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Electricity Distribution Company performance 2010 to 2015

Performance report

Publication date: 16/12/2015

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Overview:

This report summarises the performance of the electricity distribution companies from 2010 to 2015 under the fifth electricity distribution price control (DPCR5). It includes the bill impact, costs and what the companies delivered.

Context

Each of the 14 electricity distribution network operators (DNOs) operating in Great Britain are monopoly providers of electricity distribution services. Our principal objective is to protect the interests of gas and electricity consumers, and in the context of DNOs we do this by periodically reviewing the revenue which DNOs are allowed to recover from their customers. This involves establishing a framework that creates incentives for DNOs to operate efficiently, deliver outputs and improve levels of service, contribute to sustainability and meet their statutory obligations and licence conditions.

In December 2009 we published our final proposals on the revenues the DNOs could recover for the five year period commencing 1 April 2010 and the associated outputs and incentives. This report uses the data and supporting information submitted by the DNOs to review how they have performed, their effectiveness in delivering outputs and services in a cost-efficient manner and the benefits they have delivered to consumers and stakeholders.

Associated documents

- DPCR5 Price Control Review Final Proposals
- Electricity Distribution Annual Report for 2010-11
- The findings of our review of the electricity connections market
- Quicker and more efficient connections – next steps
- Decision on the Stakeholder Engagement Incentive 2014-15: Electricity Distribution
- Decision on the 2015 Successful Delivery Reward for innovation projects
- Decision not to activate the Losses Incentive Mechanism in the Fifth Distribution Price Control
- 2015 Network Operators (DNOs) Common Network Asset Indices Methodology
- Decision on funding for the Shetlands Northern Isles New Energy Solutions (NINES) Project 2011
- Completion of the Competition Test Process 2014
- DECC Electricity Distribution 2013 Christmas Storms Review
- Stage two review of the Christmas 2013 storms - impact on electricity distribution customers
- Standard Licence Condition 15A Guidance Document 2010
- Investigation into whether SSE has infringed the requirements of Chapter II of the Competition Act 1998 and/or Article 102 Treaty
- Strategy decision for RIIO-ED1 - Outputs, incentives and innovation
- RIIO-ED1 final determinations for the slow-track electricity distribution companies
- RIIO-ED1 Draft Determinations for fast-tracked Distribution Network Operators

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Executive Summary

Background

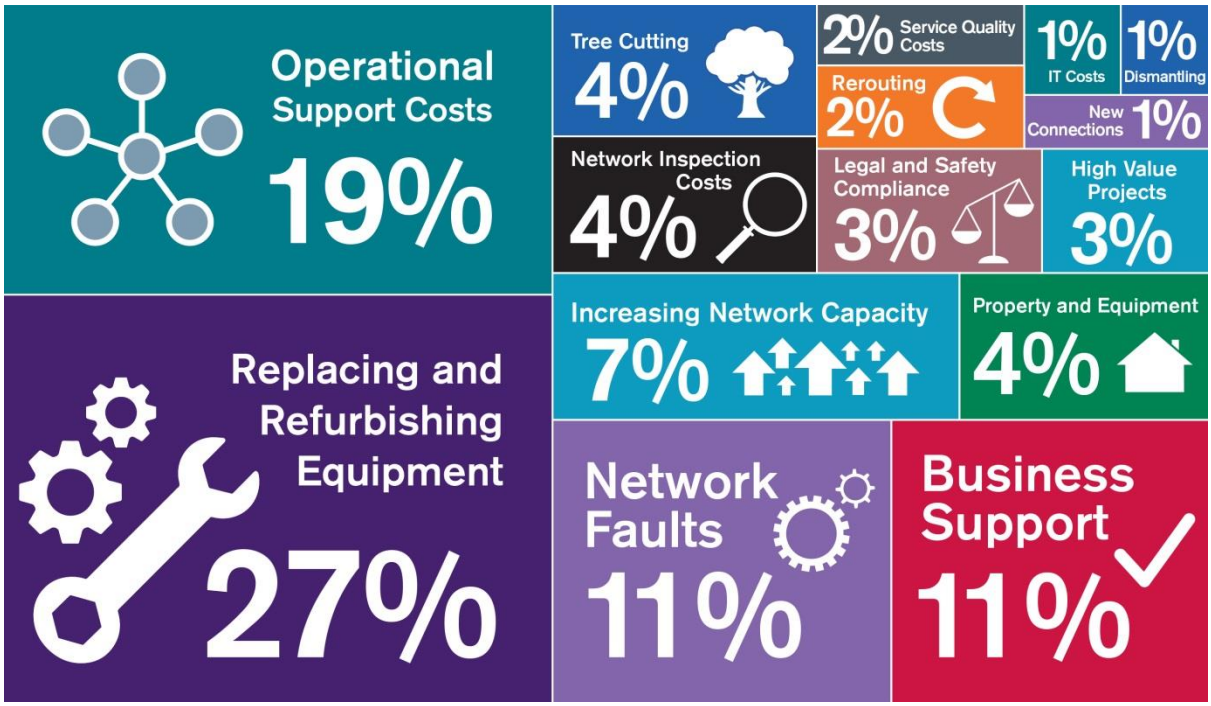
Our fifth electricity distribution price control (DPCR5) applied from 2010 to 2015. This period has seen substantial changes in the energy sector and the economy more widely. This has had a significant impact on the electricity Distribution Network Operators (DNOs) bringing both challenges and opportunities:

- the economic recession and slow recovery meant that demand from new and existing customers did not increase as initially forecasted;
- government subsidies contributed to rapid growth in the amount of small scale generation (for example wind and solar) connecting to the network; and
- the increasing availability of new technologies has had a growing impact on how the DNOs manage and run their networks.

Against this backdrop, the DPCR5 price control has delivered significant improvements in DNO performance across the piece. DPCR5 also saw the introduction of a number of mechanisms which have become key features of the new RIIO (Revenue = Incentives + Innovation + Outputs) price control framework.

Key Messages

DNOs have spent £15bn managing and making large improvements in the reliability of their networks (including record investment in asset replacement) and customer satisfaction. The chart below represents the breakdown of DNO spending.



The average annual electricity distribution charge to domestic customers by the end of the period was about £93.

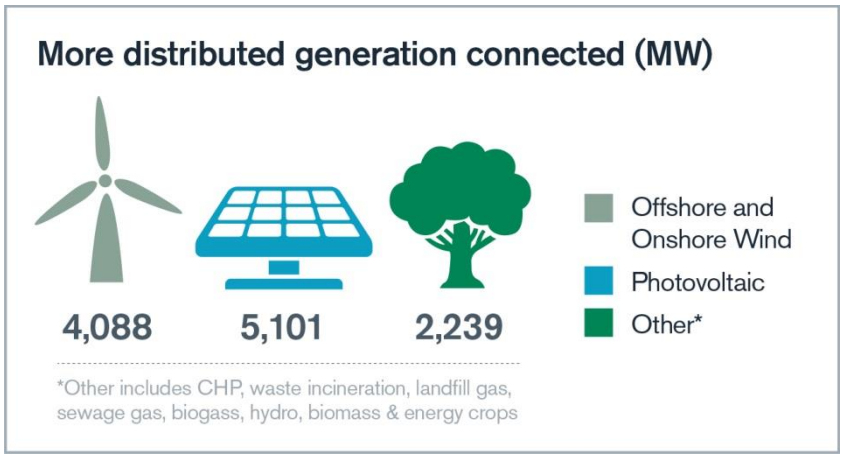
Overall, DNOs have outperformed their DPCR5 settlement and delivered major benefits for consumers throughout the period. DNOs have made significant efficiency gains in delivering their outputs and have spent £1.2bn less than we allowed for in DPCR5.

Customers will receive a £660m share of these cost savings over the next twenty years. DNOs have also earned an additional £1bn pre-tax in incentive reward payments. Incentives encourage DNOs to improve performance and deliver better value for money for customers. Key areas of improvement achieved by the DNOs over the period include:

- **A more reliable network:** the average number of customer interruptions and the average length of these interruptions over the period have gone down by 21% and 36% respectively.

- **Improved customer satisfaction:** the introduction of the Broad Measure of Customer Service during the period has resulted in significant improvements in customer service and engagement, with the average customer satisfaction survey score across DNOs reaching 8.46 out of 10 in 2014-15.

- **More distributed generation:** DNOs have facilitated the connection of larger amounts of small scale distributed generation (DG) than expected. In total over 11,400MW of DG was connected to the distribution network during the DPCR5 period.



DPCR5 also saw the introduction of the Low Carbon Networks (LCN) fund. The LCN fund has enabled DNOs to trial new technologies and innovative commercial arrangements, which has encouraged the development of a smarter and greener network for the benefit of future consumers.

Closing out DPCR5

The DPCR5 price control ended on 31 March 2015. However, a number of schemes and mechanisms still need to be analysed and determined to gain a full picture of DNO performance during the period. Work on this is ongoing and may have a significant impact on DNO returns. We will provide an updated view of DNO performance as and when the remaining schemes are closed out.

1. Key findings overall and by group

Chapter Summary

A summary of the key findings to date from our assessment of DNO performance over DPCR5.[1]

Introduction

1.1. The five years of DPCR5 have seen a significant change in the energy sector and the economy more widely. DNOs have spent £15bn managing and making large improvements in the reliability of their networks (including record investment in asset replacement) and customer satisfaction. The DNOs have successfully trialled new technologies and commercial solutions to address future needs.

1.2. However, demand from existing and new customers has not increased as expected, due to the recession and slow recovery. As a result, the forecast volumes of demand connections and work to increase the network capacity have not been required. There are mechanisms in place enabling us to adjust the allowances we gave to the DNOs to account for changes in demand. Work is ongoing and we will be reviewing these as part of the process for closing out the price control. We explain this further in paragraph 2.34.

1.3. In contrast, there has been a rapid increase in the volume of small scale generation (such as wind and solar) connecting to the DNOs' networks, driven by government subsidies. Approximately 11.4GW of distributed generation (DG) have been connected in DPCR5. The connection of this DG has been achieved with relatively low levels of investment. DG stakeholders have raised concerns that some DNOs' networks are now nearing full capacity with insufficient investment to enable more DG to connect.

1.4. Technological change has continued to accelerate during this period and has had a growing impact. We have started to see more active management of the distribution networks and some use of batteries and contracting with customers for different demand patterns (demand side response) to address capacity constraints.

1.5. On average, electricity distribution charges to domestic consumers have risen by about 24% during DPCR5 compared with increases of about 30% that were anticipated at the start of the control period. The 24% increase in charges are a result of:

- a 12% increase in DNOs' total expenditure between DPCR4 and DPCR5; and
- the profiles of revenue and expenditure changed across these periods, compared to the upward revenue slope for most DNOs in the DPCR5 settlement.

The charge increase was lower than anticipated due to changes in the balance of charges between different types of customer resulting from:

[1] Unless otherwise stated, all cost figures in this document are indexed at 2012-13 price base (for consistency with RIIO-ED1) and are pre-tax and without interest payments.

- improvements in households' energy efficiency (which resulted in a lower average household consumption); and
- changes in the distribution charging methodologies at the start of DPCR5).

1.6. Subject to a number of mechanisms that are still to be determined for DPCR5 (see paragraph 2.34), the individual DNOs have earned annual rates of return of between 10.4% and 13.6% (11.2% to 12.8% for DNO groups) on their regulatory equity (RoRE) against the DPCR5 baseline cost of equity of 6.7%. The outstanding mechanisms could reduce these RoRE percentages significantly, so our provisional RoRE percentages can be thought of as upper estimates. This provisional outperformance has been earned from efficiency savings and incentives (for example for improved reliability) which have delivered major benefits to consumers.

