Scottish and Southern Energy
Power Distribution

Technical Appendix 08.1

Expenditure

This Paper is part of the RIIO-ED1 Business Plan of Southern Electric Power Distribution plc ("SEPD") and Scottish Hydro Electric Power Distribution plc ("SHEPD"), together Scottish and Southern Energy Power Distribution ("SSEPD").

A map of the full Business Plan can be found at http://www.yourfutureenergynetwork.co.uk

All costs shown are in 2012/13 prices unless indicated otherwise.

Summary

Key changes from initial plan

Since our first submission in July 2013 we have made a number of targeted and proportional changes to our plan. These substantially increase the value our customers will experience during RIIO-ED1. They include:

- Reduction in RPEs forecast over ED1 by £74m
- Reduction in Load Related investment of £33m
- Reduction in Asset Replacement of £9m
- Reduction in Smart Metering ex-ante of £27m
- Reduction in Worst Served Customer of £20m
- Reduction in Smart Metering pass through of £66m
- Reduction in TCPC pass through of £24m

We have also reviewed our IT strategy and consider that, in order to meet the challenges of a developing electricity distribution industry, we should marginally increase our investment, £29m over ED1.

Value for money

We believe that our business plan proposals represent excellent value for money to all our Customers and wider stakeholders. Over ED1 we will deliver a safe, reliable and affordable network service. We anticipate this period will bring challenges including integrating a rapidly expanding Distributed Generation industry, a national Smart Metering roll out programme and optimising investment in aging networks. However, we also expect to experience progression in our management of faults, understanding asset condition and management of network demands; all through the advancement of technology and processes through an embedded innovation programme.

These objectives for ED1 will only be realised through targeted and carefully managed investment. This paper outlines the areas of proposed investment and the level of expenditure, as justified by our wider business plan, required to achieve these targets.

Refining our plan

Changes from July 2013 Business Plan

As highlighted above we have made some careful amendments to the requested allowances for ED1, responding to stakeholder feedback and recognising where we can learn from our peers and wider industry. The refinements made are discussed in the sections which follow and across the wider business plan. The catalyst for change and the key amendments are summarised in the respective sections of this paper.

We have highlighted where focused updates have impacted our RIIO-ED1 plan. We also remain confident of our forecasts for volumes and costs within the remaining sections which have not altered from our initial proposals. To assist in understanding how our plan is integrated we have repeated much of the initial plan within this document. Sections where costs, volumes or justification have been updated are clearly identified as such.

Where ever appropriate we have referenced additional sources of information to support our proposals, most of which are from within this plan or our July 2013 submission. We also provide links from the expenditure and volumes quoted to the supporting business plan data templates (BPDT) provided to the regulator as part of this submission.

Innovation

Innovation is core to all of the work that we do. Many of the cost reductions and outputs that we describe in our papers are dependent on a healthy innovation programme.

We are committed to an innovative approach within RIIO ED1. We have evidence based faith in the value of innovation, a single innovation “Active Network Management systems” on Orkney paid for our entire innovation programme from DPCR4 and DPCR5, we have little doubt that innovation pays back a dividend to our customers in the form of easier connections and lower bills.

SSEPD has a well earned reputation for applying innovation; our intention for RIIO ED1 is to move this to the next level create organisational and stakeholder relationships that accelerate the process of taking an idea or a challenge and turning it into an applied solution in the field as business as usual.

Innovation plays another vital role in our Business plan by ensuring that we are ready for any “Scenario” that may transpire at the end of RIIO ED1, by accelerating our innovation programme we believe we can have a large box of innovative “tools” ready to meet the challenges of heat pumps, electric car charging or hydrogen production and anything else that the low carbon economy generates.

Our innovation programme, both its impact to date and its intended application is discussed in our output papers. Our Innovation Strategy knits these separate innovations together and describes the means by which we choose when, how and what to innovate.

This should be read in conjunction with the relevant papers and is applicable to most elements of this Paper.

In order to deliver this programme, we are asking for the full 1% of revenue Network Innovation Allowance.

Contents

Introduction

This paper outlines where we have elected to update our expenditure forecasts for RIIO-ED1. We have integrated our original July 2013 document and provided for each expenditure area details of the changes made and where further information can be found. Where we have no changes from our first submission this is also highlighted.

Our expenditure forecasts should be considered in parallel with our enhanced justification of our business efficiency, see our Be efficient paper.

In the tables which follow we have summarised our forecast expenditure and shown how this has changed relative to July 2013.

All expenditure figures quoted are after the savings forecast from ongoing efficiency and include pensions. Real price effect forecasts are shown separately from these costs.

Our expenditure summary

The overall effect of these changes, compared with the July 2013 Business Plan, is a reduction in the base allowed revenue of £339 million over the eight-year period. Our proposals mean that the electricity distribution element of the average household energy bill for SSEPD's four million customers will fall by 15.8% in 2015/16, and increase in line with inflation thereafter.

As a consequence of these revisions, the March 2014 Business Plan presents significantly greater delivery challenges to SSEPD with significantly higher downside risk.

We have completed a thorough review of the expenditure we proposed within our July 2013 Business Plan. From this we have concluded that the overwhelming majority of the costs and volumes we forecast for ED1 remain valid, efficient and the basis of a value enhancing plan for our customers. There are a small number of areas where we have revisited the underlying macro economic assumptions or the needs case.

Where we have identified the opportunity to reduce costs to customers we have. This enables us to forecast £134m less controllable totex during ED1 and over £90m of pass through costs. Coupled with this we have clearly demonstrated the considerable benefits that our original investment plan delivered for customers. This is summarised in our accompanying paper, Be efficient.

The amendments to our July 2013 expenditure forecast are across a limited number of categories. To preserve the continuity between the first and second plans we have included our original narrative with clearly marked updates where appropriate.

Network Investment costs (Load Related)

Overview

Within this section we outline the individual elements of our Load related investment proposals for RIIO-ED1. The individual elements are summarised in the following table.

Figure 1. Load related investment proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
High Value Schemes	28.5	0.0	0.0	Bicester HVP
General Reinforcement	235.0	51.7	(17.4)	General reinforcement Justification Paper: SEPD and SHEPD
Connections	20.6	29.8	0.0	Connections output paper
LCT – core	9.0	5.5	3.3	Connections output paper
Transmission Connection Point Charges (TCPC)	4.3	53.0	(18.6)	TCPC justification paper

Connections

Updates to July 2013 Business plan

In our second business plan we have made no changes to our forecast Connections proposals across ED1. We believe the forecast volumes on which our plan is based reflect an anticipated, but limited recovery, in the underlying UK economy and as such substantiate our proposals for RIIO-ED1. This is clearly demonstrated in Figure 2 below.

To assist our stakeholders understand our current plan we have included below the connections information presented in our July 2013 Business Plan.

Figure 2. Summary of connections proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Connection projects; DPCR4	0.0	0.0	0.0	Connections output paper Reliability output paper
Connections: funded through ED1 allowances	20.6	29.8	0.0	Our Innovation Strategy SHEPD Distributed Generation paper SSEPD Transform scenario model
Connections: funded by Customer	*19.8*	*37.5*	0.0	

In order to understand our expenditure in this area it is important to understand how costs are recovered when new connections are made to the network.

The capacity of a network is the amount of electricity that the network may safely carry while remaining within statutory limits of voltage and frequency. Sometimes a new connection may trigger work on a network to increase its capacity because there is not enough spare capacity to carry the additional electricity. This investment to increase network capacity is split into connections driven reinforcement expenditure as described above, and general reinforcement expenditure (dealt with later). These are defined below:

- Connections driven reinforcement expenditure is driven by individual identified connections customers with costs shared between the customer and all other customers through DUoS charges. The expenditure in Figure 2 above is what we require in order to deliver this.
- General reinforcement expenditure relates to the necessary reinforcement works and investments that are required to ensure that our networks are able to accommodate the background growth in demand and generation where no individual connecting customer is identified.

This growth may be as a result of a customer installing a new electric heating system, electric car or micro-generation such as photovoltaic panels on their roof, it can be imported or exported energy driven. Our plans for general reinforcement expenditure to address background growth are explained in detail in A reliable supply of electricity and supporting annex.

The expected reduction in requested funding for RIIO-ED1 in this category is significant and counters our expectation of additional connection activity driven by LCTs and Distributed

Generation. This is in fact a result of changes in the regulatory treatment of connections and Customer contributions between DPCR4 and DPCR5 and lower connections activity in the first half of DPCR 5 as a result of changes in economic conditions.

The amounts listed in Figure 2 above are net of any customer contribution including contributions from previous price periods.

Figure 3. Forecast Connections volumes through RIIO-ED1

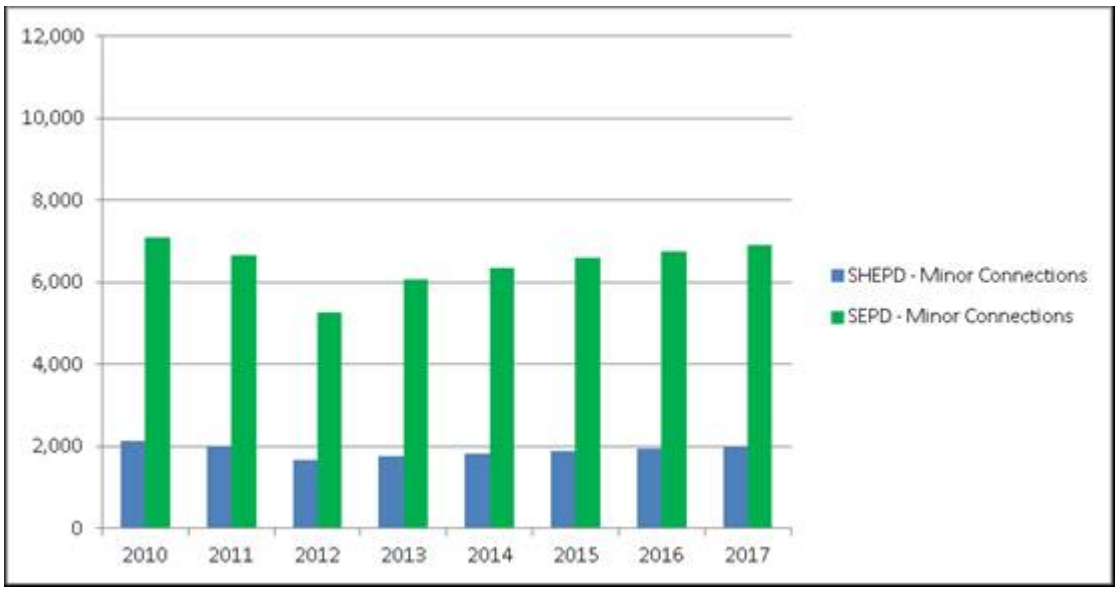


Figure 3 above indicates what we forecast activity levels will be for minor connection in our 2 licence areas. The level is relatively flat with a gradual pick up towards the end of the period. Our predictions around the expected upturn in connections are robust and well founded. As we believe it is essential to use all available information to inform our view they are based on known projects; stakeholder engagement with regional planners and developers and our own design team's local knowledge. We have verified this with externally validated predictions such as those provided by Global Insights comparative world overview UK-Real GDP growth (15th March 2013) which predicts and relatively steady growth rate of around 2% per annum during the RIIO ED1 period.

More information on the rational for this forecast can be found in the supporting paper, Connections outputs.

Uptake of Low Carbon Technologies (LCTs)

Updates to July 2013 Business plan

We continue to believe the prudent forecast made for Low Carbon Technology (LCT) uptake and our evaluation of the impact on our network business is justified. As outlined in our July 2013 Business Plan, and repeated below, we have adopted an assumption of low LCT uptake across the RIIO-ED1 period. Our proposed volumes and costs reflect this conclusion and are therefore considerably lower than forecast allowances which could be justified by more aggressive DECC scenarios.

Figure 4. Impact of Low Carbon Technologies (LCTs)

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Network Reinforcement arising from LCT uptake	9.0	5.5	3.3	Connections output paper
Shallow Reinforcement arising from LCT uptake	*11*	*9*	*0.0*	Embedded within CV101

Developing Low Carbon Technology Impact

In order to quantify the likely uptake of low carbon technology by our minor connections and its impact on our networks, while reflecting our commitment to prudent and efficient expenditure we have actively engaged with other network operators in developing a software model through the Ofgem championed Smart Grid Forum. This Transform™ model forms an integral part of our well justified business plan as it has allowed us to quantify the uptake and impact and then model and consider alternative options to address LCT.

