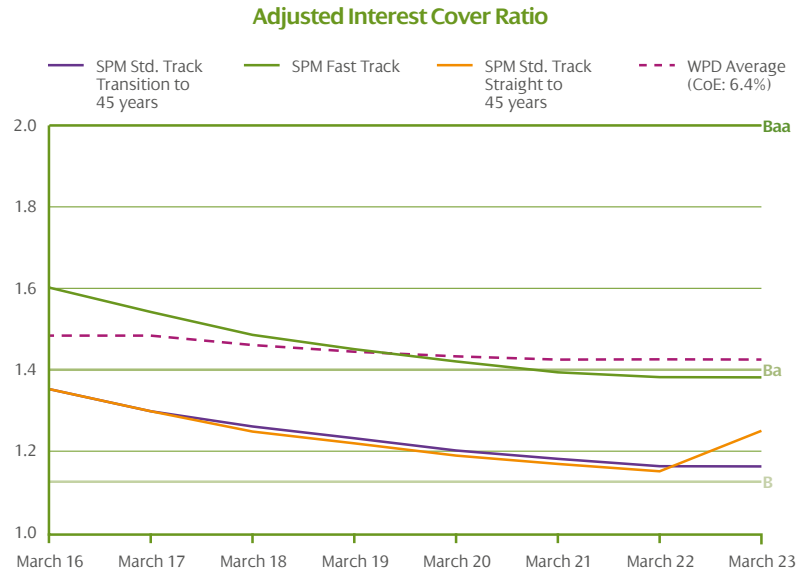
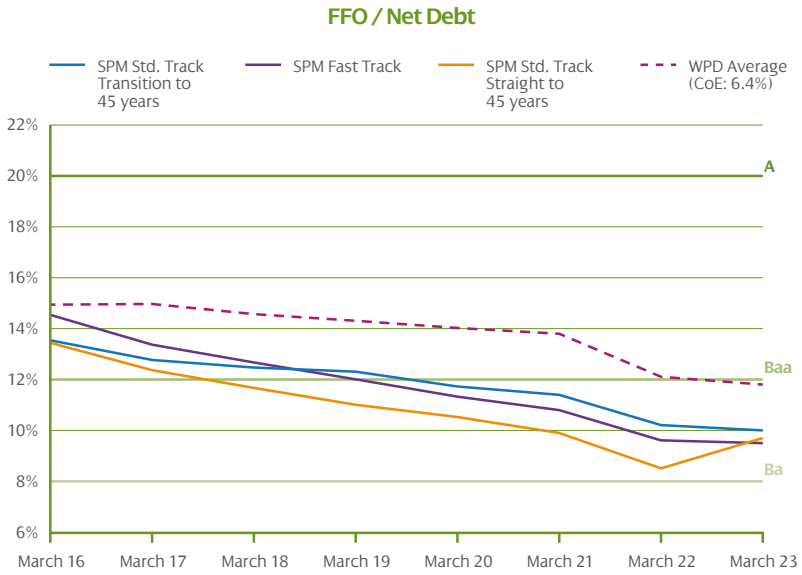


Figure 16



The following table compares the 4 key credit metrics for SP Manweb used by Moody's in their rating assessment:

SP Manweb	Fast track			WPD			Straight to 45			Transition		
	A	Baa	Ba	A	Baa	Ba	A	Baa	Ba	A	Baa	Ba
Factor 4: Key Credit Metrics (40%)												
a) Adjusted Interest Cover Ratio (3 Year Avg) – 15%			1.39		1.43				1.18			1.18
b) Net Debt / RAV (3 Year Avg) – 15%		66.8%			65.5%			67.1%			67.0%	
c) FFO / Net Debt (3 Year Avg) – 5%		9.9%		12.6%				9.4%			10.5%	
d) RCF / CAPEX (3 Year Avg) – 5%			0.56			0.62			0.55			0.58
Rating Indicated Rating from Grid factors 1-4		Baa1		A3				Baa1			Baa1	
Credit rating score		7.75		6.65				7.75			7.75	

The table shows that, compared with the WPD average, all the ratios look stretched for SP Manweb. The overall indicated rating is upper quartile Baa1 (significantly lower than WPD companies pre-risk and after the inclusion of transition). This could easily worsen with a few adverse risk shocks or as a result of the impact on revenues of the IQI settlement particularly as adjusted interest cover is already borderline B rating. Therefore transition is required.

3.g.6 RIIO Regulatory Precedent

As stated in section g.1. above "target credit rating", the recent RIIO price control proposals for regulated electricity and gas network companies result in an implied rating of Baa1/A3 based on Moody's rating methodology.

In the detailed Financing Our Plan Annex we set out in detail how we have followed Moody's rating methodology for SP Distribution and SP Manweb and have mainly assumed that the qualitative factors applied in recent RIIO price control proposals are the same.

From the tables it can be seen that the ET1, GT1, GD1 (on average) and ED1 (fast track only) companies have an implied credit rating of comfortable Baa1/A3; hence our justification that the ED1 final proposals for SP Distribution and SP Manweb need to achieve an implied credit rating of at least comfortable Baa1.

It is worth noting that all the standard track companies with IQI ratios ranging between 106.1 and 112.4 received significant positive additional IQI income allowances in their final proposals base revenue allowances which contributed significantly to their investment grade credit ratings.

As noted above we have mainly assumed, in our assessment of the implied credit ratings, that the qualitative factors are the same as those that we have applied to SP Distribution and SP Manweb. These qualitative factors have a weighting of 60% and contribute broadly the same score for all companies to the overall credit rating score. The remaining factors that will influence the final credit rating score are the four key credit metrics used in Moody's rating methodology which have a weighting of 40% towards the overall score and therefore could have a significant impact. For the four ED1 companies owned by WPD we have used the financial model published by Ofgem to accompany WPD's RIIO-ED1 fast track decision, which was published in February 2014 and, in order to ensure consistency, we modified this to reflect the standard track financial assumption in respect of cost of debt of 2.72%.

Table 10: Implied credit ratings for RIIO price control proposals

Fast Track	Additional IQI Income £m (Real)	Cost of Equity	Gearing	Credit Rating Score	Implied Credit Rating
ET1					
SPTL	42.2	7.0%	55%	6.85	A3
SHETL	30.7	7.0%	55%	7.32	A3
ED1					
WMID	52.7	6.4%	65%	7.62	Baa1
EMID	52.8	6.4%	65%	6.65	A3
Swales	28.1	6.4%	65%	6.65	A3
Swest	42.9	6.4%	65%	6.65	A3
Average ED1					A3

Table 11

Standard Track	Additional IQI Income £m (Real)	Cost of Equity	Gearing	Credit Rating Score	Implied Credit Rating
ET1					
NGET	93.1	7.0%	60%	7.41	A3
GT1					
NGGT	-10.3	6.8%	62.5%	6.61	A3
GD1					
East	10.9	6.7%	65%	7.15	A3
London	10.1	6.7%	65%	7.64	Baa1
North West	8.2	6.7%	65%	7.55	Baa1
West Midlands	6.4	6.7%	65%	7.55	Baa1
Northern	24.6	6.7%	65%	6.68	A3
Scotland	16.4	6.7%	65%	6.22	A2
Southern	33.4	6.7%	65%	6.68	A3
Wales & West	10.9	6.7%	65%	7.64	Baa1
Average GD1				7.55	Baa1

3.g.6.1 Comparison to RIIO GD1

Table 12 shows the average credit ratios for the GD1 companies.

As demonstrated below these ratios imply an average rating for the GD1 companies of:

- *Capex to RAV rating of mid Aa to A*
- *Adjusted interest cover rating of upper quartile Ba to Baa*
- *Net Debt to RAV rating of comfortable Baa*
- *FFO to Net Debt rating of comfortable Baa (moving from lower quartile to upper quartile)*
- *RCF to Capex rating of comfortable Ba*

The key credit metric ratings are shown in table 13 below.

It is worth noting that Moody's rating methodology takes the average of the worst three consecutive years in assessing an overall rating for a particular ratio. In respect of the adjusted interest cover ratio (as demonstrated in the credit ratio table) the average for the GD1 companies is Ba in the first three years only of GD1 and thereafter becomes Baa. So it could be argued that the rating of Ba for adjusted interest cover used in the assessment of the indicated rating of Baa1 is misleading as the long-term outlook is Baa. Adjusting this rating to Baa1 results in an overall indicated rating of an upper quartile A3 score of 6.58 which is more reflective of the GD1 position as FFO/ Net Debt is comfortable Baa1.

Table 12: Average credit ratios for RIIO-GD1

Ratio	31 Mar 2016	31 Mar 2017	31 Mar 2018	31 Mar 2019	31 Mar 2020	31 Mar 2021	31 Mar 2022	31 Mar 2023
Capex to RAV ratio	4.90%	5.17%	5.50%	5.83%	6.18%	6.46%	6.74%	7.02%
Adjusted interest cover ratio	1.37	1.39	1.39	1.40	1.41	1.42	1.43	1.44
Net Debt / Total closing RAV	64.2%	63.5%	63.1%	62.7%	62.4%	62.1%	61.7%	61.3%
FFO / Net Debt	8.8%	9.2%	8.7%	8.8%	9.2%	9.9%	10.5%	11.3%
RCF / Capex	0.89	0.87	0.76	0.72	0.72	0.74	0.77	0.80

Table 13

RIIO-GD1 - Average			
	A	Baa	Ba
Factor 4: Key Credit Metrics (40%) a) Adjusted Interest Cover Ratio (3 Year Avg) – 15%			1.38
b) Net Debt / RAV (3 Year Avg) – 15%		61.7%	
c) FFO / Net Debt (3 Year Avg) – 5%		8.9%	
d) RCF / CAPEX (3 Year Avg) – 5%			0.7
Rating Indicated Rating from Grid factors 1-4		Baa1	
Credit rating score		7.55	

3.g.6.2 Comparison to WPD

Table 14 shows the average credit ratios for the four WPD ED1 fast track companies.

These ratios imply an average rating for the four WPD ED1 fast track companies of:

- *Capex to RAV rating of Baa*
- *Adjusted interest cover rating of Baa*
- *Net Debt to RAV rating of comfortable Baa*
- *FFO to Net Debt rating of A (borderline Baa in the last year)*
- *RCF to Capex rating of Ba*

The key credit metric ratings are shown in table 15.

The average credit ratios for the four WPD ED1 fast track companies are those that are required to deliver an overall implied credit rating of comfortable A3 (a credit rating score of 6.65) for WPD pre risk; hence our justification that the ED1 final proposals for SP Distribution and SP Manweb need to achieve similar credit ratios in order to deliver an implied credit rating of at least comfortable Baa1 and be able to absorb risk.

Table 14: Average credit ratios for the four WPD ED1 fast track licences

Ratio	31 Mar 2016	31 Mar 2017	31 Mar 2018	31 Mar 2019	31 Mar 2020	31 Mar 2021	31 Mar 2022	31 Mar 2023
Capex to RAV ratio	12.20%	11.76%	10.87%	10.87%	10.50%	10.46%	10.22%	9.99%
Adjusted interest cover ratio	1.48	1.48	1.46	1.45	1.44	1.43	1.43	1.43
Net Debt / Total closing RAV	65.8%	65.7%	65.5%	65.6%	65.5%	65.6%	65.8%	65.8%
FFO / Net Debt	15.0%	14.9%	14.6%	14.3%	14.0%	13.7%	12.2%	11.9%
RCF / Capex	0.65	0.67	0.71	0.69	0.69	0.68	0.60	0.59

Table 15

RIIO-ED1 – Average four WPD fast track			
	A	Baa	Ba
Factor 4: Key Credit Metrics (40%) a) Adjusted Interest Cover Ratio (3 Year Avg) – 15%		1.43	
b) Net Debt / RAV (3 Year Avg) – 15%		65.5%	
c) FFO / Net Debt (3 Year Avg) – 5%	12.6%		
d) RCF / CAPEX (3 Year Avg) – 5%			0.62
Rating Indicated Rating from Grid factors 1-4	A3		
Credit rating score	6.65		

3.g.7 Additional Income

Tables 16 and 17 show the comparable IQI additional income allowances for the recent RIIO price control proposals for fast track and standard track regulated electricity and gas network companies. It is worth noting that all the standard track companies, with the exception of NGGT who have an IQI ratio of 122.6, received significant positive additional IQI income allowances in their final proposals base revenue allowances reflecting IQI ratios ranging between 106.1 and 112.4 contributing significantly to their investment grade credit ratings.

3.g.8 Revenue Profiling

All of the financeability assessments above reflect unprofiled revenues to ensure direct comparability of the ratios based on the underlying cash flows. However, from our quarterly meetings with stakeholders to discuss our revenue forecasts we are aware of customers' aversion to volatility in charges.

For SP Distribution there is a significant increase in revenues between 2014/15 and 2015/16 as a consequence of the profiling in DPCR5 which resulted in declining base revenues; thereafter there is enough volatility to warrant a profiling adjustment to smooth revenues over ED1 by adjusting revenues on a NPV neutral basis.

For SP Manweb there is a significant reduction in revenues between 2014/15 and 2015/16 - a legacy of the profiling in DPCR5 which resulted in increasing base revenues; thereafter there is material volatility and in 2021/22 revenues reduce materially as a result of the second depreciation cliff edge. As a result of this volatility we decided to smooth the RIIO-ED1 revenues by making profiling adjustments by adjusting revenues on a NPV neutral basis.

