

5 Expenditure

In RIIO-ED1 we expect to spend a total of £2.6 billion in maintaining, replacing and upgrading our network, together with carrying out all the other functions required of us as a distribution business.

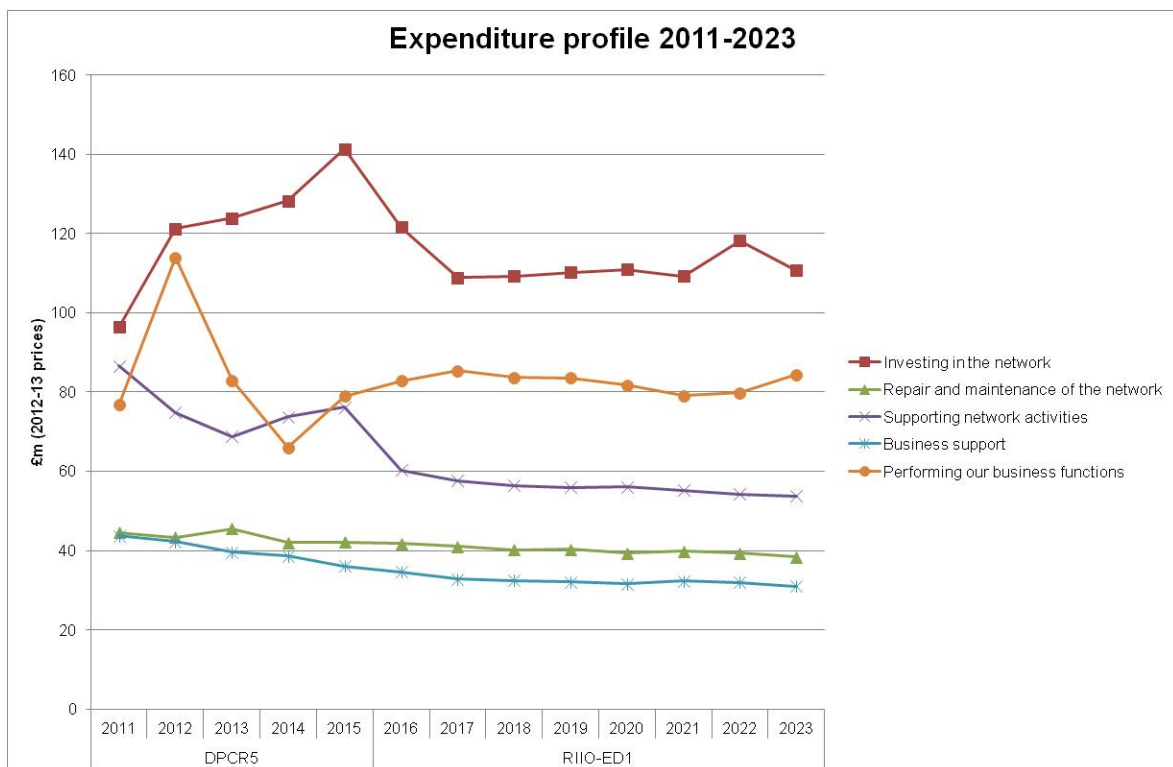
5.1 This expenditure breaks down into five main areas:

- Investing in our network
- Repair and maintenance of our current network
- Supporting network operations and investment
- Business support
- Performing our other business activities

5.2 Our focus is on ensuring we maintain a fit-for-purpose network that delivers for customers, is affordable and can meet the future challenges of demand growth and low carbon technology. In DPCR5 we have been progressively reducing our support costs whilst increasing investment in our network. In RIIO-ED1, replacement and renewal investment requirements are kept relatively flat through efficient delivery and innovative solutions, particularly to network reinforcement challenges. We anticipate a modest increase in reinforcement and connection costs towards the end of RIIO-ED1 in response to an increase in low carbon technology adoption.

5.3 We continue to challenge all aspects of our cost base and are committed to achieving substantial reductions in operating and support costs. We have benchmarked our cost base within our industry and against non-regulated asset-intensive businesses to ensure we are competitive. We are also committing to an annual compound efficiency improvement of at least 1% in each year of RIIO-ED1.

5.4 The following sections look at each of these five expenditure areas, discuss the factors that drive expenditure and detail our major assumptions in each case. All financial values are presented in 2012-13 prices and are gross costs prior to any customer contributions.



Developing efficient costs

Like any business, we constantly challenge ourselves to deliver more value at a lower cost. Our cost performance has improved significantly during DPCR5 and we are committed to continuing this through RIIO-ED1. Following Ofgem's fast-track determination, we have looked again at all aspects at our cost base.

- 5.5 Our use of framework contracts gives us stability and predictability in the costs our contractors charge us and allows us to drive both quality and cost improvements as a result of our purchasing power. We tend to use five-year contracts to help us do this. All framework contracts are competitively tendered at the outset and are subject to market testing at various stages during their lives. Each major capital project is competitively tendered.
- 5.6 Our procurement strategy means we optimise the way we buy major items of plant and equipment. Sometimes we buy on our own. At others we buy as part of a purchasing group, when the equipment is less time-critical or we can use plant that conforms to a standard specification.
- 5.7 We test our market-driven and internal costs by benchmarking. We benchmark our teams and sections against each other within the company. We benchmark our company against:
- Other DNOs
 - Other asset, engineering and service companies in the UK
 - International energy companies
 - International engineering and asset management companies
- 5.8 Whilst cost benchmarking is important, it tends to lose some of its meaning unless it is also benchmarked against outputs. We have been leading the industry in the development of tools to allow efficiency to be assessed across DNOs using unit costs linked to outputs.
- 5.9 We commissioned a number of external benchmarking reports to help us identify areas where we can become even better (see Annex 5).
- 5.10 We asked Mott MacDonald to benchmark our entire business against the competitive, unregulated asset management industry. This provided some major insights, particularly in the proportionality of our organisation (customer-facing versus support) and optimising our standby and response teams. As a result, we are now examining best practice in emergency response organisations like the fire and ambulance services and identifying how we can implement this within our company.
- 5.11 We asked Gartner to benchmark our IT services in terms of scope, service level and cost. Their findings were generally favourable and ratified our existing plans to streamline non-operational IT services and reduce resultant support and IT life-cycle costs.
- 5.12 We asked KPMG to analyse our fixed cost base and compare this to "group" organisations, where fixed costs appear proportionately lower because they are spread across a wider range of operational companies. Their analysis suggests that the fixed costs of a "double" company should be around 30% higher than those of a "single" company. We have used this ratio to test the proportionality of our fixed cost base to other DNO groups and satisfy ourselves that our fixed costs are both efficient and justified.
- 5.13 We have independently developed our Control Room systems over the years to add custom functionality which has not been available in the wider market. This has supported our automation, restoration and monitoring performance improvements. We recognise that, over time, "off-the-shelf" solutions have caught up and we are satisfied that as we prepare to renew our Control Room systems an "off-the-shelf" solution offers better long-term value for our customers and us. We have carried out a number of national and international reference site visits to help us make the right choice.
- 5.14 We have used all this independent analysis alongside a number of regulatory comparative efficiency assessment tools to test and challenge every aspect of our cost base. We are confident that our costs are among the most competitive in our industry and, when assessed against the Outputs we will deliver, offer outstanding value to our customers.

- 5.15 We took our July 2013 plan seriously and undertook a lot of work to ensure that it was efficient and included analysis demonstrating its efficiency. Ofgem's analysis showed us to be upper quartile based on its totex analysis but to be outside of the upper quartile in its bottom up assessment. We were very disappointed that our plan was not assessed by Ofgem to be efficient. Our view of the efficiency of our plan at totex level was very similar to Ofgem's ultimate view. This shows that our clear focus on managing the total costs that we ask customers to pay for was successful.
- 5.16 We have undertaken a detailed review of Ofgem's cost assessment approach. Within Ofgem's bottom up analysis, it is clear that inappropriate analysis of a small number of activities has had a disproportionate effect on the assessed efficiency of our plan. We recommend that Ofgem makes a small number of important changes to its cost assessment approach for slow track companies to address these material issues.
- 5.17 More details of our analysis and recommendations can be found in Annex 14.
- 5.18 We have reviewed our plan in great detail in preparation for resubmission and have undertaken substantial analysis to assure ourselves that our revised plan represents an efficient and well justified proposition for customers to fund. We have removed costs where there is evidence that the costs included in our July 2013 plan were inefficient and have removed more than £37 million costs from our plan as a result. Our analysis shows that we can expect our revised plan to be assessed to be upper quartile across all activity areas and to be comfortably within overall upper quartile.
- 5.19 We are confident that our resubmitted plan represents an efficient proposition for our customers in the North West to fund.

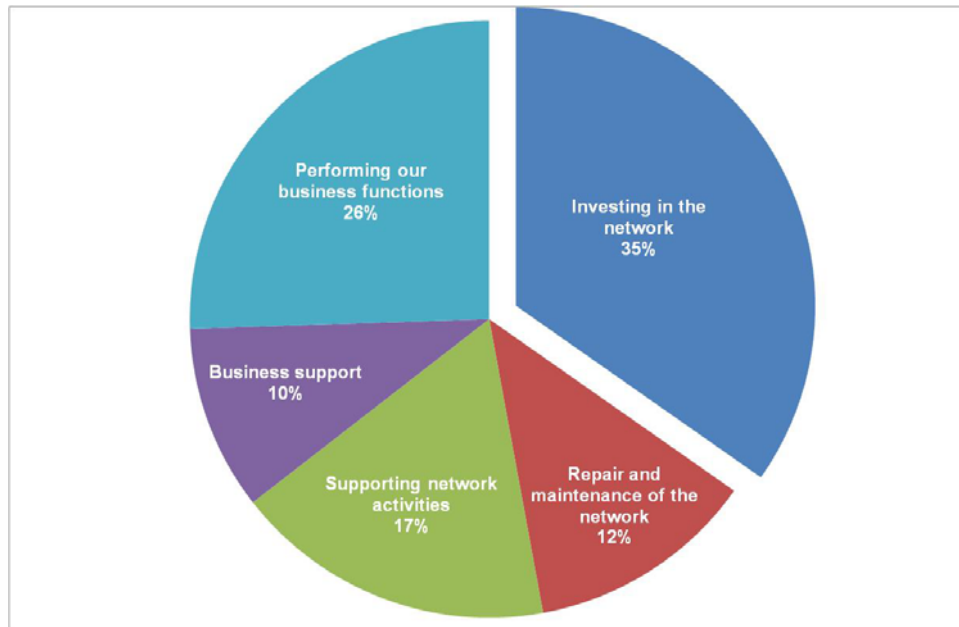
Developing Efficient Volumes

Our customers want a safe, reliable network and that is what we provide. There are a number of different ways to do this and we seek to use the optimum mix of repair, replacement and reinforcement to deliver it.

- 5.20 We are generally guided by our asset management strategies and engineering expertise however we regularly test these with other techniques (eg Cost Benefit Analysis (CBA)) to ensure they are driving the right mix and level of work.
- 5.21 We asked PB Power to benchmark our initial volume plans and assess them against our network reliability objectives. Their review identified some areas where alternative approaches and solutions would deliver similar or better outputs but with reduced levels of work.
- 5.22 Consequently, we implemented a number of changes which resulted in a volume-driven cost reduction of £53 million across our asset replacement and reinforcement programmes. We verified our new plans by asking PB Power to repeat their initial exercise and provide an opinion on the efficiency of the revised programme. They concluded that we had acted on their recommendations and our proposed volumes were robust. We are confident, therefore, that the volumes and mix of work which underpin our business plan commitments are efficient (see Annex 17).
- 5.23 We develop volumes from a bottom-up analysis of asset and network condition and performance, CBRM, policy and standards and national guidelines combined with stakeholder engagement on priorities and willingness to pay.

Investing in the Network

Our largest single spend category (35% of our total expenditure) is investing in our network.

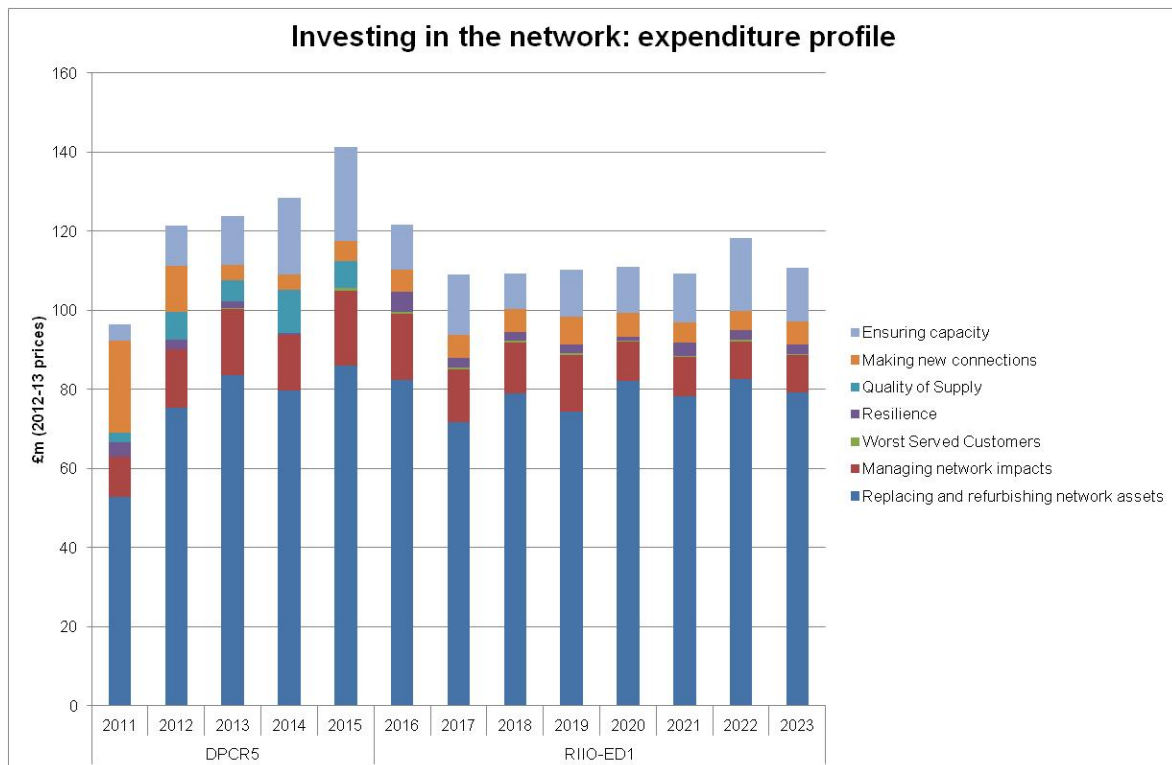


5.24 This covers:

- Replacement and refurbishment of existing assets to maintain network performance and safety
- Management of our safety and environmental impacts
- Improving network performance
- Connecting new customers to our network
- Upgrading the network to increase its capacity

Our stakeholders are prepared to pay £2.27 more on their bill to allow us to make further improvements to the network.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Replacing and refurbishing network assets	377.4	75.5	629.5	78.7	4.3%
Managing network impacts	74.7	14.9	96.1	12.0	-19.6%
Worst Served Customers	1.3	0.3	3.4	0.4	66.1%
Resilience	7.8	1.6	20.7	2.6	65.2%
Quality of Supply	32.8	6.6	-	-	-100.0%
Making new connections	47.5	9.5	46.2	5.8	-39.2%
Ensuring capacity	69.8	14.0	103.4	12.9	-7.3%
Total	611.2	122.2	899.2	112.4	-8.0%



Replacing and refurbishing network assets

Replacing and refurbishing existing network assets is the largest single component of our network expenditure. Our network comprises a variety of asset types, each of which performs a specific function in the electricity distribution process.