Produced for all network operators to use, Transform™ models our entire network and, using a number of representative networks, simulates the impact of different uptake of low carbon technologies. The model determines:

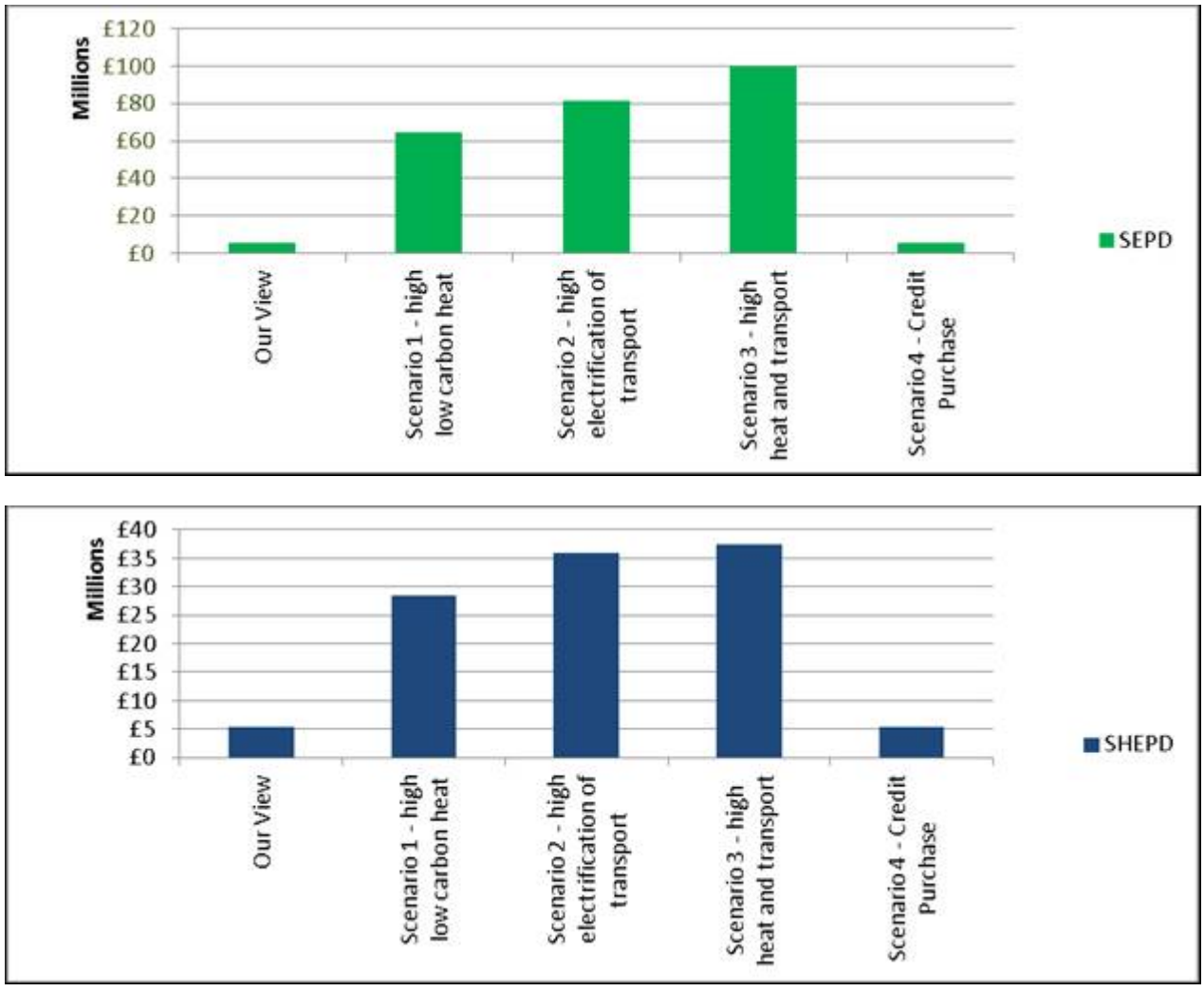
- the existing capacity of our networks;
- the change in this depending on different LCT uptake scenarios (based on DECC scenarios); and,
- predicts the point at which investment is required.

It then considers both conventional and innovative solutions, their likely impact and cost.

More details on how this model works, the different scenarios and solutions and its outputs are laid out in our associated Domestic Low Carbon Technology paper.

The high level results of an incremental solution to the alternative DECC scenario are presented on Figure 5 below.

Figure 5. Modelled DECC Scenarios



DECC Scenarios:

- Scenario 1 – High low carbon heat
- Scenario 2 – High electrification of transport
- Scenario 3 – High Heat and transport
- Scenario 4 – Some uptake of heat and transport but with credit purchase to fulfil obligations

Having considered the alternative results quantified by this work together with our own experience, stakeholder views, knowledge of developer plans and local planning requirements we have come to an informed view of the likely uptake and costs required to connect LCT during RIIO ED1. Our decision is based on a low LCT uptake (most closely aligned to DECC Scenario 4) with an approach that resolves issues wherever possible through incremental innovative solutions.

We are committed only to spend money where absolutely necessary and to actively seek innovative solutions wherever possible. Not only does this most closely mirror our experience and knowledge but we believe it also reflects our commitment to prudent and efficient expenditure.

We therefore predict and have built into our business plan an increased expenditure of £5.5 million in SHEPD and £9.0 million in SEPD during RIIO-ED1 in additional reinforcement costs to allow for the uptake of LCT. These costs will be recovered from all customers through DUoS charges.

In order to now deliver this we require continuing development of innovative network solutions. More details on how we will identify and develop these together with the cost benefit analysis included in this are laid out in our associated Innovation Strategy. Some examples of innovations ready for deployment in RIIO ED1 for on our low voltage networks are listed below:

- The Esprit – a plug-in device which manages car charging on a low-voltage network to avoid overloading by co-ordinating when individual chargers are on/off.
- LV Regulator – a device installed on the low voltage network that automatically addresses high or low voltage issues in real time.
- Targeted LV Network Monitoring – measures utilisation of low-voltage network “hot-spots” to identify where intervention may be required to avoid overloading or unnecessary reinforcement.

This work is showcased in our Thames Valley Vision low carbon networks fund project. Here, in addition to trialling specific devices, we have installed extensive network monitoring to inform our proposals. This is in preparation for RIIO ED1 and will allow us to:

- Understand consumption behaviour to determine potential network issues
- Anticipate future changes to identify new network management requirements
- Support the necessary changes to network management through new technology and commercial solutions

Central to our innovation strategy is an Innovation matrix summarising the range of innovations we are considering, developing and evaluating. This matrix is aligned with each area of business expenditure

including connections and clearly shows where we expect the principle benefits of each innovation to appear. This matrix also forms part of our associated Innovation Strategy.

We will continue to develop and apply these and other innovative solutions to ensure that all connections are provided by making use of innovative and flexible connections wherever available.

Reinforcement

Updates to July 2013 Business plan

In response to the feedback from stakeholders, and in particular from Ofgem following their initial assessment, we have undertaken a review of our ED1 reinforcement forecasts. This has included a review of:

- Scheme needs case
- Options considered and solution proposed
- Incremental investment options embedded e.g. low loss transformers
- Innovation potential during ED1

As a result we have reduced our reinforcement ask by £17.4m over ED1 while ensuring we continue to meet all our demand driven requirements.

We have identified within our plan that a proportion of the Primary reinforcement requirements are driven by the need to replace and reconfigure key network assets. They have been reported as reinforcement in keeping with Ofgem guidance on business plan tables. These two schemes are:

- North Hyde
- Leamington Park

Together they represent almost £13m of investment adding 123MVA of capacity. As they are asset condition driven they represent no increase in demand. We believe this could distort the evaluation of investment efficiency and therefore should be accommodated in future iterations.

Figure 6. Reinforcement investment proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Primary Network				
Substation	47.0	16.6	7.3	
Circuit: n-1	51.5	15.6	(11.6)	
Circuit: n-2	57.1	0.0	(7.4)	
Secondary Network				SEPD and SHEPD General Reinforcement justification papers
Substation / Circuit	68.8	17.0	0.0	
Fault Level	5.2	0.0	(2.4)	
Other (*inc DSM*)	3.6	2.5	0.0	

Reinforcement overview

Reinforcement is the process by which we increase the capacity of our network to carry energy to or from a particular point. It involves upgrading existing assets, or constructing new circuits to augment the power that can be transfer to or from a particular area.

Increasingly we are deploying innovative methods of managing the physical limitations of our circuits through the use of Statcoms and active network management systems. We are particularly focussing on innovative effort in this area; this is effort which we believe will provide very good returns for our customers by keeping the cost of reinforcing our network low.

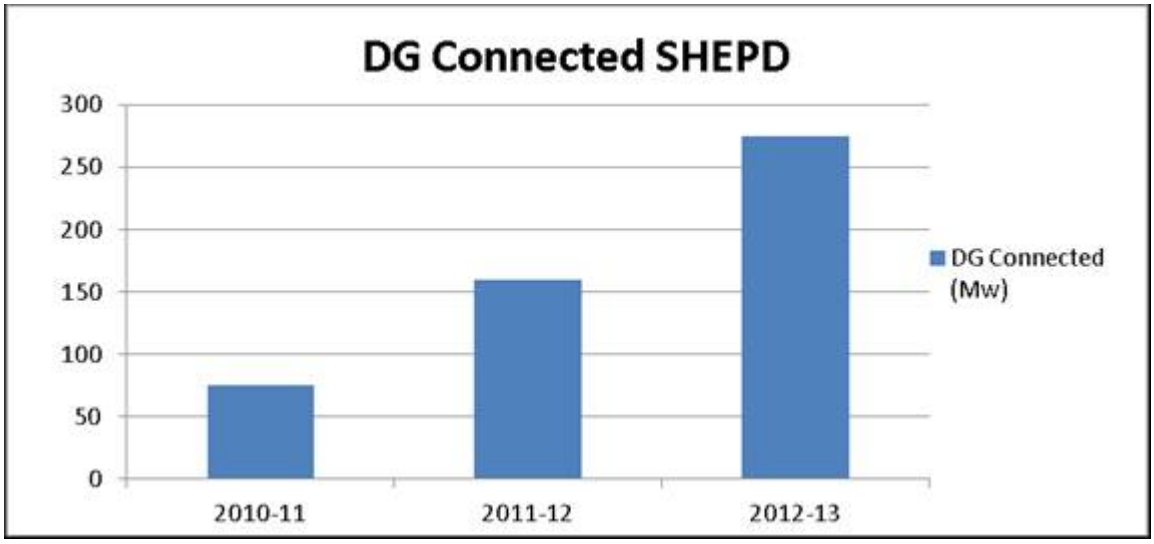
By way of example one single innovation project on Orkney, an active network management system, has allowed us to avoid £30m of expenditure for an innovation which cost £500k to deploy during DPCR 5. Without this lower cost solution it is unlikely that much of the 25MW of renewables connected would have been viable for the developers, many of whom are community groups.

Our overall expenditure for reinforcement for SEPD is decreasing relative to DPRC5 on an annualised basis. However, it is increasing on an annualised basis for. Full details are available in the associated justification papers.

Renewables – Impact on Reinforcement

In the SHEPD area the majority of growth has been a combination of individual wind generators and larger wind farms. Increased public support, improved planning consents backed up by government incentives have accelerated this growth. During 2012 and 2013 the Feed-In incentives and the improved availability of low-cost photovoltaic (PV) units has driven considerable growth in both domestic-scale installations and more recently in large-scale PV farms; mostly in our SEPD area.

Figure 7. Growth in Distributed Generation – DPCR5



We predict that around £6.5 million of reinforcement will be required to accommodate new DG in the RIIO ED1 period, with £2.1 million funded by the connecting customers with the remaining £4.3 million to be funded through our load-related reinforcement expenditure

In our SHEPD area many of our networks have now run out of capacity and require reinforcement to allow more DG to connect, but the high cost of this reinforcement is a barrier to further schemes. The cumulative affect of many small, medium and large DG installations will also require reinforcement of the connections between our distribution networks and the transmission network with modified or new transmission connection points (Grid Supply Points or GSP's). In our SEPD area growth in PV installations has generally been within networks where capacity is available, but if growth continues this situation is likely to change in the near future.