Table 16

Fast Track	Allowed Totex £m (Real)	IQI ratio	IQI Incentive Strength	Additional Income £m (Real)	Implied Credit Rating
ET1					
SPTL	1689	100.0	50%	42.2	A3
SHETL	1228	100.0	50%	30.7	A3
ED1					
WMID	2106	100.0	70%	52.7	Baa1
EMID	2111	100.0	70%	52.8	A3
Swales	1123	100.0	70%	28.1	A3
Swest	1715	100.0	70%	42.9	A3
Average ED1					A3

Table 17

Standard Track	Allowed Totex £m (Real)	IQI ratio	IQI Incentive Strength	Additional Income £m (Real)	Implied Credit Rating
ET1					
NGET	11291	112.4	46.89%	93.1	A3
GT1					
NGGT	1705	122.6	44.36%	-10.3	A3
GD1					
East	2088	111.8	63.04%	10.9	A3
London	1885	111.8	63.04%	10.1	Baa1
North West	1587	111.8	63.04%	8.2	Baa1
West Midlands	1249	111.8	63.04%	6.4	Baa1
Northern	1660	106.1	63.98%	24.6	A3
Scotland	1324	107.6	63.73%	16.4	A2
Southern	2671	107.6	63.73%	33.4	A3
Wales & West	1670	111.0	63.17%	10.9	Baa1
Average GD1					Baa1

3.h Risk Assessment

Cost of Equity (real, post-tax)	6.4%
Cost of Debt (real, indexed)	2.72%
Notional Gearing	65%
Dividend Yield (on equity proportion of RAV)	5%
Capitalisation Ratio	80%
Depreciation allowance move to 45 years	Single period transition

As part of our justification that our proposed financing package is not just efficient, but robust, we have worked with economic consultants (NERA) to develop a Financeability risk model. This model is based on the Ofgem Price Control Financial Model. We have extended the base model to incorporate the calculation of credit metrics and overall score (using the Moody's Methodology previously described).

We attach a paper by NERA describing their modelling methodology in the Risk Modelling for RIIO-ED1 Annex.

We have used this Risk Model to demonstrate that our preferred financeability scenario delivers an efficiently financeable plan that will offer an adequate return to investors at the lowest possible cost to customers.

In order to demonstrate efficient but robust financeability, our model simulates (by Monte Carlo) the individual and aggregate credit metrics over the full range of plausible outcomes for each of the individual risks we have identified.

The model considers the risk to cash flows from external risks only. For each of these, we have (where possible) identified what we believe to be the plausible distribution of outcomes for an average network business. In conjunction with our RoRE analysis, this should ensure that the business is sufficiently securely funded that the normal operation of RIIO-ED1 incentives is unlikely to lead to financial distress when coupled with adverse shocks from external risks.

We interpret a robust plan as one that ensures that the expected overall credit rating ('overall' meaning including non-financial ratio components) for a notional average distribution business will be solidly within the A to Baa (Moody's) range of credit rating, with only a small probability that under any realistic adverse combination of external outcomes this rating might drop to a level inconsistent with the allowed Cost of Debt. More specifically we target an overall credit rating of A3 or Baa1.

3.h.1 Initial Assumptions

Before conducting our financeability testing we have considered each of the components of the allowed return to provide opening parameters for our risk and financeability testing. The components established earlier are:

Our cost of equity assumption of 6.4% (real, post-tax) is the same as for the WPD fast-track decision and 30bps points below that set for DPCR5 and RIIO-GD1. We justify this value in section 3.d.

We have followed Ofgem's guidance for RIIO-ED1 and assumed 2.72%, which is the value of the 10 year trailing average to 31 October 2013, for the real cost of debt. Nevertheless, we note that independent forecasts are for the cost of debt index to continue to fall for the foreseeable future.

DNOs may be compelled to refinance or raise new debt in RIIO-ED1 at a spot rate which differs from the 10 year trailing average. The impact of this mismatch within RIIO-ED1 is unlikely to be zero (whether shortfall or otherwise). At present the 10-year trailing average of the index lies above the spot value of the index, but there is likely to be a crossover at some point in RIIO-ED1 (or later).

DNOs have embedded debt costs which arise from commitments entered into before the introduction of debt indexation. These commitments may not match the duration of the iBoxx index, and DNOs do not have unlimited discretion to issue debt at what, in retrospect, could be identified as an optimal time. In addition as referred to in the earlier debt section 3.e previous analysis [32] by First Economics and Moody's [33] has highlighted the mismatch between the allowed cost of debt, which is set in real terms and the nominal interest rate payments which arise from the majority of DNO debt. This leads to a substantial and growing shortfall in the cost of debt allowance relative to the nominal interest rate payments which will have to be made to lenders by SP Manweb and SP Distribution.

For the above two reasons, we model the actual interest cost imposed by the embedded historic debt. This has been included in our risk modelling to ensure a complete distribution of possible RIIO-ED1 financeability outcomes.

Our RoRE analysis in section 3.f, leads us to assume that notional gearing should be set to 65%.

32. *First Economics (2010), "Financeability: An Update", April*

33. *Moody's (2013) "Low Real Interest Rates Reveal Risks of Funding Choices of UK Regulated Utilities", Special Comment, October 9, and "UK Regulated Utilities: Cash Flow Vulnerable to Low Real Interest Rates", Special Comment, October 9*

We have also assumed a dividend yield of 5% on the notional equity proportion of the RAV. This is consistent with regulatory precedent (Ofgem's assumptions for DPCR5 and RIIO-GD1), and with our view of market expectations discussed in Section 3.e.

Each unique combination of these inputs constitutes a single scenario. For each scenario, a Network Business will be exposed to a range of financial risks. Some of these risks will be external to the business, and some will arise from regulatory mechanisms specific to the price control (incentive/output mechanisms and residual risk which may be only partly mitigated by uncertainty mechanisms).

3.h.2 Our Financeability Assessment

We test the robustness of our financial plan only to those external risks which are not directly within the control of the DNO. We exclude risk arising from performance under regulatory incentives except for the IQI incentive and Totex incentive mechanism to account for the additional penalty applying if we do have to spend in excess of the allowance in order to deliver our outputs and, importantly, ensure that we meet our licence obligations regarding continuity of electricity supply. As raised earlier in the financeability section we found the IQI incentive has a material impact on credit ratings and is therefore included.

A Totex sensitivity is included as while efficiency of expenditure is within the control of the DNO, the scale of future expenditure is also subject to external uncertainty (for example the uptake of LCT) . We include any proposed uncertainty mechanisms in our modelling.

The external risks considered are:

Risk	Comment	Modelling approach
Totex Uncertainty (including Real Price Effects (RPEs))	DNOs are exposed to uncontrollable changes in costs due to uncertainty about the future. Costs may inflate at a rate different from RPI.	We apply a triangular distributed shock to Totex centred on a mean of zero. This shock represents a combination of RPE risk and other future uncertainty impacts on Totex. We include the mitigating effect of any uncertainty mechanisms
IQI	The notional average DNO will, by definition, be below the quartile. There will be an "additional income" penalty with immediate impact on cash flow	We simulate an industry average IQI score of 105.
Cost of Debt	DNOs have embedded debt which was subject to market conditions at time of issue. New debt is refinanced at market rate rather than a trailing average of historic rates.	We calculate debt cost based on the historic embedded debt, with new debt issued at the prevailing iBoxx rate (forecast)
Taxation (Corporation Tax)	The Tax Trigger uncertainty mechanism has a central deadband within which DNOs are exposed to changes in tax (allowance is not recalculated)	For simplicity we approximate by applying a plausible tax change impact as a direct revenue adjustment. A symmetric triangular distribution is used with maximum and minimum set at 0.33% of revenue.

We simulate a set of outcomes by Monte Carlo. For each iteration of the Monte Carlo Model we calculate the credit metrics and use these to derive an overall credit rating using Moody's methodology (as described in the **Annex C9 – Financing Our Plans**)

We calculate the ratings for the individual credit metrics based on a three year (backward looking) average of the individual annual metrics.

These are then combined with the wider rating criteria in accordance with the Moody's methodology to produce an overall numeric score and to infer from this a final Credit Rating for each year for that model iteration.

We then consider the distribution of outcomes from all iterations under the full range of plausible input scenarios.

In assessing the overall risk to financeability we consider the distribution of outcomes for all years of the price control rather than focussing on individual years.

The individual credit metrics calculated within the model may take continuous values. The Moody's methodology places these into rating bands in the later stages of the calculation. It then assigns scores according to these individual sub-ratings. For this reason the final numeric scores take a set of discrete values, rather than generate a continuous distribution.

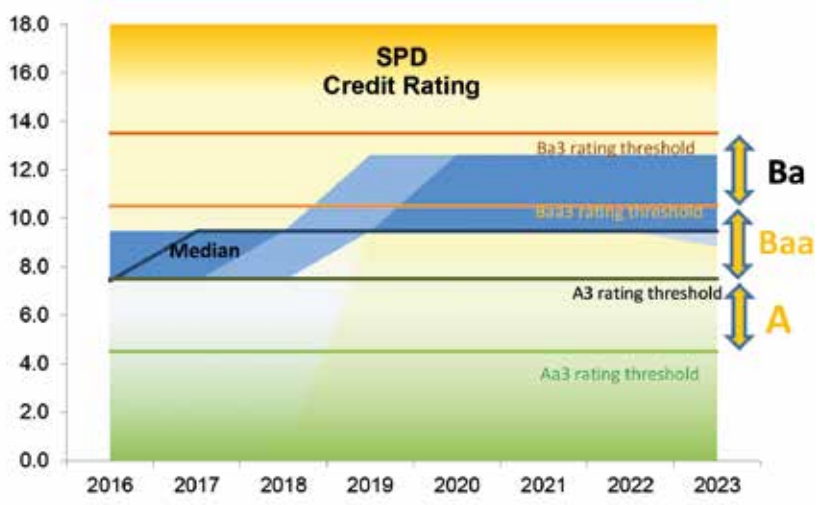
In considering this distribution we attach weight to both the range of outcomes, and the median (50th percentile) rating score.

The median will by its construction take one of the discrete numeric values leading to a final rating.

The median can therefore be taken to indicate a "central" and actual rating score, but may mask the fact that the financeability position is very close to a jump between discrete values (and possibly rating bands).

Moody's methodology applies significantly greater weights to components of the overall calculation which are towards the low rating end than to components at A or above. This means that the distribution of rating outcomes is strongly asymmetric. This skew towards outcomes on the downside is clear in the following analysis.

Figure 17: Fan Chart showing SPD credit rating including External Risk with an IQI assessment of 105 and expenditure at 105



3.h.3 SP Distribution

The distribution of credit rating outcomes generated by simulation is shown as a fan chart in figure 17 for SP Distribution and figure 21 for SP Manweb with the assumption the IQI assessment is 105 and the DNO is required to spend their full totex forecast.

The central path for SP Distribution (the median) is shown as a dark line which (using Moody's methodology) commences at the A3 / Baa1 boundary and declines from 2017 onwards to the Baa2/Baa3 border for the majority of the period. At the median position we are therefore forecasting an investment grade credit rating will be maintained but the distribution of the graph shows there is a material risk at the 75% percentile that a combination of adverse outcomes could lead to a credit rating inconsistent with the allowed cost of debt.

The table below shows the ratings based on the median for the individual years of RIIO-ED1.

Table 18

SP Distribution (ED-1 IQI calibration)								
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Median	7.42	9.47	9.47	9.47	9.47	9.47	9.47	9.47
Median Rating	A3	Baa2	Baa2	Baa2	Baa2	Baa2	Baa2	Baa2

Figure 18: Fan Chart showing SPD credit rating including External Risk with an IQI assessment of 105 and expenditure at an allowance 101.25

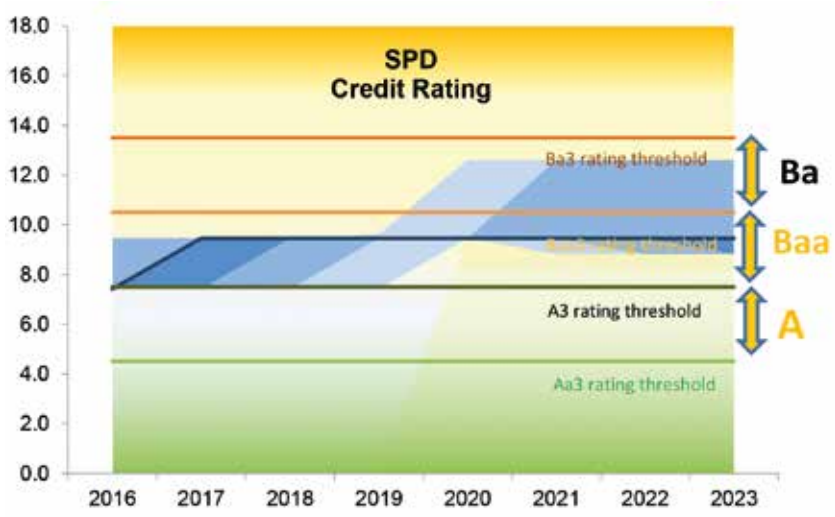


Figure 19: Fan Chart utilising GD-1 IQI calibration showing SPD credit rating including External Risk

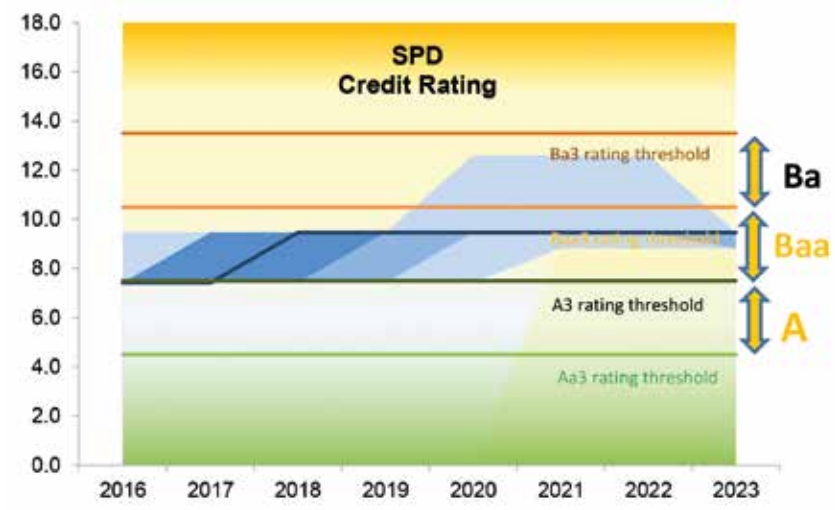
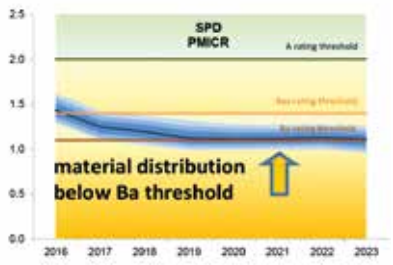


Figure 20: Fan Chart comparing SPD's PMICR under the IQI calibration proposed for ED-1 and GD-1 IQI.