- 5.25 As these assets age, their probability of failure generally increases and they must eventually be refurbished or replaced. For a small number of asset types it is more efficient to replace them only after they fail but in most cases it is best to carry out the replacement or refurbishment before failure occurs. This requires a careful balance between investing too early (potentially foregoing some remaining useful operating life) and too late (running an unacceptable level of failure with consequential impacts on network performance, safety and future costs).
- 5.26 We improve network reliability through a combination of automation and operational response. This improvement depends on maintaining a stable base in underlying network performance. Our investment in asset replacement and refurbishment provides this stable base. We have a number of options in the way we combine replacement and refurbishment and we use a number of techniques and models to help us get the balance right.
- 5.27 We develop pricing from a bottom-up analysis of actuals, forecasting future frontier shift (efficiency improvements in our business) and Real Price Effects (RPE). RPE is a measure of the actual cost increases we experience relative to Retail Price Index (RPI) inflation. In RII0-ED1 we expect the RPE impact to be £82.6 million. We have fully absorbed this cost impact through cost efficiencies elsewhere in our business plan.
- 5.28 Where we have multiple intervention options, we combine our asset management practices with CBA to determine the most cost effective interventions.

- 5.29 We will spend £629.5 million over RIIO-ED1 on investment in our network. This is broadly similar to our annual investment rate in DPCR5, although the mix of work has changed substantially. The investment plans by a major asset group are as follows:

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Services	15.4	3.1	23.3	2.9	-5.7%
Rising lateral mains	3.0	0.6	14.5	1.8	198.4%
Woodpole lines	47.8	9.6	38.2	4.8	-50.0%
Steel towers	39.4	7.9	80.1	10.0	27.1%
LV & HV cables	25.1	5.0	43.5	5.4	8.2%
EHV & 132kV cables	46.1	9.2	47.2	5.9	-35.9%
LV & HV plant	49.9	10.0	132.6	16.6	65.9%
EHV & 132kV plant	52.2	10.4	108.8	13.6	30.4%
Civil structures	28.0	5.6	75.8	9.5	69.4%
Operational IT	31.7	6.3	65.6	8.2	29.3%
High value projects	38.8	7.8	-	-	n/a
Total	377.4	75.5	629.5	78.7	4.3%

Impact on network risk

Our Risk Index approach lets us assess the impact of each replacement on network risk on a common scale. Overall our target is to keep network risk within 3% of its 2015 position.

- 5.30 To achieve this, we are forecasting improvements from each major asset group for which we have risk index forecasts. Further details can be found in Annex 2B – CBRM Detailed results. The following sections describe the investment required to meet this target.
- 5.31 Refurbishment can provide a substantial majority of the benefits of replacement for a fraction of the cost. We expect to save around £50 million from refurbishing rather than replacing in RIIO-ED1.

Detailed expenditure plans

Services

- 5.32 Our underground services which carry electricity from our network to our customers are not managed using CBRM because their large number and underground location make it difficult to gather reliable condition data.
- 5.33 We handle faults reactively and our forecast is based on an extrapolation of historic fault rates and unit costs to repair them with an increment for the replacement of obsolete cable types to ensure that all replacement services are capable of supporting low carbon technology adoption. We will spend £23.3 million on underground services during RIIO-ED1, a 5.7% annual reduction compared to DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Services	15.4	3.1	23.3	2.9	-5.7%

Rising and lateral mains

- 5.34 These are the services within multi-occupancy dwellings such as maisonettes and high-rise flats. They comprise mains wiring to a series of meters within the building. Following national debates over the ownership of these installations in DPCR4, we established a programme of inspection in DPCR5 and have commenced replacement where necessary.
- 5.35 Over the course of RIIO-ED1, we will spend £14.5 million on replacing these services, an increase of 198.4% on our DPCR5 programme due to the recent instigation of this work.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Rising lateral mains	3.0	0.6	14.5	1.8	198.4%

Woodpole lines

- 5.36 Parts of our overhead network are carried by wooden poles, many of which date from the 1950s and 1960s.
- 5.37 We are completing a major programme of overhead line compliance work in DPCR5 which is replacing a large number of the poorest condition poles. As a result, our forecast for woodpoles is a reduction in the replacement rate compared to DPCR5.
- 5.38 We will use a defect management regime to replace specific poles rather than undertaking widespread rebuilds or cyclic refurbishment. We will spend £38.2 million on woodpoles over the course of RIIO-ED1, a 50% decrease on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Woodpole lines	47.8	9.6	38.2	4.8	-50.0%

Steel towers

- 5.39 Steel towers (pylons) support the majority of our above ground 33kV and 132kV circuits. They are made up of a number of components and as such are much easier to refurbish than woodpoles (eg through selectively replacing deteriorated steel members) but more difficult to replace in their entirety. As such, our management regime for these assets is generally one of on-going refurbishment and painting to minimise the need to replace whole towers.
- 5.40 We will spend £80.1 million on refurbishing and replacing steel towers over RIIO-ED1, a 27.1% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Steel towers	39.4	7.9	80.1	10.0	27.1%

- 5.41 The increase is the result of the completion of our full tower condition survey in 2012. This condition data was used in our CBRM model to produce our forecast.

LV and HV cables

- 5.42 Underground LV and HV cables form the bulk of the distribution network by length and value. The very oldest installations date back to the early 20th century and they are intrinsically reliable. Where issues do occur, they are often localised based on local environmental factors, disturbance or issues specific to particular cable types and/or construction methods.
- 5.43 Our plans are based on the selective overlay of cables exhibiting high fault rates. As they are underground and rarely disturbed, it is very difficult to collect condition information on these cables and equally difficult to predict where future faults will occur.

- 5.44 Over the course of RIIO-ED1 we will spend £43.5 million on LV and HV cables, an 8.2% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
LV & HV cables	25.1	5.0	43.5	5.4	8.2%

- 5.45 As the majority of our spending on these assets is fault related (and we expect to maintain a stable fault rate) our volumes will remain steady. The reduction in total spending is the result of reduced unit costs due to delivery efficiencies.

EHV and 132kV cables

- 5.46 Our higher voltage cables form the majority of our bulk distribution network. Most of these cables are extremely reliable and replacing them is a highly disruptive activity.
- 5.47 More recently installed cables are of solid construction which require no on-going maintenance, however we have significant numbers of earlier cable types where insulation is provided by pressurised gas or oil. These are electrically very reliable but they bring environmental, service and operational risks. We have to inspect and maintain the tanks, pumps and other ancillary equipment that are required to operate these cables.
- 5.48 In RIIO-ED1 we will spend £47.2 million on these cables, a 35.9% reduction on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
EHV & 132kV cables	46.1	9.2	47.2	5.9	-35.9%

- 5.49 Based on stakeholder feedback and our environmental obligations, we have set a target of reducing oil lost from these cables by 3200 litres a year by 2023. Part of our response to this is a planned programme of cable replacement which we started in DPCR5 and will take us 30 years to complete. Together with on-going refurbishment activities, CBA analysis suggests that this is the best value approach to managing these assets over the medium term (see Annex 3). As a result, we plan to replace 57km of these cables with modern solid equivalents in RIIO-ED1. This programme is based on replacing those cables in the highest risk settings (eg in the vicinity of a watercourse) first.
- 5.50 The 35.9% decrease in spending is a result of the adoption of the efficient 30-year cable replacement plan.

LV and HV plant

- 5.51 These assets are the ones that transform the voltages we use for distribution into standard mains voltage and route electricity through our LV and HV network. These assets are often located in residential areas, under pavements and on street corners close to the customers they serve.
- 5.52 Over the course of RIIO-ED1 we will spend £132.6 million on LV and HV plant which is a 65.9% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
LV & HV plant	49.9	10.0	132.6	16.6	65.9%

- 5.53 Based on the current health of the network and our projections of future risk, we need to increase the replacement rates for these assets to prevent a significant increase in failures and replacement costs in the future.

- 5.54 One model of LV switchgear contains a fuse board which presents a safety hazard for our employees. There are several thousand of these on our network. Where possible, we are refurbishing them but a large number of replacements are unavoidable and this contributes to the increase in volumes and expenditure.

EHV and 132kV plant

- 5.55 Plant consists of the transformers used to transform electricity between voltages and the switchgear used to operate them. These are our largest single assets and are located on major substation sites around the region.
- 5.56 Some of the largest sites are shared with National Grid and occasionally other DNOs. Where this is the case, we co-ordinate with these other operators to ensure we have efficient work programmes.
- 5.57 As these assets are so fundamental to the delivery of our service and take so long to replace if damaged, they are duplicated so that the backup transformer can take the load in the event of a fault. We inspect and maintain these assets regularly and use the condition information to carefully judge the best time to replace or refurbish each unit. Over the course of RIIO-ED1, we will spend £108.8 million on replacing and refurbishing EHV & 132kV plant which is a 30.4% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
EHV & 132kV plant	52.2	10.4	108.8	13.6	30.4%

- 5.58 These assets are getting older; inevitably older assets require increasing amounts of investment. We use CBRM to ensure replacement is kept to a minimum, but the technique can not fully mitigate the necessary increase brought about by age.
- 5.59 We have included programmes of plant refurbishment in the forecast, including 33kV, 11kV & 6.6kV circuit breakers, where we have developed innovative options for the installation of retrofit breakers. This assumption has allowed us to reduce the volume of units planned for full replacement.
- 5.60 Our forecast also includes refurbishment of over 100 Grid and Primary transformers, using the in-situ oil regeneration technique we developed in partnership with the University of Manchester.

Civil structures

- 5.61 The civil structures we look after include buildings, concrete plinths, compound fences and other structures. These play a vital role in protecting our electrical equipment. We need to invest to ensure that the civil works are fit for their intended purpose and that they meet all relevant safety standards.
- 5.62 We will spend £75.8 million on civil work over the RIIO-ED1 period, which is a 69.4% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Civil structures	28.0	5.6	75.8	9.5	69.4%

- 5.63 The increased programme size is driven by:
- Additional plant volumes
 - New major programmes on cable structures (pits, tunnels and bridges)
 - An increase in Grid and Primary works (eg substation dehumidifier upgrades)
- 5.64 The volumes of civil work driven by plant asset replacement have been reduced following implementation of standard solutions, which allow more in-situ plant replacement and refurbishment.

Operational IT and Telecoms

- 5.65 Operational IT and Telecoms assets are those used in the real-time control, monitoring, management and restoration of our network. The infrastructure includes the Remote Terminal Units (RTU) connected directly to the primary electrical plant, the control room real-time systems and the communications infrastructure that links the RTU population to the control room systems.
- 5.66 We have historically developed and maintained our own custom Network Management System (NMS) software. This has provided many benefits, particularly in relation to network automation, which were not available from 'off-the-shelf' systems. We have recently completed an evaluation of future requirements based on developments in the software market and analysis of the requirements of a future smart network (including smart meter data integration).
- 5.67 We concluded that continuing to develop bespoke real time systems in house would incur significant additional cost and present increasing risk to our business. We also conducted a number of expert reviews of our Operational IT strategy, focused on fit-for-purpose current and future functionality, simplification of infrastructure complexity and reduction in total cost of ownership.
- 5.68 We conducted a number of reference client engagements with both British DNOs and with US electricity and gas companies. We found that internationally, the maturity of the smart grid roadmap and integration to Advanced Meter Infrastructure (AMI) is generally more advanced than in the UK. As a consequence most of the real time systems vendors with implementations across Europe and the US have already started to move their core systems along the smart future roadmap and some have mature offerings in demand side management, contract management and advanced meter infrastructure.
- 5.69 The recommendations from the reviews and reference engagements led to the creation of a strategy for Operational IT and Telecoms investment that is underpinned by a scalable and reliable strategic platform, which allows the future deployment of new smart grid technologies. This strategy relies on improving data quality, data management, and implementation of a commercial off-the-shelf NMS platform. Advanced analytics and smart functionality will be developed on top of this core platform.
- 5.70 The Operational IT transformation programme will create benefits by integrating smart meter data much earlier than would otherwise be the case (see Annexes 18 and 28).
- 5.71 As part of the transformation programme, we will also refresh the Operational IT communications equipment and RTU population to maintain and improve network performance as smart technology is progressively implemented in the UK.
- 5.72 We will spend £65.6 million on Operational IT over RIIO-ED1, a 29.3% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Operational IT	31.7	6.3	65.6	8.2	29.3%

- 5.73 Costs are driven by the replacement of our network management system which started in DPCR5, implementation of smart grid capabilities such as contract management, energy management and distributed generation management. Through refreshing and upgrading our operational IT estate to maintain current performance and to support the increase in automation we will deliver network performance improvements at a lower overall cost.

Managing network impacts

- 5.74 We need to ensure that we operate a safe and environmentally sound network. We invest in these areas to ensure we follow our safety and environmental principles, comply with all applicable legislation, and deliver our safety and environmental Outputs. We also sometimes have to move our assets where we no longer have the right to maintain them on land which does not belong to us.

5.75 Over the RIIO-ED1 period we will spend £96.1 million which is a 19.6% decrease on an annual basis from DPCR5. This decrease is driven by the completion of our ESQCR programme.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Maintaining safe network	14.1	2.8	39.7	5.0	75.9%
Reducing environmental impacts	2.4	0.5	6.4	0.8	67.4%
Reducing electrical losses	0.7	0.1	10.4	1.3	857.5%
ESQCR compliance	34.4	6.9	3.3	0.4	-94.0%
Diverting our equipment	18.0	3.6	27.2	3.4	-5.6%
Undergrounding	5.2	1.0	9.1	1.1	9.7%
Total	74.7	14.9	96.1	12.0	-19.6%

Maintaining a safe network

Safety is our number one priority and we invest to ensure the safety of our people, our contractors and the public.

5.76 Many of our assets were installed several decades ago. The materials, tools and equipment available today have significantly improved. Consequently we are undertaking a range of investment programmes on our assets to ensure they are fully compliant with modern standards and legislation.