Low Carbon Technologies – Impact on Reinforcement

Low Carbon technologies are those technologies that are being encouraged to reduce carbon emissions. These technologies regularly bring with them a network related challenge. In the case of electric cars this relates to multiple cars simultaneously charging in the same street and overloading a network, this can also be the same for heat pump technologies where customer are replacing non electric system like oil heating. Similarly there are number of challenges associated with new energy exporting technologies like solar panels and micro wind all of which can trigger the reinforcement of our networks particularly at a local level resulting in extensive and expensive underground cable replacement programmes.

We have focussed a large proportion of our innovation strategy on addressing these issues and finding innovative ways of avoiding having to dig up street to allow our customer to charge their electric car, our “My Electric Avenue” project is a good example of this.

Based on the predictions from modelling described in our Transform and connections papers we estimate the impact of this type of growth will require £4 million of additional reinforcement will be required to accommodate this during the RIIO-ED1 period in our SHEPD area, with an equivalent £8 million in our SEPD area.

Low Carbon Technologies – Reinforcement funding

Within RIIO Ofgem’s stated policy is to socialise the funding of reinforcement work necessary to enable the connection of Low carbon Technologies. At a domestic scale, based on data on new connections applications from our PROMIS system we estimate this will require additional investment of £9 million in our SHEPD area and £11 million in our SEPD area during the RIIO-ED1 period over and above levels in DPCR5 5. This is part of our Secondary network reinforcement forecast.

Transmission Connection Point Charges

Update to July 2013 Business plan

The charges incurred for transmission connection points are heavily influenced by the location and volume of distributed generation (DG). The overwhelming concentration of ongoing TCPC sites is in our Scotland network. Network configuration coupled with low levels of local demand increases the requirement for a transmission solution.

Since July 2013 we have reviewed the justification for the gross asset value (GAV) and number of connections. This continues to show that transmission charges represent a material ongoing cost for SHEPD

through out ED1. We have adopted a more conservative position on forecast volumes and costs. These volumes and costs are considerably below the range of potential new and upsized connections.

This necessarily exposes our ED1 cost base to an increased level of risk. We consider this to be an acceptable position in light of the ongoing national debate on the development of low carbon generation solutions. The forecast programme represents a number of sites which are already committed to plus those for which there is considerable evidence that they will progress.

For ED1 Ofgem have proposed a load uncertainty mechanism which we support. This provides some assurance should the demand for connections in Scotland accelerate further. However we will be exposed to the uncertainty of timing and a materiality threshold of 20%.

For further information please refer to our supporting TCPC paper.

Figure 8. Transmission Connection Point Charges (TCPC)

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Transmission Connection Point Charges				
Ex-ante allowance	4.3	54.6	(17.0)	TCPC
Pass through - non controllable	105.8	131.6	(25.6)	

ED1 forecast

Ofgem's March 2013 Policy document outlined that during ED1 the DPCR5 pass through mechanism for all Transmission assets installed prior to 1st April 2015 would continue. Ofgem decided that for Transmission connections initiated by DNO's after 1st April 2015 there should be some form of ex ante incentive for DNO's to manage the costs. It is believed that DNO's via ongoing dialogue with Transmission operators should have a degree of certainty over future work and level of charges. Therefore all schemes in ED1 that are initiated by the DNO should be included within the ED1 Totex ex ante allowances.

Due to the significant increase in scale of the Transmission infrastructure in SHEPD's area to facilitate the growth in renewable generation it is forecast that there are 23 additional Transmission connections, including 8 new GSP sites, forecast to connect between April 2015 and March 2024. Of these, 14 will connect within the first four years of ED1. This will require an ex ante allowance of £57.3m in ED1.

High Value Projects

Update to July 2013 Business plan

We have reviewed and enhanced the justification for the single scheme qualifying as a high value project within our ED1 forecast. There is no change to the forecast expenditure in this area from our July 2013 submission.

Figure 9. High Value Projects

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Bicester - 132kv substation	28.5	0.0	0.0	Bicester HVP

ED1 forecast

We have one high value project addressing Load related issues at Bicester 132kv substation. This project requires an expenditure of £28.5m in RIIO ED1. Full justification paper on this scheme has been prepared and submitted to Ofgem as part of our business plan.

Network Investment costs (Non Load Related)

Overview

We remain committed to delivering a reliable and safe network service through out ED1. The volumes and costs proposed within this proposal remain consistent with our previous version and are required to ensure we will meet our regulatory commitments.

We have recognised that not all our expenditure forecasts were fully explained in our July paper. This is addressed comprehensively within our revised plan. Our paper, Be efficient, outlines the various building blocks on which we are able to assert the efficiency of this plan. Further reference to our CBA annex and accompanying catalogue of models will demonstrate the quality of our investment decision process.

Figure 10. Non Load Related investment proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Asset Replacement	470.4	204.8	(8.5)	Reliability outputs and annex
Asset Refurbishment	94.6	28.4	0.0	Reliability outputs and annex
Diversions	55.3	3.5	0.0	
Civil Works	38.3	14.4	0.0	
Legal & Safety	26.2	10.2	0.0	
Operational IT and Telecoms	23.0	14.0	3.0	SSEPD ICT Strategy Supporting Paper

Asset Replacement

Update to July 2013 Business plan

As with our reinforcement proposals we have use the opportunity from the time when our initial plan was submitted to review the appropriateness of our forecast volumes and associated costs. We continue to believe the volumes of interventions are reflective of the current and forecast health of our network assets. Combined with a view of the criticality of key assets the modelled workloads are at the levels required during ED1.

Innovation: We have also demonstrated where, in some instances, we are able to adopt a lower level of replacement activity than conventional forecasting would direct. In particular the reader is directed to our Innovation Strategy. Examples, such as Wool pole condition monitoring, highlight the considerable volumes saved during ED1. IN this instance over 2,000 pole replacements avoided due to the targeted application of an innovative solution.

Cost benefit analysis: Our CBA annex and supporting models also demonstrate why we have elected to adopt a refurbishment solution rather than traditional replacement. Examples such as 132kV Transformer replacement versus refurbishment are considered within this document. This shows that, contrary to wider industry practice, with the correct level of targeted investment an effective refurbishment solution is possible. This in turn delivers considerable savings on replacement projects deferred at least 10 years.

LV Consac: Further detailed evidence and justification has been provided for the levels of LV Consac cable overlay during ED1. This investment is a continuation of our approach during DPCR5. It is a proactive solution to an ongoing issue with high levels of failure in cable of this type. We demonstrate that through our monitoring of network failures, hot spots and the targeting of concentrated sections of deteriorating network we are able to maintain fault rates at a manageable level avoiding considerable ongoing operating costs and persistent customer interruptions.

Sub sea cable: The lengths forecast for ED1 are derived from detailed knowledge of the current condition of these critical network links. Our paper illustrates the impact of faults on both our HV and EHV sub sea cable network and why we have selected the particular assets listed to prevent prolonged and very costly disruption to our customers on island networks. Movement between EHV and HV volumes between price controls is in direct response to the assessed asset condition demonstrates we are targeting investment where and when it is required, not simply in proportion to historic levels of activity.

The reduction in Asset Replacement expenditure highlighted below reflects our decision to address a proportion of the EHV cable replacement activity in DPCR5 rather than defer to ED1.

Figure 11. Asset Replacement expenditure

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
LV Network				
Overhead Line - pole	62.1	26.5	0.0	
Cable - Consac	72.6	6.7	0.0	
Cable - Other				
Switchgear & Other	9.6	2.6	0.0	
HV Network				
Overhead Line - pole	21.4	32.7	0.0	
Cable	55.9	31.5	0.0	
Switchgear	45.1	21.6	0.0	
Transformer	8.6	12.8	0.0	
Other	2.1	0.1	0.0	
EHV Network				Reliability output paper, annex and supporting justification papers
Overhead Line - pole	10.5	9.0	0.0	
Overhead Line - tower	4.3	0.8	0.0	LV Consac justification Paper
Cable	41.4	28.8	(8.5)	Submarine cable justification paper
Switchgear	26.9	13.4	0.0	
Transformer	42.5	17.9	0.0	
Other	0.3	0.3	0.0	
132kV Network				
Overhead Line - tower / pole	38.1	0.0	0.0	
Cable	5.5	0.0	0.0	
Switchgear	4.0	0.0	0.0	
Transformer	18.7	0.0	0.0	
Other	0.0	0.0	0.0	
Other	0.8	0.0	0.0	
Total Asset Replacement	**470.4**	**204.8**	**(8.5)**	

Replacement Strategy

Asset replacement makes up one of the larger part of our programme. In the transition to RIIO ED1 we require an additional 12% on an annualised basis against our DPCR5 allowance.

Our stakeholder engagement programme has given us support for the strategy of keeping the health of our assets at a constant level rather than investing more or less to change the network health. On this basis the scale of delivering our core programme has remained constant for the bulk of asset types and in a number of areas our efficiencies have brought the unit costs of these activities down.

Our asset management methodologies have however highlighted a number of specific asset types that require particular attention during RIIO ED1; these are the primary reason for the increases in our expenditure ask during RIIO ED1.

The same efficiency measures that have allowed us to be able to manage and minimise our reinforcement costs down (see later) has resulted in a relatively low increase in the costs associated with asset management in comparison to volume increase. The range of factors affecting these costs is complex and can be explored in the relevant papers listed above.

The asset groups which are attracting additional investment in RIIO ED1 include:

Pro-active Consac Cable Overlay

In SEPD we are proposing to replace 303kms of Consac cable at a cost of £46m. This cable was laid between 1976 and 1982 and is known to have a high fault rate due to the defective resin used in the joints at that time. This has resulted in the joints becoming porous and causing short circuits and, in some instances, neutral faults. Through effective risk management SEPD has recognised the need to remove this cable from the network and has invested money to remove the potential safety risk.

We are continuing to manage this programme through traditional asset replacement and more innovative asset management techniques such as the ‘Bidoyng’. The Bidoyng has the key features of being capable of auto-re-closing and determining a failing cable within the energised network. SEPD can then be cost effective with its asset replacement by targeted network requirements. The Bidoyng system also provides; remotely replacing fuses within the network, improved safety/protection and increased efficiency of supply restoration. The Bidoyng allows SEPD to restore circuits within 3 minutes, reducing the CML’s and improving the service to our customers. The system further benefits from being portable as it can be relocated to another site without loss of functionality.

Submarine Cables

In SHEPD we are proposing to replace 112km of submarine cable in the period at a cost of £44.8m, we intend to replace these cables with larger cables to reduce losses and reduce export constraint to reflect the

load demand on the network thereby leveraging our expenditure to provide more of the benefits that our stakeholders are looking for.

Legacy Network

We have a number of old, non standard, networks in SEPD which were installed in the 1930s and 40s, these are becoming increasingly difficult to maintain and operate and present a number of safety related issues that are not sustainable. As a result we are proposing an expenditure of £5.3m to address the 25 remaining legacy networks in our SEPD area.

Overhead Towers (132kV)

SEPD have a significant population of Steel Towers predominantly supporting our 132kv network. The health of these towers is now such that they warrant comprehensive refurbishment and replacement on what are usually high criticality circuits. We are proposing to spend £38m replacing tower lines and associated components. Please refer to our additional papers on network reliability and health and criticality.

66kV gas filled cable

We are proposing to spend £31 million in SEPD replacing our aging 66kv gas filled cables. These cables are approaching the end of their useful life and have a high level of criticality and as a result warrant replacement as a priority within RIIO ED1.

Undergrounding of Overhead line – not driven by Scenic beauty

We have proposed a programme to underground 500km of overhead line at a cost of £30m in SEPD during RIIO ED1.

SSEPD owns almost 60,000 km of overhead line operating at voltages from LV to 132kV. Most rural networks built over the last fifty years have been largely overhead lines due to reduced cost of construction compared with installation of underground cable. However modern high-voltage cables are less costly than previous designs, modern installation techniques in open ground are less costly and underground cables are essentially maintenance-free.