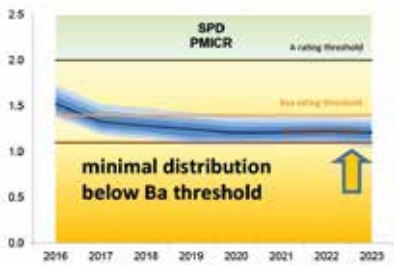


Figure 18 presents the scenario that SP Distribution's expenditure is at an allowance of 101.25 following an assessment of 105. This is a marginal improved view than figure 17 where the expenditure assumption is at the DNO's forecast level rather than allowance. The distribution of the graph shows that at the 88% percentile from 2020 a combination of adverse outcomes could lead to a credit rating inconsistent with the allowed cost of debt.

As we referred earlier in this section the IQI incentive reward/penalty has a material 'Asymmetric' impact on financeability in the standard track phase of this price control. Figure 19 below incorporates the IQI calibration utilised in the recent GD-1 RIIO price control. The credit rating distribution below materially improves under these assumptions.

At the median position using the GD-1 IQI calibration the forecast credit rating maintains Baa1 until 2017 before reducing to the Baa2/Baa3 for the remainder of the period but the risk of a credit rating below investment grade is much reduced and at the 95% percentile in 2020 to 2022.

The additional income penalty / reward impacts all the main credit ratios, however, it is the post maintenance interest cover ratio (PMICR) figure 20, that is most materially impacted. From the distributions below it can be seen, adopting the ED-1 proposed IQI, left-hand graph, that from 2019 onwards at the 25% percentile the PMICR ratio will be below the level of a Ba rating credit ratio. The graph on the right presents the PMICR following established RIIO IQI calibrations and the risk is materially reduced and only at the 5% percentile.

SP Manweb

The distribution of credit rating outcomes generated by simulation is shown as a fan chart in Figure 21.

The central path for SP Manweb (the median) is shown as a dark line within the Baa band until 2019 before dropping materially below investment grade into the Ba band for the remainder of the period. As highlighted earlier in the 'static' modelling section the credit ratios for SPM are weaker than SPD before any risk is modelled. The distribution of the graph above shows that the likelihood of a credit rating within investment grade progressively deteriorates from median in 2019 to only at the 25% percentile for 2020 & 2021, dropping further to the 13% percentile at 2022 and 5% percentile in 2023.

Clearly the credit rating is inconsistent with the i-Boxx allowed cost of debt. To mitigate this forecast combination of adverse outcomes we calculate an equity injection of c.£190m would be required to maintain an investment grade rating for the period. The COE therefore needs to be maintained, at least, at the modelled 6.4%, as it is highly likely SP Manweb will need to attract equity, after the inclusion of risk, to maintain an investment grade credit rating in the period.

Figure 21: Fan Chart Showing SPM credit rating including External Risk

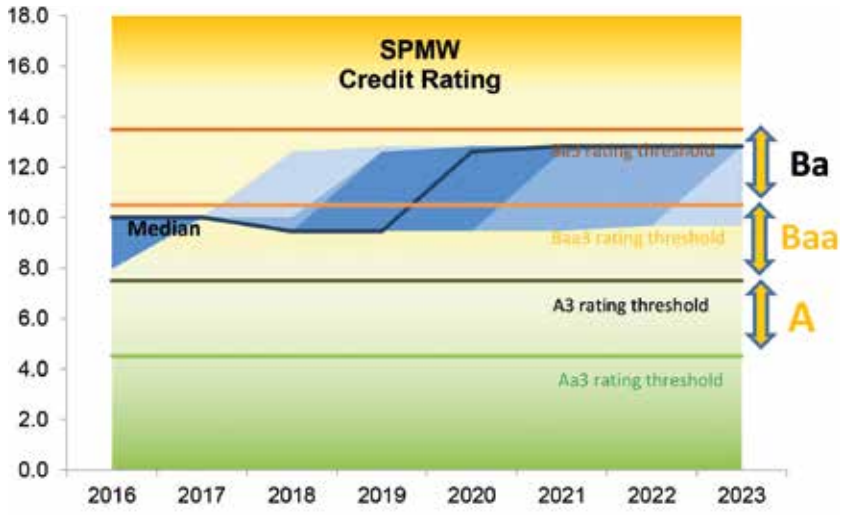


Table 19

SP Manweb (ED-1 IQI calibration)								
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Median	10.01	10.01	9.47	9.47	12.62	12.83	12.83	12.83
Median Rating	Baa3	Baa3	Baa2	Baa2	Ba3	Ba3	Ba3	Ba3

Figure 22: Fan Chart showing SPM credit rating including External Risk with an IQI assessment of 105 and expenditure at an allowance 101.25

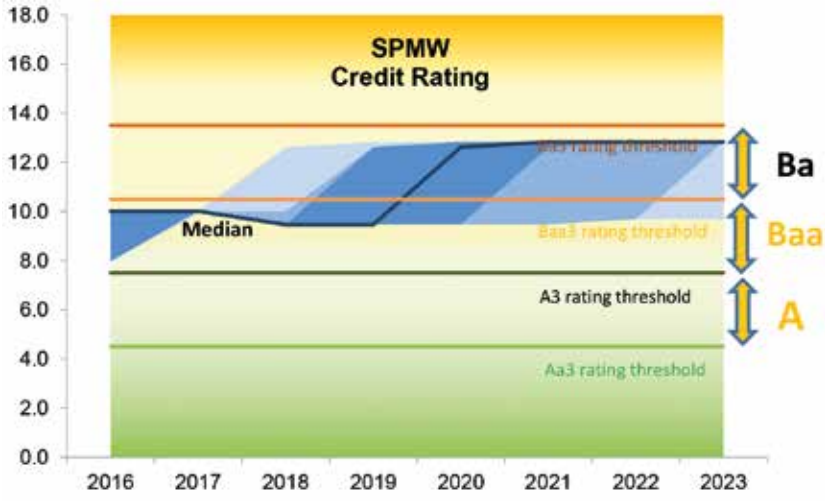


Table 19 shows the ratings based on the median for the individual years of RIIO-ED1.

Figure 22 presents the scenario that SP Manweb's expenditure is at an allowance of 101.25 following an assessment of 105. This is a marginal improved view than figure 21 where the expenditure assumption is at the DNO's forecast level rather than allowance. The median is within the Baa band until 2021 before dropping materially below investment grade into the Ba band for the remainder of the period. The likelihood of a credit rating within investment grade progressively deteriorates from median in 2019 to only at the 25% percentile for the remainder of the period.

Similar to SP Distribution the IQI incentive reward/penalty has a material impact on financeability and the credit rating is very sensitive to deductions in revenue. Figure 23 incorporates the IQI calibration utilised in the recent GD-1 RIIO price control as in figure 19 above for SP Distribution. The median credit rating distribution below materially improves under these assumptions to Baa and investment grade for the majority of the period until 2022. There is still material risk, with this IQI calibration, that exposes equity holders to the possibility, at the 75% percentile, the company from 2021 onwards will require an injected equity to maintain an investment grade rating.

As we referred earlier in this section the IQI incentive reward/penalty has a material 'Asymmetric' impact on financeability in the standard track phase of this price control. Figure 23 incorporates the IQI calibration utilised in the recent GD-1 RIIO price control. The credit rating distribution below materially improves under these assumptions.

Figure 23: Fan Chart utilising GD-1 IQI calibration showing SP Manweb credit rating including External Risk

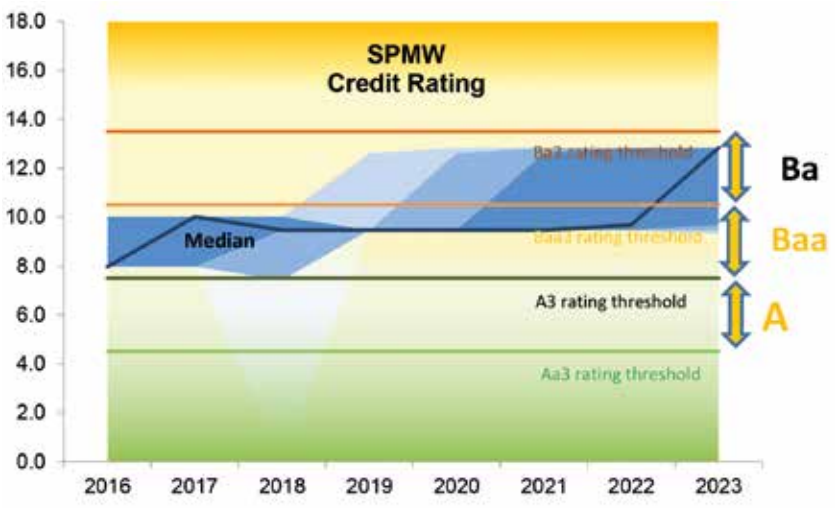
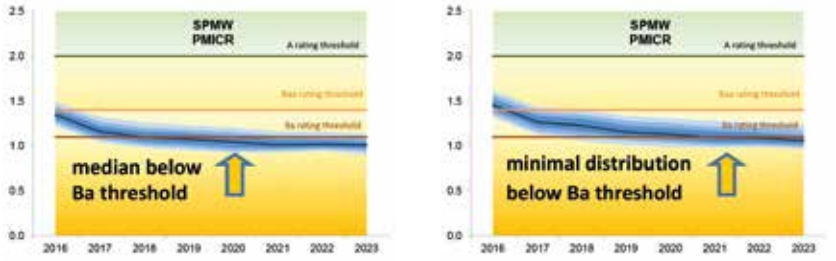


Figure 24: Fan charts comparing SPM's PMICR under the IQI calibration proposed for ED-1 GD-1 IQI



As with SP Distribution it is the post maintenance interest cover ratio (PMICR) that is most materially impacted. From the distributions in figure 24 it can be seen, adopting the ED-1 proposed IQI, left-hand graph, that after 2019 at the median the PMICR ratio will be below the level of a Ba rating credit ratio. The graph on the right presents the PMICR following previous IQI calibrations and the risk is materially reduced from 2020 and at the 25% percentile.

Conclusion

In summary, we have demonstrated by this risk analysis that our plan incorporating a notional gearing of 65%, is materially affected by Ofgem's calibration of the IQI incentive. The distribution of external risk based on the proposed ED-1 IQI calibration, presented above in SP Distribution figure 17 and SP Manweb figure 21, show a material risk that both SP Distribution and SP Manweb's credit ratings, as assessed using Moody's methodology's quantitative and qualitative factors, are at a level inconsistent with the allowed cost of debt. Under such outcomes equity holders will be required to inject equity and the 6.4% CoE assumption, consistent with the fast track DNO, will be necessary to compensate equity holders of both SP Distribution and SP Manweb for bearing this higher level of risk. In addition, the CoE assumption needs to be maintained to attract the likely additional equity to maintain an investment grade credit rating.

Under the base risk modelling for SP Manweb, inclusive of the proposed ED-1 IQI, we have identified that equity injections of c£190m would be required to reduce gearing to c.60%. This would be necessary to ensure SP Manweb is securely funded so that the normal operation of proposed RIIO-ED1 incentives is unlikely to lead to financial distress when coupled with adverse shocks from external risks.

There remains an inherent uncertainty around the base assumption of 65% gearing for SP Manweb until the IQI mechanism is finalised. Only on the final calibration of the IQI mechanism will we be able to conclude that the base financeability position of our plan is robust to a plausible range of external risks and consistent with the Allowed Cost of Debt.

4. Evolution of the Regulatory Asset Value (RAV)

This section sets out our Business Plan assumptions impacting the evolution of the Regulatory Asset Value (RAV). In all cases our assumptions are consistent with RIIO principles and fully adhere to Ofgem's strategy decisions.

4.a. Totex and Capitalisation

Our total expenditure (totex) comprises of the categories prescribed by Ofgem. Within our plan a fixed 80% of totex is allocated to the RAV for both SP Distribution and SP Manweb.

This was calculated with reference to the expenditure projections over the RIIO-ED1 period and applying an asset life threshold to distinguish between 'slow' and 'fast money'.

4.b. Asset Lives and Depreciation

Our base assumption is to recognise a move to regulatory depreciation using average economic asset lives of 45 years for new assets with straight line depreciation. Existing assets continue to be depreciated over 20 years.

However, as noted above in section 3.g.5 our analysis suggests that both SP Distribution and SP Manweb are not financeable at a comfortable investment grade credit rating unless transitional arrangements or other financeability adjustments are applied. We have looked at other options such as changing the capitalisation rate to 75% but we consider that a straight line transition approach moving from 20 years to 45 years over the course of RIIO-ED1 is the most appropriate; this also has the benefit of mitigating any financial shocks in future price control periods.

Asset life applied to RAV additions acquired in each year of RIIO-ED1							
2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
23.125	26.25	29.375	32.5	35.625	38.75	41.875	45.0

5. Financial Policies

5.a. Taxation

The Ofgem policy decisions effecting taxation are in the main modelled automatically in the Price Control Financial Model. Our Business Plans fully reflect all policies that are well established and understood. Full details are provided in the Financing Our Plan Annex Section 5.a.

5.b. Pensions

Our Business Plans fully reflect Ofgem's pensions methodology as set out in various documents and consultations since 2009.

Our pension costs are calculated on the basis of the decisions set out in section 6 of the RIIO-ED1 Strategy decision document (Financial Issues reference 26d/13) and clarification of a number of points in those decisions in a presentation by Ofgem and subsequent meetings/correspondence with Ofgem.

5.b.1 Established deficit

For both the ScottishPower Pension Scheme (SPPS) and the Manweb Group of the Electricity Supply Pension Scheme (Manweb Scheme) a roll forward valuation to 31st December 2012 has been produced from the previous formal triennial valuations dated 31st March 2009 reflecting the requirements set out in Appendix 6, paragraph 1.38 of the RIIO-ED1 Strategy decision document (Financial Issues reference 26d/13). We have used the method set out in the Pension Deficit Allocation Methodology (PDAM) to determine the split of liabilities and assets between pre (Established) and post (Incremental) cut-off date of 31 March 2010. The funding allowance of the regulatory portion of the Established deficit reflects a 2.6% discount rate spread evenly over the 12 years from 1st April 2013.