1.7. DNOs have beaten our baseline expenditure assumptions delivering savings to consumers and earning rewards under our efficiency incentives. The DNOs spent £15.1bn compared to our baseline assumptions of £16.3bn, a saving of £1.2bn. These savings are shared with consumers resulting in a saving of approximately £660m for consumers over the next 20 years. [2]

1.8. The companies have made significant performance improvement and outperformed in a number of elements of our price control arrangements, reflecting improved delivery to consumers as well as enabling the DNOs to earn incentive rewards:

- **interruptions** – we set incentives for DNOs to reduce the number and duration of interruptions. This has worked well during DPCR5 with DNOs reducing the average number of customers' interruptions by 21% and the average length of these interruptions by 36%. DNOs have earned £611m in incentive payments by beating their targets regarding interruptions.
- **distributed generation -** DNOs have earned £286m through the DPCR5 DG incentive by connecting over 11,400MW of DG at lower than expected cost.
- **customer service** – through increasing the level of satisfaction of their customers, DNOs have earned £13m from the broad measure and its predecessors.
- **cost of debt** – DNOs have been able to raise financing through issuing debt at cheaper rates than we assumed in setting the DPCR5 price control. As a consequence, the sector would have benefited by £327m from the movement in debt markets compared to our assumption. In RIIO we index debt allowances so in the future, the DNOs cannot benefit in this way.

1.9. Overall, DNOs have earned approximately £1.5bn from the DPCR5 package of incentives,[3] on top of £220m awarded at the beginning of the period for the quality of their submitted information.

[2] Customers receive the benefits of these cost savings principally through reduced allowances for DNOs for depreciation and from lower return allowances on a lower Regulatory Asset Value (RAV) over the remaining regulatory asset lives.
[3] Excluding financing elements such as the cost of debt and the tax triggers, as well as excluded services and connections margins.

Distributed generation

1.10. In recent years, we have witnessed a dramatic transformation in the energy generation landscape, stimulated by government incentives for renewables. The amount, type and location of generation connecting to the distribution networks has significantly altered. At the start of the price control, the relationship between DNOs and generators was difficult and they were regularly criticised for poor customer service. Since then, DNOs have made significant improvements to better understand the requirements of their DG stakeholders (eg the annual DG Fora and DNO specific DG stakeholder groups). They have made changes to how they run their business (eg "heat maps" showing where there is spare capacity on the network and offering "flexible" connection quotations). Whilst DG customer satisfaction has improved, it is important that DNOs remain ready to respond to changes in the amount, type and location of generation connecting to the distribution network during the price control for DNOs from 1 April 2015 to 31 March 2023 (RIIO-ED1).

1.11. The rate of DG growth exceeded any expectations at the start of DPCR5 with over 11,400MW being connected during the DPCR5 period. In some regions this growth exceeded available capacity for new generation connections. When there is no available capacity, customers can face extremely high costs and long timescales to get connected. Sometimes customers have a choice to move to other, less loaded, locations nearby. We encourage this as it means the network is being used more efficiently, which reduces costs for all customers. But sometimes, when large parts of a network are full, a DNO has to take action; a fundamental purpose of a DNO is to be able to connect people to their network. This may require investing in new infrastructure or finding smart ways of connecting customers without new network capacity having to be built. In either event DNOs should provide prospective customers with an early understanding of conditions on their network to inform their decision on whether to proceed with a connection.

Connections

1.12. During the DPCR5 period, we introduced several new incentives to encourage DNOs to improve the service they provided to connection customers (eg the BMCS and the Connection Guaranteed Standards of Performance (GSOP)). Overall, we consider that these incentives have been successful and we have seen improvements in the connection services provided by DNOs. For example, all DNOs have improved the information and guidance available to customers seeking a connection and there are more opportunities for connection customers to engage with the DNOs. As a result, average industry customer satisfaction with the DNOs' connection service has increased by 5% since the introduction of the BMCS in 2012-13. However, at an industry level, connection customers are still less satisfied than customers who deal with DNOs during an interruption to supply or for a general enquiry.

1.13. We believe that competition in the market for new connections is the best way to ensure customers get good and efficient service. During the DPCR5 period, we found that effective competition developed in some parts of the market and overall the proportion of connections provided by parties other than DNOs has increased from 14% to 36%.[4]

[4] Competition in Connection Code of Practice - Standard Condition 52 of the Electricity Distribution Licence

1.14. However, there are sections of the market where competition has not developed as well (eg some DNO regions and some types of connection work). To understand why, we conducted a review of the electricity distribution connection market[5]. Our review found that many of the issues restricting competition relate to the DNOs' role in the connection process.[6] To address this we introduced a competition in connections licence condition which put in place an enforceable Code of Practice. We will review the market again in spring 2017 to determine whether this remedy has been effective.

Broad Measure of Customer Service

1.15. We introduced the BMCS during DPCR5 and it has been successful in improving the service received by customers. Over the past five years customers have become more satisfied with the service they receive (eg overall industry average customer satisfaction has risen 6% since 2012-13) and when complaints arise DNOs have become more effective at resolving them (eg the average industry percentage of complaints outstanding unresolved after one day has fallen from 55% in 2012-13, to 35% in 2014-15). We are also beginning to see a cultural change within DNOs in terms of the range of stakeholders they engage with and methods of engagement.

Innovation

1.16. For DPCR5 we retained the Innovation Funding Incentive (IFI) and introduced the new Low Carbon Network (LCN) Fund. In total during DPCR5, the DNOs were awarded over £300m to spend on innovation funding[7].

1.17. The largest innovation scheme is the LCN Fund. The LCN Fund has resulted in the DNOs successfully trialling a range of new technologies and commercial arrangements which will deliver important benefits to customers and other network users. It has enabled DNOs to explore how their networks can facilitate the take up of low carbon and energy saving initiatives such as electric vehicles, heat pumps, micro and local generation and demand side management. They have also investigated the opportunities that smart meter roll-out provides to network companies. These more innovative approaches will also help to manage the efficient costs associated with delivering the outputs that customers require in RIIO-ED1. A number of these projects have now been completed and are being embedded into the DNOs' businesses. The LCN Fund has been recognised worldwide as a novel approach to delivering innovation. As a result we have engaged with many international stakeholders who have been interested in adopting similar innovation funding arrangements in their own countries.

Environment

1.18. DNOs have reduced the carbon footprint of their businesses (excluding losses) by 5% over DPCR5. Overall, across all DNOs there was a marked reduction in Sulphur hexafluoride (SF_6) emissions; however, by DNO group the results were more mixed.

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[5] https://www.ofgem.gov.uk/sites/default/files/docs/2015/01/connections_competition_review_findings_2.pdf
[6] In each region, the DNO is the sole provider of a number of the key inputs needed to make a connection. It provides these to both its own connections business and to its competitors.
[7] The combined total of LCN Fund Tier 1, LCN Fund Tier 2 and IFI allowances is approximately £302m.

1.19. While some implemented measures to reduce technical losses on their network, others reported only incidental benefits from wider network activities. Most DNOs have reported steps to manage losses from theft of electricity. In RIIO-ED1, DNOs have a licence obligation to manage losses to a level as low as reasonably practicable, and we have improved reporting to provide more visibility of DNOs' loss reduction activities.

1.20. The DPCR5 undergrounding allowance has enabled DNOs to remove 284km of overhead lines from areas of outstanding natural beauty and national parks. DNOs have spent 46% of the funding available under this scheme.

Restructuring and efficiency

1.21. There have been significant changes in the ownership and business structure of several DNOs during DPCR5. The key changes are:

- Electricity North West (ENWL) became an independent entity in early DPCR5, following the sale of the business by United Utilities in 2007. 2010-11 saw a year of consolidation following ENWL's insourcing of more than 1,000 operational employees from United Utilities, which has led to significant improvements in its efficiency.

- Western Power Distribution's parent company acquired the Central Networks DNOs from E.ON in 2011. It has significantly reduced interruptions and improved customer service in these DNOs since acquisition.

- The Cheung Kong Group purchased the three DNOs owned by EdF Energy in 2010, naming the group UK Power Networks. It has also achieved material improvements in performance and efficiency.

- CE Electric changed its name to Northern Powergrid but stayed in the same ownership.

Data and reporting

1.22. Robust data is vital for the efficient management and operation of the networks as well as the effective running of the regulatory framework. We trialled the Data Assurance Guidelines (DAG) in DPCR5 in which the companies explain their processes and procedures for ensuring all data they submit to Ofgem is robust and fit for purpose. The DAG is in place for RIIO-ED1. We have ongoing concerns with the quality of data provided by some DNOs, particularly with respect to their asset management. We are undertaking further work to investigate this.

Summary by DNO group[8]

Electricity North West (ENWL)

1.23. As explained above, ENWL has established itself as a standalone business during DPCR5 which has been a key driver of its improvements in efficiency and performance. In the DPCR5 review we identified significant efficiency improvements for ENWL and it has achieved significant improvements in its unit cost efficiency during the period.

1.24. It has significantly outperformed our baseline total expenditure (totex) allowance during DPCR5, with the largest percentage savings in asset replacement and load related expenditure. It has delivered £162m in cost efficiency savings in total, resulting in £115m in savings for consumers over the next 20 years.[9]

1.25. During DPCR5, ENWL was the most successful at developing effective competition in connections. It demonstrated effective competition existed in seven out of nine segments of the connections market in which competition might be viable. It also received positive feedback from stakeholders for aspects of their work to improve the competitive connections process.

1.26. ENWL has significantly improved its customer service during DPCR5. Its score under the customer satisfaction survey has improved from 7.59 to 8.28 out of 10. However it is still below the industry average.

1.27. ENWL has performed well in reducing the number and length of interruptions. Average interruptions per customer per annum have improved by 23% and the average length of a customer interruption has reduced by 26%. It has earned £42m through beating its interruption targets over DPCR5.

1.28. It has reduced its Business Carbon Footprint (BCF), excluding losses, by 35% over the period, and was the best performing DNO in percentage reduction terms. It was the only DNO to report undertaking a trial of novel technical losses reduction measures, alongside incidental losses reduction benefits of other actions and revenue protection and theft. It has removed 46.8km of overhead lines from designated areas under the DPCR5 undergrounding allowance, using 77% of its available allowance – the greatest proportion of any DNO.

1.29. Subject to the mechanisms that are still to be determined for DPCR5, ENWL has earned an upper bound RoRE of about 12.0% per annum.

1.30. ENWL did not substantially change its funding structure over the period.

[8] Background on the distribution networks is included in Appendix 1. This includes a map of the DNO regions and the ownership groups.
[9] Cost efficiency savings are after adjustments to both allowances and expenditure. The total cost efficiency savings reconcile to the overall saving of £1.2bn in Chapter 1. They are not the same as totex savings presented in Chapter 3.

Northern Powergrid (NPg)

1.31. NPg has significantly reduced its operating costs during DPCR5, which has been a key factor in it beating its totex baseline by 7%. It has delivered £156m in cost efficiency savings in total, resulting in £78m savings for consumers over the next 20 years.

1.32. It spent closely in line with our assumptions for network investment, substituting more condition related expenditure for load related expenditure which declined due to reductions in demand.