5.77 These programmes comprise:

- Managing the risk from asbestos at substations
- Installing safe climbing equipment on our steel towers and key items of plant
- Increasing the security of substation sites to prevent third party access

5.78 We have made good progress on remediation of asbestos at our indoor substations and have planned for a programme of remediation for our outdoor substations. We have identified overhead line assets where specific legal and safety issues exist, for example high earth resistance values and the replacement of ceramic surge arresters.

5.79 We will spend £39.7 million on these safety programmes over RIIO-ED1, a 75.9% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Maintaining safe network	14.1	2.8	39.7	5.0	75.9%

5.80 A significant part of the increase is driven by our response to an increase in metal theft incidents over the last few years. This is projected to continue as metal prices rise and we need to upgrade substation security measures to address this.

Reducing environmental impacts

5.81 We have included volumes in our plan to continue to mitigate a range of environmental impacts including noise from our transformers, oil loss from our equipment and cleaning up contaminated land.

- 5.82 The total spend on reducing environmental impacts over RIIO-ED1 will be £6.4 million, a 67.4% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Reducing environmental impacts	2.4	0.5	6.4	0.8	67.4%

- 5.83 The increase is a result of greater volumes of remediation work on oil-contaminated land and work on containment systems to prevent contamination from sites leaking into the surrounding environment.

Reducing electrical losses

- 5.84 Electrical energy is lost in the process of distribution. Equipment that leads to lower losses is available but this is generally more expensive than our existing equipment.

- 5.85 We used CBA to identify where installation of low loss equipment, particularly transformers, would deliver long-term cost and environmental benefit for our customers. Consequently we have included £10.4 million in our plans to replace 652 installations over the first four years of RIIO-ED1. This is expected to produce savings of 10,972 MWh a year, the equivalent of removing 5,709 tonnes a year of CO₂ from UK emissions (see Annex 19).

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Reducing electrical losses	0.7	0.1	10.4	1.3	857.5%

ESQCR compliance

- 5.86 Our work to ensure our circuits meet the requirements of the Electricity Safety, Quality and Continuity Regulations (ESQCR) will be complete in 2016.
- 5.87 We forecast that we will need to continue our current programme of rectification into 2016. No specific forecast has been made for a proactive programme beyond this point. If isolated instances are identified in the future, whether by customer referral or in the course of routine inspection, we will respond to them as Troublecall (operational fault remediation) incidents if urgent, or otherwise as part of our planned replacement and refurbishment work.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
ESQCR compliance	34.4	6.9	3.3	0.4	-94.0%

Diverting our equipment

- 5.88 Diversion costs are incurred where we have to move our assets because the current route or site becomes unavailable, for example through the termination of the legal rights to locate our equipment, or because of the construction of a new highway.
- 5.89 Every year we deal with a number of claims from property owners relating to the reduction in value or productivity of their property and/or land as a consequence of our assets. In these cases, we often pay the grantor a sum to convert our access right from a terminable wayleave to an easement, which gives us permanent right to remain. This is done where it is cheaper than moving the assets involved and where there is a continued requirement for the assets.
- 5.90 In some cases, it is cheaper to move or divert the assets. This may also be the case where the landowner or developer wishes to develop a new site and serves us with a termination notice.

- 5.91 In developing the forecast we have looked at recent trends and concluded that the rate of terminations has stabilised. We have also considered the effects of the New Roads and Street Works Act (NRSWA) and of large infrastructure projects in our region. For example with the Network Rail Electrification Project we have made a provision for the NRSWA diversions within roads and bridges in our submission, but we have made no provision for overhead line diversions, as we expect these to be recharged to Network Rail. Combining all of these factors, we expect the volume of diversions work to remain steady over the course of RIIO-ED1.
- 5.92 Where diversions are required, at the specific request of third-parties, we will seek to charge them where appropriate. We have forecast a decrease of 5.6% in diversion expenditure, driven by efficiency savings on a constant volume of work. We will spend £27.2 million in RIIO-ED1.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Diverting our equipment	18.0	3.6	27.2	3.4	-5.6%

Undergrounding

- 5.93 We will invest £1.1 million per annum throughout RIIO-ED1. The detailed selection of areas for undergrounding will continue to be guided by our regional partners and stakeholders. Our investment will allow us to underground approximately 80km of existing overhead lines by 2023.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Undergrounding	5.2	1.0	9.1	1.1	9.7%

Worst Served Customers

- 5.94 We are planning to ensure that no customers receive a service that would qualify them as 'worst-served' by 2023. Worst Served Customers (WSC) are those who experience 12 or more interruptions due to faults on the high voltage network, over a three-year period.
- 5.95 It is our firm view that as our customers' use of and dependence on electricity increases, particularly as a result of the decarbonisation of transport, heating and generation, extremities of performance will become increasingly unacceptable to them.
- 5.96 We already have the lowest percentage of worst served customers of any DNO outside of London and will reduce this to zero by the end of RIIO-ED1.
- 5.97 The investment is a package of measures tailored to the requirements of the network in the vicinity of the relevant customers. It includes a mix of overhead line rebuilds as well as additional protection and remote control facilities.

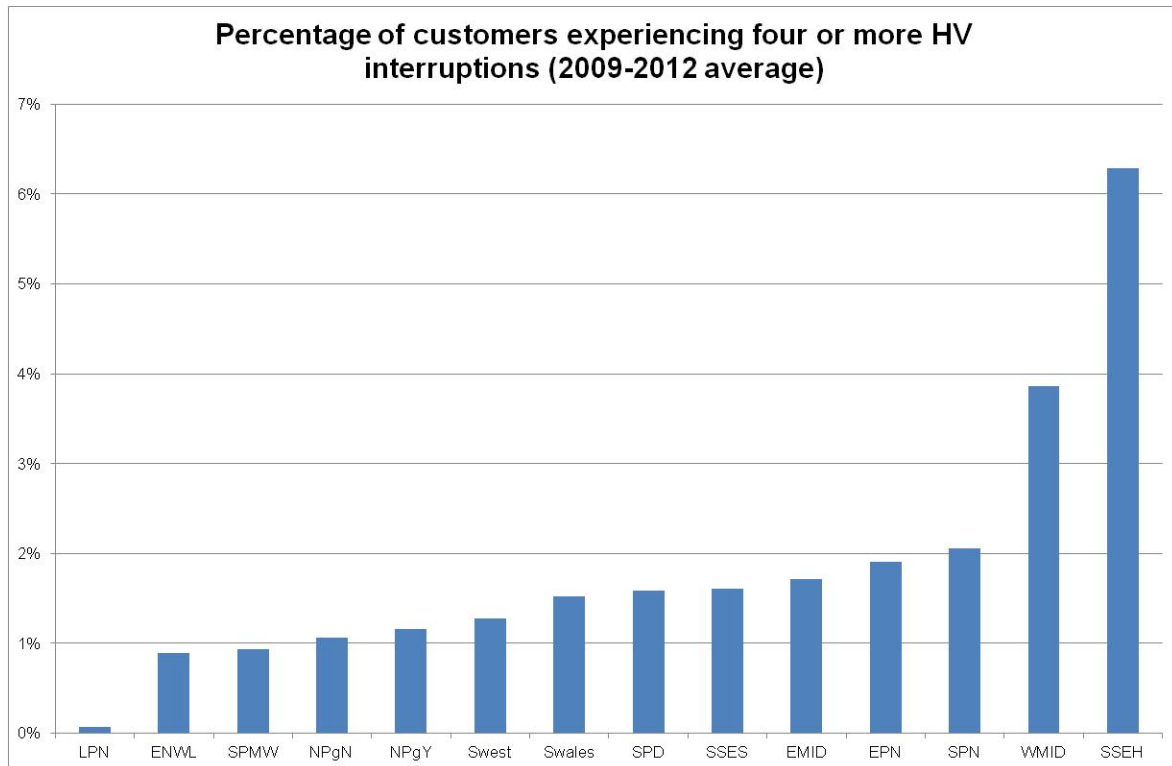
£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Worst Served Customers	1.3	0.3	3.4	0.4	66.1%

- 5.98 We will spend £3.4 million in RIIO-ED1 on our WSC programme.

Improving resilience to extreme events

- 5.99 It is important that our network is able to survive and recover from extreme events such as flooding, terrorist attack, and a total shutdown of the National Grid.
- 5.100 We have analysed the high-risk points on our assets and routes where multiple circuits can be affected by a single incident. This study identified seven 132kV and thirteen EHV sites where the risk was significant. Further work on potential mitigation measures identified that three 132kV sites and three EHV sites require network reinforcement or diversion to appropriately manage the risk.

One very high priority site is being addressed in DPCR5. The other five sites are currently included in our RIIO-ED1 forecast. The expenditure associated with this work is included in our expenditure forecasts for civil work and cables.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Flooding	7.8	1.6	10.7	1.3	-14.4%
Critical National Infrastructure	-	-	2.6	0.3	n/a
Black Start	-	-	7.4	0.9	n/a
Total	7.8	1.6	20.7	2.6	65.2%

Flooding

- 5.101 Protecting our substations from severe flooding is essential to maintain a resilient network. We have made excellent progress in delivering the DPCR5 flooding programme with all 31 sites planned for DPCR5 completed by January 2014. This will ensure that 550,000 customers benefit from additional protection against interruptions due to 1-in-100-year flood.
- 5.102 Working with new data from the Environment Agency we have identified a further 56 sites which are also now identified as at risk of flooding. We will spend £10.7 million on protecting substations from flooding in RIIO-ED1, a 14.4% decrease on an annual basis from DPCR5.

Communication with the public is important – dealing with problems people need to have clear information available. Also when improvements are being made, publicise what you are doing and what the benefits will be.

Dave Walker, Wigan Council

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
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Flooding	7.8	1.6	10.7	1.3	-14.4%
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Critical National Infrastructure (CNI)

5.103 CNI sites are those deemed most critical to the national interest. As a result of our work with the security services, we have agreed that two sites should be classified as CNI and protected during RIIO-ED1. In addition to the upgrading investment, we need to maintain a dedicated 24-hour monitoring function for these sites. The most cost-effective solution is outsourcing to a specialist vendor.

5.104 We will spend £2.6 million on our CNI programme over RIIO-ED1.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Critical National Infrastructure	-	-	2.6	0.3	n/a

Black Start

5.105 When an entire region loses electrical power, the generation, transmission, and distribution networks must be re-energised in a precise sequence known as Black Start. To comply with these requirements, we need to ensure that our major substations have enough backup battery capacity to be able to switch back on when required.

5.106 When batteries come up for replacement at these sites, we will upgrade their capacity to 72 hours in line with guidance from DECC. This will cost £7.4 million over the RIIO-ED1 period.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Black Start	-	-	7.4	0.9	n/a

Quality of Supply (QoS)

5.107 Over the last few years we have invested significantly to reduce the impact of power cuts on customers by improving the ability of the network to detect faults and restore supplies. This has produced real benefits for customers in terms of improved supply availability.

5.108 Customers tell us that this remains their top priority so we expect to continue to invest in such programmes as we seek to achieve our goal of a 20% reduction in Customer Interruptions and Customer Minutes Lost by 2019. Much of the investment in our plan has an incidental effect on the reliability and availability of supply. We have not included funding in our plan for investment which is solely designed to improve Quality of Supply. This will be paid for through the rewards we earn for out-performing Ofgem's RIIO-ED1 performance targets.

Making new connections

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Making new connections	47.5	9.5	46.2	5.8	-39.2%

Customer connections (associated reinforcement costs)

5.109 When customers need to connect to our network we sometimes need to increase capacity to allow this to happen. Customers are sometimes asked to contribute to this cost; this income is not included in the figures above. We forecast that growth on our network will continue to be largely driven by demand from customers for new connections to new buildings.

5.110 The rate of these will be driven by a combination of population and economic growth factors. Connecting customers is a competitive market, with a number of different service providers capable of providing quotations and making new connections to our network. The 39.3% change is largely due to a change in categorisation.

Connecting Distributed Generation

5.111 The amount of local generation (also called Distributed Generation) that connects to our network is largely driven by the economic rewards for customers and developers. Many customers also want to connect renewable sources of generation to play their part in reducing their carbon impact.

5.112 Successive government policies (such as the Feed in Tariff) have driven an increase in the amount of distributed generation connected to our network.

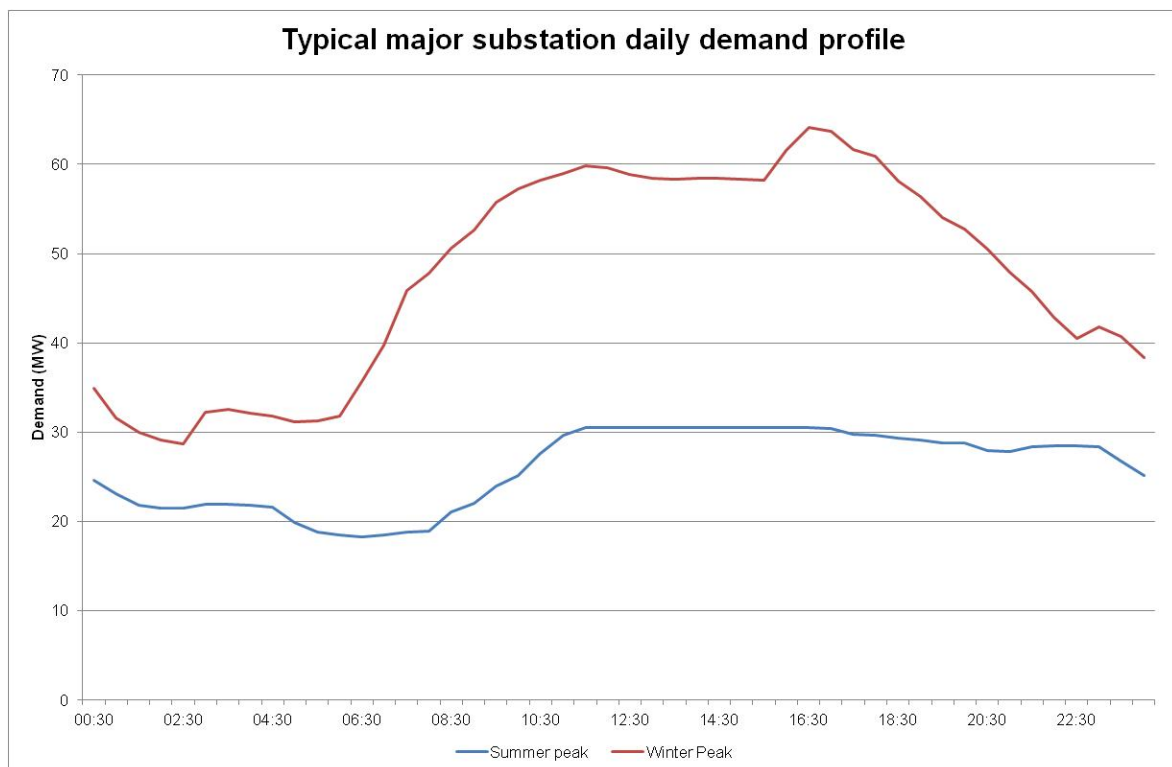
45% of customers think it is important for us to help people and schools save energy and reduce their carbon footprint.