Furthermore, overhead lines have a number of disadvantages compared to underground cable networks, e.g.:

- Higher operating costs, e.g. statutory inspections, maintenance and refurbishment
- High costs of tree-cutting coupled with increasing growth rates and difficulty securing owners' permissions to cut trees
- Safety risk of accidental contact with bare conductors (public) and risk of working at heights (staff)
- Cost of maintaining specialist off-road and access vehicles

- High vulnerability to adverse weather conditions and climate change e.g. storms, lightning and snow/ice
- Impact of extreme weather events causing large fault numbers and disrupting customer supplies for several days
- Environmental impact of poor visual amenity
- Impact of an EU ban on use of creosote on wood poles

Across all our engagement activities, 59% of stakeholders agreed that we should invest more in undergrounding lines to reduce the risk of future power cuts due to severe weather (22% disagreeing and 19% neither agreeing nor disagreeing).

Please refer to our additional papers on network reliability and health and criticality.

Asset Refurbishment

Update to July 2013 Business plan

We have proposed no change to our original refurbishment programme for ED1. The assets, volumes and associated costs forecast remain consistent with our expectations of ED1 requirements. This incorporates where we have made benefits based decisions to refurbish over replacement.

Figure 12. Asset Refurbishment

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
LV Network				
Overhead Line - pole	9.5	2.1	0.0	
Cable - Consac	9.8	0.0	0.0	
Cable - Other	0.0	0.0	0.0	
Switchgear & Other	0.0	0.0	0.0	
HV Network				
Overhead Line - pole	6.8	7.0	0.0	
Cable				
Switchgear	17.1	5.7	0.0	
Transformer	0.0	0.8	0.0	
Other	0.0	0.0	0.0	
EHV Network				
Overhead Line - pole	5.3	4.3	0.0	Reliability output paper, annex and supporting justification papers
Overhead Line - tower	6.3	1.1	0.0	
Cable	1.4	0.2	0.0	
Switchgear	0.0	0.2	0.0	
Transformer	7.2	4.9	0.0	
Other	0.6	2.3	0.0	
132kV Network				
Overhead Line - tower / pole	21.4	0.0	0.0	
Cable	4.0	0.0	0.0	
Switchgear	0.0	0.0	0.0	
Transformer	5.0	0.0	0.0	
Other	0.1	0.0	0.0	
Total Asset Refurbishment	**94.6**	**28.4**	**0.0**	

Refurbishment strategy

Our refurbishment programme covers a number of asset types from primary and secondary substations to overhead lines. We operate a series of routine refurbishment programmes utilising a number of condition based methodologies to promote and maintain the health of individual assets.

These programmes undertake sustainable maintenance programmes on our existing asset base, they are well established and the volumes relatively stable. Unit costs are being reduced as a result of efficiency, innovation and the benefit of our ongoing asset replacement programme.

The costs of refurbishment on an annualised basis are reducing by 20% primarily as a result of efficiency gains both in terms of our operational efficiency and our investment decisions.

The support documents listed above expand on the nature of the programme our policies and how innovation is playing a role in the way that we are refurbishing more efficiently.

Diversions

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

With continued uncertainty surrounding the Rail electrification programme impacting our Southern network we have not proposed any ex-ante allowances. Should the programme proceed we will work with all stakeholders to ensure the costs are passed through to rail users. Where networks are required to fund diversion or alteration work we will incur the expenditure until such a point as the uncertainty mechanism is activated. We have no guarantee that this trigger will be surpassed and this necessarily means we will carry increase risk of not recovering such costs.

Figure 13. Diversions

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Injurious affections, Wayleaves & Easements	18.3	1.2	0.0	
Diversion (easement)	35.4	1.9	0.1	SEPD and SHEPD diversion justification papers
NRSWA Diversion	1.6	0.5	0.0	
Rail Electrification	0.0	0.0	0.0	
Total	**55.3**	**3.5**	**0.0**	

ED1 forecast

Diversion expenditure relates to those costs that we incur relocating our equipment when a landowner or developer requests it be moved, this can be a statutory request through the New Road Streets Works act or a way leave termination. Similar costs for Injurious affections (Claims for property devaluation) are included in this section.

Terminations and Injurious Affections

Injurious affections are claims usually prompted by predatory agents with a view to gaining a commission for injurious affections associated with an overhead line in proximity to private property. Although there is increasing activity in these areas, costs and volumes are generally predictable, and are forecasted agreed and funded on an ex ante basis as part of each Price Control.

Our approach to these claims is to robustly defend these and, we believe, this has resulted in us being able to minimise the costs of these claims during the last 2 price control periods. This robust approach to dealing with claims will continue during ED1.

Claims for Injurious Affection have been ongoing for some years and have generally stabilised. As these situations have typically been related to tower claims, the majority of such claims are in our SEPD area. This reflects the fact that 132kV tower lines in the North are classed as transmission assets and are outside the Distribution Price Control.

We are seeing a general reduction in the unit cost of these settlements as a result of our active management of potential injurious affections.

We are starting to see claims coming through for wood pole lines that may well affect our position in the coming years, where the presence of these circuits may lead the landowner to claim that it has affected the value of his property. We have forecast increasing spend in this particular area during the ED1 period.

NRSWA Diversions

SSEPD must accept a proportion of costs where network diversions are required due to road widening. There are no known major road schemes in the SEPD area during the RIIO-ED1 period. Our forecast expenditure is based on historic data. An expenditure of £213k per annum is forecast; a total of £1.7m over the RIIO-ED1 period.

There are likely to be two major road schemes in the SHEPD area during the RIIO-ED1 period. The Aberdeen bypass will likely be a new road and diversion for highway charges only apply to road widening schemes so no costs are expected for this. The conversion of the A9 from Perth to Inverness to dual carriageway over its entire length will result in costs being accepted by SHEPD. These costs will be

apportioned as per the Scottish Government agreement and we expect these costs to be in the order of 18% costs to SHEPD, the remainder being funded by the responsible Government Authority.

The total estimated expenditure on Diversions for Highways in SHEPD are estimated at £0.5m over a five year period from 2018 to 2022.

Rail Electrification

The Rail network operators and Electrical network operators have legacy agreements relating to the custom of diverting overhead lines. There is currently a debate regarding the absorption of the costs associated with moving electrical network that is in proximity to railway lines programmed for electrification. In the case of Cross rail alone this could cost up to £35m. SSEPD are currently driving discussions at Government level, through the Energy Networks Association (ENA), to debate how these costs should be funded.

We have stated that it is our view that the costs should be funded as part of the rail electrification project and not passed on to customers through the Distribution Price Control. We estimate that this will have a significant effect on customers bills to be a material consideration and worthy of full and proper consideration at Government / Treasury level. We have not included any expenditure within our business plan for rail electrification. We have proposed a reopener on this issue and this is details within our Risk and Uncertainty paper.

Civil Works

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

In our efficiency paper we have pointed out that the benchmark unit cost adopted in future cost assessment iterations should reflect the inclusion of this activity within forecast reinforcement costs.

Figure 14. Civils

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Driven by site condition	31.6	5.3	0.0	
Driven by plant asset replacement	6.8	9.1	0.0	SEPD and SHEPD Civil justification paper
Total	**38.3**	**14.4**	**0.0**	

Civils

Our Civil works programme involves maintaining and inspecting buildings, fences, supports and ancillary services associated directly with our network. It is a relatively stable area of the business in terms of volumes and expenditure as a result of the long term and sustainable maintenance strategies we have had in place.

An additional element of our expenditure for RIIO-ED1 will be civil works associated with security enhancement of our Primary substations. This is being spread over 8 years and includes £7.4 million for our SEPD licence area where 318 substations will benefit; it also includes £1.5m for enhanced security doors at 300 sites in the SHEPD Area. Costs for this are apportioned between "Legal and Safety" and "Civils" to reflect the element of betterment associated with the security upgrade.

The result of this policy decision and our generic efficiency improvements is a relatively static expenditure in the transition from DPCR5 to RIIO ED1.

Legal & Safety

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

Figure 15. Legal and Safety

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Asbestos	13.0	1.9	0.0	Legal and safety justification paper
Site Security	7.0	2.8	0.0	
Compliance activities	6.3	0.4	0.0	
Total	**26.2**	**5.1**	**0.0**	

Legal & Safety

Our legal costs are composed of costs associated with Site Security, Asbestos Management, Safe climbing fixtures, Fire protection, earthing upgrades and confined space mitigation. The two main areas of movement between DPCR5 and RIIO ED1 are asbestos and security.

Asbestos

The increased costs are driven by changes in regulations and also a gradual deterioration in our asbestos sites meaning that traditional low cost mitigations are no longer the lowest cost or safest solution. As a result we have proposed a comprehensive programme to deal with asbestos in our sites during RIIO ED1. This programme will involve remediation or removal work at approximately 22,000 substation at a cost of £15m.

Security

The increased costs are driven by security trends and economic circumstances. We are forecasting and seeing an increase in criminal attacks on our network assets usually motivated by metal theft attempts. We anticipate as the value of metals increases in coming years and possibly encourage by economic stagnation we anticipate our substations will come under increasing attack by criminals and as a result we are investing in upgrading security in a significant number of our key sites.

Operational IT and Telecoms

Update to July 2013 Business plan

We have updated our operational and non operational IT and Telecoms forecast for ED1. Our revised confidential strategy paper outlines what we propose to deliver and the costs for each component. Please also refer to the Indirects section later in this document.

Figure 16. Operational IT and Telecoms

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Operational IT and Telecoms	23.0	14.0	3.0	IT and Telecoms supporting paper

Network Investment costs (Non core)

Overview

In our March 2014 plan we have provided comprehensive evidence justifying the continued investment to deliver environmental benefits for our customers through ED1. These focus on the reduction of network losses and the elimination of carbon emissions.

We are not proposing a significant programme of discrete investment in loss reducing plant and equipment therefore have not shown the costs or volumes within our ED1 environmental reporting tables, CV12. Incremental costs associated with investment in environmentally beneficial network solutions continue to form part of our core replacement and reinforcement forecasts.

Figure 17. Non core investment proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Flooding	19.8	0.7	0.0	
Environmental	18.0	10.4	0.0	Environmental outputs
Other Non core investment	13.8	11.1	0.0	

Flood Prevention

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

Figure 18. Flooding investment

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Flood mitigation schemes				
HV	0.0	0.0	0.0	
EHV	16.8	0.7	0.0	
132kV	2.7	0.0	0.0	Environmental outputs
275kV & 400kV	0.3	0.0	0.0	
Flood mitigation schemes	**19.8**	**0.7**	**0.0**	

Our Flood risk mitigation programme is a continuation of our DPRC5 programme; it aims to address the risk of flooding affecting large numbers of customers. Using data from the Environment Agency (for England and Wales) and Scottish Environmental Protection Agency (for Scotland), we have been able to identify which of our substations are at risk of flooding, and may result in the loss of supply to our customers. In order to provide the best economic return, flood risk mitigation has been targeted at our more critical substations for which emergency alternatives would be technically challenging so we have focussed on grid and primary substations and not at local secondary substations.

Based on the latest update from the Environmental Agency issued in April 2013 we have re-assessed sites impacted and identified a further 398 sites which may require mitigation. Based on experience during DPCR5, we expect 133 of these sites to require civil and / or electrical remedial work during RIIO-ED1 at an estimated cost of £21m

In our SHEPD area, flooding data was not initially available from SEPA for the start of DPCR5, and this has been developed later. Civil surveys are now complete and this indicates that 15 sites require specific action to be taken. In the majority of cases only minor intervention is required and we are confident that this work will be completed by the end of DPCR5 for an expenditure of £0.8M.

Figure 19. Flood prevention intervention planned

	Activity	RIIO Forecast Expenditure (£m)	Sites Addressed
SHEPD	Flood Mitigation	1	15
SEPD	Flood Mitigation	20	157

Environmental: Technical Losses and other Environmental

Update to July 2013 Business plan

We have not altered our funding proposals for specific environmental mitigation investment from our initial ED1 plan.

Our expanded Environmental outputs paper and accompanying CBA annex and models demonstrate our current environmental credentials in targeted losses reductions. Our benefits summary clearly shows the ongoing societal value created by maintaining our current network losses procurement and design strategy during ED1. We forecast that by continuing to invest marginally more in loss reducing assets we will be able to avoid 739 GWh of network losses over the ED1 period

The benefits in losses avoided and associated carbon emissions reductions are achieved at minimum additional expenditure by being integrated into our wider programme or replacement and reinforcement works. We have demonstrated from our historic performance that we will be able to continue to deliver these sizeable benefits.

We continue to believe our forecast for selective oil filled cable replacement is justified by the need to eliminate the damage caused to the local environment by the worst of these incidents. The volumes are small proportion of the total over all oil filled cable network.