1.33. During DPCR5, NPg was one of the least successful DNOs at demonstrating that effective competition existed across the market for new connections. NPg only demonstrated effective competition existed in two out of the 18 market segments in which competition might be viable across their regions.

1.34. NPg has significantly improved its customer service during DPCR5. Its score under the customer satisfaction survey has improved from 7.79 to 8.19 out of 10 for Northern Powergrid Northeast (NPgN), and from 7.81 to 8.26 for Northern Powergrid Yorkshire (NPgY). However it still performs below the industry average.

1.35. It has performed well on interruptions with an 8% improvement in average interruptions per customer per annum and an 24% improvement in average customer minutes lost. It has earned £46m through outperforming its interruption targets over DPCR5.

1.36. NPg has reduced its BCF (excluding losses) by 13% over the period, with an overall reduction in SF_6 emissions of 43%. It reported some incremental losses reduction benefits from wider investment including capitalised loss transformers, alongside revenue protection activities, though it did not estimate associated benefits. It has removed 44km of overhead lines from designated areas under the DPCR5 undergrounding allowance, using 62% of its available allowance.

1.37. Subject to the mechanisms that are still to be determined for DPCR5, the two NPg DNOs have earned an upper bound RoRE of about 11.8% per annum.

1.38. NPg did not substantially change its funding structure over the period.

Western Power Distribution (WPD)

1.39. WPD has gone through a major transformation during DPCR5 with the acquisition of the two Midlands DNOs in 2011. It spent approximately two years reorganising the businesses and has spent more than our DPCR5 totex assumptions in both Midland DNOs. It turned round performance on Interruptions Incentive Scheme (IIS) and BMCS almost immediately for these two DNOs. WPD was already a strong performer in its existing licensed areas but has now extended this to the Midlands. It has driven significant efficiencies both in network investment and operating costs.

1.40. It has spent 16% less than our baseline assumption for load related expenditure. As explained earlier in this chapter this is largely explained by demand having fallen away and a drop in the volume of new demand connections. However, there has been a significant increase in DG connections and concerns have been raised about capacity

constraints in the south-west of the U.K, which may be seen as surprising given the degree of outperformance against our load related expenditure assumptions. It has delivered £8m in cost efficiency savings in total, resulting in £34m in savings for consumers over the next 20 years.[10]

1.41. WPD was successful in developing effective competition in 13 out of the 36 segments of the connections market in which competition might be viable.

1.42. WPD has consistently been the best performer under the BMCS. Their score under the customer satisfaction survey has improved from 8.31 to 8.69 out of 10 for WPD West Midlands (WMID), from 8.46 to 8.77 for WPD East Midlands (EMID), from 8.59 to 8.80 for WPD South Wales (SWALES), and from 8.59 to 8.74 for WPD South West (SWEST). WPD has also consistently received positive feedback for their engagement with stakeholders.

1.43. WPD has shown frontier performance on interruptions with a 24% improvement in average interruptions per customer and a 49% improvement in the average duration of interruptions. It has earned £267m through outperforming its interruption targets over DPCR5.

1.44. WPD's BCF (excl. losses) remained broadly constant over the period, while its SF_6 emissions increased by 8%. It has reported some technical losses reduction measures and reported associated additional costs, alongside revenue protection activities. It has removed 77km of overhead lines from designated areas under the DPCR5 undergrounding allowance, using 43% of its available allowance.

1.45. Subject to the mechanisms that are still to be determined for DPCR5, the four WPD DNOs have earned an upper bound RoRE of about 11.7% per annum.

1.46. WPD brought its gearing levels closer to our assumed optimal gearing level by issuing more debt and returning broadly about £0.95billion of capital (over and above its underlying profitability) to shareholders by way of dividends.[11]

UK Power Networks (UKPN)

1.47. UKPN acquired the London Power Networks (LPN), Eastern Power Networks (EPN) and South Eastern Power Networks (SPN) DNOs in 2010. The new management team lead a refocus of their business, driving improvement in efficiency and performance under both the IIS and BCMS. The new management has led a change of approach which has driven significant improvements in efficiency and performance for its DNOs.

1.48. It has outperformed our baseline totex allowance by 7% in DPCR5. The main areas of outperformance were asset replacement and load related expenditure. It has used greater volumes of refurbishment to manage its poorer condition assets and

[10] The overall saving was low due to overspends on certain fast money cost types, which DNOs bear the full overspend on. There was an underspend on the portion that is shared with consumers. The overall consumer saving therefore exceeds the net cost saving. See paragraph 2.23 for more detail.
[11] Gearing indicates the extent to which a company is financed through debt.

expected load growth has fallen away. It has delivered £306m in cost efficiency savings in total, securing £173m for consumers over the next 20 years.

1.49. UKPN was successful in developing effective competition in 14 out of the 27 segments of the connections market in which competition might be viable. UKPN received positive feedback from stakeholders for some aspects of their work to improve the competitive connections process.

1.50. UKPN has significantly improved its performance during DPCR5 under the Broad Measure of Customer Service. Their score under the customer satisfaction survey has improved from 7.29 to 8.27 out of 10 for LPN, from 7.78 to 8.44 for SPN, and from 7.82 to 8.49 for EPN.

1.51. UKPN has performed well on interruptions with a 35% improvement in average interruptions per customer per annum and a 44% improvement in the average duration of interruptions. It has earned £173m through outperforming its interruption targets over DPCR5.

1.52. UKPN's BCF (excl. losses) fell by 24% over the period, with a similar level of decrease in its SF_6 emissions, which fell by 29%. As loss reduction measures it reported the installation of low loss distribution transformers, incidental benefits of rationalising conductor sizes, and revenue protection activities. It has removed 64km of overhead lines in designated areas under the DPCR5 undergrounding allowance, using 51% of its available allowance

1.53. Subject to the mechanisms that are still to be determined for DPCR5, the three UKPN companies have earned an upper bound RoRE of about 11.2% per annum.

1.54. UKPN did not substantially change its funding structure over the period.

SP Energy Networks (SPEN)

1.55. SPEN has delivered significant improvements in operational efficiency during DPCR5. It has outperformed it our baseline totex allowance by 6% in DPCR5. The main areas of outperformance were load related expenditure and opex. It has delivered £212m in cost efficiency savings, resulting in £112m for consumers over the next 20 years.

1.56. During DPR5, SPEN paid considerably more than any other DNO for failing to meet the Connection GSOP standards. SPEN paid nearly £815,000 to connection customers for failing to meet the standards. In comparison, the rest of the DNOs combined paid only £287,000. We also determined several disputes against SPEN.[12]

1.57. SPEN was one of the least successful DNOs at developing effective competition in the connections market. Across its regions SPEN only demonstrated effective competition existed in four out of 18 market segments in which competition might be viable.

[12] We have the power to determine disputes between electricity distribution network companies and customers (both commercial and domestic) in certain circumstances.

1.58. SPEN has significantly improved its performance during DPCR5 under the Broad Measure of Customer Service. Their score under the customer satisfaction survey has improved from 7.77 to 8.39 out of 10 for SP Distribution (SPD) and from 7.91 to 8.40 for SP Manweb (SPMW).

1.59. SPEN has performed well on interruptions with an 11% improvement in average interruptions per customer per annum and a 28% improvement in average customer minutes lost. It has earned £63m through outperforming its interruption targets over DPCR5.

1.60. SPEN's BCF (excluding losses) marginally increased by 1% over the period, while its SF_6 emissions rose significantly by 14%. It reported incidental losses benefits from replacement of transformers and overhead line rebuild, alongside revenue protection activities. It reported no losses-driven reduction activities. It has removed 26km of overhead lines from designated areas under the DPCR5 undergrounding allowance, using 29% of its available allowance, among the lowest proportions used by any DNO.

1.61. Subject to the mechanisms that are still to be determined for DPCR5, the two SPEN DNOs have earned an upper bound RoRE of about 12.1% per annum.

1.62. SPEN brought its gearing levels closer to our assumed optimal gearing level by issuing more debt and returning broadly about £0.9billion of capital (over and above its underlying profitability) to shareholders by way of dividends.

Scottish and Southern Energy Power Distribution (SSEPD)

1.63. SSEPD has strongly outperformed our totex baselines in DPCR5, achieving savings of 14%. It has beaten our assumption for load related expenditure by 40% and asset replacement by 10%. It delivered £316m in cost efficiency savings in total, resulting in £149m in savings for consumers over the next 20 years. SSEPD seems to have placed a strong emphasis on cost reduction throughout the period.

1.64. SSEPD considers that it has met it asset health, load and fault rate targets for DPCR5 at lower cost. We have ongoing concerns about the robustness of SSEPD's asset data and are having discussions with them about how they will be addressed.

1.65. During DPCR5, SSEPD was one of the least successful DNOs at developing effective competition in the connections market. Across its regions SSEPD only demonstrated effective competition existed in two out of 18 market segments in which competition might be viable. We took enforcement action against SSEPD twice for providing connection quotations too slowly. We also made decisions for several disputes against SSEPD.

1.66. SSEPD has significantly improved its performance during DPCR5 under the Broad Measure of Customer Service. Their score under the customer satisfaction survey has improved from 8.35 to 8.65 out of 10 for Scottish Hydro Electric Power Distribution (SSEH) and from 7.89 to 8.05 for Southern Electric Power Distribution (SSES). However SSES is still below the industry average.

1.67. SSEPD has performed well on interruptions with a 5% improvement in average interruptions per customer and an 11% improvement in the average duration of

interruptions. It has earned £22m through outperforming its interruption targets over DPCR5.

1.68. SSEPD's BCF (excl. losses) and its SF_6 emissions each rose substantially over the period with an increase of 27% - the greatest increase of any DNO group. It reported only incidental losses benefits from wider technical activities, and was the only company to report no revenue protection activities. It has removed 28km of overhead lines from designated areas under the DPCR5 undergrounding allowance, using just 25% of its available allowance, the lowest proportion used by any DNO group.

1.69. Subject to the mechanisms that are still to be determined for DPCR5, the two SSEPD DNOs have earned an upper bound RoRE of about 12.7% per annum.

1.70. SSEPD brought its gearing levels closer to our assumed optimal gearing level by issuing more debt and returning broadly about £0.95billion of capital (over and above its underlying profitability) to shareholders by way of dividends.

2. Bills, expenditure, returns and finance

Chapter Summary

The impact of company performance on expenditure, revenue and returns and on customer charges.

Introduction

2.1. This chapter focuses on a number of key financial elements of DNOs' performance during DPCR5, including:

- Allowed revenue
- Customer bill impacts
- Totex
- Equalised efficiency incentive
- Regulatory asset values (RAV) and rolling incentive
- Return on regulatory equity (RoRE)
- Financing of the RAV and application of returns.