Engaged Consumer Panel

Ensuring available capacity

5.113 We need to reinforce our network as the demands on it increase. These increases result from changes in population, customer consumption and connection of Distributed Generation to our network. We carry out reinforcement work by installing larger capacity transformers and/or linking parts of the network by installing new cables.

5.114 We also need to ensure that our network is capable with dealing with faults, even at times of peak demand. These peaks occur at different times of the day and year depending on the load that a particular substation is supplying, as illustrated in the graph below. Our network is designed to ensure that sufficient spare capacity is maintained to cope with incidents. Maintaining this spare capacity underpins future performance levels.



5.115 In RIIO-ED1, general reinforcement requirements will be supplemented by a need to connect increasing levels of Low Carbon Technologies (LCT) such as electric vehicles and heat pumps.

- 5.116 The level of LCT take-up is difficult to predict and therefore we need to take a prudent but responsible approach to reinforcement forecasting. We led work for the Smart Grid Forum to develop the Transform model that is used by all UK network operators to predict levels of LCT penetration and clustering (see Annex 20). Through Innovation Funding Incentive (IFI), Low Carbon Networks Fund (LCNF) and our own internally funded innovation (such as Demand Side Response) we are developing cost-effective solutions to allow our network to transition to and fully support the low carbon future. Our Capacity to Customers (C₂C) project aims to significantly reduce the amount of network reinforcement required to support load growth through applying smart grid technology and demand side response.
- 5.117 In each case we have looked carefully at non-traditional intervention options, either through innovative technical solutions, looking to exploit existing capacity, or ways of moving the peak demand which causes the investment requirement.
- 5.118 Spending on reinforcement is separated into general reinforcement and fault level reinforcement. Fault level reinforcement ensures that in the case of a fault, our network is able to handle it safely and without incurring damage (see Annex 21).
- 5.119 In forming our plans for RIIO-ED1, we have been careful to take account of the longer term context in which those plans will be delivered. Whilst we forecast that the need to reinforce our network will increase considerably in RIIO-ED2 and RIIO-ED3 we do not believe this requires or justifies the need for additional work in RIIO-ED1. The risk of creating stranded assets is still too great as we do not know where the reinforcement needs will occur (see Annex 22). In four years' time we will review this analysis as we approach the mid-point review of RIIO-ED1.
- 5.120 Our total reinforcement expenditure in RIIO-ED1 will be £103.4 million, a 7.4% decrease on an annual basis from DPCR5.

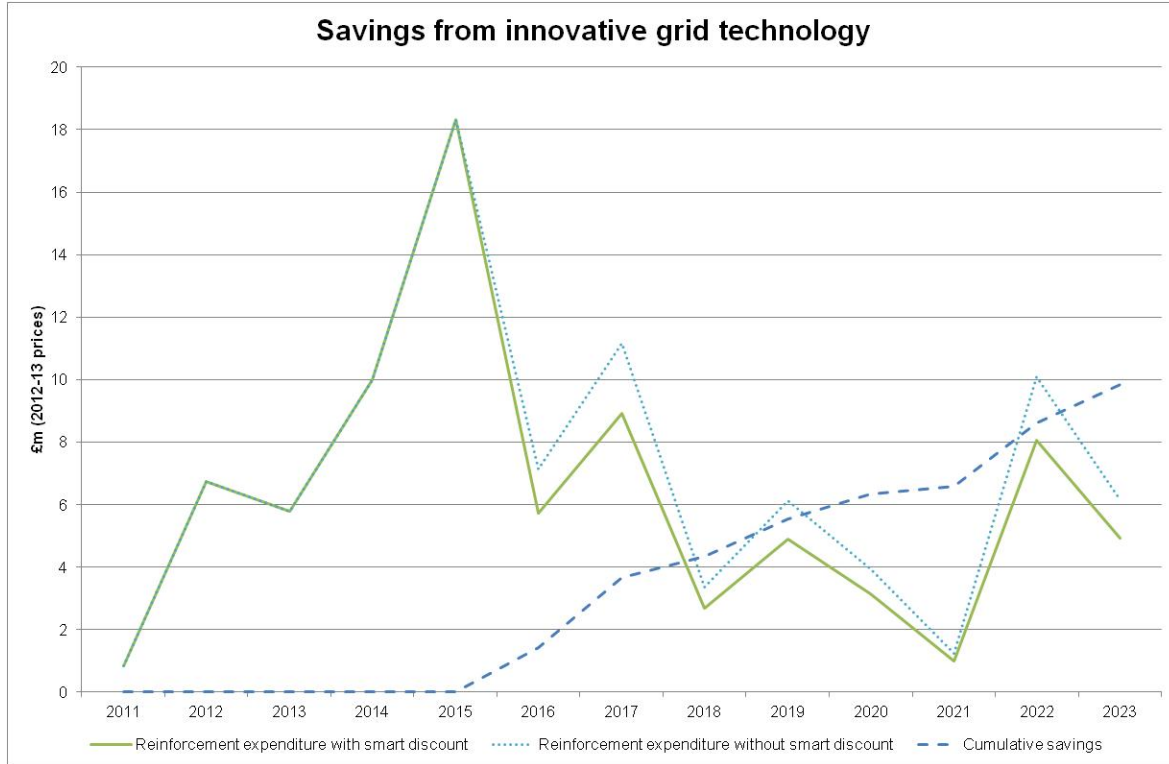
£m (2012-13 prices)		DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
General reinforcement	EHV and 132kV	41.7	8.3	39.3	4.9	-41.0%
	LV and HV	24.5	4.9	49.5	6.2	26.5%
Fault level reinforcement	EHV and 132kV	1.8	0.4	7.7	1.0	173.7%
	LV and HV	1.9	0.4	6.8	0.9	129.2%
Total		69.8	14.0	103.4	12.9	-7.4%

- 5.121 The requirements for non-low-carbon related reinforcement at the higher voltages reduces in RIIO-ED1 as overall demand requirements are projected to be largely static.
- 5.122 However, we do foresee an increase in the investment required to both prepare for and respond to the impacts of LCTs. This is particularly pronounced towards the end of the period.

EHV and 132kV general reinforcement

- 5.123 We study the current and future demand and capacity for each substation group to establish the reinforcement requirements for the higher voltages. We developed high-level reinforcement solutions taking into account overall system performance and the status of neighbouring parts of the network. The resulting projects have been costed using the efficient construction costs we expect in RIIO-ED1.
- 5.124 Total costs have then been discounted by 20% on the assumption that we will be able to drive additional efficiencies from our innovation programme.
- 5.125 We have developed an integrated reinforcement programme to ensure that any duplication of other solutions or interventions is removed and that the proposed solution meets the needs of all relevant requirements on that site or portion of network. We will competitively tender each project prior to commencement to ensure we are getting the best available prices and contract conditions.
- 5.126 We plan to reinforce 20 major sites during RIIO-ED1 at a cost of £39.3 million, a 41.0% decrease on an annual basis from DPCR5.

£m (2012-13 prices)		DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
General reinforcement	EHV and 132kV	41.7	8.3	39.3	4.9	-41.0%



LV and HV general reinforcement

- 5.127 While our EHV and 132kV reinforcement programme is made up of a small number of discrete projects, our LV and HV programme requires a larger number of smaller interventions.
- 5.128 The nature of the new LCT that we anticipate will be connected during RIIO-ED1 will create issues not previously seen in any significant volume on the distribution network, for example harmonic compliance and LV voltage compliance. We have included these considerations in our modelling. We have developed a software model for the whole of the LV and HV network that identifies network overloads at these voltages (see Annex 21).
- 5.129 A significant proportion of our services are 'looped' off another service and do not have a separate connection to the supplying mains cable. These services have limited capacity which will constrain the take up of LCT in the locations in which they are found. As such, we propose to address looped services that constrain the connection of LCT to the network.
- 5.130 The total spend on LV and HV reinforcement in RIIO-ED1 will be £49.5 million, a 26.5% increase on an annual basis from DPCR5.

£m (2012-13 prices)		DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
General reinforcement	LV and HV	24.5	4.9	49.5	6.2	26.5%

EHV and 132kV fault level reinforcement

- 5.131 Fault level reinforcement is undertaken so that our network can handle faults safely and without incurring damage. We calculate fault levels using network modelling. Using the 2023 peak demand forecast and associated technical assumptions, we can identify switchgear calculated to have a fault level in excess of its fault rating and flag it for replacement or reinforcement.
- 5.132 We will spend £7.7 million on reinforcing our EHV and 132kV networks to handle fault conditions which is a 173.7% increase on an annual basis from DPCR5.

£m (2012-13 prices)		DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Fault level reinforcement	EHV and 132kV	1.8	0.4	7.7	1.0	173.7%

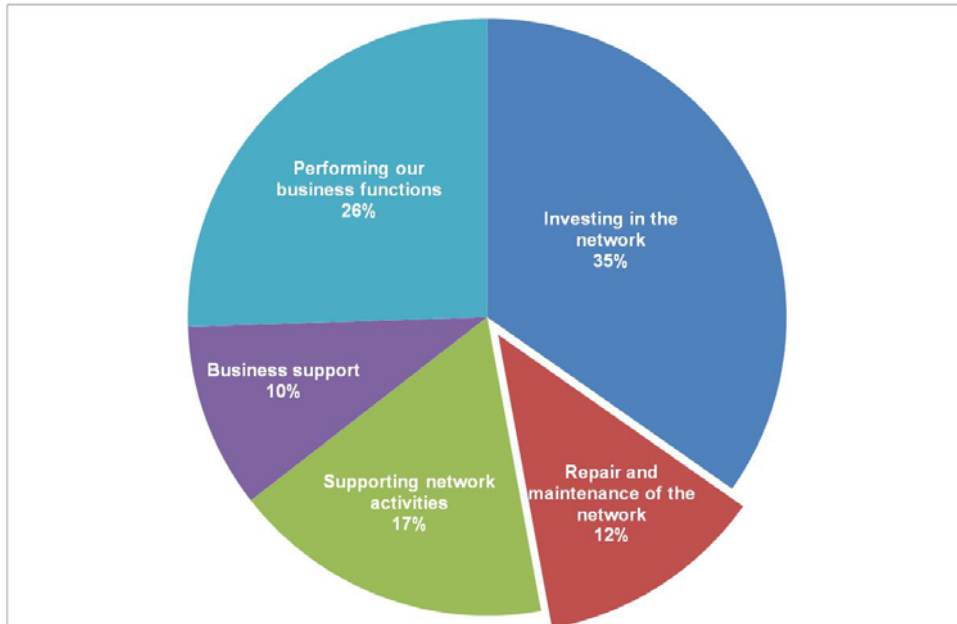
LV and HV Fault Level Reinforcement

- 5.133 The urban areas in the North West have HV networks operating predominately at the 6.6kV level rather than the 11kV more commonly found in the rest of our area. This is a legacy from the original network installation. The fault rating of much of the switchgear associated with this network often presents a barrier to the connection of LCT. To remove this potential block we propose to remove this switchgear from our network over RIIO-ED1 and RIIO-ED2 to coincide with the expected profile of LCT adoption.
- 5.134 We will spend £6.8 million on this programme over RIIO-ED1, which is a 129.2% increase on an annual basis from DPCR5.

£m (2012-13 prices)		DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Fault level reinforcement	LV and HV	1.9	0.4	6.8	0.9	129.2%

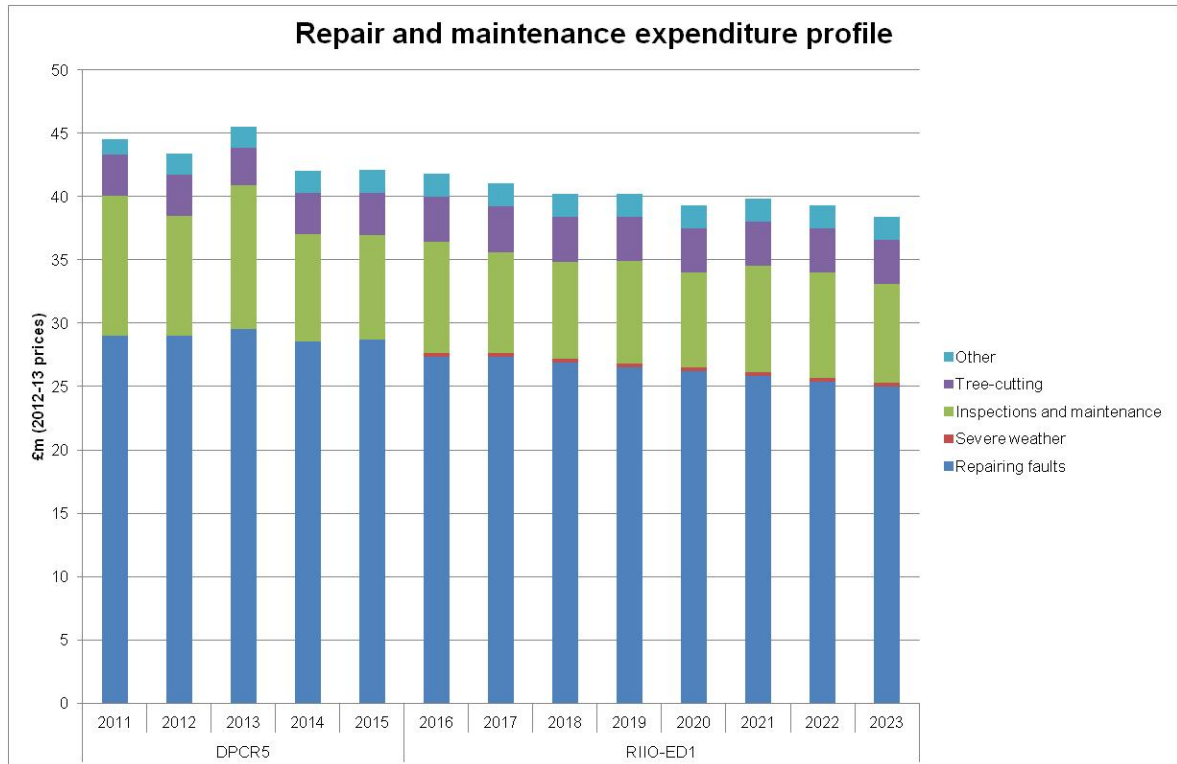
Repair and maintenance of the network

5.135 Our repair and maintenance programme keeps our network fully operational and fit-for-purpose. We invest to respond rapidly to fix faults, inspect and maintain the equipment regularly, manage the vegetation growing near our lines and run the substations on which the major plant is sited. 12% of our total expenditure is on repair and maintenance of our network.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Repairing faults	144.8	29.0	210.6	26.3	-9.1%
Severe weather	-	-	2.3	0.3	n/a
Inspections and maintenance	48.6	9.7	64.6	8.1	-16.9%
Tree-cutting	16.2	3.2	28.2	3.5	9.1%
Other	8.0	1.6	14.6	1.8	14.6%
Total	217.5	43.5	320.2	40.0	-8.0%