Figure 20. Environmental management investment

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Oil pollution mitigation schemes	14.4	9.3	0.0	
SF6 emitted mitigation schemes	0.0	0.0	0.0	
Noise pollution	1.7	0.0	0.0	Environmental outputs
Contaminated land clean up	0.4	1.1	0.0	
Technical losses reduction	1.4	0.0	0.0	
Total	**18.0**	**10.4**	**0.0**	

Environmental strategy in ED1

This category includes expenditure in Oil pollution mitigation, SF6, noise pollution and losses reduction. We are proposing to increase our expenditure in this category on annualised basis by 74% in SHEPD and 26% in SEPD. The environment is an important consideration for both us and out stakeholders.

Oil Losses

We are spending £27m on oil mitigation and schemes to reduce oil loss by 15% and manage environmental damage. This reflects the feedback from stakeholders that pollution reduction is important and should be undertaken economically. By proactively managing our worst oil filled cables and substations we are able to ensure that we achieve the maximum reduction in spill risk for the money that we invest.

In relation to fluid filled cables we are restructuring our expenditure in this area to adopt a more proactive approach to managing high risk assets as described in Managing our environmental impact and our Fluid filled cables Scheme papers.

Our stakeholders have clearly expressed that they expected us to manage our environmental impact, that this should be done efficiently and present customers with a benefit.

In our environmental outputs paper we have described how, by moving to a programme of selective oil filled cable replacement based on risk and impact, we can both reduce the probabilistic loss of oil and drive a more cost efficient programme of cable replacement when contrasted with our current reactive approach. We believe this approach is aligned with the feedback we received from our stakeholders in relation to this topic.

As stated previously we actively seek to improve our efficiency by designing schemes which are able to achieve multiple outputs thereby ensuring efficiency. In SEPD we will be replacing an existing high oil loss cable with 80km of new cable to reduce oil losses. This new cable will also be sized slightly larger then necessary in order to also achieve a reduction in technical losses, this is a cost effective leveraging of expenditure to achieve multiple outputs

Innovations such as the self reconfiguring networks and the development of Active Network Management systems to link times of local renewables generation with times of local demand are all aimed at both reducing the need for network reinforcement. They do this by significantly reducing the MW*KMs (the distance and amount we transfer energy) associated with the movement of energy from source to sink. We believe this is by far the most effective means of reducing losses on the network and as such is a core aspect of our innovation programme appearing in our “top 20” innovations.

SF6 Leakage Rate

Our commitment to reduce our SF6 leakage rate is driven by feedback from our stakeholders and by legislative changes proposed by the EU. Through our Innovations group we are actively pursuing alternatives to SF6 gas as well as trialling new leak detection technologies. These innovations are in their infancy, so in the meantime we monitor and review all our SF6 assets on a quarterly basis to identify problem units early and design an intervention, either refurbishment or replacement, that will eliminate any further loss of SF6. Further details are given in our Environment paper.

Technical Losses

Our stakeholders have told us that they would expect us to reduce losses on the network where this is economically justified.

Our **Strategy during DPCR5** has been to substitute standard plant and cable for low loss equivalents on suitable reinforcement or asset replacement projects. **Optimal network configuration** is also an integral part of our Asset Replacement and General Reinforcement work (where safe and economically efficient to do so). This has been **effective** and we will continue with this strategy.

Alongside this we will continue to develop and implement, where appropriate, a range of innovative solutions and new technologies these are described in more detail in Managing our environmental impact and our Innovation Strategy.

Other Non Core Investment

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

Figure 21. Other Non Core Investment

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
ESQCR	0.0	2.5	0.0	
Black Start	2.4	4.1	(0.1)	Black start justification paper
Rising Mains and Laterals	7.3	2.6	0.0	BT21CN Rising Mains and Laterals justification paper
BT21CN	4.0	1.8	0.0	
Other	0.0	0.0	0.0	

ESQCR

Our allowed expenditure for ESQCR (Electricity Supply Quality and Continuity Regulations) in DPCR 5 was a £43m programme. This will reduce to £2.6m in RIIO ED1.

ESQCR spend is predominantly related to a programme of work to remove and mitigate legacy clearance issues on our overhead line. The ESQCR regulations set the standards by which we are required to operate our network and includes a range of requirements from safety signage, electrical clearance from ground and buildings etc. As a result of alterations in the regulations during DPCR4 we established a programme of remedial work to rectify a large population of clearance defects.

As a result of our extensive programme we are anticipating a significant drop off in this programme during RIIO ED1 in SHEPD with a final 4,500 sites requiring rectification and in SEPD we are expecting the programme to be completed before we enter RIIO ED1. After this point we will continue to rectify clearance issues as part of our routine remedial programme that through inspection and reporting identifies spans of overhead line where clearances have been altered or land use changed. Table 10 shows the remaining

expenditure for SHEPD on ESQCR during ED1. This is in line with our submission as part of the ESQCR reopener.

Black Start

Black Start provision in our substations is a licence obligation; we are required to be able to restore our network after the loss of the UK power system. In such an event our substation would require to function without power long enough for the main UK network to be restored and stabilised, in such an event this could be a prolonged period. We are upgrading our substation auxiliary systems to provide improved battery and standby generator provisions to allow for such a scenario. We believe this expenditure to be driven by mandatory requirements.

In SEPD we are forecasting a 25% increase to £5m relative to DPCR5, allowing us to complete work on our network by 2018.

In SHEPD we will undertake our entire Black Start programme in RIIO ED1 with completion by 2020 at a forecast cost of £3m.

Rising Mains and Laterals

Rising mains and laterals are the cables within customers' property but owned by SSE. These cables carry power from a single building connection point through the building to the individual flats. They are complicated assets to manage with multiple ownership and access issues linked to the history of individual properties.

SEPD owns 950,000 rising and lateral mains in apartments. Of these, approx 79% have been rated as having a health index of 1 or 2. This indicates that these assets are in a good and serviceable condition and no replacement is necessary. 14% have been categorised as 3 which indicates a need for ongoing monitoring of their condition. The remaining 7% falls into categories 4 and 5. These assets will require intervention in the next 5 years.

SEPD is increasing it's spend 21% and SHEPD 40% to manage the health of these assets.

BT21CN

In DPCR5 we did not request any allowance for BT21CN.

British Telecom through their BT21CN project are upgrading their communications infrastructure protocols. As a result the time delay or "latency" for signals will become too slow to provide the control that we require

for many of the protection systems on our network. We considered replacing a number of these communications circuits in DPCR5 to ensure that we could maintain the functionality that we needed however in the interest of efficiency we decided to work with BT to establish if a solution making use of the existing infrastructure and commercial arrangements was achievable. This allowed us to, as a minimum, defer expenditure on this category through the DPCR5 period. Our decision has been vindicated and we have achieved a deferment of costs for customers at no risk to the network however we have not been able to identify a sustainable solutions that will allow us to avoid new communications infrastructure.

We are now asking for funding to resolve this issue in RIIO ED1; we estimate that we will require spending £4m in SEPD and £2m in SHEPD during ED1.

Network Investment costs (Stand alone)

Overview

The categories, summarised below, are not subject to the totex incentive mechanism during ED1. Our proposed expenditure to improve service to our worst served customers has increased from DPCR5 levels. However, we believe tackling the persistent poor service levels of our worst served customers in the North of Scotland is an investment which can not be deferred indefinitely. When considering all associated costs and benefits which will accrue over this and subsequent price controls we believe this intervention delivers a net value and merits associated allowances during ED1.

Figure 22. Stand alone network investment costs

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Worst Served Customers	7.4	26.1	(20.1)	
Undergrounding – visual amenity	9.2	5.2	0.0	

Worst Served Customers

Update to July 2013 Business plan

In response to stakeholder feedback we have revised our proposals for addressing the areas of worst served customers within our Scotland network. We have demonstrated that both costs and benefits have been incorporated into our decision process and therefore the proposed expenditure represents a significant value for our customers.

Figure 23. Worst served customer forecast

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
North Scotland Worst served – 4 projects		25.2	(16.8)	
Worst Served Customers mechanism - SSEPD		0.0	(4.0)	Worst Served Customer Supporting Paper
Worst Served Customers mechanism - SEPD	7.4		(0.2)	

We are investing in improving the service to our Worst Served customers in RIIO ED1. Although we have consistently invested in improving the reliability of our network this targeted approach will be an area of increased expenditure for ED1.

We believe our plans to improve supply reliability and reduce the number of interruptions for customers generally will also reduce the number of customers in the worst served category during RIIO-ED1.

SSEPD have WSCs in both our SEPD and SHEPD areas totalling 32,500 from the period 2010 to 2012. We are proposing to invest £7.4M in SEPD to reduce our number of WSCs by up to 2,400 during the period of RIIO-ED1.

In our SHEPD area, we have a specific group of WSCs incurring a high number of interruptions. SHEPD have identified specific circuits with a high density of WSCs where customers are incurring between 12 to 33 interruptions over the three year period from 2008 to 2010 and looking at further three year periods, these customers continue to endure a high number of interruptions on an ongoing annual basis. SSEPD consider it unacceptable for these customers to continue suffering interruptions to their supply on such a regular basis and therefore propose to invest above baseline costs to reduce the number of interruptions to below the WSC criteria by proposing expenditure to target specific schemes that will significantly reduce the number of WSCs in SHEPD's remotest parts of the network.

Therefore in addition to WSC improvement investment, SSEPD will propose to invest a further £25.2M towards expenditure in four areas within SHEPD thus removing an average of 3,400 WSCs.

In choosing the areas to target, we have also considered what other benefits can be accrued from selecting these circuits, such as providing compliance with security of supply standards, improving the network's capacity for connecting further renewable generation and environmental benefits from decommissioning diesel generating stations thus establish a greater benefit from the investment. This will ensure that we will be improving service to our WSCs in the most efficient way whilst meeting our stakeholders' requirements of minimising expenditure. Our plans are outlined in the table below.

In summary SSEPD propose to invest £32.5m to reduce the number of WSCs by up to 5,800.

Undergrounding – visual amenity

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

Undergrounding within/ outside designated areas for visual amenity.

The overriding opinion of stakeholders, including Ofgem, is that we should be doing more work in this area. To date within the DPCR5 period our spend on dealing with undergrounding in designated areas has been 3.1km in our SEPD area having been completed at a cost of £0.52m. This total is forecast to increase by the end of the period. During Focus Group Consultation, there was a universal perception that undergrounding was either 'important' or 'very important' for visual amenity. During our second consultation, the majority of respondents support our stakeholder-led approach to address concerns around visual amenity. One key stakeholder responded that it "supports the stakeholder-led approach to address concerns around visual amenity and applauds SSEPD's ambitions to be the industry leader in this area". Other stakeholders wished to ensure that factors important to them, such as the historic environment, were considered as part of the selection process.

We intend to spend £5.5m and £9.6m respectively in SHEPD and SEPD undergrounding approx 90km of our overhead network. The selection of these circuits is not predetermined and will be guided by a stakeholder lead selection process and will focus on lower cost 11kv overhead lines.

Network Operating Costs

Overview

Through targeted investment of our replacement, refurbishment and reinforcement programmes coupled with the application of innovative solutions and a commitment to ongoing efficiency we believe we can constrain our network operating costs (NOCs) at levels broadly consistent with our expenditure during DPCR5.

When considered alongside the conditions experience during the winter of 2013/14 and the improvements in customer interruptions standards required during ED1 this represents a challenge, but one which we are confident we can meet.

Figure 24. Non core investment proposals

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Trouble Call	163.7	96.7	0.0	Trouble call justification paper
ONIs	55.0	9.7	0.0	
Severe Weather- Atypical	8.0	8.0	0.0	
Inspections & Maintenance	123.6	32.1	0.0	I & M justification paper
Tree Cutting	124.6	53.0	0.0	Tree cutting justification paper
NOC's other	8.2	61.4	(0.8)	
Total	**483.1**	**260.9**		

Trouble Call

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

ED1 forecast

We expect to keep costs at current levels in this area with underlying fault levels remaining relatively constant through the period.

In order for SSEPD to provide world class service to our customers, we need to be able to provide a reliable supply of electricity, with extreme weather events being of no exception. Maintaining continuity of supply depends on having networks in good condition, as a consequence, SSEPD expends significant time, money and effort looking after its assets.