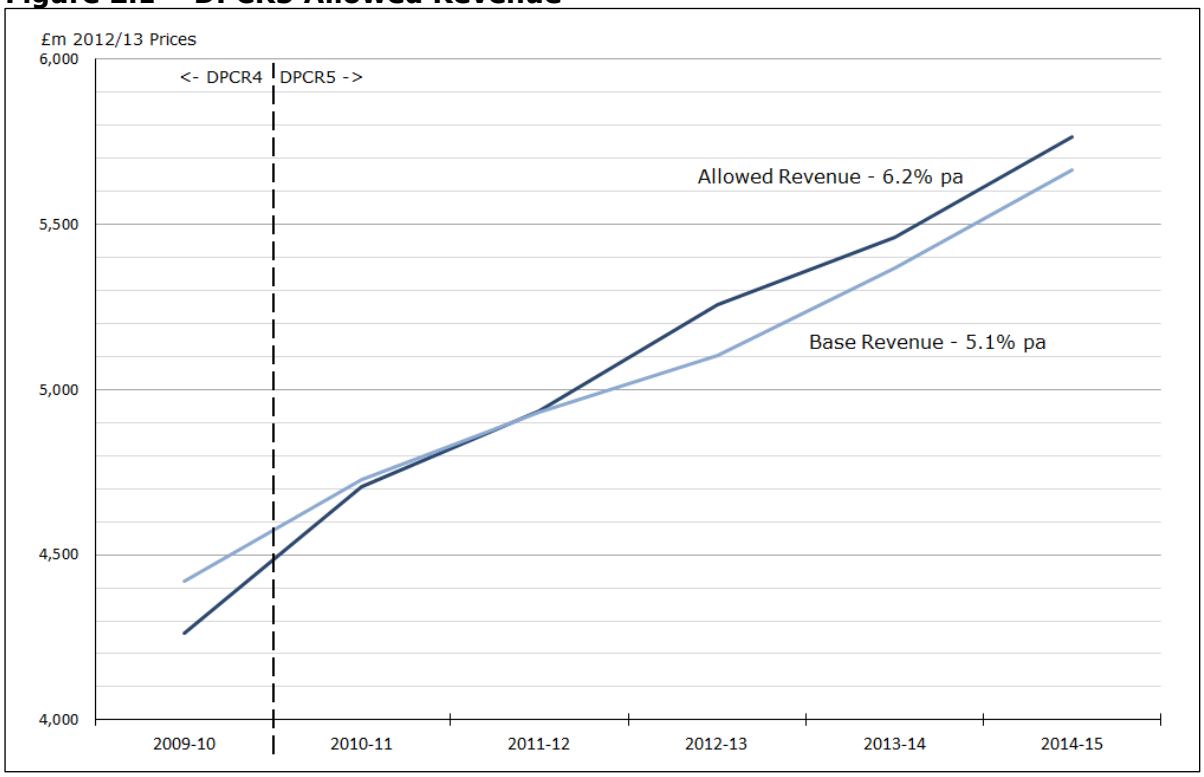
Allowed revenue

2.2. Our DPCR5 price control specified the base level of revenues, the main component of revenues that the companies were permitted to recover through electricity distribution use of system (DUoS) charges for the five-year period.

2.3. We concluded that DNOs would need an increase in their base revenues to reflect the significant investment needs across the sector; in particular we anticipated a peak in asset replacement and refurbishment expenditure which we refer to later in this chapter. We gave base revenue an upwards profile to allow for the planned increase in investment and provide for a smooth transition in DUoS charges from the previous price control.

2.4. On top of base revenues, DNOs can earn additional revenue through our package of financial and performance incentives, which are awarded for the delivery of desirable outcomes. The sum of base revenue and incentive revenues make up allowed revenue, the total DNOs can collect through DUoS charges. A comparison of base and allowed revenue is shown in Figure 2.1 below.

Figure 2.1 – DPCR5 Allowed Revenue



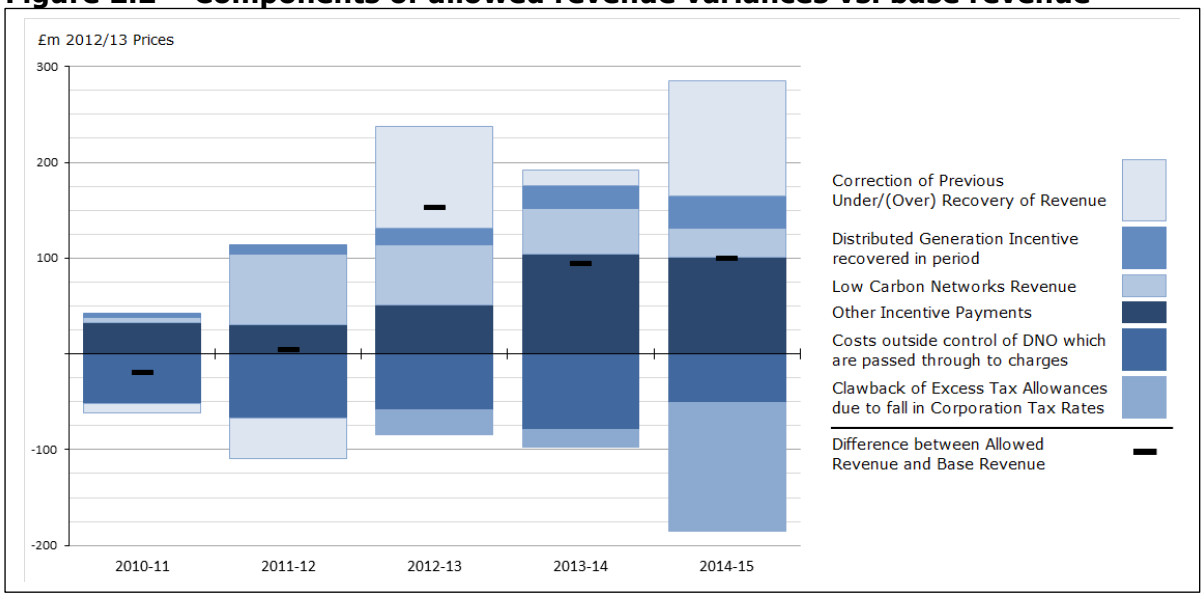
2.5. At the start of DPCR5 we anticipated a 5.1% annual increase in revenue from the end of DPCR4. The inflation-adjusted outturn allowed revenue increased by 6.2% per annum, [13] 1.1% more per annum than anticipated. Of this difference, approximately 0.4% per annum can be explained by lower than expected outturn allowed revenue at the end of DPCR4.

2.6. Allowed revenue closely tracked base revenue at the start of the price control, then deviated from 2012-13 onwards due to performance incentives. With the exception of expenditure incentives, incentive revenues are generally recovered from customer bills with a two year lag to allow time for the measurement of performance. Regulatory year 2012-13 is the first year where the increased level of incentives in DPCR5 impacted on allowed revenues. Approximately half of incentive performance occurred in the final two years of DPCR5. With the two year lag on collection of incentive revenue, these did not impact on allowed revenues in DPCR5. Around £320m of incentive revenue, over all 14 DNOs, will be recovered through allowed revenues in the first two years of RIIO-ED1.

2.7. The six individual components that make up allowed revenue in addition to base revenue are shown in Figure 2.2. The black dash represents the net effect (the difference between allowed and base revenue). If it is above the horizontal axis, it shows that allowed revenue exceeded base revenue.

[13] Following a Government initiative (see footnote 14 below), the majority of DNOs did not fully recover their allowed revenue in the final year of DPCR5. As allowed revenue itself didn't change, this has not been reflected in Figure 2.1. The rebate will be recovered by the DNOs during RIIO-ED1.

Figure 2.2 – Components of allowed revenue variances vs. base revenue



2.8. Figure 2.2 shows significant positive incentive payments, particularly during the last three years of DPCR5. This reflects the first three years' performance. However, the effects on consumers were in part offset by adjustments to reflect the fall in UK Corporate Tax rates from 28% in 2010-11 to 21% in 2014-15. In DPCR5 a new mechanism was introduced to claw back reductions in corporation tax for consumers. Business Rates also reduced over the period, with the reduction fully passed through to customer bills (part of costs outside the control of DNOs).

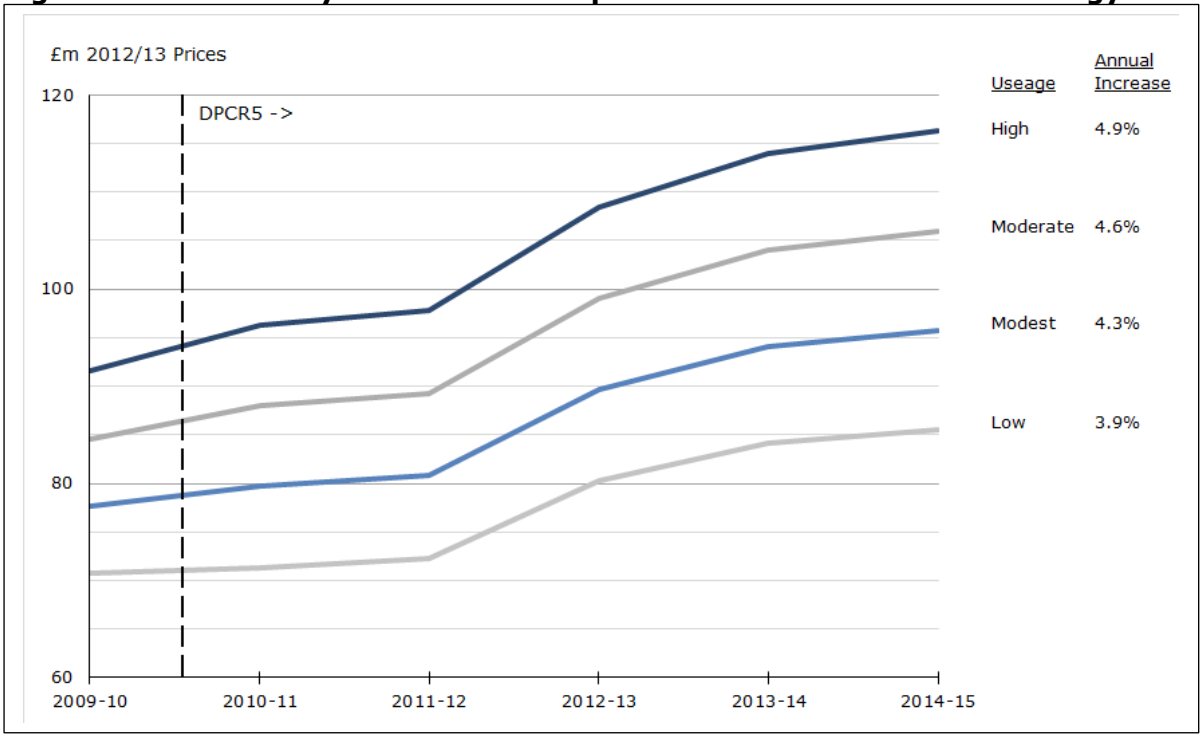
2.9. The majority of the large correction of previous under/over recovery of revenue in 2014-15 is from the automatic correction of the voluntary under-recovery by some DNOs towards the end of 2013-14 following a Government announcement in December 2013.[14] Those DNOs did not utilise that correction in 2014-15 (so actual revenues continued to under-recover allowed revenues).

Customer bill impacts

2.10. To see the impact of the DPCR5 control on customer bills, we have analysed the DNOs' DUoS charges over the period.[15] Figure 2.3 illustrates the impact on household energy bills for four representative levels of household electricity usage.[16] These distribution charges account for about 8% of the dual fuel energy bill for a typical household.

[14] On 2 December 2013, the Government announced a £50 package for energy consumers that included a voluntary re-profiling of charges for household consumers by DNOs.
[15] Analysis is based on DNOs' unrestricted DuoS tariffs for domestic households.
[16] These levels are 100%, 90%, 80% and 70% of the average household temperature corrected consumption in Table 3.07 in https://www.gov.uk/government/statistics/energy-consumption-in-the-uk. Average household consumption is weighted towards high-consumption households that benefit from savings from using two-rate tariffs. These representative levels reflect the overall improvements in household energy efficiency shown in government data for average household electricity consumption in the UK.