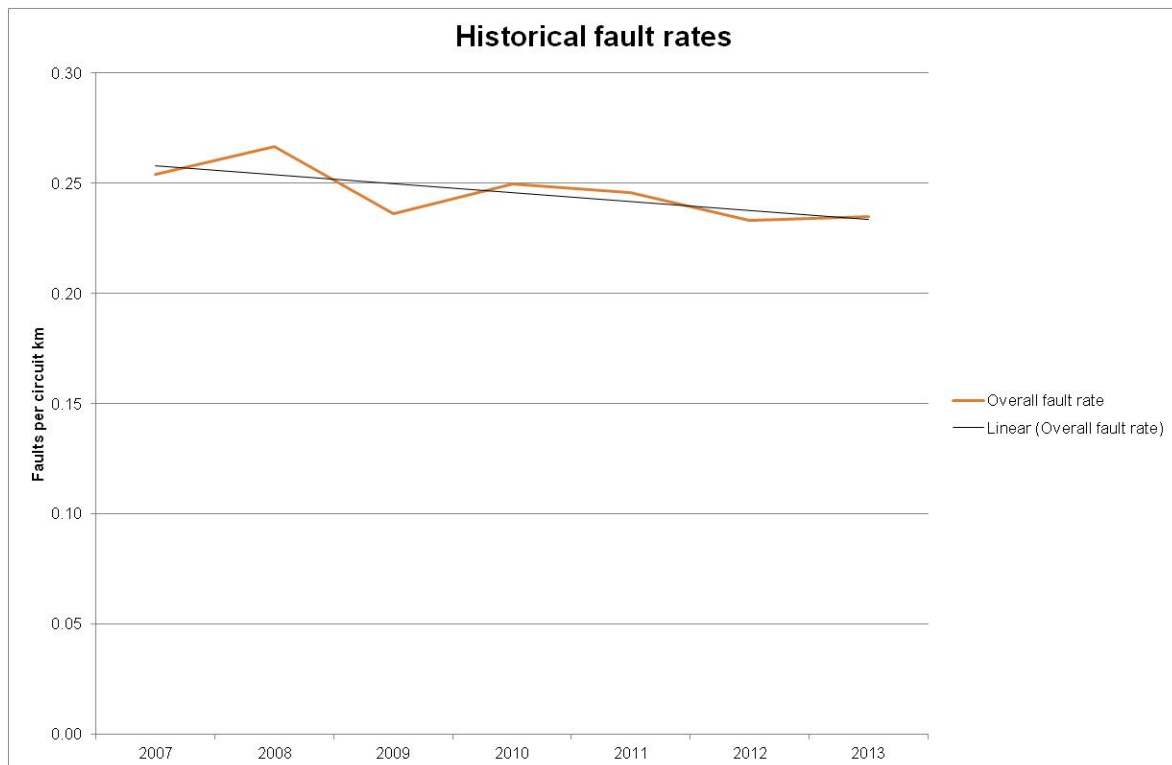
5.136 A percentage change is not applicable for severe weather as this is an allowance for events beyond our control.



Repairing faults

- 5.137 When a fault occurs on our network we act to resolve it as soon as possible. Some faults can be restored from our control centre or by sending an engineer to site but 70% of faults causing an interruption to supply need to be repaired before supplies can be restored.
- 5.138 In a typical day we will respond to 35-40 faults resulting in an interruption to supply and 30-35 other incidents requiring a response. Responding to faults quickly is critical to achieving our goal of a 20% reduction in Customer Minutes Lost. The majority of fault response work is carried out by our own people supported, when necessary, by one of our contract partners.

Our cost forecast has been determined by assessing the historic fault volumes. Fault volumes have been stable over the last few years and our forecasts are based on the latest three-year average.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Repairing faults	144.8	29.0	210.6	26.3	-9.1%

Severe weather costs

- 5.139 Severe storms such as those over Christmas 2013 which affected much of the UK have a disruptive impact on our network. We experience periods of bad weather such as this in most years but occasionally have an unusually disruptive event which causes widespread damage. We refer to these as 'severe weather events' and include a provision for expenditures as a result of these severe storm damage events.
- 5.140 In 2005, we suffered the effect of severe floods at Carlisle, which cost £5.5 million to repair. This was our largest atypical event of the last few years and passed Ofgem's threshold to be treated as an atypical 1-in-20 year event. We have estimated our RIIO-ED1 Severe Weather costs by assuming that an event of this magnitude will occur once every 20 years and included a pro-rated cost allowance into each year's expenditure.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Severe weather	-	-	2.3	0.3	n/a

- 5.141 A percentage change is not applicable for severe weather as this is an allowance for events beyond our control.

Inspections and maintenance

- 5.142 We maintain our assets to ensure they are safe, reliable and efficient throughout their operating lives. In total, we will spend £64.6 million on Inspection and maintenance during RIIO-ED1, a 16.9% reduction on an annual basis from DPCR5.

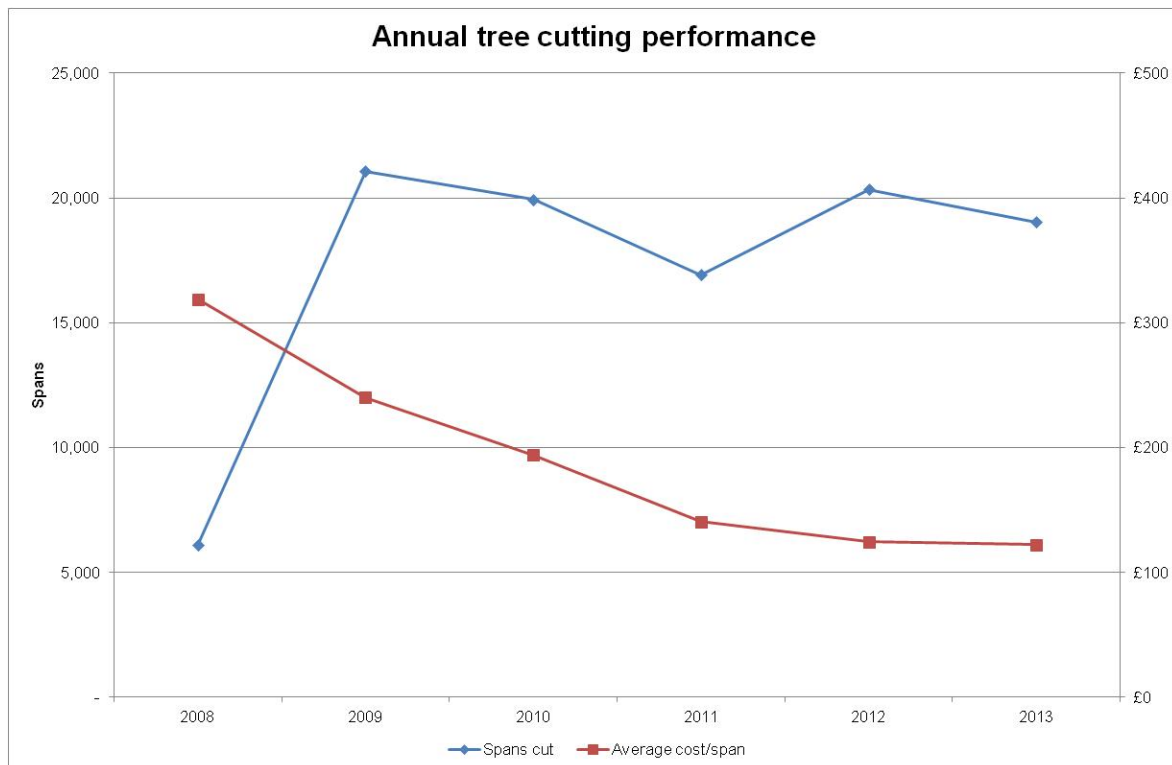
£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Inspections	10.5	2.1	12.3	1.5	-26.6%
Maintenance - switchgear and transformers	18.7	3.7	31.3	3.9	4.4%
Maintenance - protection	3.6	0.7	4.0	0.5	-31.1%
Maintenance - civil works	11.6	2.3	11.1	1.4	-40.2%
Maintenance - other	4.2	0.8	5.9	0.7	-11.2%
Total	48.6	9.7	64.6	8.1	-16.9%

- 5.143 Our programme is broadly in line with DPCR5 and we will deliver it at a more efficient cost.
- 5.144 Maintenance of switchgear and transformers is necessary to ensure reliable and safe operation of the network. This programme will be marginally bigger in RIIO-ED1 however programme efficiencies mean we will deliver this increased volume at a lower equivalent unit cost.
- 5.145 Protection maintenance activities are necessary to ensure our network operates correctly under both normal and fault conditions. We maintain and inspect relays, batteries and communication links to minimise the risk of exceptional shutdowns, extensive damage to plant and risk of injury to our people and the public.
- 5.146 Our electrical assets are often housed on substation sites which need to be maintained properly to ensure they continue to protect the equipment they house and minimise the safety risk to the public. Planned activities on these assets (buildings, fences etc) have been forecast based on the number of assets within our asset database and policy frequencies for planned maintenance.
- 5.147 We also carry out a number of reactive maintenance visits, usually in response to issues found during inspection, or notified to us by customers. Our forecast is based on historic volumes; however we will deliver this work at a more efficient unit cost.

Tree cutting

- 5.148 Trees that grow too close to our power lines are a safety hazard and can cause power cuts. Our tree cutting activity is delivered by our own teams, who consistently deliver industry-leading levels of cost and productivity efficiency.
- 5.149 We have forecast a small increase in total cost despite our decreased unit costs due to additional cutting work required to comply with resilience standards². These regulations require us to fell additional trees in the vicinity of our overhead lines so that trees brought down by storms cannot disrupt them. We are currently undertaking a 25-year programme to ensure we are compliant with these regulations, focussing initially on our 33kV network, which has the greatest combination of risk from tree falls and criticality to our network.
- 5.150 Tree cutting activity is predictable and based on a cyclical programme. As a result, expenditure is very stable over time. In RIIO-ED1, we will spend £28.2 million on tree cutting which is a 9.1% increase on an annual basis from DPCR5.

² ENA Engineering Technical Recommendation 132: Improving network performance under abnormal weather conditions by use of a risk based approach to vegetation management near overhead electric lines.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Tree-cutting	16.2	3.2	28.2	3.5	9.1%

Other operational costs

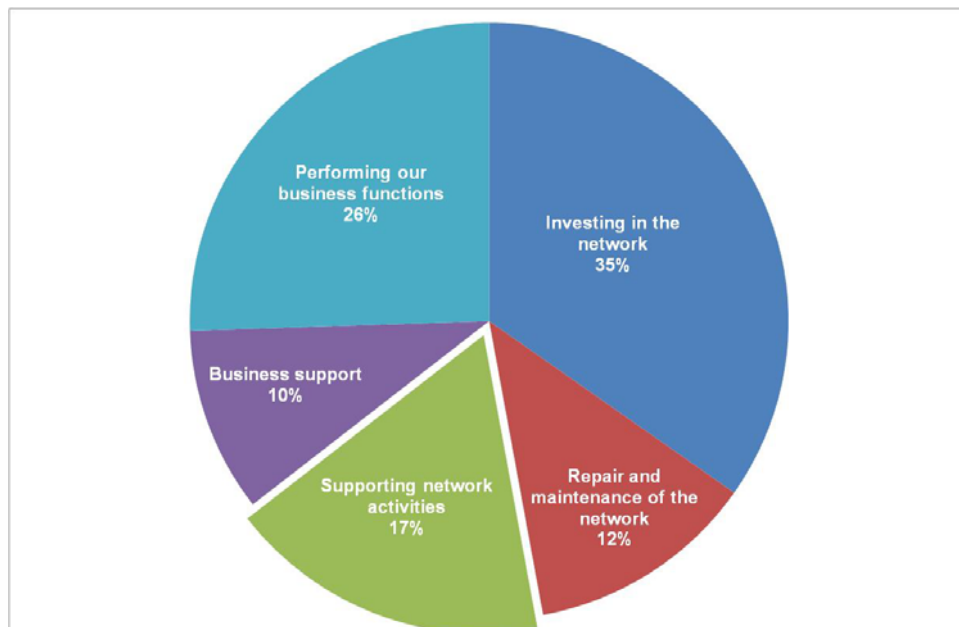
- 5.151 Substations which are live but no longer used, or where the level of utilisation is very low (eg because a factory has closed down) are potential safety hazards and are vulnerable to attack, vandalism and theft.
- 5.152 We are obliged by law to dismantle and remove substations when there no longer appears to be a use for them. During RIIO-ED1 we will spend £2 million on dismantling substations, a 56.6% increase over the DPCR5 period, which is driven by higher volumes.
- 5.153 We also have to pay for the electricity that our substations use. We use an energy procurement service, which reduces the risk to us from energy price fluctuations.
- 5.154 This provides a number of benefits over single supply contract procurement including:
- Allowing the purchase of energy at any time within the contract in order to take advantage of a falling market price whilst protecting against upside risk
 - Avoiding the risk of purchasing on a single day for the year ahead
 - Allowing multiple purchases within the contract period which spreads the risk
- 5.155 Our unit forecasts are based on 2012-13 consumption (13,413 MWh, equivalent to just over 4,000 houses) with a 270 MWh reduction (2%) following the deployment of smart meters which we anticipate will identify abnormally high consumption which can be reduced. Future years will see further reductions as innovations to reduce energy use within our substations are deployed across the network.
- 5.156 By 2023, it is anticipated that the energy consumed within substations will have been reduced by 18% through the replacement of substation appliances with more energy efficient units. However, we anticipate a 33% increase in the unit price for electricity over RIIO-ED1 which results in an increasing overall expenditure forecast.