Reduction in CIs and CML remains a priority for SSEPD, and we continue to drive for rewards which will fund our future investment in this area. For the RIIO-ED1 period we see this as our focus for investing further in the areas that require further improvement and to continue to be rewarded against Ofgem's challenging targets.

With the change to the normal weather standard (Regulation 5) from 18 to 12 hours, there will inevitably be an increase in expenditure in the area of asset repair. A proportionate number of faults will see the focus move from full repair to initial restoration of supply via alternate methods; this will inevitably result in multiple visits and an upward driver on costs. Whilst this is the case, SSEPD will aim to review processes and available technologies to continue to drive the required efficiencies, thus keeping overall costs down.

Some areas of current focus for SSEPD and within RIIO-ED1 are:

- Advanced distribution automation – network reconfiguration
- Weather impact and response modelling tools
- Smart metering
- Self reconfiguring High Voltage networks
- Advanced fault passage indicators
- ENMAC mobile

Full details of our approach can be found in our "Trouble call supporting paper"

Occurrences Not Incentivised (ONIs)

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

ED1 forecast

ONIs are fault driven costs, with relatively stable volumes including

- Emergency Disconnections
- Streetlights/Street Furniture/Unmetered Services/Unmetered Cut Outs
- Cut Outs
- Cut Out Fuses Only
- Asset repairs instigated by trouble calls
- Abortive Visits - no immediate work required
- Meters
- Responding to critical safety calls
- Pilot Wire Failures

We do not forecast any significant change in volumes and costs in this area relative to DPCR5.

Severe Weather - atypical

Update to July 2013 Business plan

During the winter of 2013/14 the UK has experienced repeated and severe winter storms causing significant disruption to utility services and transportation. We have not been immune to this and have incurred significant sever weather - atypical costs. Within our two networks we have incurred additional costs over the festive period in excess of £14m.

We have chosen not to increase the forecast for trouble call or severe weather. If, during ED1, the weather patterns across the UK continue to be subject to current levels of volatility we will be exposed to significantly higher totex.

ED1 forecast

Over the first 3 years of DPCR5 SSEPD has seen a significant number of events occur which have been categorised as Severe Weather. SHEPD alone has seen an increase with 2 recorded in 2010/11, 5 recorded in 2011/12 and 4 recorded in 2012/13. In addition to these events there has also been a 1-in-20 event recorded in 2011/12. The logistics and costs associated with storms are significant.

Using the recent Severe Weather event in the North of Scotland as an example, there were over 30 large generator units connected to the electricity network on Arran and in Kintyre to allow restoration of supply to

customers. It is recognised that no other generation mobilisation has been carried out on this scale before. The total mobile generation connected was the equivalent generation capacity of two small power stations.

The expenditure forecast for Trouble Call has been generated taking these points into consideration whilst analysing historic performance, future volume forecasts due to Severe Weather and Exceptional Events, and using Engineering judgement.

We are forecasting that we will incur, on average, £1.0M p.a. in this cost category during ED1 in both SEPD and SHEPD.

Inspection and Maintenance

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

ED1 forecast

Inspection and Maintenance is a key area for effective efficiency improvements, SSEPD continues to strive to identify ways of improving the efficiency of this core function of a DNO. Our Inspections and Maintenance Supporting Paper details some of the good practice and innovation, in essence the activities associated with inspection and maintenance is static and predictable in terms of volume.

SSEPD is focussing on finding new techniques, methodologies, tools and asset protection to allow the number of inspections to be reduced or consolidated into single visits. Through this process we are able to reduce our expenditure forecast for RIIO-ED1 by 18% in comparison to our forecast at the outset of DPCR 5 on an annualised basis to a total of £152m.

Tree Cutting

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

ED1 forecast

Our Tree Cutting Supporting Paper lays out how we aim to maintain a reducing unit rate and manage growth volumes in an environment where growth rates are demonstrably increasing.

As can be seen in our paper this is a combination of the smart application of innovation to a very practical topic, innovation including new cutting techniques, chemical intervention and a focus on efficient cutting. Please also refer to our paper on making innovation happen.

Figure 25 displays the results of independent growth surveys which compare relative tree growth rates for different geographical locations in the UK. This clearly demonstrates the challenge for SEPD with the highest growth rates in the UK.

Volumes

We are forecasting a year on year decrease in affected spans across all voltages which reflect the continued use of ABC conductor on LV overhead lines and the use of Ecoplugs and our undergrounding programme on our HV circuits. In many cases this will eliminate potential faults where spans are affected by large trees and limbs within 3 metres without recourse to carrying out any tree cutting which would have been at significant cost. Many of these sites will not need any future tree cutting. This year on year reduction is estimated to be 2% in SEPD and 1% in SHEPD and sustainable throughout RIIO-ED1.

Figure 25 displays the results of independent growth surveys which compare relative tree growth rates for different geographical locations in the UK. This clearly demonstrates the challenge for SEPD with the highest growth rates in the UK.

Figure 25. Relative tree growth rates across UK

Company area	Average baseline USD (m)
Electricity North West	0.59
WPD East Midlands	1.05
WPD West Midlands	1.08
National - National Grid	0.82
Scottish Power (Scotland)	0.57
Scottish Power (Wales)	0.80
UK Power Networks (EPN)	1.05
UK Power Networks (SPN)	1.31
SSE (Scotland)	0.47
SSE (South)	1.32
Median	0.94
Average	0.91

Unit Rates and costs

Unit rates have been derived by analysing 2012 and 2013 actual and applying savings expected from our efficiency measures. The result in HV and EHV cutting rates is to bring them back to 2012 levels. Significant further reductions in unit rates across all voltages are expected to continue year on year for the first four years of the RIIO-ED1 period.

In SHEPD the unit rates are forecast to be 11% less at the start of RIIO-ED1 than in 2012 and remain constant throughout the price control.

In SEPD the unit rates are forecast to be 22% less at the start of RIIO-ED1 than in 2012 with a further year on year reduction for the first four years to 2019, where they will level out at 39% less than the 2012 unit rates.

The proposed expenditure for RIIO-ED1 is £125M in SEPD and £53M in SHEPD.

In SHEPD the total spend forecast is consistent with DPCR5 allowances. Due to reduced numbers of affected spans, the expenditure will reduce slightly year on year from £6.78m to £6.49m over the period.

In SEPD the total spend forecast is on average around £2m per annum greater than DPCR5 allowances due to the high growth rates and volumes. To balance this, our efficiencies and reduced numbers of affected spans will reduce expenditure year on year from £18.1m to £14.1m over the period.

Network Operating Costs other

Update to July 2013 Business plan

We have reflected the forecast savings from avoided diesel generation at Bowmore in our March 2014 business plan. This is as a result of investing in our four worst served customer projects in the north of Scotland. These totex savings will endure into ED2.

ED1 forecast

Included in NOC other is the costs of operating our Fixed Diesel Generating Stations. There are six of these stations required in SHEPD as back up to the network.

Reinforcements to the island networks, towards the end of ED1, largely driven by Distributed Generation may make these stations redundant and this would initiate a significant dismantling and decontamination cost. Similarly should the requirement for these stations extend there is potential that we will require to invest to mitigate their emissions. Despite this uncertainty our strategy is to continue maintaining these stations at lowest cost through the RIIO ED1 period. We anticipate a slight increase in costs in comparison to DPCR5 primarily as a result for the age of the assets and the increasing challenges associated with keeping them operational.

However, there is a significant increase in the cost of purchasing the diesel fuel for these stations in comparison to the allowance received in DPCR5. An allowance of less than £2M p.a. was obtained to cover fuel costs in DPCR5. There has been a significant increase in both the cost of diesel fuel over the last 5 years and there has been increased operation of these fuel stations due to a number of submarine cable faults in the past few years. We do not expect to see a decrease in these fuel costs and therefore we are forecasting diesel fuel costs to remain at similar levels to those we have experienced during DPCR5. On average we expect these costs to be £5.2m p.a. during ED1.

The benefits of reduced generation requirements resulting from our focused network investment in improving the service to our worst served customers in SHEPD have been incorporated into our ED1 forecast.

In addition included within NOCS are the costs associated with substation electricity, these costs will remain at DPCR5 levels.

Indirects

Overview

We have revised our targets for IT and Telecoms during ED1. The impact on non-operational IT and Telecoms is summarised below. Our strategy and justification of an additional £3.3m per annum is clearly laid out in our supporting paper, Operational Technology and Communications Supporting Paper.

All other indirect costs remain consistent with our July 2013 submission.

Figure 26. Indirect costs

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Closely Associated Indirects	**479.8**	**250.7**	**0.0**	
Network Design & Engineering	23.1	15.3	0.0	
Project Management	70.9	23.9	0.0	
Engineering Mgmt & Clerical	164.5	104.2	0.0	
System Mapping	7.9	2.9	0.0	Indirects supporting paper
Control Centre	18.9	14.7	0.0	
Call Centre	18.8	12.9	0.0	
Stores	15.3	6.1	0.0	
Operational Training	41.9	24.6	0.0	
Vehicles & Transport	112.0	44.0	0.0	
Network Policy	6.5	2.0	0.0	

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Business Support	**220.4**	**144.3**	**0.0**	Indirects supporting paper
HR and Non-Op Training	12.3	6.8	0.0	
Finance & Regulation	73.2	40.1	0.0	
CEO etc.	13.7	9.0	0.0	

IT & Telecoms	91.3	63.7	0.0	
Property Mgt	29.8	24.7	0.0	

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Non Operational Capex	**95.1**	**51.3**	**26.3**	
Vehicles	23.6	8.1	0.0	
Small Tools, Equipment, Plant & Machinery	20.6	6.6	0.0	Indirects supporting paper
Non-Operational Property (inc. Office Equipment)	21.6	13.5	0.0	IT & Telecoms supporting paper
IT & Telecoms	29.3	23.1	26.3	

Indirects

Update to July 2013 Business plan

We have reviewed our IT and Telecoms strategy leading to an increase in non operational capex of £3.3m per annum across both our networks. ICT is an SSEPD priority. Efficient and cost effective ICT enables business goals to direct, operate and manage the SSEPD business. In addition it is a key enabler for Innovation and strategic investment in ICT will enable SSEPD to perform optimally in the RIIO-ED1 period and beyond.

Our ICT Strategy addresses the ability to realise these objectives by

- Consolidating data and applications bringing them up to a robust standard and then integrating the technology landscape as a platform for further innovation
- Giving technology a role of underpinning core business objectives, tools to monitor effectiveness and implementing an environment and culture of continuous improvement

We believe our comprehensive IT strategy and proposed investment fully justifies this expenditure within ED1.

Summary of Expenditure

In order to support the direct activities that we undertake, such as network investment and network operating costs, we need to undertake and provide a range of engineering and business support services costs. Within RIIO ED1 we will spend £446m SHEPD and £795m in SEPD across the areas of Closely Associated Indirect costs (CAI), Business Support Costs (BSC) and Non Operational Capex costs. This is 91% of our DPCR5 allowance and an increase of 10% on our forecast DPCR5 spend. This increase from DPCR5 represents £11.5M per year on an annualised basis.

The rationale and full details of these costs are contained within our supporting justification paper – "Indirect Costs – Closely Associated Indirects & Business Support Costs Supporting Paper". This paper also includes our views on the relative efficiency of both our DNO's.

There is, as always within SSEPD, a continued stringent focus on the level of expenditure on indirect costs, and we would expect both SEPD and SHEPD to maintain, or improve on, their relative efficiency rankings within the industry.

Included within our forecast for CAI and BSC is a 1% p.a. efficiency saving on controllable costs within our forecasts amounting to an overall saving of £2.8m within SHEPD and £5.3m within SEPD.

In order for SSEPD to provide world class service to our customers, we need to be able to provide a reliable supply of electricity, with extreme weather events being of no exception. Maintaining continuity of supply depends on having networks in good condition, as a consequence, SSEPD expends significant time, money and effort looking after its assets.

Cost forecasts for RIIO-ED1

Our main objective is to provide value for money for our customers, and in the area of indirect costs, this has simply meant keeping these as low as possible. During DPCR5 in order to meet ongoing regulatory and business requirements we have seen these costs steadily increase in real terms and we expect to see this general trend continue through the remainder of DPCR5 and into RIIO-ED1. Examples of this include increasing levels of customer service and fulfilling more stringent Guaranteed Standards i.e. 12 hour fault restoration standard instead of the previous 18 hour standard.