Figure 2.3 - Electricity distribution component of annual household energy bills



2.11. The chart indicates that households' electricity distribution costs have increased by less than the 6.2% per annum rate of increase in allowed revenues. We calculate that a typical household energy bill would have been affected by annual real-terms increases in electricity distribution charges of between 3.9% and 4.9%.

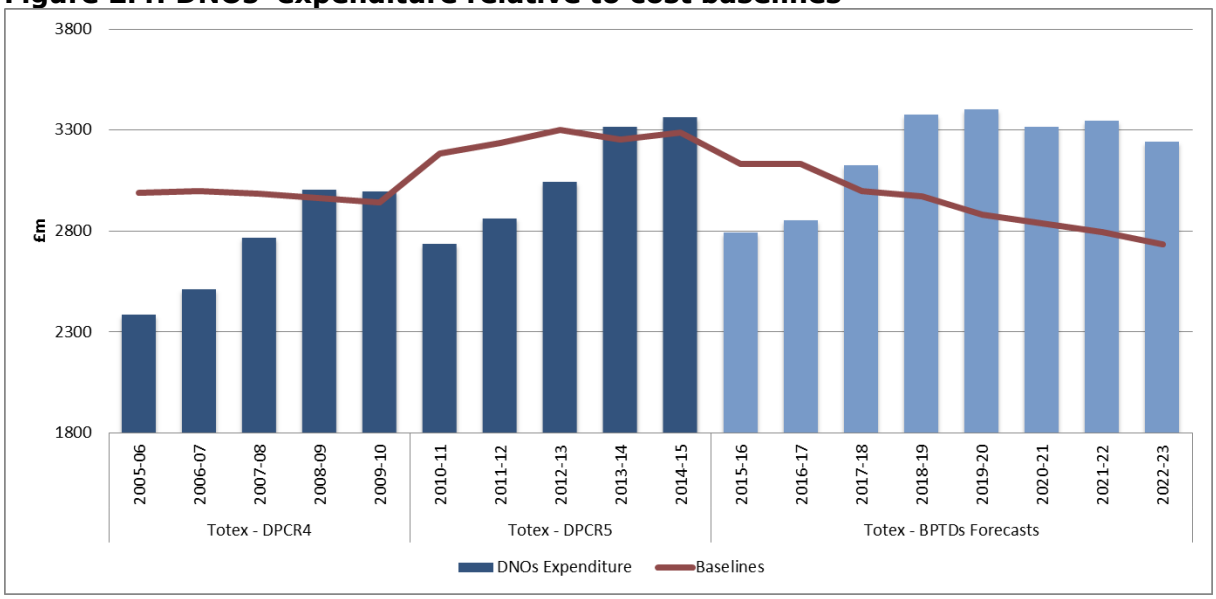
2.12. Households in general have benefitted from progressive reductions in electricity consumption levels, in large part through the use of more energy-efficient appliances. This has led to households representing a reducing proportion of overall electricity consumption, and thus a reducing proportion of DUoS charges. Household bills have also been affected by the DNOs adopting a common charging methodology. Previously, DNOs had been using different methodologies and changing to a common methodology meant there was some redistribution of the overall revenue requirement between different groups of consumers. On balance, households have benefitted from these changes.

Totex[17]

2.13. As part of DPCR5, we set cost baselines for DNOs' total expenditure (totex) for each year of DPCR5. These assumptions were key elements in determining allowed revenue for the price control.

[17] DPCR5 Totex numbers exclude pensions and are net costs after allocations for RAV. Stand Alone Funding, Atypicals non severe weather (non RAV) and IQI additional income were excluded from the calculation. Baselines include Traffic Management Act and Rising Lateral Mains reopener changes.

Figure 2.4: DNOs' expenditure relative to cost baselines



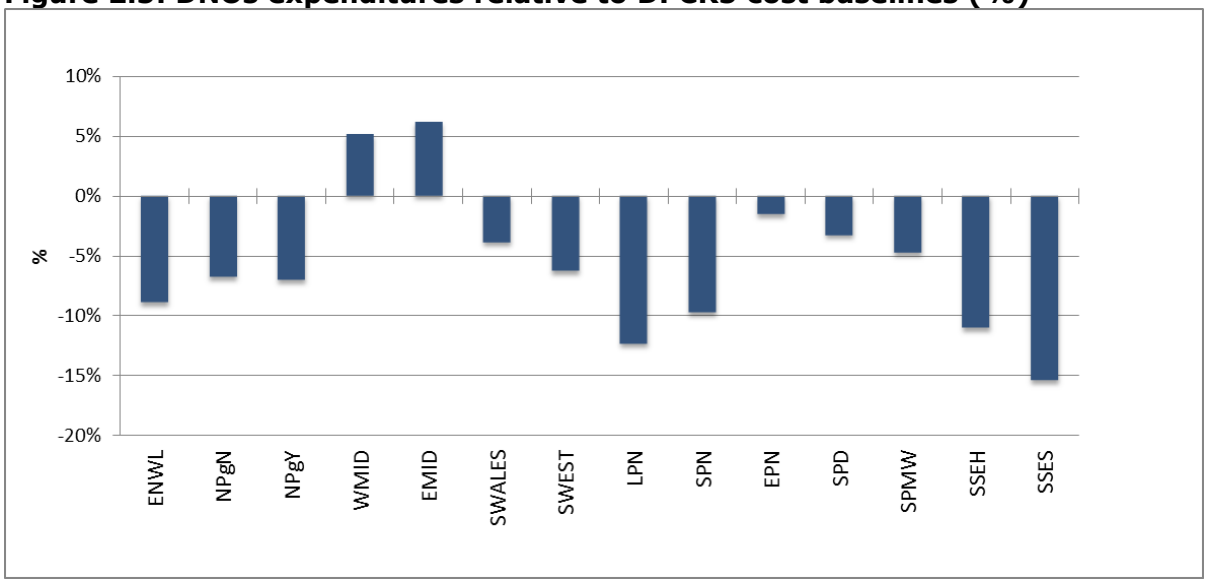
2.14. Figure 2.4 shows DNOs' allowed, actual and forecast expenditure between 2005-06 and 2022-23 covering DPCR4, DPCR5 and RIIO-ED1. There was a peak in investment in electricity distribution assets between 1950 and 1970 with rural electrification. Many of the assets that were installed during this period were nearing the end of their useful lives during DPCR5 requiring refurbishment or replacement. While companies have managed to reduce the scale of the peak and/or smooth the peak through modern asset management techniques, significant investment has still been required to manage such assets. The peak in asset replacement and refurbishment expenditure during DPCR5 has been offset to some degree by the expected growth in electricity demand and volume of demand connections falling away during DPCR5, through reductions in input prices and significant improvements in efficiency under the price control incentives.

2.15. The total expenditure baseline for DPCR5 was £16.2bn. DNOs have spent £15.3bn, a difference of £0.9bn or -6%.[18] DNOs overall have outperformed both the DPCR4 and DPCR5 price controls delivering significant benefits to customers as the efficiencies are shared with customers through the efficiency incentive rates. The composition of DNOs' expenditure has been very similar to our cost baselines with asset replacement being the single largest area of expenditure. See Appendix 2 for more detail.

2.16. The DNOs have back-loaded expenditure in both DPCR4 and DPCR5. One potential explanation for this is that following a price control review, DNOs pause to reassess and revise their business strategy and renegotiate contracts. A number of the DNOs have indicated that they restructured in the early stages of the price controls and reviewed and retendered work programmes. Some of the work from earlier years of the price control was deferred to later in the period.

[18] This number compares unadjusted expenditure to unadjusted allowances (apart from the two reopeners). The total saving of £1.2bn set out at the start of the document takes into account adjustments to allowances and other financial adjustments.

Figure 2.5: DNOs expenditures relative to DPCR5 cost baselines (%)



2.17. Figure 2.5 shows the difference between our cost baselines and actual expenditure for each of the 14 DNOs. SSES beat our cost assumptions by the largest percentage (-15%), while the highest spend relative to allowance was for EMID (+6%) and WMID (+5%), where WPD stepped up expenditure to improve performance. At a group level SSEPD beat their cost baselines by the largest percentage (-14%) and WPD spent more than its cost baseline (+2%).

2.18. The main area of costs where DNOs were beating our price control assumptions was network investment. DNOs overall have spent 10% (£823m) less than our cost baselines. The main factors driving this were improvements in efficiency, with unit costs for asset replacement work falling significantly during DPCR5, falling input prices and a drop in reinforcement, demand connections and high value projects because of economic conditions.[19] However, in some areas the DNOs have underspent and have not delivered on their commitments. As an example, there was lower than expected expenditure on flooding, and some of the DNOs have not completed their flood risk reduction programmes. You will find more details on flooding expenditure in paragraph 3.65.

2.19. DG connections volumes have been much higher than expected and DNOs have made significant gains under the DPCR5 DG incentive as they were paid a unit rate per kW connected to reflect average reinforcements (DG use of system capex). In practice DNOs do not appear to have done much reinforcement for those schemes which have gone ahead.

2.20. There is anecdotal evidence which suggests that some DNOs have not done sufficient network reinforcement to facilitate DG connections and customers have often chosen new locations for their projects when their original connection requests would have resulted in expensive specific reinforcement. The connecting customers would potentially have had to pay a significant proportion of such costs as part of their connection charges. As a result, only the DG connection schemes with low or no

[19] High value projects (HVPs) were defined in DPCR5 as discrete projects with a value of more than £15m over the lifetime of the project (in 2007-08 prices).

reinforcement have typically gone ahead and companies have earned significant returns by outperforming the unit rate per kW connected.

2.21. DNOs have beaten our assumptions for indirect costs (overheads) by 4% (£232m).

Equalised efficiency incentive

2.22. In previous price controls, DNOs had a tilted incentive to invest in capital intensive solutions rather than operational and maintenance solutions. The distortion came from the DNOs' ability to retain a higher proportion of capital underspend and an inability to pass on overspends on operational solutions. The DPCR5 price control was the first to introduce the equalisation of incentives between capital and operational expenditure. DNOs would therefore pick the best option rather than preferring purely capital based solutions.

2.23. During DPCR5, the majority of totex was split 85% into the DNOs asset base (known as slow money) and 15% into cash (known as fast money). [20] DNOs are entitled to keep all underspend and are exposed to all overspend on fast money. They keep a proportion of any underspend and are exposed to a proportion of any overspend on slow money. The weighted average of the incentive rates for fast and slow money give the overall efficiency incentive rates for the DNOs.

2.24. Over the period, the 14 DNOs beat their fast money allowance by £236m overall, net of a £121m overspend by WMID and EMID. The overspends have been borne by the two DNOs and have not been shared with consumers.

2.25. After accounting for adjustments to allowances, DNOs have beaten their slow money allowance by £926m over the five years of DPCR5. A share of these savings is returned to consumers through two mechanisms discussed below.

Regulatory asset values (RAV) and rolling incentive

2.26. The regulatory asset value (RAV) is the value we attribute to the DNOs' cumulative net investment in their respective licenced businesses. It forms the basis for our calculations of allowances for depreciation and the cost of financing. The process for rolling the RAV forward each year is tightly governed by the DNOs' licences, mainly by taking account of the portion of totex that is capitalised less the depreciation included in the calculations for allowed revenues.