5.157 We anticipate spending £12.6 million on substation electricity over the RIIO-ED1 period, which is a 9.8% increase on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Dismantlement	0.8	0.2	2.0	0.3	56.6%
Electricity	7.2	1.4	12.6	1.6	9.8%
Total	8.0	1.6	14.6	1.8	14.6%

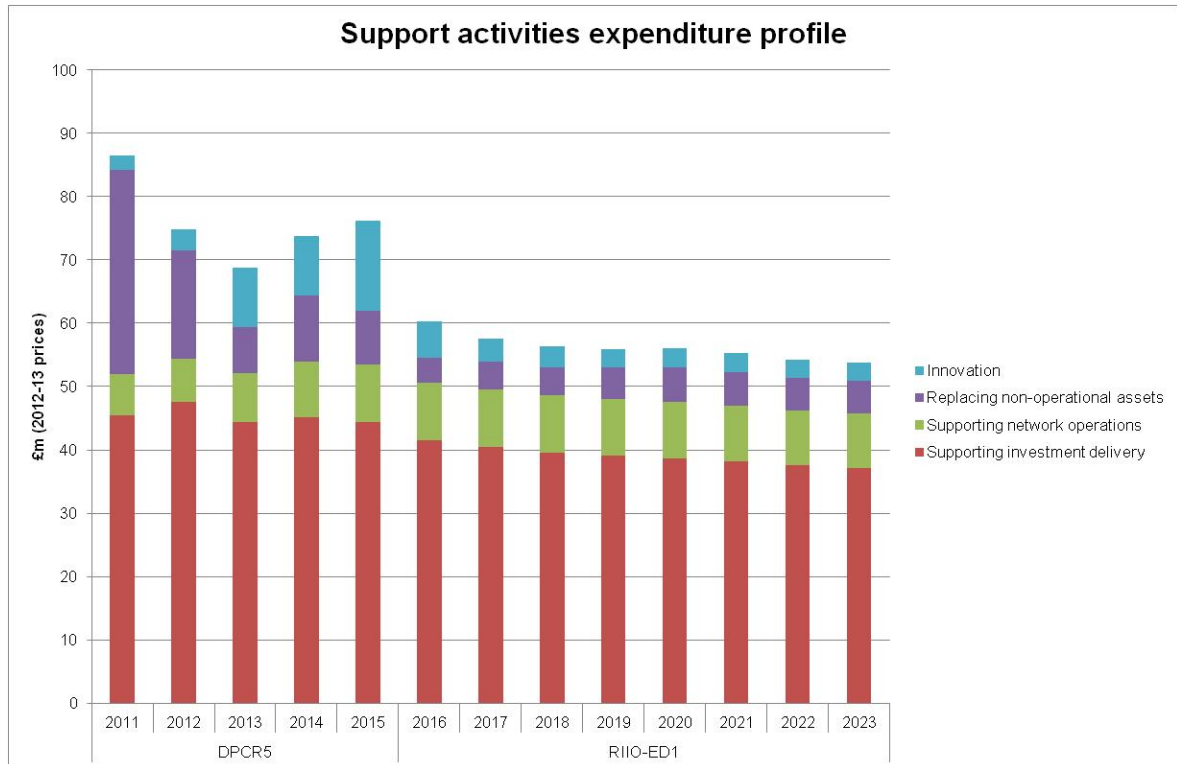
Supporting network activities

5.158 Managing our network requires considerable support activity, whether through the delivery of capital works, or providing the capability to manage day-to-day operations. We also have to plan for and manage a range of non-operational assets (such as vehicles and buildings) and also invest in innovation to continually seek out new ways of doing things. 17% of our total expenditure will be spent on supporting network activities.



5.159 We will spend 26.1% less annually on these supporting activities in RIIO-ED1 than in DPCR5 as a result of cost efficiencies.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Supporting investment delivery	227.0	45.4	312.0	39.0	-14.1%
Supporting network operations	38.7	7.7	71.4	8.9	15.3%
Replacing non-operational assets	75.7	15.1	38.6	4.8	-68.1%
Innovation	38.9	7.8	27.5	3.4	-55.8%
Total	380.2	76.0	449.5	56.2	-26.1%



Supporting investment delivery

- 5.160 We support delivery of our investment programmes with design, project management, logistics, materials and vehicles.
- 5.161 We will spend £312.0 million on supporting the delivery of investment in our network during RIIO-ED1, which is a 14.1% decrease on an annual basis from DPCR5. We have made significant savings in almost every category without compromising our objective of delivering a safe, reliable and resilient network for our customers.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Design and planning	46.4	9.3	60.5	7.6	-18.5%
Project management	23.3	4.7	39.1	4.9	5.0%
Work management	94.1	18.8	119.1	14.9	-20.9%
Managing materials and stock	9.7	1.9	14.3	1.8	-8.1%
Operational training	32.3	6.5	48.3	6.0	-6.7%
Vehicle operations	18.8	3.8	27.6	3.5	-8.1%
Network policy	2.4	0.5	3.1	0.4	-18.5%
Total	227.0	45.4	312.0	39.0	-14.1%

Design and planning

- 5.162 Our design and planning team is responsible for determining what work is necessary on our network, planning its delivery and carrying out the engineering design work on all our major projects.
- 5.163 In RIIO-ED1, we will spend £60.5 million on design and planning work, which is an 18.5% saving on the DPCR5 costs. This saving will be achieved by progressively increasing the number of standard designs we use, reducing the need for bespoke design on each capital project.

Project management

- 5.164 Our project management team ensures the timely and efficient delivery of our investment programme. Management of the smaller projects on our secondary network is done directly by the engineer in charge of the work. Our Grid and Primary projects, which tend to be much larger, are managed by our Major Projects Unit, which is also responsible for their design.
- 5.165 We will spend £39.1 million on project management over the course of RIIO-ED1, which is a similar level to DPCR5.

Work management

- 5.166 Work management is a very broad category that includes all the activity required to plan and efficiently deliver investment on our network. It ranges from strategic planning of the programme through the efficient co-ordination and scheduling of resources between supply restoration, repair, maintenance and planned capital programme work and the subsequent management, monitoring and reporting of delivery against the plan.
- 5.167 It includes managing permissions for working in the highway and the costs of the permits, dealing with wayleaves and planning consents and the annual costs we incur to secure them, customer liaison and response to enquiries, providing quotations to connections customers and important health and safety services.
- 5.168 We have rationalised our support model during DPCR5 to improve efficiency, breadth of support and flexibility to respond to changes in workload across the business. Some work management costs are now allocated to 'Supporting Network Operations'. As a result we have been able to reduce our work management expenditure by 20.9% to £119.1 million.

Managing materials and stock

- 5.169 We operate a stores system to manage the materials required on our network.
- 5.170 We use an external logistics provider with an offsite storage facility, together with local stores in depots supported by a number of satellite stores. Materials that are distributed by our provider are purchased by us through framework agreements with suppliers or are purchased by Framework Contractors through the same procurement arrangements. Careful stock control and liaison with our policy team ensures that we minimise the stock holdings but always have the right items in stock when required. This arrangement is competitively tendered every five years to ensure we continue to get the best rates.
- 5.171 We have recently completed a tender exercise; TVS Supply Chain Solutions will replace our current supplier, CEVA Logistics, from 1 April 2014.
- 5.172 Our spending on stores will decrease by 8.1% to a total of £14.3 million over RIIO-ED1. This cost reduction is made possible by improved logistics and inventory management policies.

Operational training

- 5.173 It is critical that the staff who work on our network are appropriately trained and equipped to work safely and efficiently. We achieve this by delivering programmes of specialist technical training for both our own people and the contractors who work on our behalf.
- 5.174 As well as our standard training programmes we also operate a Workforce Renewal Scheme. This helps us recruit and train the next generation of craftspeople and engineers to replace the large number of qualified employees who will be retiring in the next few years. Based on the profile of leavers and our plans for upskilling we will recruit the following:

	Recruitment per annum
Craftspeople	28
Engineers	41

- 5.175 We will continue to up-skill our existing employees and hire from other DNOs and contractors in the electricity supply industry. We still, though, need to supplement this by training an increasing number of new recruits. As part of this, we opened our new Training Academy in Blackburn in 2013.

- 5.176 We will spend £48.3 million on training operational employees over RIIO-ED1 which is a saving of 6.7%. We are able to reduce total spending despite the increase in training of new and existing staff by switching from outsourced training to our own training academy and by making our graduate and apprentice training programs shorter but more intense.

Vehicle operations

- 5.177 We need to operate and maintain our vehicle fleet to ensure it is as efficient as possible. The capital costs associated with replacing vehicles are dealt with in paragraph 5.197 – Replacing our vehicle fleet.
- 5.178 We run a fleet of 845 operational vehicles. This fleet ranges from small vans through to specialist equipment for installing poles and working on steel towers. The size and nature of the fleet is determined by the operational requirements.
- 5.179 We plan to improve our fleet's efficiency and carbon footprint through a number of ongoing initiatives including:
- Installation of rev limiters
 - More efficient use of the logistics contractor's vehicles in delivery of plant and material
 - Close scrutiny of fuel consumption to identify and remedy inefficiencies in the fleet
 - Publication of the lowest local fuel prices at each site
 - Further use of electric and hybrid vehicles
- 5.180 Fuel usage is monitored monthly against a volume reduction target of 2% per year from 2012 to 2019. As a result of these and other cost saving measures we have reduced our spending on fleet management by 8.1% to £27.6 million in RIIO-ED1.

Network policy

- 5.181 These costs relate to the small team of engineering experts who develop and maintain our technical policies, standards and specifications. These specify the equipment we buy and guide both the way in which it is installed and how the network is operated.
- 5.182 We will spend £3.1 million in this area over RIIO-ED1 which mainly relates to the costs of employing a small number of expert staff, together with the costs of maintaining the technical library. This represents a reduction of 18.5% from DPCR5 due to insourcing control of technical authorship and headcount reductions.

Supporting network operations

- 5.183 We support network operations with a number of services including running the Control and Customer Contact centres and managing our records.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Running the control centre	19.0	3.8	32.5	4.1	7.2%
Keeping our records up-to-date	7.1	1.4	11.4	1.4	0.5%
Customer Contact Centre	12.6	2.5	27.5	3.4	35.9%
Total	38.7	7.7	71.4	8.9	15.3%

- 5.184 The allocation of costs between 'Work Management' and 'Supporting Network Operations' has been refined as we have changed how we carry out and manage these activities to reduce costs.

Running the Control Centre

- 5.185 The Control Centre is at the heart of our day-to-day operations and allows us to control the entire network. The key responsibilities of the Control Centre are to manage planned network outages and restore power quickly after unplanned outages.

- 5.186 Our Control Centre operates 24 hours per day, 365 days per year. This will cost £32.5 million in RIIO-ED1.

Keeping our records up-to-date

- 5.187 It is vital to have good asset and geographical records as these are the basis for carrying out work on site and informing decisions about the future network investment requirements. Records are a key safety management tool in terms of ensuring that anyone working on or near our network knows what assets are in the vicinity.
- 5.188 We will spend £11.4 million on records in RIIO-ED1. Investment in accurate network data helps ensure our wider investment and repair programmes are as efficient as possible.

Customer Contact Centre

- 5.189 We operate a central Customer Contact Centre from our headquarters in Warrington, which operates 24 hours per day, 365 days per year to provide our customers with an exceptional level of service.
- 5.190 We will spend £27.5 million on the customer contact centre over RIIO-ED1. We will improve customer service through improved training and data management. We will supplement this by investment in a flagship Customer Relationship Management system, which will be fully funded by us.

Replacing non-operational assets

- 5.191 We own and operate a range of assets which are not used in the real-time management of the network but are nevertheless required to support the efficient running of our business. These include IT systems, buildings and vehicles. This section deals with the cost of replacing and renewing these assets. We deal with their operating costs in the next section, Business Support.
- 5.192 Our total spending on replacement of non-operational assets in RIIO-ED1 will be £38.6 million which is a 68.1% decrease on an annual basis from DPCR5.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Replacing our IT Systems	57.0	11.4	21.2	2.6	-76.8%
Investing in our buildings	6.9	1.4	2.6	0.3	-76.7%
Replacing our vehicle fleet	9.1	1.8	12.1	1.5	-16.5%
Investing in tools and equipment	2.7	0.5	2.8	0.3	-36.0%
Total	75.7	15.1	38.6	4.8	-68.1%

Replacing our IT systems

- 5.193 We have to replace our non-operational IT systems to ensure that our people are provided with appropriate IT tools to enable them to do their jobs efficiently and effectively. We have built a future-proof, cost effective IT estate during DPCR5 therefore our RIIO-ED1 investment programme is focussed on cost minimisation.
- 5.194 Our investment requirements are driven by general technology refresh cycles and the steps we are taking to protect our systems and telephony from hacking and other forms of cyber attack.
- 5.195 We will be using extended support contracts to increase the operational lives of our IT assets. This means we have to refresh our technology less frequently and lets us optimise whole life IT costs. Consequently, our RIIO-ED1 forecast is based on extended lifecycles for both hardware and software. This is a reduction of 76.8% from our DPCR5 costs to a total of £21.2 million over RIIO-ED1 (see Annex 18).

Investing in our buildings

- 5.196 We own a number of buildings that house our operational and support employees. Some of these are major sites housing hundreds of people and some are small parts of substation sites used by a few people.

- 5.197 Where we can, we are realigning our non-operational property portfolio (offices and depots) to owned rather than leased properties. As well as saving money this will ensure that we have consistent and appropriate accommodation across our non-operational estate to support operational delivery.

	Properties Owned	Properties Leased	Total Properties
At commencement of DPCR5	4	13	17
At commencement of RIIO-ED1	10	4	14

- 5.198 Our total spending on replacing non-operational property over RIIO-ED1 will be £2.6 million which is a 76.7% decrease on an annual basis from DPCR5. For more detail on support costs relating to our non-operational property, see paragraph 5.217- Managing our buildings.

Replacing our vehicle fleet

- 5.199 We need to replace vehicles when they become worn out or out of date. We also purchase new types of equipment that become available that help us do our job quicker or more efficiently. This includes generators and other forms of mobile plant
- 5.200 New vehicles are fitted out to an agreed standard by a framework contractor. We have developed components including van racking that can be recycled from one vehicle to the next. This reduces cost and can speed up the turnaround of new vehicles. Electricity North West branding is standard across each vehicle type and is applied by the fitting out contractor.
- 5.201 We also work with manufacturers to develop safer and more cost effective vehicles. We worked with Toyota to develop and fit out a Hilux model which meets our operational needs but is £10,000 per vehicle cheaper than competitors' equivalents. This is now our standard vehicle for this role.
- 5.202 To date, purchase and operational costs have precluded the use of electric or hybrid vehicles. In our forecast, we assume that the capability and cost of these vehicles will allow us to incorporate a limited number into our fleet during RIIO-ED1. We have assumed the vehicles will be leased on the basis that changes in technology would be detrimental to a capital payback period.
- 5.203 We have also assumed that by 2015, the cost of leasing these vehicles will be broadly equivalent to leasing diesel equivalents.
- 5.204 We will spend £12.1 million on replacement of vehicles over RIIO-ED1 which is a 16.5% decrease on an annual basis from DPCR5.