The contributing factors to these forecast increases in each cost category are set out in detail in "Indirect Costs – Closely Associated Indirects & Business Support Costs Supporting Paper - Regional Factors.

The main reasons for increased costs are as follows:

- Increased number of Network Design and Project Management staff to deal with increased levels of Network Investment spend such as DG connections, general connections activity Black Start, Worst Served Customers etc.

- Provision of additional resource staff and plant to meet new “unplanned interruption” target of 12hrs (previously 18hrs)
- An increasing focus on delivering customer service changes and fully implementing our 10/10 change programme, including the Provision of “one stop shop” for complaint handling
- Supporting the role out of smart metering and transferring a number of innovative systems and processes into BAU (e.g. Support of Active Network Management Systems)
- Increased IT & Telecoms costs for staff and support and maintenance of new IT systems, including the roll out of PMR in SEPD
- Increased workforce renewal spend as many of our staff reach retirement age over the ED1 period

Non Operational Capex

Non Operational Capex during ED1 will increase by 5% from DPCR5 allowance levels. This is the combination of an increase in investment in IT and telecoms offset by a change in our vehicle procurement policy where we no longer purchase our own operational vehicles below 6 tonnes. These are now leased from a 3rd party service provider.

During ED1 we are forecasting that the areas of expenditure (Property, Vehicles and Plant) will remain broadly at DPCR5 actual levels. There is an underlying level of spend in all of these areas for normal business as usual upgrades and replacement programmes. However, in addition we intend to complete our depot property upgrade programme that commenced during. A more comprehensive summary can be found within our indirect cost supporting paper.

Smart Metering

Figure 27. Smart Metering forecast expenditure

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Allowance proposed				
Smart Meters - Costs subject to ex ante funding.	12.8	3.5	(27.5)	
Smart meters - Costs subject to pass through	12.3	3.2	(43.7)	
Potential costs				Smart Metering supporting paper
Smart Meters - Costs subject to volume driver	20.9	4.6	(66.2)	
Smart meters - Costs not subject to pass through	2.0	0.6	0.7	

Update to July 2013 Business plan

We have reassessed our costs forecasts following development of our remediation procedures which will allow most work to be carried out live and hence at a lower forecast unit cost. We have also undertaken further design work on the interfaces between our IT. This is reflected in the incremental IT investment options considered in our Smart Metering Supporting Paper.

In summary we expect to spend £54.6m during the first five years of RIIO-ED1 supporting the mandated national programme to install smart meters in domestic and small commercial premises. This expenditure is made up of £39.6m carrying out work at our service terminations to facilitate the installation of smart meters, and £15.0m on payments for use of the smart meter data and communications infrastructure.

In addition to savings accruing to suppliers and customers, in our role as a network operator we anticipate deriving almost £50m of indirect benefits from this investment where actions by suppliers and customers reduce the peak demand for electricity.

During RIIO-ED1 we also plan to spend £16.3m building and using IT systems to allow us to take information from smart meters and use it to operate our network more efficiently and to improve some services to our customers. This expenditure involves £10.5m of investment in IT systems and £5.8m operating costs.

We expect to generate over £17m of benefits during RIIO-ED1 and RIIO-ED2 from this programme.

Smart meter programme

As a DNO SSEPD will not be installing smart meters directly, under the arrangements for the roll out of smart metering this work will be undertaken on the behalf of suppliers by appropriate meter operators. The Smart Metering programme will be one of the biggest projects undertaken in the UK at individual premise level for 50 years.

Extensive work undertaken by the ENA (Energy Network Association) has demonstrated that a large proportion of the properties will have some form of issue that will affect or delay the safe installation of Smart meters. Many of these issues will be related to DNO assets or assets in proximity to them. In particular relocating the supply termination and fixing damaged assets discovered as part of the installation process.

This will place a significant burden on DNOs in particular given the intensive nature of the Smart Meter roll out programme. Recruitment and training will be necessary to allow DNOs to keep pace with the Smart Meter roll out programme. SSEPD has established how to deliver their part of this project of national significance.

Estimates show this will result in SSEPD receiving up to 40,000 defects to attend per annum at the peak of the Smart Meter roll-out programme. See figures 28 and 29 below.

Ofgem has decided to include a volume driver for DNO related call outs that are attributable to the roll out of smart metering over and above an ex-ante allowance set at 2%. SSEPD are required to put forward appropriate unit costs for the volume drivers as part of the justified business plan. These can be found in our Smart Metering Supporting Paper.

Figure 28. Smart Meter forecast remedial volumes - SHEPD

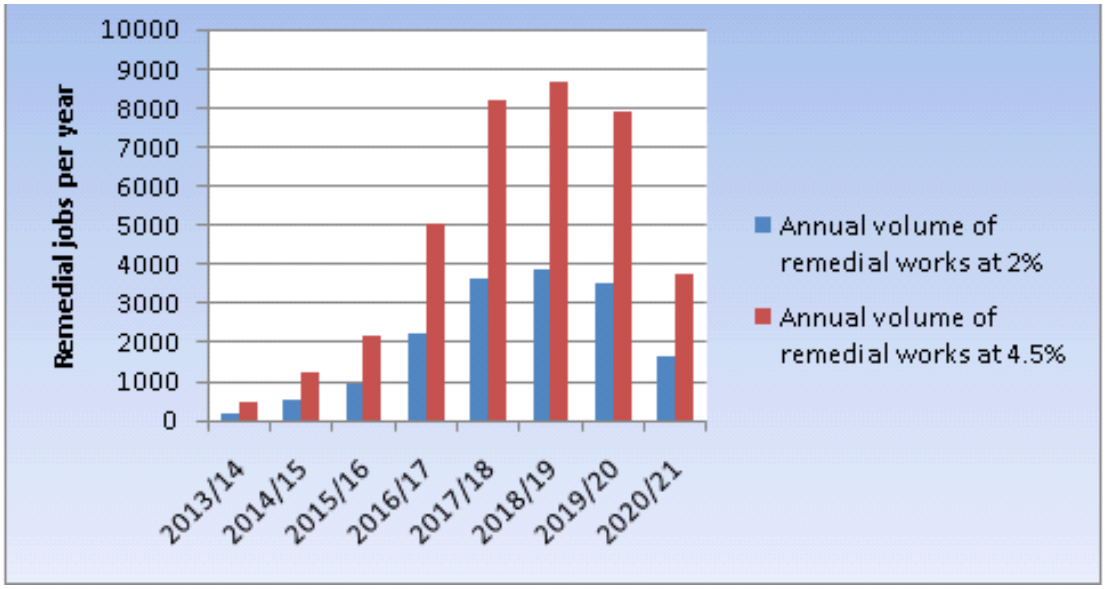
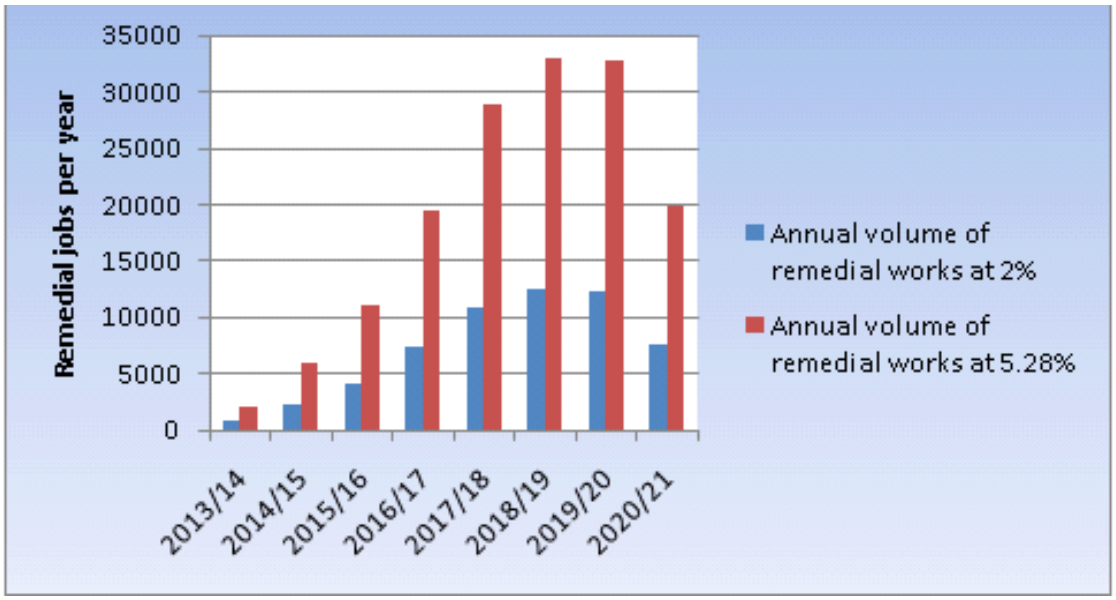


Figure 29. Smart Meter forecast remedial volumes - SEPD



Stand Alone funding – non RAV

Update to July 2013 Business plan

We propose no change to the level of workload or costs forecast for ED1.

Figure 30. DPCR5 LCFN Tier 2 expenditure

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
LCN Fund Second Tier	9.0	5.0	0.0	

Stand alone funding – non RAV

The expenditure in Stand Alone Funding relates to the funding of LCNF Tier 2 projects, we have allowed for the tail end of the funding of New Thames Valley Vision (NTVV Project) and have assumed a level of success in future bids in the remainder of DPCR5. Details of our current bids and general direction for future bids are indicated in our "Innovation Strategy".

Non Activity Based Costs

Overview

Update to July 2013 Business plan

In parallel with the amendments discussed in earlier sections for Transmission Connection Point Charges and Smart Metering we have revised the pass through expenditure forecasts for ED1. The detailed explanation of the drivers behind these updates is contained within the respective supporting papers.

We have retained the forecast costs for Shetland balancing charges from our July 2013 submission. Working alongside Ofgem the process to establish an enduring solution for the energy supply to the island is ongoing and will run in parallel with the RIIO-ED1 price control. In the absence of established future costs we have elected to remain consistent with previous allowance requirements. We would expect to resolve the level of costs required and the timing of such independently of the ED1 process.

Figure 31. Non activity based costs

Category	SEPD (£m)	SHEPD (£m)	Change from July 2013	Supporting documents
Pass through				
Business Rates	321.6	198.8	0.0	
Ofgem Licence Fee	11.6	3.0	0.0	
Smart Metering IT and DCC	12.3	3.2	(66.2)	Smart Metering supporting paper
TCPC - Pre 1st April 2015	107.0	131.6	(24.4)	TCPC justification paper
Shetland Balancing Costs	0.0	79.5	0.0	
Other pass through costs	0.4	0.4	0.0	
Pensions Deficit Repair Payments	174.6	105.8	0.0	
Other Non activity based costs	(0.4)	4.5	0.0	
Total	**625.9**	**526.7**	**(90.6)**	

Pass through Costs

Non Activity Based costs and pass through costs are those that sit outside of Totex. These costs are mainly of a pass through nature under the current Ofgem policy. We summarise these and the main rationale for the charges below.

Business rates

Business rates are taxes that we are required to pay on our distribution networks and associated properties. These costs are treated as a pass through cost as we have no control over these costs once the periodic rating revaluation is completed. During this valuation process we fully engage with the ratings authority to ensure these costs are minimised.

The next revaluation period is not due to be finalised until April 2017. There is a large degree of uncertainty as to what these costs are likely to be following the revaluation. At this point in time we would expect to see a small rise in our rates liability in SEPD but the SHEPD charge remains flat at current levels.

The annual charge is calculated by multiplying the rateable value (RV) of the network by the unified business rate (UBR). Historically these charges have been treated as a pass through cost as long as DNO's ensure every effort is made to minimise the rates liability.

The main assumptions are:

Rates charges will remain at 2012/13 levels through until 2016/17 pending the outcome of the 2017 valuation. The rates revaluation calculation is based on an income and expenditure methodology. One of the key components of the RV is the level of RAV. An increased RAV in real terms will result in increased revenue. Between 2007/08 and 2012/13 there has been an increase in RAV of 6% in SEPD & 1% in SHEPD. There are a number of other smaller contributing factors associated with the valuation methodology that may be assessed differently in 2017 for SEPD and will give rise to an increased RV in SEPD. We do not expect similar methodology factors to impact SHEPD. Following the 2017 valuation we would expect the SEPD RV to increase by approx 5% to 10% and the SHEPD RV to remain broadly in line with 2010 RV.