5.b.2 Incremental deficit

The incremental deficit is included in totex and benchmarked as part of total totex. Consistent with the calculation of the ongoing future service costs, this has been calculated based on the 31st March 2012 triennial valuations which were finalised on 29 July 2013 (SPPS) and 28 August 2013 (Manweb). The table below is a summary.

Established Deficit Annual allowance	SPPS	Manweb Scheme
Regulatory fraction	57.4%	80.0%
SPD annual allowance 12 years from 1 April 2013 at discount rate of 2.6%	£20.6m p.a.	
SPM annual allowance restricting funding to 5% LPI pension increases only		£19.4m p.a.

Incremental Deficit Annual allowance	SPD	SPM
Incremental deficit payments over 10 years from 1st April 2013	£0.7m p.a.	£0.7m p.a.

5.b.3 Ongoing future service costs (Employer Contribution rates) – Defined benefit schemes

The possible contribution rates for future service accrual for 2013/14 (based on the 31st March 2012 triennial valuation) are shown in the table below:

Ongoing future service costs	SPPS	Manweb scheme
Pension and death benefits (excluding expenses)	36.0%	35.6%
Employee	5.0%	5.5%
Employer	31.0%	30.1%

Projections of defined benefit scheme employer contribution rates (excluding expenses) are set out below:

Scheme	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23
SPPS %	20.8	27.6	31.0	31.0	32.3	32.3	32.3	34.6	34.6	34.6	36.7
Manweb %	23.9	27.5	30.1	30.1	31.5	31.5	31.5	34.0	34.0	34.0	36.4

5.b.4 Ongoing future service costs (Employer Contribution rates) – Defined contribution schemes

Projections of defined contribution scheme employer contribution rates (excluding expenses) are set out below:

Scheme	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23
Average	8.7%	7.7%	7.7%	8.1%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.7%

5.b.5 Pension scheme administration costs and pension protection fund (PPF) levy costs

These costs are reflected in our plan but are relatively small in value.

Full details of our pension costs are provided in the Financing Our Plans Annex Section 5.b

10 Our Revenues, Customer Bill Impacts & Value-for-money

The money we will recover from electricity suppliers and the effect this will have on our customers' bills. The overall value-for-money to SPEN's customers.

In this Section – **Our revenues and customer bill impacts** we show the movement of our forecast revenues from 2014/15 (the last year of the current DPCR5 price control) through the eight year ED1 period.

We explain the impact this will have on our customers' bills. The latest analysis from Ofgem shows that electricity distribution charges represent 16% of an average UK customers electricity bill. We also set out the 'value-for-money' review we performed to assess our proposals in comparison to the post-track DNOs.

Using the UK average consumption of 3,300kWh, as required by Ofgem:

- *Our customers in Central and Southern Scotland will see a 11% reduction in our average bills from £99 p.a. to £88 p.a.*
- *Our customers in England and Wales will see a 18% decrease from £126 p.a. to £103 p.a.*

We finish this chapter by explaining how our plan delivers **value-for-money for SPEN's customers**.

In this chapter we explain:

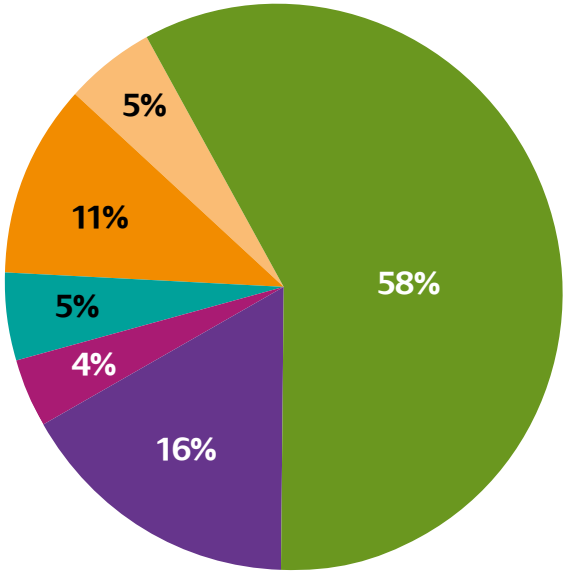
Topic	Annexes and Supporting Documents
a. Our revenues and customer bill impact	
b. Value-for-money for SPEN's customers	

a. Our Revenues & Customer Bill Impacts

The makeup of average UK customer's electricity bill

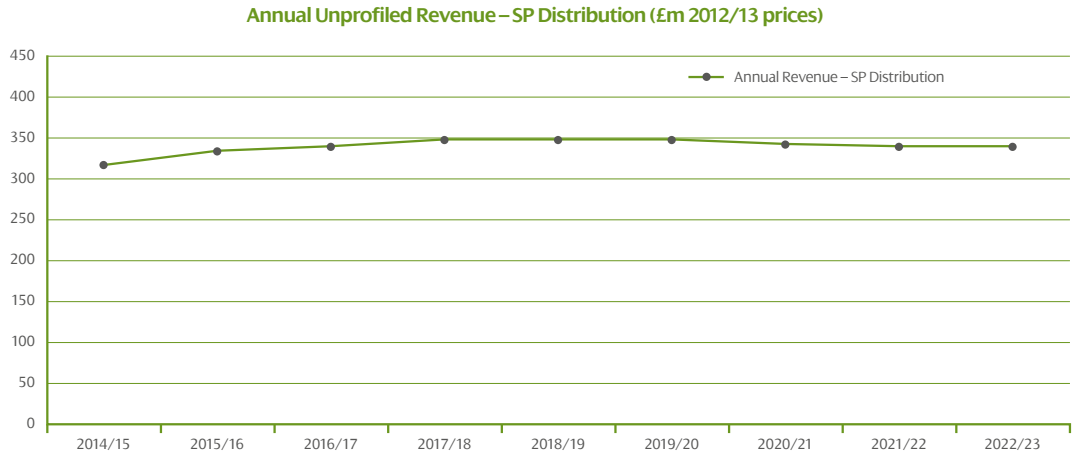
58% – Wholesale energy, supply costs and profit margin
16% – Distribution charges
11% – Environmental charges
5% – Other costs
5% – VAT
4% – Transmission charges

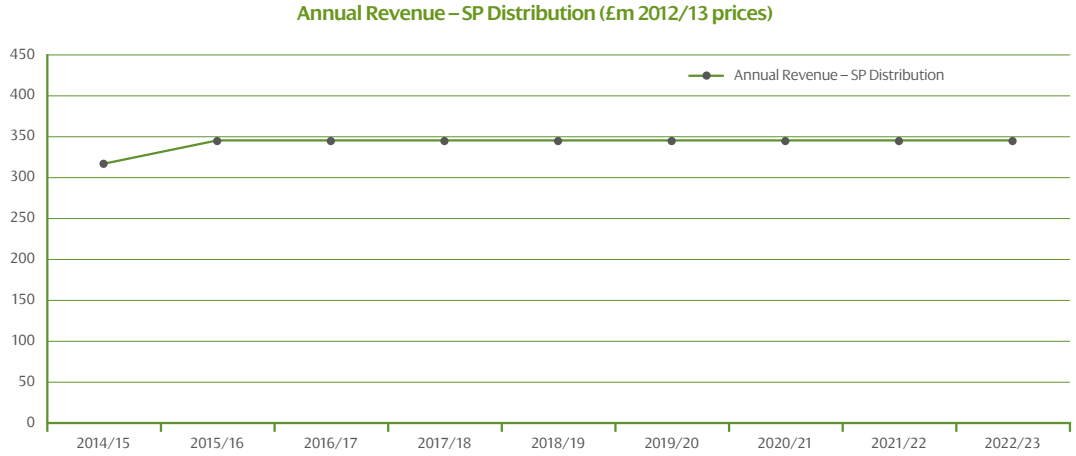
Ofgem customer bill fact sheet January 2013.

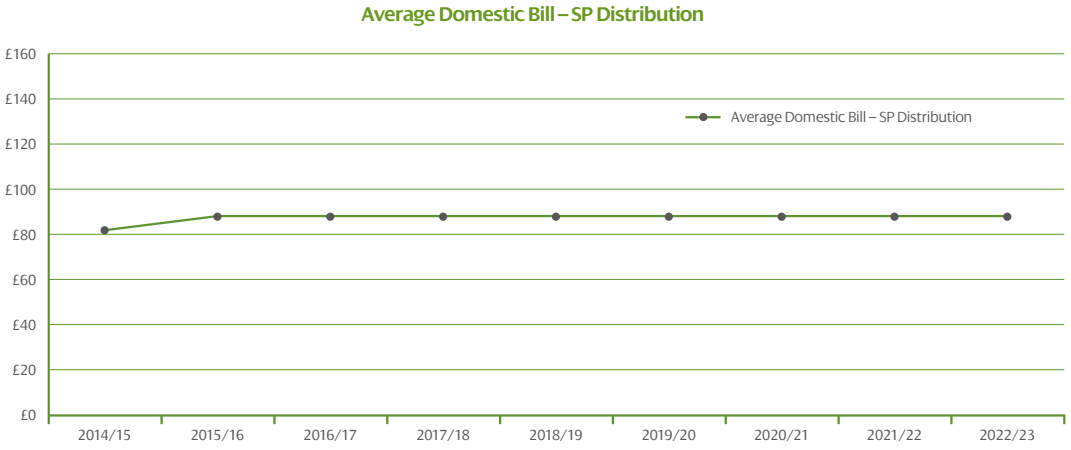


We believe we have demonstrated that our financing Business Plan is efficient. Application of the financial parameters to our cost forecasts result in revenues that lead to a forecast investment grade credit rating for both SP Distribution and SP Manweb. However in order to ensure investment grade credit rating we needed to include transition arrangements in respect of depreciation lives which means that there will be intergenerational issues in respect of customers funding of RIIO-ED1 total expenditure.

Stakeholders have told us that they want to know the impact on future bills particularly in the short term. This section shows the movement in forecast revenues from 2014/15 (the last year of the current DPCR5 price control). To ensure that the revenues are comparable the 2014/15 forecast revenues only include base revenue. This section also includes graphs showing the impact on domestic customer bills based on average annual consumption of 3,300kWh. Stakeholders have also told us that they are averse to volatility and we have taken this into account when considering whether or not the revenues need to be profiled.







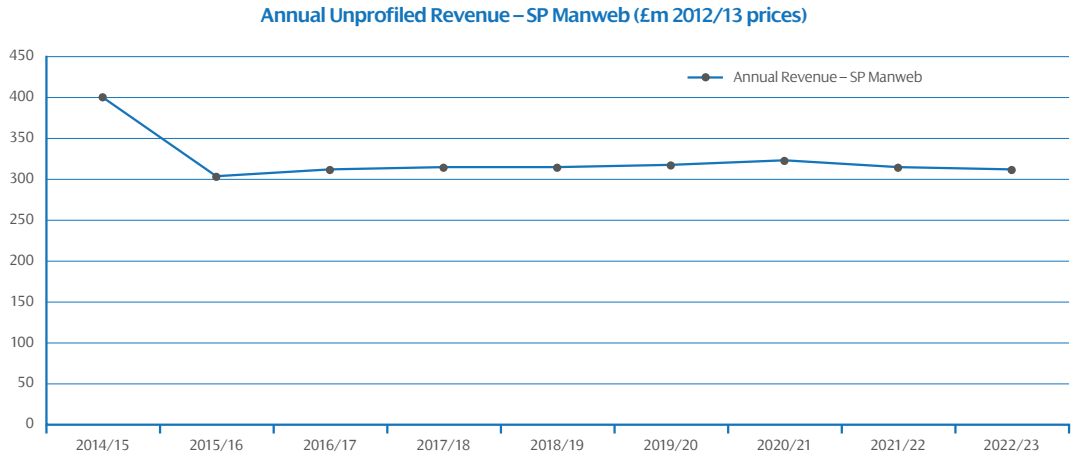
Average revenues across the eight years of RIIO-ED1 above (top) for SP Distribution are £342.8m (2012/13 prices). The graph shows that there is quite significant variation (£4.8m under to £3.0m over) to the average and material volatility. Apart from 2015/16 the forecast impact on domestic bills ranges from 1.5% to –1.0% over the remaining years of RIIO-ED1. As a result we decided to smooth the RIIO-ED1 revenues by making profiling adjustments.

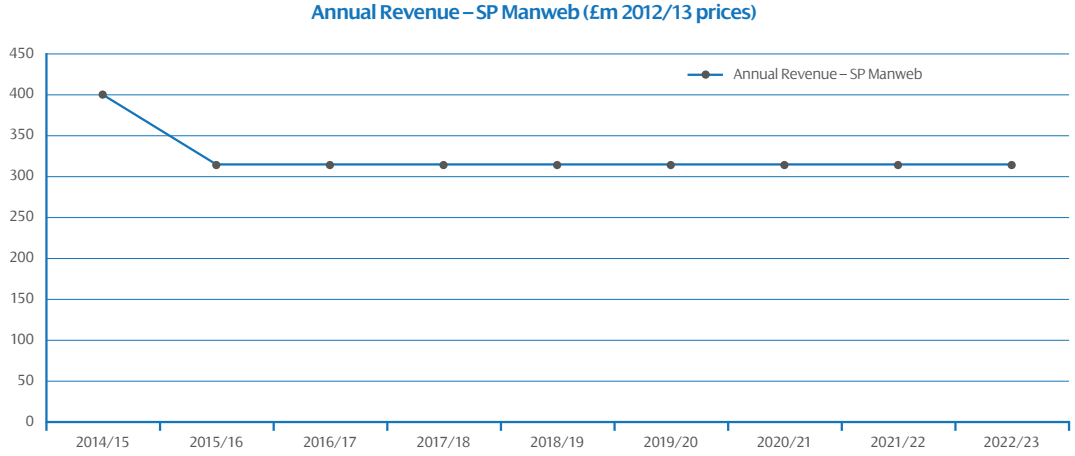
The increase in revenue between 2014/15 and 2015/16 is a consequence of the profiling in DPCR5 which resulted in declining base revenues.