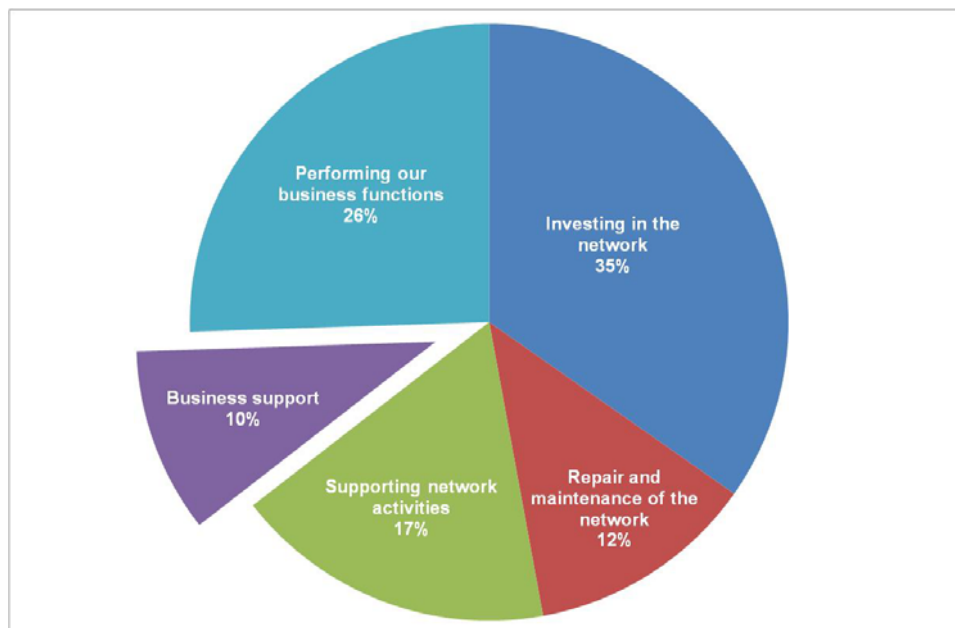
Innovation

- 5.205 We have invested significantly in innovation projects during DPCR5 under a number of schemes and intend to continue to do so in RIIO-ED1. In DPCR5, the Innovation Funding Incentive (IFI) which had been running since 2005 was joined by the new Low Carbon Networks Fund (LCNF). IFI enables investment in innovation projects across the range of our activities whereas the LCNF is aimed at trialling new approaches and technologies specifically related to accommodating the growth of LCT on our network.
- 5.206 In RIIO-ED1, the IFI and part of the LCNF scheme will be replaced by a new Network Innovation Allowance (NIA). We forecast to continue funding projects in these areas at current levels and Section 8 details the Innovation strategy that underpins our identification of future research requirements. As a result, we plan to invest £23.5 million over RIIO-ED1 (see Annex 23).
- 5.207 In addition, we have three major collaborative projects underway funded via the LCNF Tier Two mechanism – C₂C, CLASS and Smart Street. This is a competitive process managed by Ofgem and we are likely to make further applications both in DPCR5 and in RIIO-ED1 under its successor mechanism, the Network Innovation Competition (NIC). Funding for these projects will continue into the RIIO-ED1 period and we expect to invest a further £4 million on them in that time.

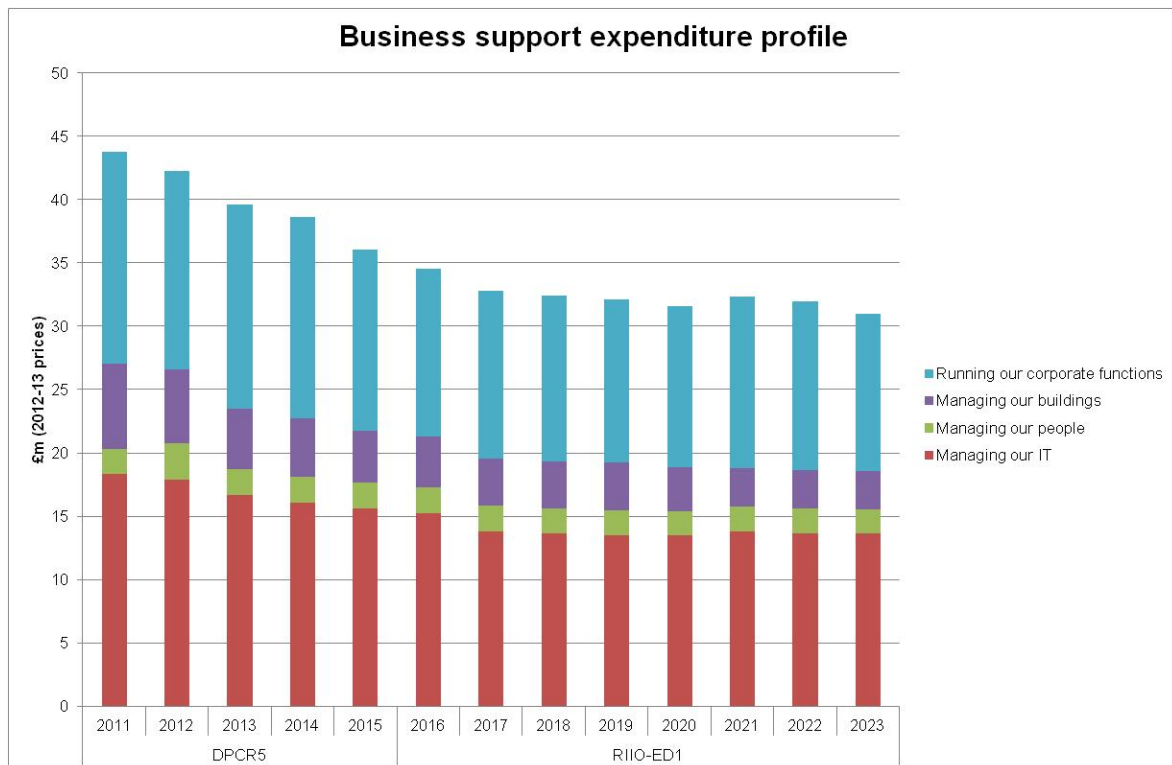
Business support

- 5.208 We have a number of central support activities which are necessary for the efficient operation of our business. These include managing our IT systems, human resources, building and facilities management, finance and regulation.

- 5.209 We have always sought to drive value for money in all support activities. Since we acquired the business in 2007, all business support activities have been tasked with focusing on the services required to support the operational parts of the business so as to deliver improved service more efficiently. We have been consistently driving the cost of these activities down while ensuring that the right level of support is provided to the field teams to ensure that as a whole the business is as efficient as possible.
- 5.210 As part of this on-going process we have undertaken extensive benchmarking to test our services and the value they provide. We have undertaken a detailed zero-based bottom-up cost assessment of our indirect costs to ascertain the most appropriate fixed and variable costs. During RIIO-ED1 we plan to continue to reduce these costs by 15.5% over DPCR5 on an annual basis.
- 5.211 We asked KPMG to analyse our fixed cost base and compare this to 'group' organisations, where fixed costs appear proportionately lower because they are spread across a wider range of operational companies. Their analysis suggests that the fixed costs of a 'double' company should be around 30% higher than those of a 'single' company. We have used this ratio to test the proportionality of our fixed cost base to other DNO groups and satisfy ourselves that our fixed costs are both efficient and justified.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Managing our IT	84.5	16.9	110.7	13.8	-18.1%
Managing our people	11.1	2.2	15.7	2.0	-11.4%
Managing our buildings	26.0	5.2	27.8	3.5	-33.1%
Running our corporate functions	78.8	15.8	104.6	13.1	-17.0%
Total	200.4	40.1	258.9	32.4	-19.3%



Managing our IT

- 5.212 A number of reviews were undertaken during 2012-13 to benchmark our IT and Telecoms operating model and cost-to-serve, for example to review the provision and usage of data centre services and to examine how we provided back office services. We are acting on the outputs of these reviews to drive significant savings into our IT cost base during the remainder of DPCR5.
- 5.213 We will do this by:
- Optimising provision of a number of service management functions using the most efficient balance between in-house employees and outsource providers
 - Constructing two purpose-built data centres to replace the four we currently operate
 - Further consolidation of the Operational and Corporate IT infrastructure and implementation of a revised IT operating model
- 5.214 We will build on this during RIIO-ED1 by:
- Regular market testing of systems and services in conjunction with contract reviews and commercial re-negotiations to ensure best value
 - Use of best practice procurement processes led by the specialist central Procurement team
 - Undertaking continuous service improvement exercises
- 5.215 By the end of RIIO-ED1 we aim to have removed almost 26% of our IT and Telecoms business support costs compared with 2011-12 levels.
- 5.216 We will spend £110.7 million over the course of RIIO-ED1, which is an 18.1% reduction on equivalent DPCR5 costs.

Managing our people

- 5.217 We have a centralised Human Resources team, responsible for recruitment, payroll, development and the well-being of our people. They also deliver non-operational training.

5.218 During RIIO-ED1, operational efficiencies mean we can reduce these costs to £15.7 million, a saving of 11.4% compared to DPCR5.

Managing our buildings

5.219 We occupy a number of premises to accommodate our operational and support teams. We have to meet the day-to day running costs (eg heating, lighting, rates and security) as well as pay rent for the buildings which we occupy but do not own. Our property portfolio plan will reduce our leased premises from nine non operational properties to four by 2015.

5.220 Our property strategy is based on investing to improve the utilisation and efficiency, lower the operating costs and mitigate the environmental impact of our property estate. We will do this through the completion of a programme we started in DPCR5, namely:

- Rationalisation of desk space across the estate to get optimum use of accommodation
- Refurbishment of offices at Frederick Road in Salford, Hartington Road in Preston and Linley House in Manchester including replacement of air conditioning and lighting systems with modern energy efficient equivalents
- Construction of a new depot at Whitegate in Oldham incorporating an energy efficient heating and lighting system, excellent insulation levels and PV panels on the building's roof
- Installation of charging points for electric/hybrid vehicles at Frederick Road and Hartington Road with a further 34 points planned for RIIO-ED1
- Installation of Smart Meters across the estate and formal reviews of energy usage with our facilities management contractor to optimise energy efficiency

5.221 As a result, our building management costs in RIIO-ED1 will be £27.8 million, a reduction of 33.1% compared to DPCR5 levels.

Running our corporate functions

5.222 We have to meet a number of legal, regulatory and financial requirements as well as deliver the efficient overall management and support of our business.

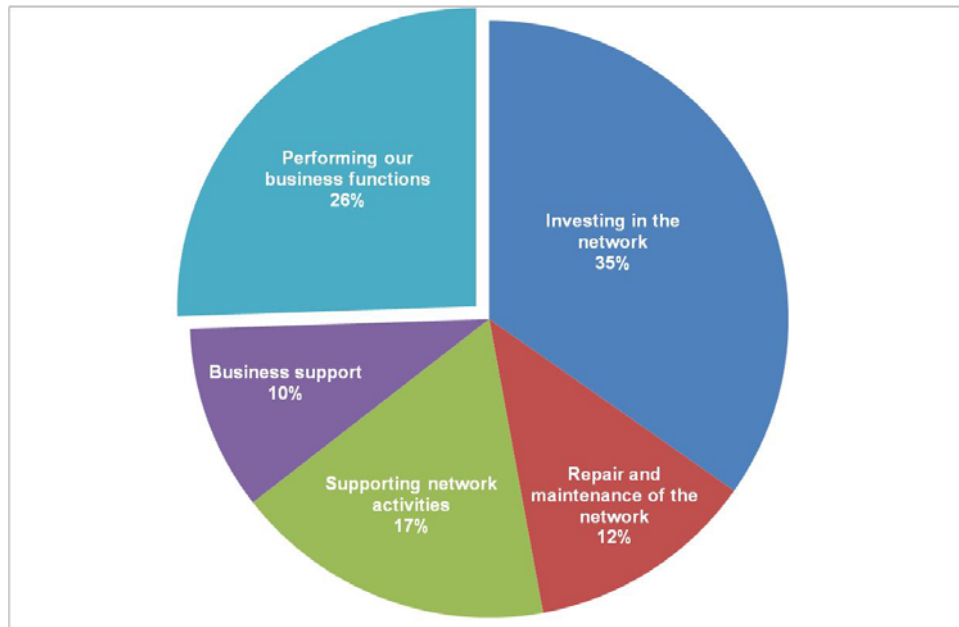
5.223 These activities include paying suppliers, running our finance function, dealing with Ofgem and ensuring regulatory compliance, legal and company secretarial responsibilities, raising finance and dealing with investors and financial markets, communications and stakeholder engagement, managing and paying our taxes and insuring our network and operations.

5.224 We will spend £104.6 million during RIIO-ED1 in discharging these and other obligations. This is 17.0% less than the equivalent DPCR5 cost, which we have achieved through benchmarking, efficiency improvements and consolidation of a number of functions.

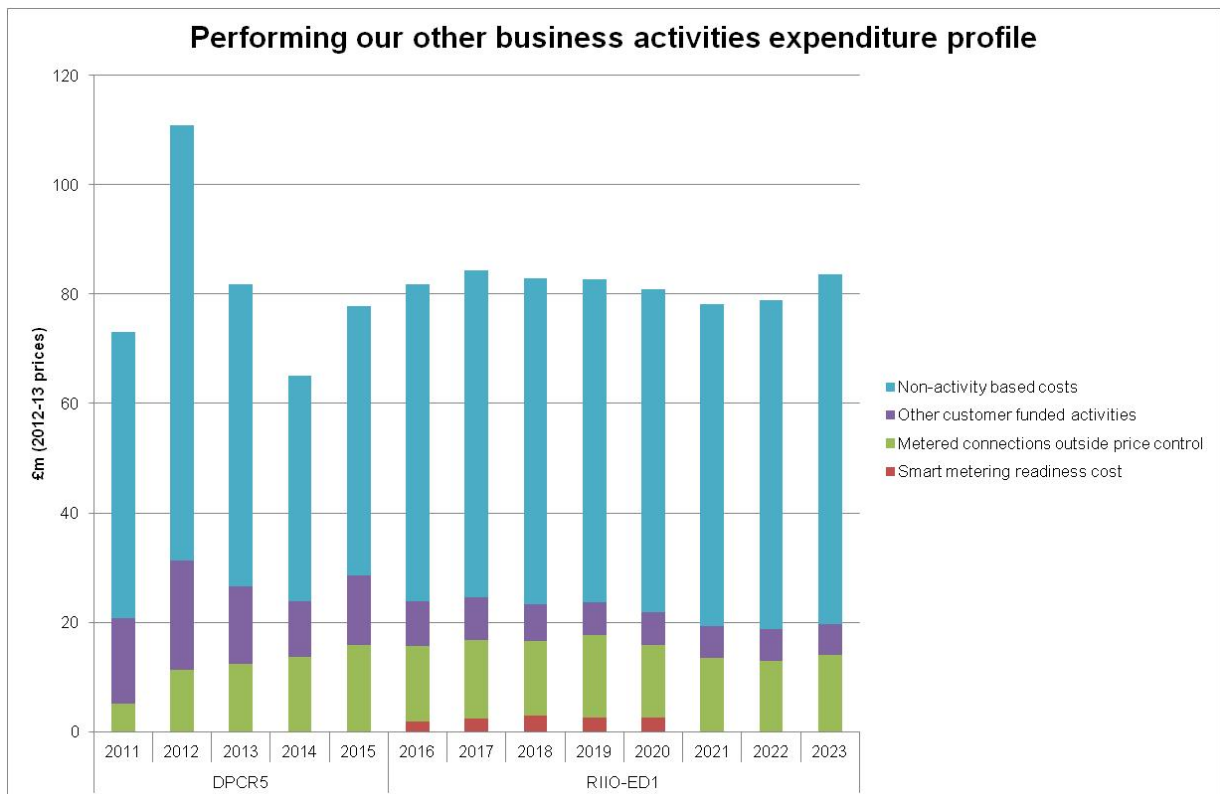
Performing our other business activities

These activities are covered by five categories of costs.