Offsetting the increased RV we would expect a small reduction in the level of the UBR. We would expect the overall UK RV to increase from 2010 as economic conditions improve. The government would not increase the total rates collected as the rates collected in theory should remain the same. In order to do this the UBR would be reduced accordingly.

Based on the above assumptions we estimate that SEPD rates will increase by approx 3% on 2010 valuation levels and the SHEPD rates charge will remain at 2010 levels.

Ofgem licence fee

Licence fees are the fees that we are required to pay to Ofgem to hold our electricity distribution licences. During ED1 these costs will continue as pass through costs. The fees are calculated by Ofgem in line with its annual costs and allocated to each DNO on a customer number basis. We cannot accurately forecast future licence fees as we do not control Ofgem's budget or the split of costs between network licensees. Our forecast of future licence fees for the RIIO-ED1 period is based on these fees increasing in line with RPI. We have forecast these charges to remain constant at £0.37M p.a. for SHEPD and £1.45M p.a. (in 2012/13 prices) during the ED1 period.

Smart Metering – DCC Licence fee; IT and Data Services costs

The Data and Communications Company ("DCC") is a key element of the Government's approach to rolling out smart meters in Great Britain. The DCC will offer the means by which network operators, suppliers and other energy services companies can communicate remotely with smart meters in domestic premises. The DCC activity will be licensed, and regulated by Ofgem. Under a new Smart Energy Code (SEC) that is currently being consulted on by the Government, DNOs will be obliged to use the DCC services. In addition during the smart metering roll out DNO's considerable effort will be required to develop business processes and IT systems in order to enable data from smart meters to be accessed, managed and used. These are costs that are unavoidable and outside of our control. Ofgem has proposed a pass through of DCC & Associated IT cost until the end of 2019.

Our forecast of Smart Metering pass through costs has been amended down to reflect the revised IT strategy proposed for ED1.

Transmission Connection Point Charges – Pre 1st April 2015

Ofgem's March 2013 Policy document outlined that during ED1 the DPCR5 pass through mechanism for all Transmission assets installed prior to 1st April 2015 would continue. Ofgem decided that for Transmission connections initiated by DNO's after 1st April 2015 there should be some form of ex ante incentive for DNO's to manage the costs. It is believed that DNO's via ongoing dialogue with Transmission operators should have a degree of certainty over future work and level of charges. Therefore all schemes in ED1 that are initiated by the DNO should be included within the ED1 Totex ex ante allowances.

The level of Transmission exit charges treated as pass through in SEPD remains broadly constant at 2012/13 levels throughout the ED1 period.

The Pass Through costs included in within our business plans are:

Figure 32. Pass through transmission exit charges

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23

	£M	£M	£M	£M	£M	£M	£M	£M
SHEPD	14.4	14.5	15.2	16.1	17.0	17.7	18.5	18.3
SEPD	13.2	13.3	13.4	13.4	13.4	13.4	13.4	13.7

Full details of the Transmission point exit charges pass through costs, and the level of ex ante allowance required in SHEPD, are contained in our supporting justification paper.

Shetland Balancing Charges

These costs impact SHEPD only.

The Shetland Islands are not connected to the mainland UK electricity distribution network. This means they have to be self sufficient; having enough generation to meet demand at all times. In 2005 when the British Electricity Trading and Transmission Arrangements (BETTA) were introduced SHEPD took on the role of System Operator (SO), managing generation and demand on Shetland to ensure it remains in balance to meet customers' needs at all times. Output from the main sources of supply; namely Lerwick Power Station and Sullom Voe Terminal are then netted off SSE Energy Supply Limited's demand to ensure all output is accounted for in GB settlement arrangements.

To ensure the price paid for electricity by customers on Shetland remains in line with those on the mainland, the incremental generation and balancing costs for Shetland are passed on to SHEPD customers through a specific balancing allowance included in SHEPD's licence. The cost of generation varies on an annual basis but in the first three years of DPCR5 the annual average differential charge recovered through SHEPD's Distribution Use of System (DUoS) charges was approx £26M.

In DPCR5 Ofgem recognised Shetland faces a number of challenges in future:

- Lerwick Power Station was initially commissioned in 1953 and is now coming to the end of its life;
- The other main source of supply, a power purchase agreement with Sullom Voe Terminal (SVT), is due to expire in May 2014; and
- While there is significant potential for renewable generation on Shetland, given the intermittent nature of wind this can not be relied upon to meet demand at all times.

As a result, Ofgem placed a licence obligation on SHEPD requiring it to submit an Integrated Plan for a renewed energy system for Shetland. This was submitted to Ofgem in 2013. The plan will recommend the replacement of Lerwick Power Station (LPS) and new arrangements to recover the cost of generation and balancing. These arrangements will be closer to those applying elsewhere in GB; as a consequence we believe they should be removed from SHEPD's DUoS charges during ED1. We are currently in discussions

with Ofgem on alternative funding arrangements. Further details will be presented as part of our Integrated Plan.

We have included in our forecast costs estimated ongoing balancing charges based on our proposed solution. Under this plan a new power station would be commissioned in late 2016 and our Business Plan therefore assumes that the Shetland balancing charge will remain at 2012/13 levels of £26.5M until 2016/17. Following commissioning we would expect LPS to remain available for back up and parallel operation until the new station becomes established and proves its reliability. This may take up to 2 years. In ED1 we propose the Shetland balancing term remains in place until then but at a reduced rate of 50% or £13.25M in the period 2017/18 and 2018/19 before falling to zero in 2019/20 and thereafter.

The final solution adopted for Shetland will necessitate the revision of these and any additional pass through variables in our price control financial model (PCFM).

Pension Deficit Repair Payments

A summary of the pension schemes that are available to SSEPD staff are documented within our Finance Output paper and full details of the costs forecast to be incurred are contained within the Finance Data Tables that accompany our business plan.

We have two defined benefit schemes (Southern Electric Pension Scheme – SHEPS & Scottish Hydro Electric Pension Scheme - SEPS) and one Defined Contribution Scheme (SSE Group Personal Pension Plan). Following the introduction of the Ofgem pension principles in June 2010 the ongoing future service contributions and the “incremental” deficit contributions are to be included as part of DNO’s totex allowance. Costs associated with the deficit repair of the “established” deficit are subject to a triennial reasonableness review by Ofgem. For the purposes of the business plan the forecast cash payments for established deficit repair costs are included within Non Activity Based Costs.

We summarise below the main assumptions and costs included within the business plan in both Totex and within Non Activity Based Costs.

Established Pension Deficit Repair Costs

The cash costs included within the Non Activity Based costs section of the business plan are based on the DNO element of the latest deficit repair plans agreed with the scheme trustees. In April 2013 the Scottish Hydro Electric Pension Scheme agreed a repair plan based on the March 2012 triennial valuation. This repair plan kept the total annual payments at the same level as agreed in the 2009 formal valuation. The last formal valuation of the Southern Electric Pension Scheme took place in March 2010. There is currently a formal valuation underway for this scheme. At this point in time it is expected that during ED1 the level of ongoing repair payments will be maintained at the levels agreed in the March 2010 repair plan. The actual repair plan will be finalised later in 2013/14.

Pension Costs included in TOTEX

The pension costs below included both Defined Benefit costs and Defined Contribution Costs. The contribution rates for the defined contribution scheme will continue at similar levels to DPCR5. The employer contributions are on a matched basis up to a maximum of 6%. After 5 years service the contribution level could increase to 9%, if matched by the employee,

For the two defined benefit scheme the contribution rates will increase slightly from historic levels. In the March 2012 valuation of SHEPD it was agreed to increase ongoing service contributions from 32.5% to 35%. We would expect the costs to remain at the same level throughout ED1. Following the formal 2010 valuation of SEPS ongoing service contributions were agreed at 28.5%. It is expected following the 2013 valuation the ongoing service contribution rates will increase to 32% and this has been used as our assumption during ED1. The actual rate will be finalised later in 2013/14 as part of the formal valuation process.

Delivering

Our RIIO ED1 Business Plan represents a continuation of programmes that we successfully delivered during both DPCR4 and DPCR5. Our approach has been to keep the network risk constant at a level that delivers both our statutory requirements and our stakeholder's expectations. We have always done this whilst delivering industry leading edge costs and with consistent improvements to network performance and customer service.

Our fundamental approach to delivering our plans is to keep costs down by delivering most areas via direct labour or by within group contractors. This has been a successful strategy for many years and allows us a degree of flexibility that is denied to many other DNOs who operate quite different strategies. It is notable that the four most efficient DNOS all employ this strategy.

This same strategy will again be employed in ED1 and for the vast majority of work programmes, most of which are at similar levels to DPCR5, they will be delivered by the same mix of workforce as currently used. We do not foresee any issues with this strategy going forwards and believe our successful delivery of outputs in DPCR5 is good evidence of our ability to deliver.

However there are a few programmes of work that will see increased volumes in ED1. We anticipate employing our usual strategy to deliver these going forwards but have also considered how this increase will impact on our existing arrangements.

Key to our delivery plans are the essential elements of:

- People
- IT Support

People

Key to the delivery of our expenditure programme will be people, even more so than previous price reviews. Our business plan significant in its complexity and breadth, many new skills, resource and systems will be required to deliver this programme.

Of particular note in relation to resource during RIIO ED1 will be the:

- Smart Meter Roll out programme
- Resourcing of new skill sets for "Smart" network solutions
- Workforce Renewal as staff retire
- Works associated with Renewables Connections

We will be recruiting extensively and utilising "Workforce renewal" funding to the value of £32m in SEPD and £18m in SHEPD to ensure that we are prepared.

The new skills necessary to operate a lot of the "Smart" solutions we are developing in our innovation programme is a particular challenge. We are ensuring that the staff we involve in our innovation programme will be in a position to carry on and spread the knowledge they have; we are also preparing structured courses as part of our LCNF project portfolio on new Smart skills both for use in SSEPD but also in a form that can be utilised by other DNOs

More detail on our plans for preparing for delivery and workforce renewal can be found in our "Workforce Renewal Supporting Paper"

Both of our DNO's have an experienced and highly skilled workforce. These staff are supported by the various corporate functions employed throughout the SSE Group of Companies.

SSE has a full range of employee related policies and procedures that have been established and created via the SSE Group HR function. In addition we have a full suite of employee related rewards and benefits in place. These combined with a detailed and wide ranging operational and non operational training programme ensures that both our DNO's have available to them a well trained and motivational workforce to deliver the expenditure and outputs of our business plan.

IT Systems

IT systems will be increasingly important during RIIO ED1 for a number of reasons:

- Increased reporting requirements.
- Customer expectations in relation to the way they interact with large organisation.
- Increasing complex "Smart" solutions in need of a hardware platform.

- The Opportunities and challenges that Smart metering data will bring.

We are have prepared an IT strategy that proposes consolidating our existing systems and keeps them in state of readiness “ever green” for the deployment of innovative solutions and to allow use to keep support costs low and improved reliability. Our innovation team work extremely closely with our IT specialists to ensure that we have an IT strategy that converges on the models and standards necessary for a smarter network and that will be ready for the challenges of RIIO ED1 and beyond.

This can be found in our “IT Overall Strategy Supporting papers” and an independent “SSE IT Benchmarking Paper”.

Data Assurance

The information provided in this report has been produced in alignment with our Data Assurance Plan. Our justification for our forecast costs and volumes are contained within our outputs papers and the associated supplementary justification papers.

We have not considered costs in one area in isolation of each others. Our well justified business plan details our overall strategy with respect to the management of our assets. This recognises the trade-off between different asset intervention techniques such as asset replacement, refurbishment, or inspections and maintenance.

From a data assurance perspective our forecast cost reporting is prepared by a dedicated team involved in preparing the information. Information is sourced from business colleagues and is subject to a detailed review process by the central team. This information is then approved by Heads of Department and at Director Level prior to submission.

The financial RIGs are prepared using input from specialists in areas of tax, pensions and treasury, as well as core financial information from Ofgem models. This is compiled and sense-checked at internal expert and senior management level, reviewed at director level and authorised at SSEPD board level. Both the compilation and the review at director level are undertaken by a regulatory expert, who understands the details of the return and Ofgem's requirements.

Load and Health indices have informed the key aspects of our refurbishment and reinforcement investment proposals and are referenced in the appropriate documents.