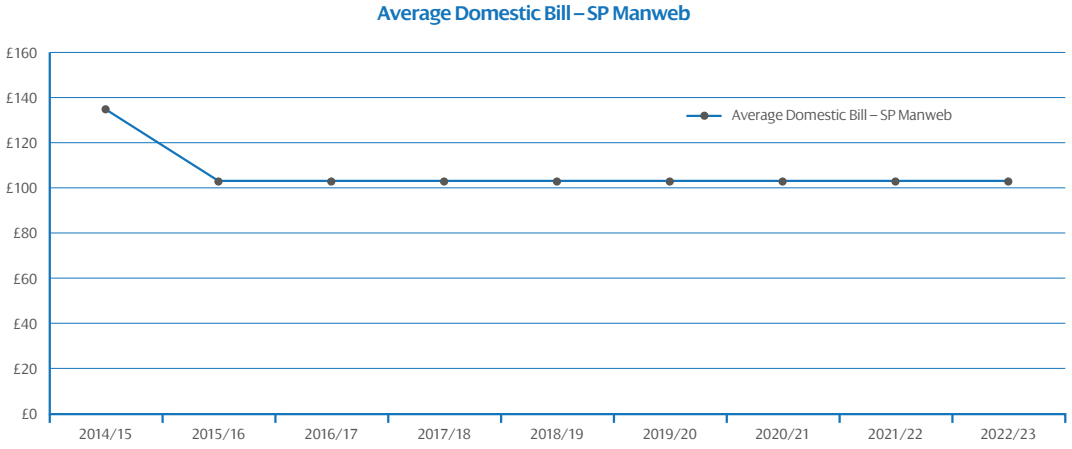
The above (middle) graph shows the profiled revenues for SP Distribution which result in a flat profile in 2012/13 prices.

The impact on domestic bills for SP Distribution customers is shown in the above (bottom) graph.

Apart from 2015/16, annual changes to domestic bills in respect of allowed base revenues are forecast to be 0.0%. We are forecasting that domestic customer bills will be unchanged over the course of RIIO-ED1.







Average revenues across the eight years of RIIO-ED1 for SP Manweb are £319.5m (2012/13 prices). The graph above (top) shows that there is quite significant variation (£11.9m under to £11.0m over) to the average and material volatility.

Apart from 2015/16 the forecast impact on domestic bills ranges from 3.8% to –4.6% over the remaining years of RIIO-ED1. As a result we decided to smooth the RIIO-ED1 revenues by making profiling adjustments. The reduction in revenues in 2021/22 and 2022/23 arises because the 15 year RAV depreciation smoothing adjustment finishes in 2020/21 (the smoothing commenced in DPCR4 as a result of the vesting depreciation cliff edge). The reduction in revenue between 2014/15 and 2015/16 is a legacy of the profiling in DPCR5 which resulted in increasing base revenues.

The graph above (middle) shows the profiled revenues for SP Manweb which result in a flat profile in 2012/13 prices.

The impact on domestic bills for SP Manweb customers is shown in the graph above (bottom).

Apart from 2015/16, annual changes to domestic bills in respect of allowed base revenues are forecast to be 0.0%. We are forecasting that domestic customer bills will be unchanged over the course of RIIO-ED1.

b. Our Business Plan Represents Value-for-Money

Figure 1.1: Our Plan Results In a 4% Reduction in Customer Bills Relative to Adopting WPD's Proposals[1]

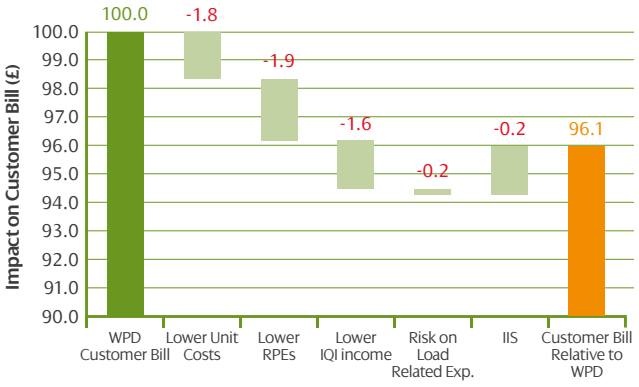
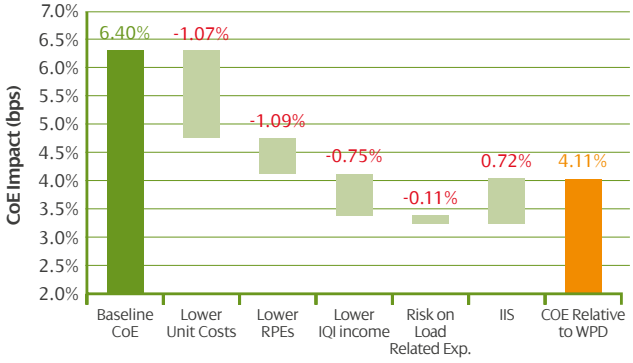


Figure 1.2: We Assume Greater Risk for Lower Reward Than WPD:



In this section we set out how our overall set of proposals – on key financing, cost and uncertainty measures – delivers value-for-money for the consumer. Analysis of our overall plan relative to WPD's, demonstrates that we assume lower costs or greater risk in a number of key areas: lower unit costs for key asset categories, lower real price effects (RPEs), zero IQI income reward, and greater risk in relation to investment to accommodate changing patterns of demand.

Our lower costs or willingness to assume greater risk in these areas correspond to an average customer bill that is 4% lower than would be the case if we were to adopt WPD's proposals, or alternatively, an effective return on equity of around 4% relative our proposed baseline cost of equity of 6.4% (and equal to WPD's allowed rate of return). (See Figure 1.2 and Figure 1.1.)

Our relative return on equity is around 230bps lower than WPD's.

In summary, we consider that our plan offers value-for-money for consumers for the following reasons:

- *Our proposed equity financing costs constitute the lowest possible return to ensure that we can finance our business. Our cost of equity proposal of 6.4% is consistent with achieving a floor investment grade debt rating: this is the minimum required*
- *Our proposed operating and capital expenditures are efficient. Our analysis of unit costs shows that we are more efficient on a unit cost basis compared to Ofgem's fast-track assessment, and result in an effective lower return on equity relative to WPD of around 107bps (as set out in Figure 1.2).*
- *Our proposed real price effects (RPEs) are more challenging than those set out by WPD in its fast-track Business Plan accepted by Ofgem, and result in an effective lower return on equity relative to WPD of around 109bps (as set out in Figure 1.2).*
- *The proposed IQI income of zero for an efficient company is lower than RIIO-GD1 and DPCR5, and lower*

*1 Basis for calculation: We assume a baseline customer bill of £100, which corresponds to what SP customer bills would be if instead of SP's own unit cost, RPE, IQI income, LRE and IIS expenditure we would have used those granted to WPD. This bill level corresponds to an "adjusted SP revenue requirement" which is equal to the sum of (i) revenue requirement in our Business Plan submission and (ii) the £m adjustments calculated for unit costs, RPEs, IQI income, LRE and IIS. We then calculate the £ reduction in the customer bill of 100 due to not including these additional expenditures in our Business Plan requirement. The £ adjustment for each of the factors is calculated as £m adjustment/adjusted SP revenue requirement*100.*

relative to WPD's reward of 2.5%. The lower totex income relative to WPD reduces our effective return on equity by around another 75bps.

- Despite the low returns, we are assuming greater risk on behalf of the customer (relative to WPD's) in relation to our load related expenditure. We have quantified our greater exposure to unfunded load related expenditure equal to 11bps return on equity.

- On balance, we consider WPD adopted stricter IIS targets relative to Ofgem's assessment, exposing WPD's shareholder to higher probability of penalties under the IIS mechanism. We quantify the stricter IIS targets expose WPD to an effective penalty equal to around 75bps return on equity.

- Overall, our packages results in greater value-for-money for consumers than WPD: we assume greater risk for a lower return.

Our Equity Finance Costs Constitute Lowest Possible Return to Ensure Financeability

- Our over-riding objective has been to deliver an efficiently financeable plan that will offer an adequate return to investors at the lowest possible cost to customers.

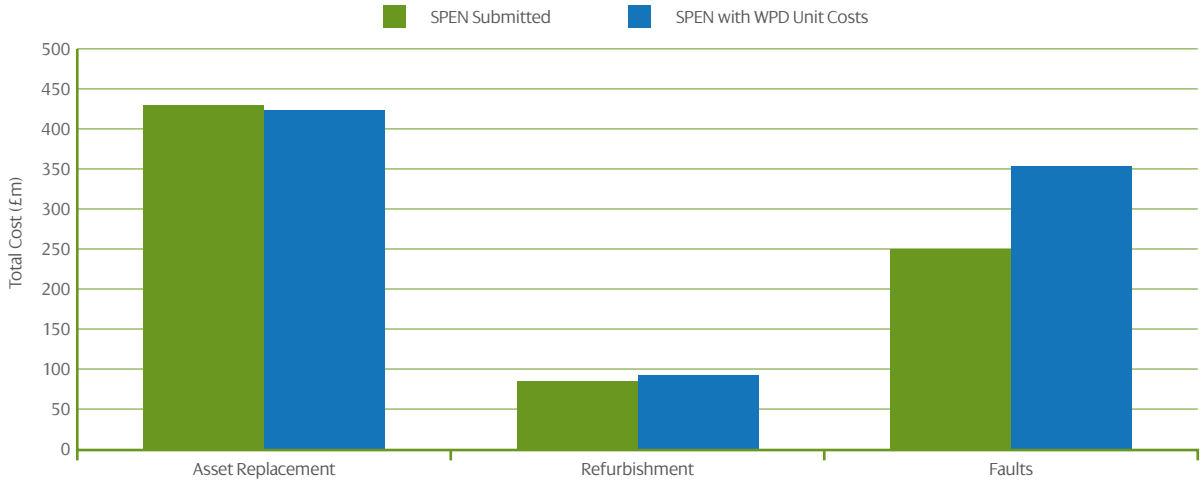
- Our base financial plan gives a credit rating of Baa1, before the addition of risk, which is at the lower end of the range that underpins Ofgem's cost of debt index and is lower than the A3 rating at fast track.

- After consideration of external risks which, if they were to materialise, yield a base rating one notch lower for SP Manweb and material downside risk for SP Distribution.

- Our risk and financeability assessment demonstrates that there is a significant chance our investors may have to provide a substantial equity injection during RIIO-ED1 to maintain an investment grade credit rating.

- We conclude that we require, as a minimum, a cost of equity of 6.4% to enable us to attract and retain sufficient equity finance to provide, in our view, the necessary investment to maintain network reliability and absorb the forecast expenditure volatility as we facilitate the transition to a low-carbon economy.

Figure 1.3: SPEN Is More Efficient Than WPD on A Range of Key Unit Costs



Our Operating And Capital Expenditures Are Efficient

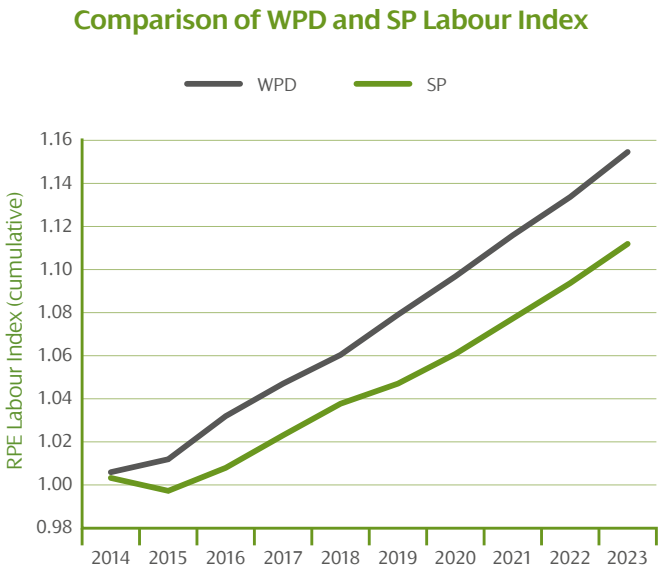
As part of the 2013 fast-track assessment, Ofgem considered that our plan was potentially inefficient in a number of areas. One of the principal areas identified by Ofgem related to our proposed volumes in relation to asset replacement and refurbishment, and notably in relation to our interconnected SPM network. Ofgem also considered that we proposed relatively high costs in relation to closely associated indirect and business support costs.

In the Expenditure Chapter (Chapter 6) of our plan, we have set out how we have addressed Ofgem's comments on our expenditure proposals, including changes to (and greater justification for) our proposed volumes for both SP Distribution and SP Manweb, evidence on our special claim for higher levels of expenditures for SP Manweb in **Chapter C6d**, as well as alternative model forms and lower costs, in relation to the other areas where Ofgem considered our costs to be high.

Our analysis of a number of key expenditure areas where unit costs can be more reliably calculated – asset replacement, asset refurbishment and costs relating to faults – shows that we are more efficient than WPD's on a unit cost basis in these core expenditure areas.

If we had applied the units costs from WPD's plan, to our volumes, for these areas we would have been asking our customers to fund costs 12% higher than we propose. Applying our unit cost advantage to these cost areas, suggests that we have costs that are £102 million lower than WPD (see Figure 1.3 above). This is equivalent to around 107bps on the cost of equity.

Figure 1.4: Comparison of WPD and SP Labour Index



Note: For WPD, we use the RPE indices reported in its fast-track BPDTs. To calculate the overall labour index, we weight the general and specialist labour components by 43% and 57% respectively, based on SP's proportion of general and specialised labour in overall totex.

Our RPEs are More Challenging than WPD

Our proposals for RPEs are more challenging than those set out by WPD in its fast-track Business Plan accepted by Ofgem.

Our proposed RPE indices yield an overall totex allowance for RPEs of £158.8m (£68.5m for SPD and £90.3m for SPMW) over the RIIO ED1 period. If instead of SP's proposed indices we use those set out by WPD in its fast-track Business Plan data tables, the RPE totex allowance for SP would increase by £103.8m (£48.1m for SPD and £55.7 for SPMW)[2].