2.27. As a result of the savings in totex, the RAV value at the end of the DPCR5 period is lower than we forecast when we set the DPCR5 price control by approximately £815m. This is equal to the £926m slow money saving after accounting for depreciation impacts.[21]

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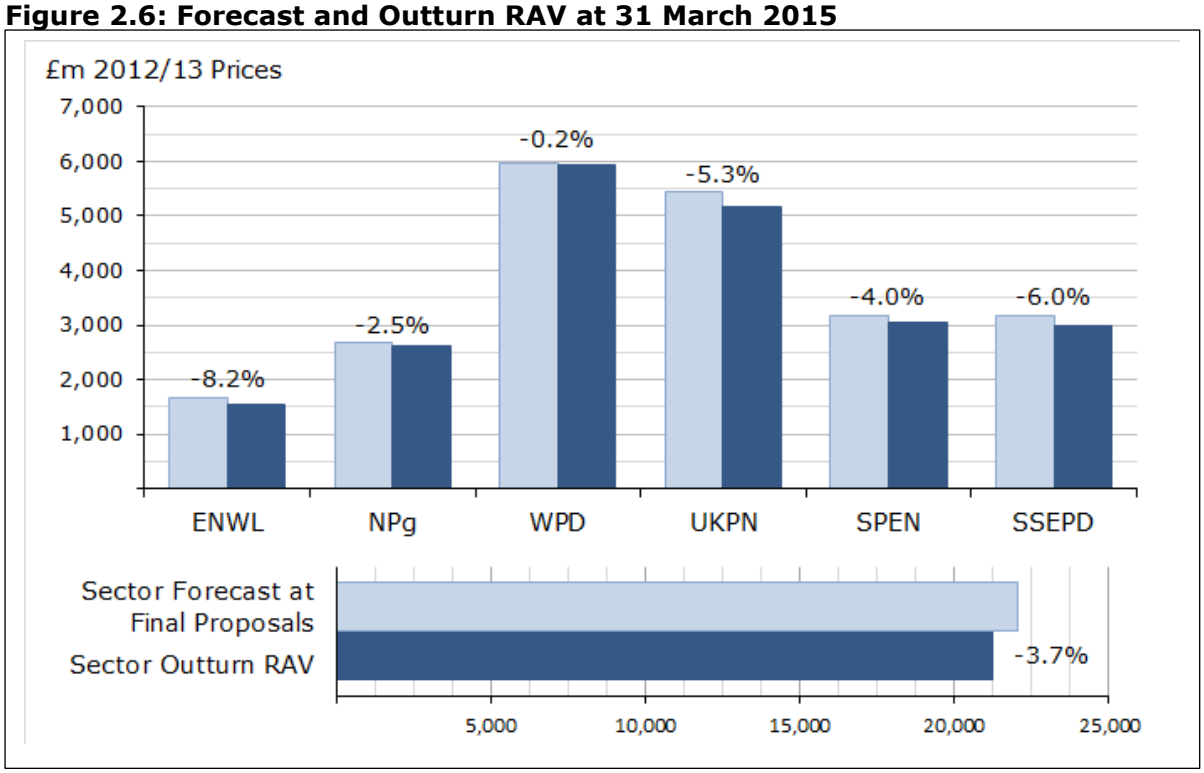
[20] Network investment, operating costs and indirects are split 85%:15%. The entirely of business support and non-operational capex costs are treated as fast money.

[21] £926m represents the difference between total allowance and total expenditure over five years. Applying this in the year the saving occurred and accounting for depreciation over a 20 year period, the resulting closing

2.28. Around £150m of this reduction is due to the deduction of certain excluded service revenue from the RAV balance. The remainder is due to underspends and efficiency savings by the DNOs.

2.29. This £815m saving represents 3.7% of the sector's forecast closing RAV. Based on their actual expenditure, the sector as a whole has a RAV balance of £21.3bn at 31 March 2015. Sector and DNO group level savings are illustrated in Figure 2.6.

Figure 2.6: Forecast and Outturn RAV at 31 March 2015



2.30. Customers have started to benefit from this reduction in RAV from the start of RIIO-ED1. The smaller RAV balance means that there is currently a lower depreciation and return allowance going forward, resulting in lower future bills. This benefit will continue over the next 20 years until the £815m saving has been fully depreciated.

2.31. As the DNOs are allowed to retain on average 37% of slow money underspend, an additional transfer occurs through the RAV rolling incentive (RRI). The RRI captures the amount owed to DNOs minus the excess depreciation and return allowance they have gained based on forecast RAV balances. At present, the value of the RRI transfer is £122m and is collected over the eight years of RIIO-ED1.

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balance at the end of DPCR5 is £815m.

2.32. Through the RAV and RRI adjustments, customers benefit from on average 63% of the slow money saving. This will be around £660m over the next 20 years. [22]

Return on regulatory equity (RoRE)

2.33. DNOs' performance over the price control can be measured using their return on regulatory equity (RoRE). This presents a comparative measure of annual equity returns for DNOs of different sizes. It is presented on a post-tax basis, that is, after allowing for the impact of corporation tax.

2.34. As we mention in paragraph 1.6, there are still a number of mechanisms to be determined for DPCR5. On the upside, there is the remainder of the £100m LCN Fund discretionary reward which might be allocated to successful projects. It will be a number of years before this is allocated, to allow time for projects to be completed and the outcomes to be analysed. There are potentially more significant downsides, including the assessment of legacy reopeners for various schemes early in RIIO-ED1. Expenditure on eight DNOs' high value projects will be subject to an efficiency review and possible reopener. The remaining six DNOs (NPgN, WMID, SWALES, SWEST, SPD and SSEH) had no high value projects in DPCR5. All 14 DNOs are also subject to reviews of their load related expenditure and network output measures.

2.35. For these reasons, we are only able to make provisional estimates of RoRE, which we consider to be upper bound estimates. These are summarised in Figure 2.7. DNOs start the period at the top of the grey bars, which represent the cost of equity and the upfront reward for information quality. Additional positive returns increase the overall bar, while any negative items reduce the starting position. Negative items have also been displayed below the axis for comparability. The overall current view of return should be read from the top of the bars.

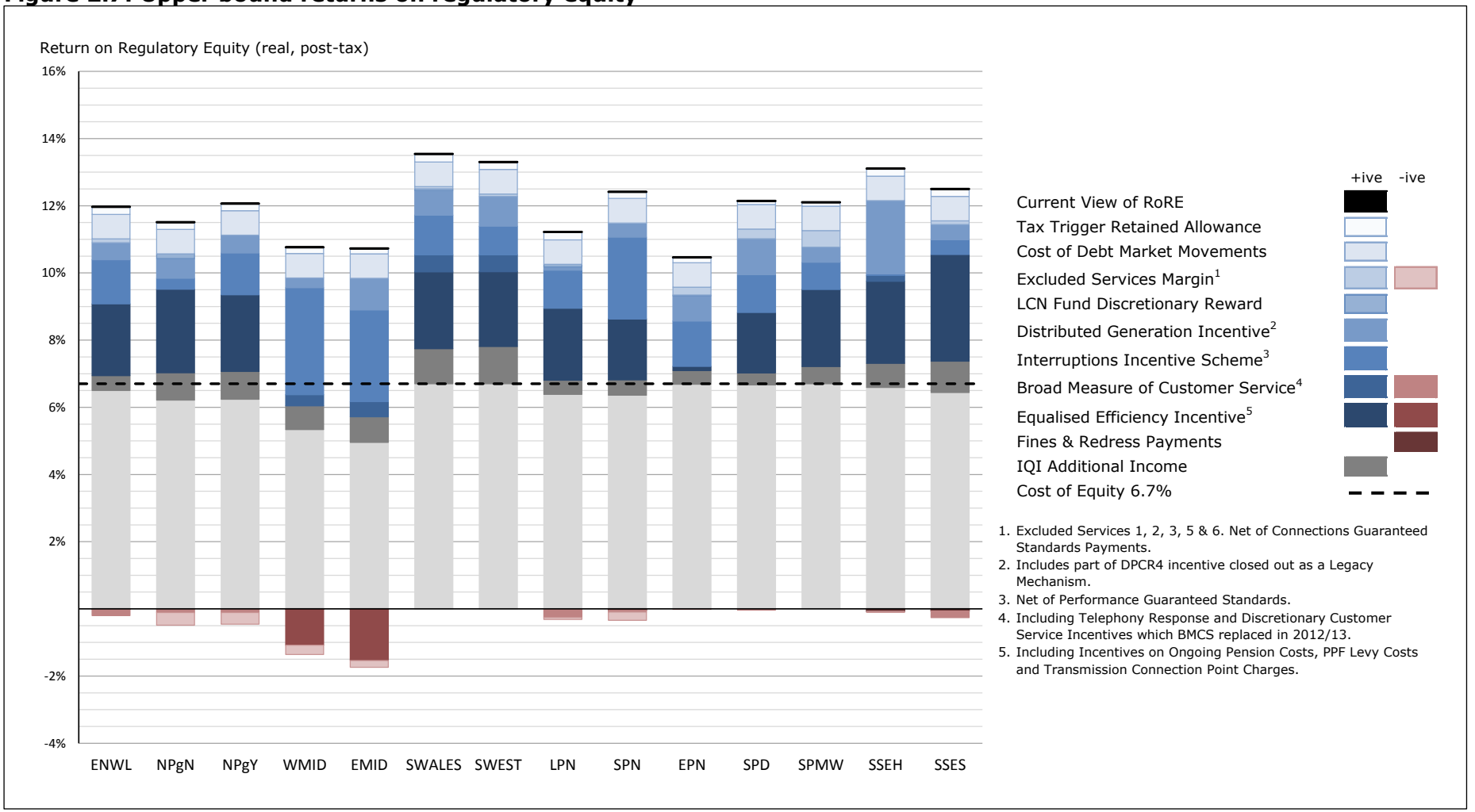
2.36. The best performers, SWALES, SWEST and SSEH achieved upper bound RoRE of over 13%, while the lowest upper bound estimates are approximately 10.5% for EMID and EPN. The RAV-weighted average upper bound return over the period was 11.8%.

2.37. The RoRE calculations are based on the notional gearing assumption of 65% and have not been adjusted for DNOs' actual levels of gearing. The majority of DNOs had a gearing level close to this assumption by the end of the period. Any excess benefits from differing gearing levels would have been subject to a clawback mechanism over DPCR5.

2.38. In the current RIIO price controls, Ofgem moved from setting a fixed cost of debt throughout the period, to an annually updating index based on a trailing average of market rates.[23] The market movement in the cost of debt component represents the difference between the fixed cost of debt assumption and the index for the relevant year. It does not reflect the additional profit or loss a company may have made when comparing the assumed cost of debt against its actual own debt costs.

[22] Total slow money saving minus total RAV rolling incentive payment grossed up for tax.
[23] A 10 year trailing average applied to the Gas Distribution, Electricity Transmission and Gas Transmission price controls. All DNOs began the current price control with a 10 year trailing average, and we have evaluated cost of debt market movements on this basis.

Figure 2.7: Upper bound returns on regulatory equity



1. Excluded Services 1, 2, 3, 5 & 6. Net of Connections Guaranteed Standards Payments.
2. Includes part of DPCR4 incentive closed out as a Legacy Mechanism.
3. Net of Performance Guaranteed Standards.
4. Including Telephony Response and Discretionary Customer Service Incentives which BMCS replaced in 2012/13.
5. Including Incentives on Ongoing Pension Costs, PPF Levy Costs and Transmission Connection Point Charges.

2.39. Low carbon network funding, DG incentives and excluded service margins are all components that have not previously been included in the presentation of RoRE. We believe the current presentation provides a more complete view of returns over the period, subject to the remaining schemes which have yet to be closed out.