5.225 We undertake some activities that are driven by the requests of individual customers, by the need to support specific projects or to ensure that we comply with the obligations placed on us as a network company. Most of these are funded in slightly different ways to our other areas of expenditure, with many of them funded by the customer who requests the work.



£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Smart metering readiness cost	-	-	12.3	1.5	n/a
Metered connections outside price control	58.1	11.6	110.5	13.8	19.0%
Unmetered connections outside price control	10.2	2.0	7.2	0.9	-55.7%
Other customer funded activities	73.0	14.6	51.8	6.5	-55.7%
Non-activity based costs	277.5	55.5	478.6	59.8	7.8%
Total	418.8	83.8	660.4	82.6	-1.4%



Smart metering readiness costs

5.226 In some instances work may need to be carried out on our network to facilitate the installation of a smart meter. Much of the work will be funded via an uncertainty mechanism, if and when work is required. Our plan is based on a need to undertake work in 2% of smart meter installations and to comply with a nationally agreed service level agreement.

Metered connections outside price control

5.227 Our customers can choose who makes their connection for them. We offer an end to end connections service. Alternatively they can use an Independent Connection Provider (ICP), who will complete the work required and then transfer ownership of the equipment installed to us to operate and maintain, or an Independent Distribution Network Operator (IDNO) who will complete the work, retain ownership and operate and maintain the equipment on the customer's behalf.

5.228 Irrespective of who the customers choose, they pay for the work to make the new connections to our existing network. These figures represent the gross costs incurred by us in making these connections for all metered connections including distributed generation.

5.229 In some cases, connecting to our network requires us to reinforce the existing network to create additional capacity or ensure any additional load from increased demand does not compromise the quality of supply for new and existing customers.

Unmetered connections outside price control

5.230 There are circumstances in which it is not practical or financially viable to meter a supply as the cost of metering could considerably outweigh the value of the electricity consumed. These are typically connections to street lighting and other highway equipment. Our plan includes the costs we will incur in making new connections, transferring connections to new equipment and disconnecting existing unmetered connections.

Other customer funded activities

5.231 There are other services that we provide to a variety of customers that are charged for separately and our plan includes the costs we will incur in providing these.

5.232 These services include:

- Diversion costs where we have to move our assets as a result of a customer's work eg construction of a new highway
- Where a customer wishes to move their service position
- Revenue protection activities to combat theft of electricity
- Construction of assets for other DNOs or National Grid at shared sites
- Any services to related third parties

Non-activity based costs

5.233 We also incur a number of other costs as part of our operations, including transmission connection point charges, rates, Ofgem licence fee and pension deficit repair costs. We cannot control the amounts we ultimately spend on these activities. We include costs in our plan based on our latest forecasts. Most are subject to uncertainty mechanisms described in Section 7, Managing Uncertainty and Risk.

Total expenditure profile 2011-2023

	£m (2012-13 prices)	DPCR5								RIIO-ED1					RIIO-ED1
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Investing in the network	Replacing and refurbishing network assets	52.8	75.2	83.5	79.8	86.1	82.4	71.8	79.1	74.3	82.1	78.3	82.5	79.1	629.5
	Managing network impacts	10.3	15.0	16.8	13.9	18.8	16.8	13.3	12.7	14.4	9.9	9.8	9.5	9.5	96.1
	Worst Served Customers	-	-	0.2	0.2	0.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	3.4
	Resilience	3.5	2.3	1.7	0.3	0.0	4.9	2.3	2.3	2.2	0.8	3.2	2.5	2.5	20.7
	Quality of Supply	2.6	7.1	5.5	11.0	6.7	-	-	-	-	-	-	-	-	-
	Making new connections	23.2	11.6	3.8	3.8	5.1	5.7	6.0	5.7	7.0	6.1	5.3	4.9	5.6	46.2
	Ensuring capacity	4.2	10.1	12.4	19.4	23.8	11.3	15.1	9.1	11.9	11.7	12.3	18.4	13.6	103.4
	Total	96.5	121.3	123.9	128.3	141.3	121.6	108.9	109.2	110.3	111.0	109.3	118.2	110.7	899.2
Repair and maintenance of the network	Repairing faults	29.0	29.0	29.5	28.5	28.7	27.4	27.4	26.9	26.5	26.2	25.8	25.4	25.0	210.6
	Severe weather	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.3
	Inspections and maintenance	11.1	9.5	11.3	8.5	8.2	8.8	8.0	7.7	8.1	7.5	8.4	8.4	7.8	64.6
	Tree-cutting	3.3	3.2	3.0	3.3	3.3	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.4	28.2
	Other	1.2	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	14.6
	Total	44.5	43.4	45.5	42.0	42.1	41.8	41.0	40.2	40.3	39.3	39.8	39.3	38.4	320.2
Supporting network activities	Supporting investment delivery	45.4	47.5	44.4	45.2	44.4	41.5	40.5	39.5	39.1	38.6	38.1	37.5	37.1	312.0
	Supporting network operations	6.5	6.8	7.8	8.7	9.0	9.0	9.1	9.0	9.0	8.9	8.9	8.8	8.7	71.4
	Replacing non-operational assets	32.2	17.2	7.2	10.5	8.5	4.0	4.4	4.4	4.9	5.5	5.3	5.0	5.1	38.6
	Innovation	2.4	3.4	9.5	9.4	14.2	5.7	3.6	3.4	2.9	2.9	2.9	2.9	2.9	27.5
	Total	86.6	74.9	68.8	73.7	76.2	60.3	57.6	56.4	55.9	56.0	55.2	54.2	53.8	449.5
Business support	Managing our IT	18.3	17.9	16.6	16.1	15.6	15.3	13.8	13.6	13.5	13.5	13.8	13.7	13.6	110.7
	Managing our people	2.0	2.9	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	15.7
	Managing our buildings	6.8	5.8	4.7	4.6	4.1	4.0	3.8	3.7	3.7	3.4	3.1	3.1	3.1	27.8
	Running our corporate functions	16.7	15.7	16.2	15.9	14.3	13.3	13.3	13.1	12.9	12.7	13.5	13.3	12.4	104.6
	Total	43.8	42.3	39.6	38.7	36.1	34.6	32.8	32.4	32.1	31.6	32.3	32.0	31.0	258.9
Performing our business functions	Smart metering readiness cost	-	-	-	-	-	1.8	2.4	2.9	2.7	2.5	-	-	-	12.3
	Metered connections outside price control	5.1	11.2	12.3	13.7	15.8	13.9	14.4	13.6	15.0	13.3	13.4	12.9	13.9	110.5
	Unmetered connections outside price control	3.7	3.2	1.2	0.9	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	7.2
	Other customer funded activities	15.7	20.1	14.3	10.2	12.8	8.1	7.8	6.7	6.0	5.9	5.8	5.8	5.7	51.8
	Non-activity based costs	52.3	79.5	55.2	41.3	49.2	58.0	59.8	59.6	59.0	59.1	58.9	60.2	64.0	478.6
	Total	76.8	114.0	83.0	66.1	79.0	82.8	85.3	83.7	83.5	81.7	79.0	79.8	84.5	660.4
Total Expenditure	348.1	395.8	360.8	348.8	374.6	341.1	325.7	322.1	322.1	319.7	315.7	323.6	318.4	2,588.2	

Fixed costs

- 5.234 Electricity North West is the only DNO that is in an ownership structure that does not contain another DNO. As a consequence of this, we incur a level of fixed costs that is higher than other DNOs (because the other DNOs can share costs with companies in the same group).
- 5.235 We asked KPMG to analyse the level of fixed costs that a single licensee would incur above the level that would be expected of DNOs in an ownership group that included two DNOs. KPMG's report estimated that the fixed cost uplift which Electricity North West should be afforded relative to other DNOs as a result of its single licence status is £10.5 million per year. We included this report in our July 2013 plan and are pleased that Ofgem recognised this as a 'well presented report'.
- 5.236 We have used the results of KPMG's analysis in testing that our forecast costs represent an efficient level of costs for a single licensee group.
- 5.237 We accept that single licensee status is not an inherent characteristic and that it is possible that during the course of RIIO-ED1 our status could change. If we become part of an ownership structure that includes one or more other DNO licensee operating in Great Britain (either because our current owner purchases another licensee or because we are sold into a group that already includes a DNO licensee) we agree that an adjustment should be made to our cost baselines for fixed costs to ensure that any fixed cost allowance that we no longer need is returned to customers.
- 5.238 We propose to introduce a mechanism, to be set out in our distribution licence, to ensure that an appropriate adjustment can be made to our allowed costs. This adjustment would effectively reverse our baseline costs for all or part of the fixed costs that were assumed in our RIIO-ED1 baseline costs at Final Determination.
- 5.239 In order to ensure that any changes associated with this mechanism are predictable to suppliers and can therefore be passed through to customers, we propose that adjustments would be proposed and made at times set out for other uncertainty mechanisms in May 2019 and at the end of RIIO-ED1 period. These adjustments would take account of any transactions that occurred before those dates so that customers are fully compensated.
- 5.240 We will work with Ofgem to develop the required licence condition and associated financial handbook chapters and price control financial model modifications to achieve this.
- 5.241 Annex 29 provides more details of how we have determined the level of fixed costs and our proposed adjustment mechanism.

Pensions

- 5.242 Almost all of our employees are members of our pension scheme. There are two key sections of the scheme, one that provides benefits linked to salary at retirement (the defined benefits section), and one that provides benefits based on contributions paid in (the defined contribution section). The defined benefits section was closed to new joiners in 2006. All our new joiners are offered membership of the defined contribution section.
- 5.243 Our costs for the defined contribution section are easy to predict and budget for, as contributions are paid as a fixed percentage of relevant pensionable salary. Predicting costs for the defined benefits section is more difficult, as the balance of cost above employees' contributions is met by the company, and this cost can fluctuate. Our pension scheme is set up under trust with Trustee Directors who are responsible for ensuring that it is run properly. As with all funded UK defined benefit schemes, a Scheme Actuary has been appointed and he completes regular funding valuations. Formal valuations, from which cash contributions are set, are carried out every three years in line with legislative requirements. Our latest valuation is due reflecting the position as at 31 March 2013 and we expect our contributions to change from 1 April 2014.
- 5.244 As our valuation is still under way, we have asked our actuarial advisers to estimate the contributions we will pay from 1 April 2014 and we have included these estimates in our plan. We also include an assumption that our National Insurance Contributions will increase in 2016 in line with recent announcements from Government about the changes to state pensions and the related National Insurance rates (see Annex 24).
- 5.245 Our pension costs are included in all the tables in this section. For completeness they are also summarised below.

£m (2012-13 prices)	DPCR5 Total	DPCR5 Annual Average	RIIO-ED1 Total	RIIO-ED1 Annual Average	% Change
Defined benefit scheme contributions	61.0	12.2	100.7	12.6	3.1%
Defined contribution scheme contributions	7.8	1.6	18.9	2.4	52.3%
Pension admin costs	4.1	0.8	6.4	0.8	-2.0%
Pension protection fund levy	0.7	0.1	1.2	0.2	10.8%
Incremental pension deficit	-	-	2.9	0.4	n/a
Total	73.5	14.7	130.1	16.3	10.5%

Future service costs

- 5.246 The amount we have to pay into the scheme to fund an active member's future defined benefit accrual is based on calculations by the Scheme Actuary taking into account a number of variable factors such as inflation, life expectancy, asset investment performance and future pay increases.
- 5.247 This is expressed as a percentage of pensionable salary, and is known as the Future Service Cost. As all our active employee members age by a year together the percentage due per member is likely to increase. As the scheme has been closed to new members since 2006 there are no younger members to lower the average rate.
- 5.248 Across the electricity industry the DNOs closed their schemes to new members at different times and age profiles and individual demographics of the schemes will differ. We believe that we were one of the earliest companies to close our scheme to new members.
- 5.249 As defined benefit scheme costs are difficult to predict in advance, before finalising our estimated pension costs for this plan, we looked at costs within different pension risk structures. We refer to these risks within our assessment of the Cost of Equity in Annex 25.
- 5.250 The range of figures we considered is shown below, and the figures we have used in the plan are highlighted.

2010 valuation figures rolled forward	Established Deficit	Incremental Deficit	Future Service Cost
31 December 2012 – Technical Provisions	£183.5m	£0.1m	37.1%
31 March 2013 – Technical Provisions	£191.3m	£2.6m	40.7% to 45.7%
31 March 2013 – Low Risk (self sufficiency rate)	£311m	£15m	52.2% to 49.5%
31 March 2013 – Least Risk	£464m	£26m	62.1% to 57.5%

- 5.251 Where historic pension liabilities exceed the invested assets there is a deficit. Deficits relate to historic liabilities and are separate to the Future Service Costs. Deficits can be recovered through cash payments from the employer, from outperformance from the invested assets, or from a mixture of the two.
- 5.252 Ofgem require that any deficit is split into the Established Deficit (for service prior to 1 April 2010), and the Incremental Deficit (for service after 1 April 2010). Under Ofgem's Pension Principles, the Established Deficit, if judged to be reasonable by Ofgem can be recovered through customer prices as a separate allowance. The Incremental Deficit, together with the Future Service Costs are considered by Ofgem to be part of our total costs of employment within Totex and are subject to comparative assessment and the total ex-ante allowance.

Real Price Effects

- 5.253 Real Price Effects (RPE) are the differences between the actual inflation we experience across our cost base compared to the inflation allowance we receive through Retail Price Indexation (RPI). We discuss this in more detail in Section 7, Uncertainty Mechanisms.

- 5.254 Our estimate of RPE inflation for RIIO-ED1 is £82.6 million. We have more than offset this through cost and frontier shift efficiencies.

Ongoing efficiencies

- 5.255 We recognise that future technological change or new working practices can be expected to deliver further savings beyond current efficient levels. We will continue to deliver efficiency savings and have included stretching assumptions in our plan. Where we expect that our innovation projects will deliver significant savings in a particular area we have included for these.
- 5.256 We asked Oxera to examine the potential for electricity distribution companies to improve their costs through ongoing efficiency improvements. Their analysis suggested that a frontier shift of 0.7% per year could be expected (See Annex 15). We have challenged ourselves to beat this expectation and have applied a 1% per year saving in our plan across all activities. The exact way in which these savings will be achieved is currently unknown, but we are confident that our innovative ways of working will deliver this.