The higher RPE allowance based on WPD's indices is explained by two factors:

- *WPD assumes higher real growth in labour costs over the RIIO ED1 period; and*
- *WPD assumes positive real growth in Equipment/Plant, Transport and Other costs over the RIIO ED1 period.*

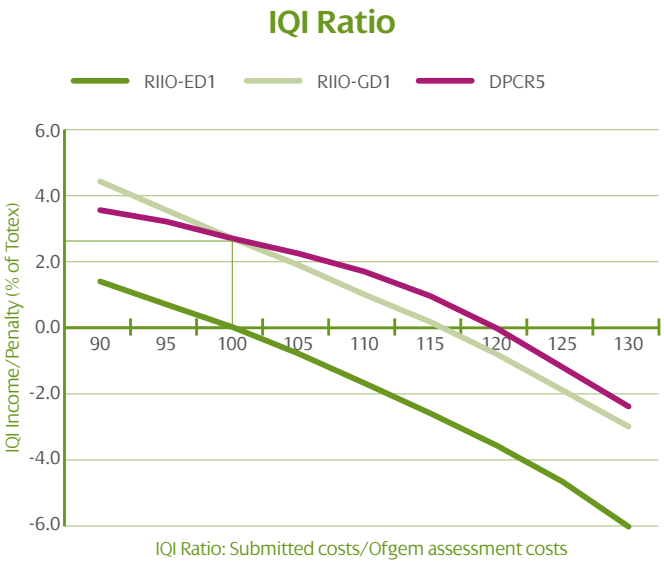
Figure 1.4 above shows the difference between the labour index used by WPD in its fast-track Business Plan and the SP proposed labour index: WPD assume an increase in labour costs by more than 14% in relation terms by the end of RIIO-ED1; we intend to contain such cost increases to closer to 10%. The difference in labour indices explains around 60% of the calculated difference in SP's RIIO-ED1 RPE allowance.

In addition to the difference in labour indices, WPD assumes a positive real price increase for Equipment/ Plant, Transport and Other costs. In comparison, our Business Plan submission assumes no real growth/ reduction in real costs for these expenditure categories. The difference in Equipment/Plant, Transport and Other cost indices explains around 40% of the calculated difference in SP's RIIO-ED1 RPE allowance.

In conclusion, relative to SP, the WPD fast-track assessment includes implicit headroom of £103.8m which shields the shareholders from real price increases over the RIIO ED1 period. This is equivalent to around 109 bps on the cost of equity (see Figure 1.2).

2. We calculate this difference by plugging in the WPD RPE Input indices from its fast-track Business Plan data tables into our own Business Plan data tables for the slow-track assessment.

Figure 1.5: RIIO-ED1 Matrix Provides Lower Income/Higher Penalty Than Previous Reviews



The Totex Income Allowance Is Lower Than All Previous Reviews

Ofgem's proposes to set a totex income allowance of zero for those companies where it agrees the submitted costs are efficient: all other companies will receive a totex penalty.[3]

The proposed calibration of the IQI menus provides a much lower income/higher penalty than that adopted by Ofgem at recent price reviews, and much lower than the totex income received by WPD equivalent to 2.5%. For example, at both RIIO-GD1 and DPCR5, the companies considered by Ofgem to have submitted efficient expenditure plans received an income reward of 2.5%, and companies continued to receive a positive totex income with IQI ratios of up to 120. (See Figure 1.5 above.)

The lower totex income relative to WPD reduces our effective return on equity by£88.5m or around 75 bps on the cost of equity (see Figure 1.1).

We Assume Greater Risks In Relation To Load Related Expenditure

As set out by Ofgem, there is significant uncertainty over the likely investment required within RIIO-ED1 to accommodate new and changing patterns of electricity use by DNO customers (load related expenditure).[4] To accommodate this uncertainty, Ofgem intends to introduce a load related expenditure re-opener with a deadband of +/-20% relative to Ofge allowed expenditure.[5] That is, companies will not be allowed to recover the costs that fall within the deadband.

We assume much greater risk on behalf of customers under this mechanism than other DNOs, and specifically WPD. This is because we operate our system with much higher capacity factors than WPD. In forming our plan, we have considered load related investment when the system load reaches 100% of firm capacity but typically propose reinforcement only

3. Source: Ofgem (March 2013) Strategy decision for the RIIO-ED1 electricity distribution price control : Outputs, incentives and innovation, p. 92 Link: https://www.ofgem.gov.uk/ofgem-publications/47068/riioed1decoutputsincentives.pdf

4. Ofgem (March 2013): "Strategy decision for the RIIO-ED1 electricity distribution price control Uncertainty mechanisms", p. 18.

5. Ofgem (March 2013): "Strategy decision for the RIIO-ED1 electricity distribution price control Uncertainty mechanisms", p. 18.

where there is sustained loading over 120%.[6] By contrast, WPD historically and in ED1 has planned load related reinforcements if there is any loading over 90% of firm capacity.

The consequence is that there is much more headroom within the WPD load related plans to accommodate load growth without risking P2/6 network security standards.[7] Therefore, WPD has much less exposure to incurring unrecovered costs, i.e. costs that fall within the deadband.

We have quantified the greater risk we face based on an assumption that overspend on our network is twice as likely as WPD. Specifically, we assume 50% probability that we incur an overspend, and 25% probability for WPD.

With a central forecast for load related expenditure of £260 million, and an IQI efficiency incentive rate of 60%, we quantify the expected risk we assume equal to £21.6 million.[8] If we were to adopt WPD's system planning standard, then the risk would be approximately half this standard at £12.6 million.[9] That is, we incur greater risk of around £10 million or approximately 10 bps.

IIS

WPD proposed stricter CI and CML targets under the Interruptions Incentive Scheme (IIS) relative to Ofgem's calculated efficient levels. By adopting stricter IIS targets, WPD's shareholder is exposed to a higher risk of receiving a penalty under the IIS mechanism when compared to other DNOs with IIS targets based on Ofgem's assessment.

Ofgem valued these stricter IIS targets for WPD at £87m over the RIIO ED1 period. If we use Ofgem's estimate of the value of the IIS targets of £87m, WPD's shareholder is exposed to a £87m reduction in equity returns. This is equivalent to around 75 bps on the cost of equity (see Figure 1.2).

Conclusion: We Assume Greater Risk for A Lower Return than WPD

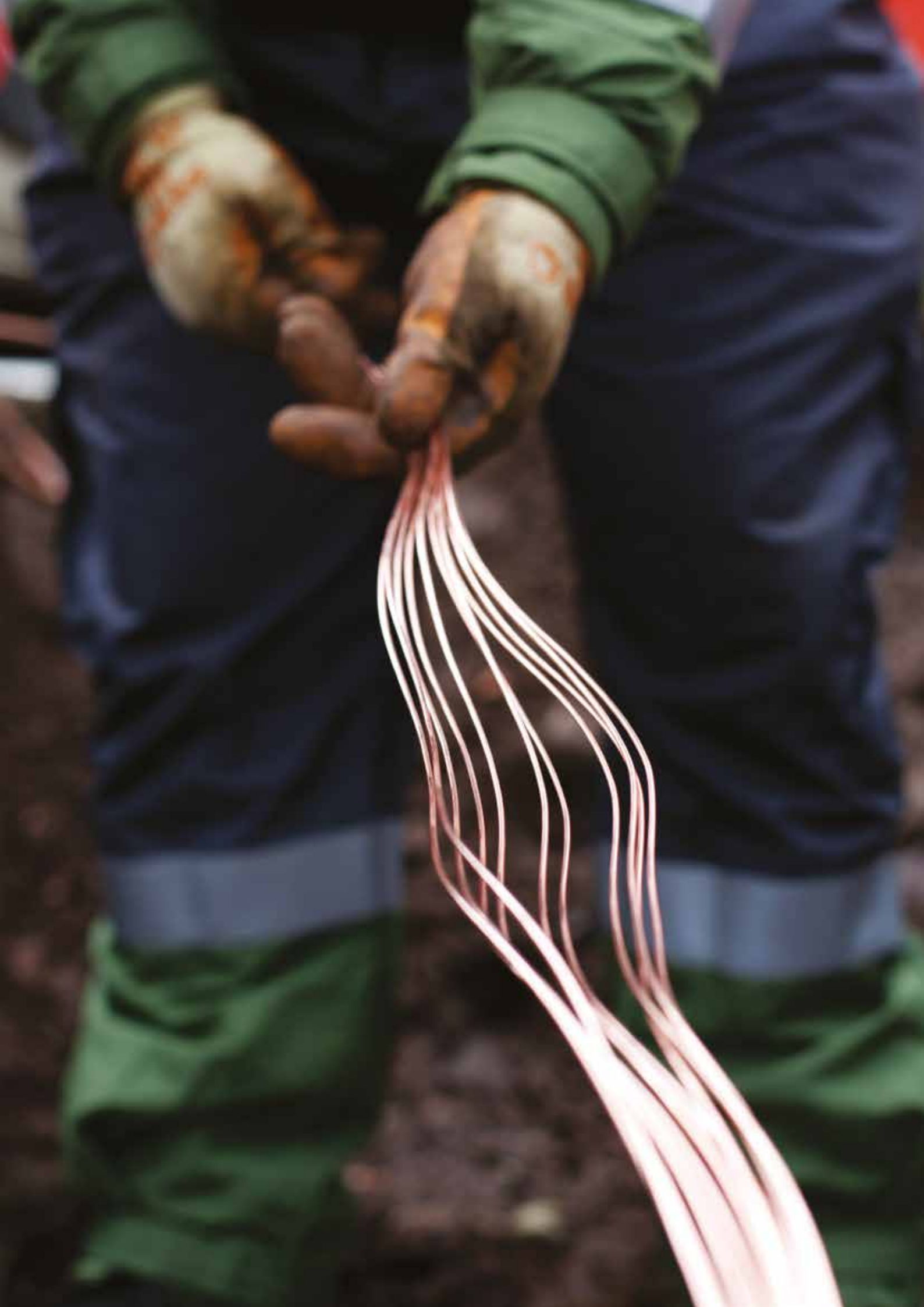
Our analysis shows that our overall package provides value-for-money in absolute terms and relative to WPD. Our plan assumes lower costs or greater risk in a number of key areas: lower unit costs for key asset categories, lower real price effects (RPEs), zero IQI income reward, and greater risk in relation to investment to accommodate changing patterns of demand. Our lower costs in these areas relative to WPD correspond to a customer bill that is 4% lower than would be the case if we were to adopt WPD's proposals, or in other terms, an effective return on equity of around 4% relative to WPD's allowed rate of return of 6.4% and our proposed baseline return.

6. Our assessment is based on risk and probability of over loading on a cyclical basis (note that most large plant items can run up to 30% overload for short periods of time as long as they also have time to cool down before being run at full capacity again)

7. [Explain standards]

8. This is calculated as: probability of overspend (50%) efficiency incentive rate (60%)*upper-limit of deadband (20%)*£360 = £21.6*

9. This is calculated as: probability of overspend (25%) efficiency incentive rate (70%)*upper-limit of deadband (20%)*£360 = £12.6*



11 Glossary

Industry-specific terms explained

We want to help our stakeholders and customers to understand our Business Plan, therefore, in this chapter we have provided an alphabetical list of industry-specific terms and their explanations.

A

Allowed revenue
The amount of money that we can earn on our regulated business.

Annual iteration process
The process of annually updating the variable (blue box) values in the price control financial model and running the model in order to provide updated MOD values.

Areas of Outstanding Natural Beauty (AONB)
Areas protected by legislation due to their visual or environmental qualities. Ofgem provide DNOs with an allowance for undergrounding overhead lines in these areas.

B

Base revenue
Base revenue is the amount of revenue that we are allowed to recover as agreed up-front with Ofgem.

Benchmarking
The process we use to compare our performance (e.g. our costs) to that of best practice or to average levels within the sector.

British Telecom 21st Century (BT 21 CN)
British Telecom are currently upgrading their telecommunications systems to a more flexible system which can send messages through both traditional hard-wire routes and the internet. This programme has implications for the protection and control systems we use to manage our network.

Broad Measure of Customer Satisfaction (BMCS)
This is an industry wide survey of the views of our customers on our levels of service. It covers customer satisfaction, social obligations, complaint handling and how we engage with our stakeholders. It both rewards and penalises performance against the targets.

Business Carbon Footprint (BCF)
The BCF scheme is a reputational incentive to encourage DNOs to be proactive in measuring and reducing the carbon impact of their operations.

Business support costs
Business support costs are related to functions that are not core to provision of network services but that are required for us to run our business. These include costs associated with running our finance department, human resources, and central IT systems.

C

Capital Asset Pricing Model (CAPM)
A theoretical model that is widely used to estimate the cost of equity. This derives the cost of equity by adding the company or sector risk premium to the risk free rate. The risk premium is calculated by applying a measure of relative risk, known as the "beta" factor to the risk premium for the stock market as a whole.

Capital expenditure (Capex)
The money we invest in tangible distribution assets, such as underground cables, overhead electricity lines and substations.

Carbon Plan
The UK government has made a commitment to cut UK carbon emissions by at least 80% of 1990 levels by 2050. The Carbon Plan sets the UK plans for achieving the first 20 years of emissions reductions.

Cost Benefit Analysis (CBA)
Where there are two or more options that we could invest in, cost benefit analysis allows us to weigh up the long-term costs and benefits for each option and select the one that gives the greatest benefit balanced against long-term value-for-money.

Cost of Debt
The interest rate that a company pays for its loans.

Cost of Equity
The rate of return on investment required by a company's shareholders.

Customers Interrupted (CI)
The number of customers in every 100, whose supplies have been interrupted per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident.

Customer Minutes Lost (CML)
The duration of interruptions to supply per year – average customer minutes lost per customer per year, where an interruption of supply to customer(s) lasts for three minutes or longer.

D

DECC
The Government Department of Energy and Climate Change.

Defined Benefit Scheme
A pension scheme where the benefits that accrue to members are normally based on a set formula taking into account the final salary and accrual of service in the scheme. It is also known as a final salary pension scheme.