2.40. RoRE as presented does not include additional returns DNOs may have earned through legacy metering provisions, work outside their network area or through de minimis business activity.

Financing of the RAV and application of returns

2.41. Our assumption has been, both in DPCR5 and in our recent RIIO-ED1 reviews, that DNOs would finance 65% of their net investment by way of debt. Net investment can be thought of as the additions to the RAV not funded by consumers through depreciation allowances.

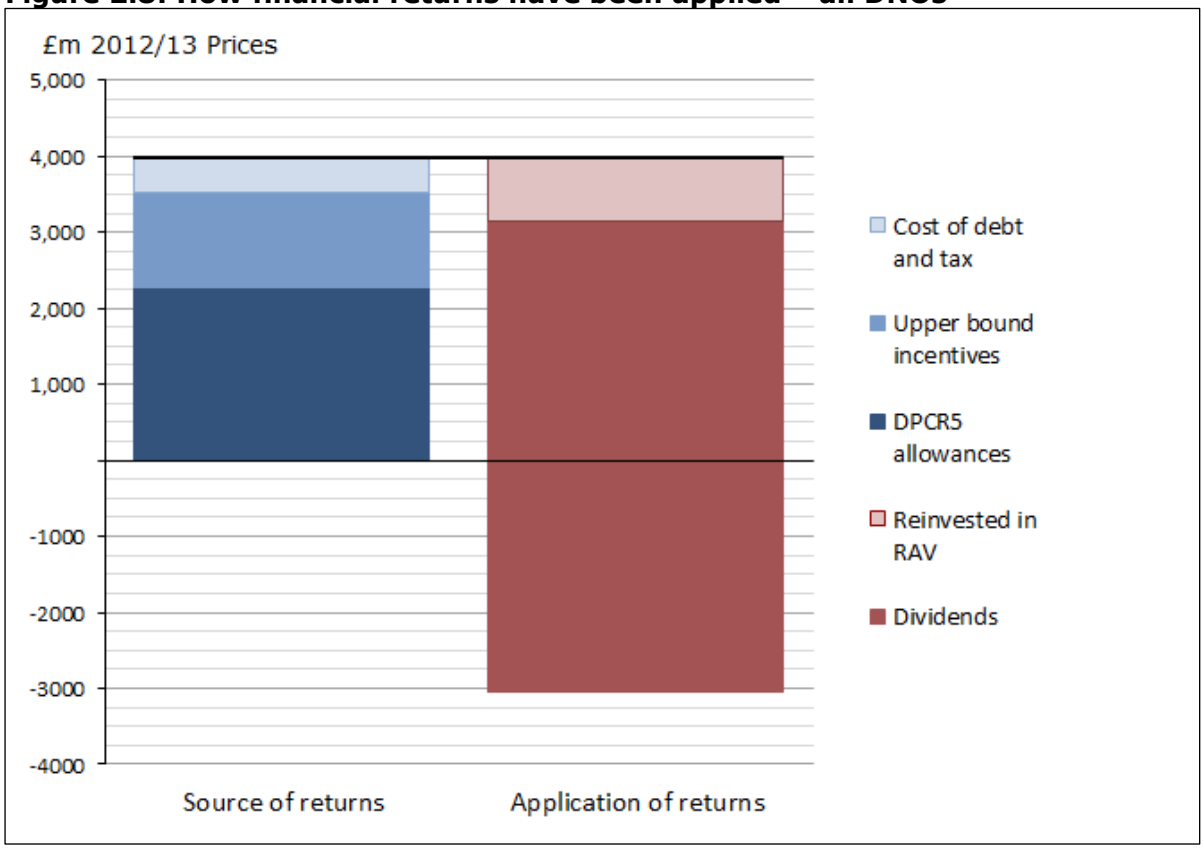
2.42. The rest of the DNOs' net investment is funded by equity. Profitable companies with relatively stable or modest rates of growth in the RAV would be able to fund the equity share of net investment by retaining some of those profits. In other words, they would distribute less of those profits to shareholders in the form of dividends and use the resources instead to fund net investment.

2.43. A company would have other financing options. It might choose to retain more of its profits to repay some of its debt, or it might choose to pay a higher level of dividend and raise more debt.

2.44. We leave these financing decisions to the DNOs, but with important safeguards that protect the interest of consumers and also protect the interests of lenders, bond holders and other creditors. These safeguards are contained in the DNOs' ring fence licence conditions. In broad terms, their licences require them to maintain an investment grade issuer rating. This means they must maintain high standards of financial viability to convince the credit rating agencies to maintain the status of investment grade. An investment grade issuer rating indicates that debt issued by the company would be of a high enough quality for banks and other financial institutions to buy and count as part of their assets for capital adequacy calculations.

2.45. Figure 2.8 shows how the DNOs overall have made these choices. The left of the chart shows the returns made by DNOs over the period, and the right hand side shows how they have applied those returns (by reinvesting them in the business or distributing to shareholders). Dividends below the axis indicate where DNOs have distributed more dividends than they have earned in the period, which they will have funded by increasing their debt.

Figure 2.8: How financial returns have been applied – all DNOs



2.46. This shows that, broadly, DNOs have used the additional returns they have made through their incentives for outperformance to fund dividends. Figure 2.8 includes the upper bound returns we describe in paragraphs 1.6 and 2.34. Three DNO groups have chosen to pay further dividends to bring their gearing levels closer to our assumption of 65%. These DNO groups are WPD, SPEN and SSEPD. By the end of DPCR5, the gearing ratios of the DNOs were all in the range 50% to 70%.

3. Delivery against DPCR5

Chapter Summary

DNOs' performance against the key deliverables of DPCR5: environment, customers and networks, including the key performance measures included as part of the DPCR5 settlement.

Introduction

3.1. The DPCR5 price control review provided us with an opportunity to review the entire regulatory framework to ensure that it encourages the services and types of behaviours that consumers expected from the DNOs over 2010 to 2015. We consulted extensively on the objectives for the DPCR5 period and received wide ranging support for a regulatory framework that addresses the following three themes:

- **Environment**: encouraging DNOs to play a fuller role in helping to tackle climate change, both directly through managing their own carbon footprint and indirectly by facilitating new uses of the networks that are likely to arise as we move to a low carbon economy.

- **Customers**: encouraging all DNOs to pay more attention to all aspects of customer service. These include the quality of service provided by their call centres, the speed and cost of new connections as well as the number and length of any interruptions to customers' supply.

- **Networks:** encouraging DNOs to invest efficiently, so that they provide secure and reliable supply at an efficient cost while ensuring that any new assets they install meet customers' needs into the future and, where possible, take into account how those needs might change.

Environment

3.2. DNOs' activities have the potential to impact the environment in a range of ways. Environmental protection and enhancement is a key feature of their outputs under DPCR5, as it is under RIIO-ED1. This section gives an overview of DNOs' environmental activities and performance throughout DPCR5, including:

- **Innovation incentives:** The LCN Fund and IFI provided funding for projects to allow DNOs to complete research and development and trial innovations to facilitate a move towards a low carbon economy.

- **Connecting distributed generation (DG):** One of the DNOs' most important roles is to connect customers to the distribution network. During DPCR5 the DNOs connected a significant amount of DG to the distribution network.

- **DNOS' direct environmental performance:** Key aspects include measures they have taken to reduce distribution losses, to improve visual amenity through undergrounding and reduce their BCF, as well as a range of wider indicators of

environmental impact, including oil leakage and sulphur hexafluoride (SF_6) emissions.

Innovation Funding Incentive

3.3. The IFI encouraged DNOs to part-fund technical research and development (R&D) on their networks. The IFI imposes an annual limit on the amount of funding available under the incentive. During DPCR5, the DNOs received £55.3m of funding under the IFI. Details of the DNOs' IFI projects are available on the ENA 'Smarter Networks' Portal.[24] The IFI has been replaced by the Network Innovation Allowance (NIA) for RIIO-ED1.

Low Carbon Networks Fund

3.4. As part of DPCR5, we established the £500 million LCN Fund. The aim of this fund is to stimulate innovation and to give DNOs the opportunity to obtain funding to trial innovative technology, operating and commercial arrangements. These trials are needed so that DNOs can understand the changing needs of consumers, generators and other stakeholders, particularly as we move towards a low carbon economy. Ultimately, the trials could result in lower costs for all customers.

3.5. Several projects have now concluded and the learning from these trials is being embedded into the DNOs' business as usual activities. Each project is required to publish a report every six months updating stakeholders on how the project is progressing. Each project is also required to publish a comprehensive "close-down" report at the end of the project so that stakeholders can fully understand the learning delivered. We will shortly be launching a review of the benefits produced by the LCN Fund. The results of this review will inform the future governance of the Electricity Network Innovation Competition (NIC)[25] and the level of funding available under the NIC during RIIO-ED1.

LCN Fund First Tier

3.6. The LCN Fund is split into two tiers. The LCN Fund first tier provides an innovation funding allowance for all DNOs. This funding can be used to implement small scale innovation projects or trial larger innovation projects, as long they meet set criteria. The LCN Fund first tier provided an allowance of up to £80 million across all DNO over DPCR5. Over the DPCR5 period the DNOs have spent £32.6m (41%) of the LCN Fund first tier allowance that was potentially available.

LCN Fund Second Tier

3.7. The LCN Fund second tier provided funding of up to £64 million a year to a small number of larger innovation projects that won an annual competition. During DPCR5, £214m has been invested in 23 second tier projects (plus Northern Isles New Energy Solutions, NINES[26]). The projects selected are shown in the supporting data file in

[24] http://www.smarternetworks.org/
[25] The Electricity Network Innovation Competition replaces the LCN Fund for RIIO-ED1.
[26] NINES was funded by us, outside of the LCN Fund innovation framework, as the first stage of SSEPD's Integrated Plan to manage supply and demand on the Shetland islands; https://www.ofgem.gov.uk/publications-and-updates/decision-funding-shetlands-northern-isles-new-energy-solutions-nines-project

Appendix 3, together with the funding awarded for each project. Further information on these projects can be found on our website[27] or the ENA Smarter Networks Portal.[28]

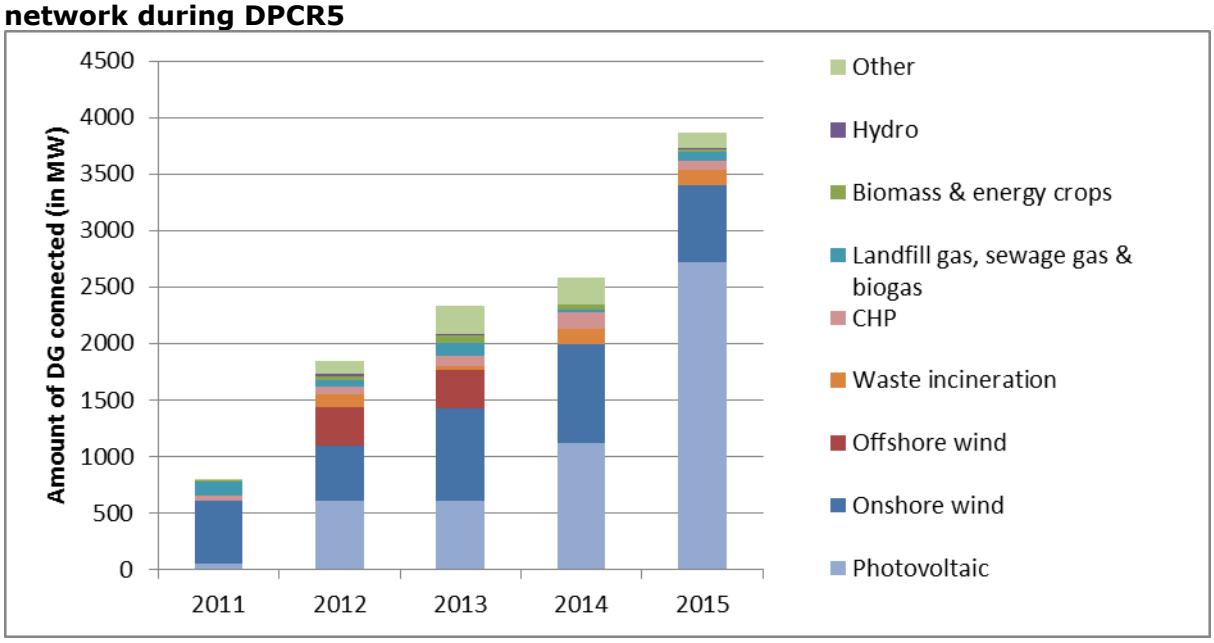
LCN Fund Successful Delivery Reward (SDR)