Defined Contribution Scheme
A pension scheme where the benefits that accrue to members are based on the level of cash contributions made to an individual account; the returns on those funds are used to provide a cash amount to purchase an annuity on retirement.

Demand side management (DSM)
Demand side management (or load management) is any mechanism (both social and mechanical) that allows a customer's demand to be intelligently managed in response to events on the power system. Such events would include lack of network capacity or insufficient generation.

Depreciation
Depreciation is a measure of the consumption, use or wearing out of an asset over the period of its economic life.

Distributed Generation (DG)
Generation connected to the distribution network, such as wind turbines, domestic solar panels, photo-voltaic farms, hydro-electric power and biomass generators.

Distribution Network Operators (DNOs)
DNOs are the organisations that look after the networks transporting electricity to end users such as homes and businesses. In England and Wales, DNOs manage the network from 132,000 down to 230 volts. In Scotland, DNOs manage the network from 33,000 volts to 230 volts. The UK distribution network is divided into 14 distribution areas and these are managed by 6 DNOs.

Distribution Price Control Review 5 (DPCR5)
To encourage competition and ensure that the industry is regulated effectively, each DNO periodically sets its commitments and agrees its expenditure with Ofgem. This process is called a price control review. Once the commitments and expenditure have been agreed, the DNO carries out its commitments and is measured on its performance. DPCR5 is the current price control period, running from 2010 to 2015 and it will be followed in 2015 by ED1.

Distribution Use of System (DUoS)
These are the costs that customers pay to DNOs via their energy suppliers, typically 15-20% of a customer's bill. The amount of DUoS charged is determined with Ofgem at each price control review.

Dividend Growth Model (DGM)
A theoretical model that is widely used, in the United States and elsewhere, to estimate the cost of equity. This derives the cost of equity as the discount rate which sets the present value of projected future dividends equal to the current share price.

E

EA Technology
This is a research company engaged jointly by all DNOs to develop and maintain the Transform model to assess the cost of the impact of low-carbon technologies on the network.

ED1
This is a prefix/suffix designating an item relevant to the RIIO-ED1 (electricity distribution) price control review which will be applicable for the eight years running from 1 April 2015.

ED1 Price Control Financial Model (PCFM)
The model of that name:

(a) that the Authority will use to determine ex ante base revenues; and

(b) that the Authority will use to calculate appropriate changes to the licensee's base revenue through an Annual Iteration Process that will determine the value of the term MOD.

Electricity, Safety, Quality and Continuity Regulations 2002 (ESQCR)
These govern the standards of safety and the quality and reliability of electricity supply that our customers can expect. The regulations were updated in 2006 to include a requirement for resilience tree cutting.

Equity risk premium (ERP)
The market Equity Risk Premium (ERP) measures the additional return required by investors to compensate them for the risk of holding a widely diversified portfolio of equities over and above the risk-free rate.

Extra High Voltage (EHV)
Voltages over 20kV up to, but not including, 132kV.

F

Fast money
Fast money is the revenue that is recovered in the year of expenditure; the proportion of Totex which is not added to the licensee's RAV balance and is effectively included in the licensee's revenue allowance for the year of expenditure.

Financeability
We use financial models to determine whether we are capable of financing our necessary activities and earning a return on our regulated asset value (RAV). This financeability is assessed using a range of different financial ratios.

G

Gearing
A ratio describing the extent to which a company is financed through borrowing.

Guaranteed Standards of Performance (GSOPs)
These are the minimum levels of service to be met across a range of customer-facing activities, including how we manage power cuts, connections and customer complaints. If we fail to provide the level of service required, we make a payment to the customer affected. There can be certain exemptions to these compensation payments, for example during extreme weather events.

H

Health Index (HI)
A system for collecting and tracking condition (health) information of distribution assets.

Health and Safety Executive (HSE)
The government body responsible for enforcing health and safety legislation.

High voltage (HV)
Voltages over 1kV up to, but not including, 22kV.

I

Incentive on Connections Engagement (ICE)
This is a new incentive in RIIO-ED1 designed to encourage DNOs to improve the way they communicate with major connections customers.

Incentive Strength
The incentive strength represents the percentage that a licensee bears in respect of an overspend against allowances or retains in respect of an underspend against allowances.

Information Quality Incentive (IQI)
This incentive encourages DNOs to forecast their costs accurately and maximise long-term value-for-money for their customers by ensuring that their activities are carried out in the most efficient and cost effective way.

Innovation Funding Initiative (IFI)
A funding scheme designed to encourage network companies to invest in appropriate research and development activities to enhance technical development of the networks and to deliver value (i.e. financial, supply quality, environmental, safety) to end customers.

Inspections and Maintenance (I&M)
The activities we carry out to check and maintain the condition of our assets.

Interruption Incentive Scheme (IIS)
The Interruptions Incentive Scheme (IIS) sets targets for planned and unplanned electricity power cuts. Performance is measured by both number and duration of power cuts. The mechanism both rewards outperformance and penalises underperformance against the targets.

ISO 9001
An international standard for quality management systems.

ISO 14001
An international standard for environmental management systems.

K

Kilowatt hours (kWh)
A kilowatt is a measure of energy equal to one thousand watts; a kilowatt hour is a measure of energy consumed over time.

L

Load Index (LI)
This is a measure of the extent to which our substations are utilised against their total capacity. The load index is used to measure the effect of load related investment.

Load-related expenditure
The installation of new assets to accommodate changes in the level or pattern of electricity supply and demand.

Low-carbon economy
An economy which has a minimal output of greenhouse gas emissions.

Low-carbon Networks Fund (LCNF)
This funding mechanism encourages DNOs to prepare for their role in the UK transition to a low-carbon economy through the use of innovative technologies and approaches. This fund enables DNOs to innovate and trial new technologies and operational and commercial processes and is granted at two tiers:

- *Tier one funds small innovation projects*
- *Tier two funds significant innovation projects*

The LCNF will be replaced by the Network Innovation Allowance (NIA) and the Network Innovation Competition (NIC) during RIIO-ED1.

Low-carbon Technology (LCT)
Technologies designed to reduce the amount of carbon we use, including electric vehicles, heat pumps, wind turbines and solar panels.

Low Voltage (LV)
This refers to voltages up to, but not including, 1kV.

M

MOD Term
The term represents the incremental change to base revenue for the Relevant Year concerned. The value of the MOD term is calculated through the annual iteration of the ED1 Price Control Financial Model and is specified in a direction given by the Authority by 30 November in each Relevant Year.

N

Net Present Value (NPV)
Net present value is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.

Net Present Value (NPV) neutral
Alternative revenue profiles are net present value neutral if they have the same NPV. This term is usually used in the context of spreading revenues over time (i.e. a price control period) where the costs that they represent have already been incurred, or in comparing different profiles of allowed revenue.

O

Office of Gas and Electricity Markets (Ofgem)
Ofgem regulate the gas and electricity markets in the UK, encouraging competition to raise standards of service and give customers long-term value-for-money.

OHSAS 18001
International standard for the management of occupational health and safety.

Operating expenditure (Opex)
Expenditure on operating and maintaining the network, e.g. fault repair, tree cutting, inspection and maintenance, engineering and business support costs.

Outputs
The things which our customers directly value, such as reliability of supply, safety and excellent customer service.

P

PAS55
Publically Available Specification for the management and optimisation of physical assets.

Pension Protection Fund
The fund, established under the provisions of the Pensions Act 2004, to provide compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer, and where there are insufficient assets in the pension scheme to cover the Pension Protection Fund level of compensation.

Pension Scheme Administration
The range of activities that pension scheme trustees are required by legislation to undertake or commission in running the pension scheme. It includes, without limitation, the keeping of scheme records, scheme management and administration, scheme policy and strategy, the provision of information to scheme members, the calculation and payment of benefits and liaison with tax and regulatory authorities, and the preparation of valuations. It does not include investment management fees which are remunerated by deduction from investment returns; or any activities which are the responsibility of the licensee, such as advisors to the licensee on managing or advising it on any and all aspects of its relationship with the trustees including recovery plans.

Pension scheme established deficit
The difference between assets and liabilities, determined at any point in time, attributable to pensionable service up to the end of the respective Cut-Off Dates and relating to Regulated Business Activities under Pension Principle 2. The term applies equally if there is a subsequent surplus.

Pension scheme incremental deficit
The difference between the assets and liabilities, determined at any point in time, attributable to post Cut-Off Date pensionable service and relating to Regulated Business Activities. The term also applies equally where there is a surplus for

the post cut-off date regulated Notional incremental deficit sub-fund

Price control (control)
The control developed by the regulator to set targets and allowed revenues for network companies. The characteristics and mechanisms of this price control are developed by the regulator in the price control review period depending on network company performance over the last control period and predicted expenditure in the next.

Priority Service Register (PSR)
Our register of vulnerable customers, enabling us to provide additional support when required.

R

Real Price Effects (RPE)
Increase in prices, of materials, direct staff or contract labour, over and above increases in the Retail Price Index.

RAV – Regulatory Asset Value
A financial balance representing expenditure by the licensee which has been capitalised under regulatory rules.

The licensee receives a return and depreciation on its RAV in its price control allowed revenues.

Relevant Year
A year beginning on 1 April.

Resilience Tree Cutting
This is the removal or extensive cutting of trees to ensure that they cannot cause damage to nearby power lines in the event of severe weather.

Retail Prices Index (RPI)
The RPI is an aggregate measure of changes in the cost of living in the UK. It differs from the CPI in that it measures changes in housing costs and mortgage interest repayments, whereas the CPI does not, they are calculated using different formulae and have a number of other more subtle differences.

Return on Regulatory Equity (RoRE)
The financial return achieved by shareholders in a licensee during a price control period from its out-turn performance under the price control. The return is measured using income and cost definitions contained in the price control regime (as opposed to accounting conventions) and is expressed as a percentage of (share) equity in the business. Importantly, in the calculation the gearing (proportions of share equity and debt financing in the RAV) and cost of debt figures used are those given as the 'assumed' levels in the relevant price control final proposals. The aim of the RORE measure is to provide an indication of the return achieved by the owners of a licensee which can be compared to the cost of equity originally allowed in the price control settlement and to the return achieved by other licensees on an equivalent basis.

Revenue = incentives + innovation + outputs (RIIO)
Ofgem introduced a new regulatory framework in 2010 replacing previous RPI-X regime. It places more emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value-for-money to existing and future consumers.

RIIO Electricity Distribution 1 (RIIO-ED1)
The price control period that will run from 1 April 2015 to 31 March 2023. It is the first electricity distribution price control that will use the RIIO framework for setting allowances.

RIIO Electricity Distribution 2 (RIIO-ED2)
The electricity distribution price control period that will run from 1 April 2023 to 31 March 2031.

RPI-X
The form of price control currently applied to network monopolies. Each company is given a revenue allowance in the first year of each control period. The price control then specifies that in each subsequent year the allowance will move by 'X' per cent in real terms.

S

Secondary Deliverables
Indicators of performance which may be used in support of the companies' required primary outputs

Slow money
The proportion of Totex which is added to the licensee's RAV balance on which the licensee receives a revenue allowance to cover finance (WACC) and depreciation costs.

Smart Grid
A generic term for a range of measures that are used to operate electricity networks allowing more generation or demand (load) to be connected to a given electricity circuit without the need for traditional reinforcement (or upgrade) of that equipment.

Smart Grid Forum (SGF)
The Smart Grid Forum was established by Ofgem and DECC in early 2011 bringing together key opinion formers, experts and stakeholders involved in the development of smart grids, with the aim of providing strategic input to help shape Ofgem's and DECC's thinking and leadership in smart grid policy and deployment.

Smart metering
Advanced gas and electricity metering technology that offers customers more information about, and control over, their energy use (such as providing information on total energy consumption in terms of value, not only volume), and/or allows automated and remote measurement.

Stakeholder
Anyone with an interested in, or affected by our operations.

Sulphur Hexafluoride (SF6)
A potent greenhouse gas widely used in transmission and distribution equipment.

Supervisory Control and Data Acquisition (SCADA)
This is the term used for the systems used to monitor and control distributed assets. It comprises the remote terminal units, communication infrastructure and human interface within central control rooms.

T

Time Value of Money Adjustment
A multiplier used when the award or application of a financial value, attributable to a particular year, is deferred until a later year, even where the deferral is routine and in accordance with a price control mechanism.

In basic terms, for any one year, the multiplier is (1+X) where:

- *X is the WACC for the licensee applicable to the period of deferral*

Totex
The aggregate net network investment, net network operating costs and indirect costs.

Totex Capitalisation Rate
The percentage of Totex which is added to RAV (slow money)

Totex Incentive Mechanism (TIM)
TIM is the financial reward (or penalty) that companies are given in allowances for under or over spend on Totex. For RIIO-ED1 Final Proposals opening base revenues will be modelled on the basis that actual Totex expenditure levels are expected to equal allowed Totex expenditure levels (allowances). If actual (outturn) expenditure differs from allowances, for any Relevant Year during the Price Control Period, the TIM provides for an appropriate sharing of the incremental amount (whether an overspend or underspend) between consumers and licensees.

Transform Model
The model – developed by EA Technology – which uses a representation of the network and calculates the investment needed to accommodate LCTs using either smart grid solutions or traditional network reinforcement.

The smart solutions include 'demand side response' as well as additional technology to move load around the network and utilise the full capacity of assets.

Triennial Valuation
An actuarial valuation of a pension scheme which has been carried out to meet the requirements of Section 224(2)(a) of the Pensions Act 2004 and which details in a written report, prepared and signed by the Scheme Actuary, the value of the scheme's assets and Technical Provisions. Actuarial valuations are usually produced triennially but the term may also refer equally to any full actuarial valuation that is not an Updated Valuation.

Turnkey
This is a contractual arrangement where the design and construction of a project is handed over to a third party.

U

Uncertainty mechanisms
Uncertainty mechanisms allow changes to the base revenue during the price control period to reflect significant cost changes that are expected to be outside the company's control. Examples include revenue triggers and volume drivers.

V

Vanilla Weighted Average Cost of Capital (Vanilla WACC)
This is the combined cost rate of funding calculated using a pre-tax cost of debt and post-tax cost of equity weighted by notional gearing.

Vulnerable Customers
Customers who are medically dependent upon electricity, have special communication requirements or have other special needs with a dependence upon electricity (e.g. stair lift).

W

WACC
The Vanilla Weighted Average Cost of Capital is Ofgem's preferred way of expressing the rate of return allowed on the Regulatory Asset Values (RAV) of price controlled network companies. The use of Vanilla WACC means that the company's tax cost is separately calculated as a discrete allowance so that only the following have to be factored in:

- *the pre-tax cost of debt – i.e. the percentage charge levied by lenders, and*
- *the post tax cost of equity – i.e. the percentage return equity investors expect to actually receive, weighted according to the price control gearing assumption.*

"Real Vanilla WACC" is used which gives a lower percentage than "Nominal Vanilla WACC" would (when inflation is positive). This is because inflation isn't taken into account in the determination of the Real Vanilla WACC percentage since revenue allowances (which include the Vanilla WACC return) are separately RPI indexed.

Worst Served Customers
a customer *"experiencing on average at least four higher voltage interruptions per year over a three year period ie 12 or more over three years."* A worst served customer must also be one who has had *"a minimum of three higher voltage interruptions in each year,"* during the three year period.

Table of acronyms

Acronym	Country	Definition
BR	UK	Base Rate
Capex	All	Capital Spending
DECC	UK	Department of Energy and Climate Change
DG	All	Distribution Generation
DNO	UK	Distribution Network Operator
DPCR	UK	Distribution Price Control Review
ESQCR	UK	Electricity Supply Quality and Security Regulations
GEMA	UK	Gas and Electricity Market Authority
IQI	UK	Information Quality Incentive
LCNF	UK	Low-carbon Networks Fund
NBV	UK	New Book Value
MEAV	UK	Modern Equivalent Asset Value
Ofgem	UK	Office of Gas and Electricity Markets
Opex	All	Operating Expenses
QoS	All	Quality of Supply
RAV	UK	Regulatory Asset Value
RIG	UK	Regulatory Instructions and Guidelines
RIIO	UK	Revenue = Incentives + Innovation +Outputs
ROE	All	Return on Equity
RPI	UK	Retail Price Index
RRP	UK	Regulatory Reporting Pack
Totex	UK	Opex & Capex
WACC	All	Weighted Average Cost of Capital

Our published annexes and supporting documents

The table below outlines our annexes and supporting documents and provides a brief description of each

Aii – A Overview – ii. Executive Summary	
Plan on a page	Our plans for SPD and SPM summarised onto single pages
Changes to our plan	A description of the changes we've made to our plan since our original submission in July 2013
Changes to our plan Appendix A – CV Table Changes	A confidential supplementary appendix to Annex Aii – Changes to our plan – SPEN
B2 – B Context – 2. Our Challenges	
Written Evidence to Scottish Affairs Committee	Evidence supplied to the Scottish Affairs committee regarding SPEN's performance during the January 3rd 2012 Storm
Assessment of Overhead Line Performance During Severe Storms	An independent evaluation of SPEN's improvement in overhead line performance between two comparable storms in 1998 and 2012
Letter Regarding Storm Response	Letter from Fergus Ewing MSP, Scottish Minister for Energy, Enterprise and Tourism, regarding SPEN's response to 2013 storms
B3 – B Context – 3. Stakeholder Engagement	
Learning from Stakeholders	A description of our overarching Stakeholder Engagement approach and the engagement process we have undertaken in developing this Business Plan
RIIO-ED1 Stakeholder Consultation - Phase 1 Report	An Independent consultation with SPEN stakeholders to understand their priorities for future investment planning in line with RIIO-ED1 - Phase 1
RIIO-ED1 Stakeholder Consultation - Final Report	An Independent consultation with SPEN stakeholders to understand their priorities for future investment planning in line with RIIO-ED1 - Final Report
Stakeholder Engagement – Further Detail	A detailed description of the engagement activities that were undertaken in preparing this Business Plan, the feedback we received and the outputs that are contained within the plan as a result.
Stakeholder Panel Scoping Phase - Final Report	Independent scoping research exercise carried out in order to establish stakeholders' willingness to support proposed Stakeholder Panel
C5 – C Our Plan – 5. Outputs and Incentives	
Black Start Capability	Our plans for ensuring that our network is black start resilient through the ED1 period
Environment Strategy	Our strategy for managing our environmental impact - setting measurable objectives related to both narrow and broad environmental impacts
Losses Strategy	Our strategy for managing the main causes of energy losses from our distribution systems. Energy losses arise for a variety of technical and non-technical reasons and this section describes the different types of distribution losses.
Customer Satisfaction Strategy	Our comprehensive strategy and roadmap for delivering outstanding customer satisfaction through the current price control period (DPCR5), through ED1 and beyond.
Social Obligation Strategy	Our comprehensive strategy and roadmap for delivering our social obligations through the current price control period (DPCR5), through ED1 and beyond.

C6 – C Our Plan – 6. Expenditure	
a. Expenditure Summary	
Expenditure Supplementary Annex	This Annex sets out our RIIO-ED1 expenditure plans across all categories of our costs for both of our licences. We describe how we have developed the plans and how we have worked to ensure that they are as cost efficient as possible.
b. Asset Stewardship	
Asset Data and Information Strategy	Our strategy for governance, validation, data assurance and data improvement in line with best practice and Ofgem guidance.
Asset Health and Criticality	Our methodology for evaluating asset health and criticality including a detailed description of the IT solutions used to derive Health Index and Criticality Index scores.
Asset Management Health Index Reporting Assurance	An independent assessment of the process recently undertaken by SPEN to update the volume of asset movements eligible for HI reporting purposes and the associated processes for reporting HI profiles and scoring, including and assessment of whether the processes adopted to amend the volumes of asset movements were robust, effectively implemented, and thus provide an accurate representation of HI profiles and capital plan delivery.
Implementation of Condition Based Risk Management	A confidential annex supporting Annex C6 – Asset Health and Criticality Strategy – SPEN
Long-Term Strategy	Our strategy for identifying and responding to long-term developments in our operating environment, based on a view of what the likely developments will be towards the end of RIIO-ED1 and in subsequent price control periods.
Network Size Amendments Assurance	Independent assessment to confirm that the process used to correct and amend the asset volume information in both SPD and SPM is robust, effectively implemented and results in a more accurate regulatory asset count.
Report on Network Size P3 & 4 Assets	Follow-up independent assessment to confirm that the process used to correct and amend the asset volume information in both SPD and SPM is robust, effectively implemented and results in a more accurate regulatory asset count.
RRP Narrative Explaining Changes in Table V1 - Changes in Opening Balance	Report explaining the key changes reflected in SPD and SPM's Table V1 for the 2012-13 RRP submission after formal review of the Asset Base volumes within SPD and SPM.
c. SP Manweb Company Specific Factors	
SP Manweb Company Specific Factors	A detailed description of the company specific cost implications of the SPM urban interconnected network
d. Load Related Investment	
Heat pump and energy efficiency scenarios	Independent report setting out heat pump and energy efficiency scenarios for use in SPEN's Transform modelling for Business Planning. These scenarios aim to represent a reasonable view of heat pump uptake and domestic energy consumption from lighting and appliances, based on the assumption that Government remains committed to meeting carbon targets.
LCT Network Monitoring Strategy	Our strategy for proactively identifying, monitoring and responding to the future growth of low-carbon technology (LCT) on the LV network.
Load Related Investment Strategy	Our strategy for determining our Load Related Investment Programmes during ED1 and beyond.
Transform Model Analysis and Support	Independent validation of key elements of the Transform Model to project the future expenditure required to manage the connection of Low-carbon Technologies (LCTs) to the distribution network.
e. Non-Load Related Investment	
11kV Substation Plant Strategy	Our strategy for the replacement and refurbishment of 11kV plant assets through the ED1 period.
132kV Cable Strategy	Our strategy for the replacement and refurbishment of 132kV cable assets through the ED1 period.

132kV Overhead Lines Strategy	Our strategy for managing our existing 132kV overhead line distribution network on the SPM network. It aims to address the current volume of assets at or approaching end of life, through an optimum level of investment, delivered through the continuation of a prioritised and project specific approach spanning DPCR5, RIIO ED1& RIIO ED2.
132kV Overhead Lines Heat Map	A confidential annex supporting Annex C6 – 132kV Overhead Lines Strategy – SPEN.
132kV Substation Plant Strategy	Our strategy for the replacement and refurbishment of 132kV substation plant assets through the ED1 period.
132kV Substation Heat Maps	A confidential annex supporting Annex C6 – 132kV Substation Plant Strategy – SPEN.
33kV and 11kV Overhead Lines Strategy	Our strategy for our 33kV and 11kV wood pole overhead line network during ED1.
33kV Substation Plant Strategy	Our strategy for the replacement and refurbishment of 33kV plant assets during ED1.
BT21CN Mitigation Strategy	Our strategy for BT21CN mitigation throughout the ED1 period.
Civil Strategy and Plans	Our strategy for determining our planned investments during the RIIO-ED1 period to manage the condition of our civil assets associated with Substations Cable Tunnels & Bridges and LV Street Furniture
Legal and Safety Strategy	Our strategy for investment plans relating to Legal and Safety issues through ED1 period.
LV and ESQCR Overhead Lines Strategy	Our strategy for our LV overhead line network including ESQCR, during RIIO-ED1.
LV Substation Plant Strategy	Our strategy for the replacement and refurbishment of LV plant assets through the ED1 period.
Operational IT and Telecoms Strategy	Annex, along with our Non-operational IT annex, covers our strategy for managing our Operational IT and Telecoms portfolio during ED1.
Protective Equipment and Supporting Systems Strategy	Our strategy for asset replacement, refurbishment and repair activities during the ED1 period associated with protection systems installed in SPD and SPM networks as well as other assets which play a major role in the protection of the network.
Regulatory Reporting Pack – Wooden Poles Guidance Document	A discussion of the wooden poles RRP submissions for SP Manweb and SP Distribution including possible options for improving the outputs position associated with wooden poles.
RIIO-ED1 HV and LV Network Investment Analysis - Phase 2	An independent bottom-up assessment of required future network investment for the 11kV and LV SPEN distribution networks, specifically considering the impact of future low-carbon technology uptake.
Rising Mains and Laterals Strategy	Our strategy for the management of rising and lateral mains assets through the ED1 period.
SWG-02-007 Switchgear Assessment 6kV, 11kV and 33kV	The methodology by which SPEN assesses all 6kV, 11kV and 33kV switchgear, to allow the need for replacement to be evaluated when the switchgear score is used in conjunction with site specific HI and CI information.
SWG-02-008 Assessment of the Operational Adequacy of 132kV, 275kV and 400kV Switchgear	The methodology by which SPEN assesses the operational adequacy of all 132 - 400kV switchgear, to allow the need for replacement to be evaluated.
TRAN-02-002 Assessment of the Operational Adequacy of Transformers and Reactors 33kV and Above	The methodology by which SPEN assesses the operational adequacy of all power transformers at 33kV and above, to allow the need for replacement to be evaluated.
h. Business Support Costs	
Non-Operational IT and Telecoms Strategy	Our strategy for Non Operational IT and Telecoms during ED1. This should be read in conjunction with Operational IT and Telecoms Strategy, Smart Metering Strategy and Smart Grid Strategy to obtain an overall picture of our comprehensive IT and Telecoms Strategy
l. Real Price Effects	

Real Price Effects 2014/15 to 2022/23	Independent estimates of the real price effects (RPEs) that are likely to confront an efficient electricity DNO over the period 2014/15 to 2022/23.
m. Cost Efficiency and Benchmarking	
Cost Assessment, Efficiency and Benchmarking	Our strategy for ensuring that our costs are as efficient as possible and a description of how we benchmark against other DNOs and Ofgem's expert assessments
Cost Benefit Analysis	A summary of the Cost Benefit Analyses (CBAs) carried out - along with a summary of each of the individual analyses setting out the approach and rationale for our chosen option.
Historical Data Comparable to RIIO-ED1 Ongoing Efficiency Gains	An independent review of historical data on productivity that might be used as a comparator for the ongoing efficiency indices that Ofgem have asked SPEN to submit as part of the RIIO-ED1 Business Plan
C7 – C Our Plan – 7. Business Readiness	
Innovation Strategy	Our approach to using innovation to improve our services and provide long-term value-for-money
RIIO-ED1 Review Project	An independent assessment of SPEN investment proposals, documenting the alternatives to conventional reinforcement and providing an outline justification for the use of the new solutions.
Smart Grid Strategy	Our strategy for developing our network for the future, in line with our wider Long-Term Strategy. This document also links into our Innovation Strategy and Smart Metering Strategy, explains how we will develop new solutions for the future network and how these will form part of our expenditure in the future.
Smart Meter Strategy	Our strategy for the use of smart meter information within network operations which will incur these costs and achieve the benefits. We explain our ambition to create a future-proofed data infrastructure that will allow us to take full advantage of smart meter information in a range of different areas.
C8 – C Our Plan – 8. Risk and Uncertainty	
Insurance Strategy	Our strategy for mitigating an appropriate level of risk through transfer by insurance. A combination of the company's risk appetite, cost of insurance and statutory obligation dictates the level of insurance cover purchased.
Risk and Uncertainty	Our strategy for identifying key risks and uncertainties affecting our Business Plan over 2015-23 and the scale of their impact and determining what controls are or can be put in place to manage these risks and uncertainties
Risk Modelling for RIIO-ED1	Our financial risk modelling platform for use during the RIIO-ED1 period. The main aim of this model is to assess the financeability of the regulated business over the period from 2015-2023, given the company's Business Plan cost forecasts, and assumptions regarding key regulatory parameters.
C9 – C Our Plan – 9. Financing	
Financing our Plans	Our consideration of the overall financeability proposal within our Business Plan.
The Cost of Equity for Scottish Power's Distribution Network Operators at RIIO-ED1 – NERA	An independent estimate of the cost of equity for SP's electricity distribution network operators (DNOs) for the RIIO-ED1 period from March 2015 to March 2023.

SP Energy Networks

Ochil House
Hamilton International Park
Technology Avenue
Blantyre
South Lanarkshire
G72 0HT