3.8. We introduced a discretionary reward, to incentivise DNOs to deliver these projects successfully. DNOs make a compulsory contribution of 10% of the total project funding. The maximum value of the SDR is the level of the network company's compulsory contribution. All completed LCN Fund projects are eligible to apply for the SDR. There is an annual application window. Four projects applied for a Successful Delivery Reward (SDR) in summer 2015 and, in total, we awarded them £6.6m for successful delivery of the projects. A summary of our decision is highlighted in the supporting data file in Appendix 3[29]. The next application window closes on 1 May 2016.

Distributed generation

3.9. Over the past five years we have witnessed a dramatic transformation in the amount, type and location of electricity generators. As a result, there has been a massive growth in the amount of generation that is now connected to the distribution networks. For example, during 2014-15 nearly 4,000MW of distributed generation ("DG") was connected to the distribution network, of which 70% was photovoltaic (solar) generation. This is capable of generating more electricity than a typical nuclear power station. This transformation in energy generation has implications for the distribution and transmission networks and how the overall system operates. In total over 11,400MW of DG was connected to the distribution network during DPCR5.

Figure 3.1: The annual amount (in MW) of DG connected to the distribution network during DPCR5



[27] https://www.ofgem.gov.uk/electricity/distribution-networks/network-innovation/low-carbon-networks-fund/second-tier-projects
[28] http://www.smarternetworks.org/Index.aspx?Site=ed
[29] You can find our 2015 Successful Delivery Reward Decision document at https://www.ofgem.gov.uk/sites/default/files/docs/2015/08/sdr_decision_document_final.pdf

3.10. The type and rate of growth for DG is heavily influenced by changes in the government's renewable policy (eg changes to the Feed-In-Tariff rates) and the installation cost of different technologies. Much of the new generation has been concentrated in certain areas of the country. There are more wind farms in the north of England and Scotland, while large scale solar parks were more likely to want a connection in the south.

3.11. The rise of DG has required DNOs to engage with new stakeholders. At the start of the price control DNOs struggled to understand and respond to the needs of these customers. However, in recent years relationships have developed and initiatives like the DG Forum and the LCN Fund have helped to improve awareness of needs and widen the range of services provided (eg DG connection guides, "heat maps" showing network capacity and new "flexible" connection offers). To ensure that DNOs continue to deliver improvements, we introduced a number of connection incentives as part of RIIO-ED1.[30] We are also working with the DNOs to support changes that deliver quicker and more efficient connections.[31]

Distribution network losses

3.12. Distribution network losses are an important part of DNOs' environmental impact, due to the carbon emissions associated with the production of this energy. Financially, losses are also important to consumers as they pay for them in their energy bills.

3.13. A financial incentive (Distribution Losses Incentive mechanism) was originally designed for DPCR5 with the aim of encouraging DNOs to reduce losses of electricity on their networks. Owing to volatility of available data to measure losses, we decided not to activate this mechanism in DPCR5.[32]

3.14. A variety of factors can affect the magnitude of network losses and we do not believe that there is currently a reliable source of data common to all DNOs for measuring losses. Therefore, our assessment below was based on the individual actions DNOs undertook to manage them – this was reported on in the final two years of DPCR5.

3.15. Table 3.1 provides a summary of the DNOs' reported losses reduction activities between 2013-15. These include, the installation of low-loss transformers and oversized cable, and a novel technical trial designed to manage technical losses.

Table 3.1: Summary of DNOs' reported losses reduction measures (2013-2015)

	Summary of losses reduction measures[33]	
DNO	**Technical**	**Non-technical**
ENWL	VAr capacitor compensation project (due to commence 2016)	Revenue protection and theft detection

[30] More information on the RIIO-ED1 package can be found here: https://www.ofgem.gov.uk/ofgem-publications/47068/riioed1decoutputsincentives.pdf
[31] https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/quicker_more_efficient_next_steps_-_final.pdf
[32] http://www.ofgem.gov.uk/Networks/ElecDist/Policy/losses-incentive-mechanism/Documents1/1A_Decision_Losses_DPCR5_161112.pdf
[33] Technical losses are physical losses on the network, while non-technical may include theft, unmetered suppliers or other measurement errors.

	Incidental benefits of transformer replacement	
NPg	Incremental benefits from other investment activities, including capitalised losses transformers and choice of conductor size were recognised. Benefits were not specifically quantified in DPCR5.	Revenue protection and theft detection
WPD	Oversizing of cables for losses reduction at LV and 11kV	Revenue protection services and identification of illegal abstraction
	Discontinuation of smaller transformer sizes (ground and pole mounted and three-phase) for losses reduction	
UKPN	Installation and replacement of low loss Distribution Transformers	Revenue protection investigations and service rectifications involving theft
	Incidental benefits of rationalisation of conductor sizes	Combined safety and energisation inspections
		New initiatives and trials
SPEN	Incidental benefit of 11kV, 33kV and 132kV transformer replacement and overhead line rebuild due to larger cross sectional area of conductor	Revenue protection services and theft detection
SSEPD	Incidental benefits from transformer replacement	

3.16. Nearly all DNOs undertook revenue protection and theft identification activities for non-technical losses. We note that SSEPD did not offer any revenue protection services. However, they have confirmed that a team has been established for RIIO-ED1 to pursue these activities.

3.17. The majority of DNOs reported measures, with associated losses reduction benefits, which were associated with wider network activities.[34] We have identified inconsistencies in the estimates of loss reductions and the scope of reported activities across DNOs, some including wider network measures with incidental losses benefits, with others reporting only on losses-driven actions. We will continue to engage with DNOs to improve consistency in reporting for RIIO-ED1.

3.18. Under RIIO-ED1 there is a licence condition on DNOs to manage losses to a level as low as reasonably practicable. As part of this new condition DNOs are required to publish a Distribution Losses Strategy on their websites which report on measures they will undertake to fulfil this obligation.

[34] Several DNOs reported measures with associated technical losses reduction benefits, which are included in Table 3.1. These reported measures do not account for all changes to losses on DNOs' networks - we note that a wide range of activities may have an impact on network losses. WPD indicated that their technical losses activities involve specifications beyond minimum requirements, with associated additional costs. We note that other DNOs report business-as-usual policies which include low-loss activities, and do not assign additional costs. These reported activities are also presented above.

3.19. We will continue to monitor DNOs' losses performance in RIIO-ED1 and we have taken steps to enhance the monitoring of losses and improve consistency in reported activities and benefits. For example, through strengthened reporting under the RIGs and the introduction of an annual, public-facing Environment Report.[35] DNOs are also expected to work towards establishing a losses baseline and a measurement methodology, to allow for a future losses incentive mechanism in RIIO-ED2 which runs from 1 April 2023 to 31 March 2031. The introduction of smart meters should help facilitate this.

Undergrounding

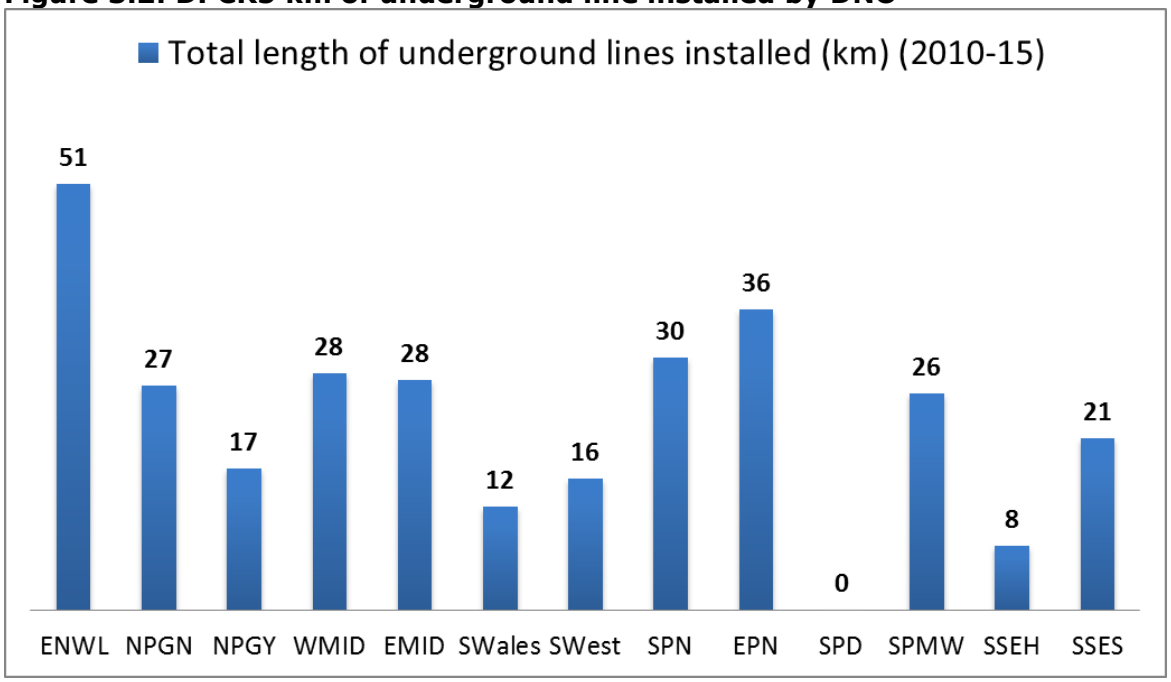
3.20. In DPCR5, each DNO was able to recover a defined amount of funding to pay for undergrounding of network cables in Areas of Outstanding Natural Beauty (AONBs) and National Parks. The overall level of allowance available over DPCR5 was £71m across all DNOs.[36] The allowance was calculated to reflect stakeholder interest in visual amenity and each DNO's funding was based on the amount of its network in AONBs and National Parks.[37] Over DPCR5, DNOs identified and prioritised undergrounding projects to take forward in consultation with their stakeholders. DNOs could only claim expenditure under their allowance for eligible activities and did not benefit from under-utilising the available funding.

3.21. Figure 3 shows that approximately 300km of underground lines were installed by DNOs over DPCR5 and a total of £32m was spent against an available amount of £71m in the period. The supporting data file in Appendix 3 provides a more detailed breakdown of activities by region and another table on DNOs' DPCR5 allowance, expenditure and activity volumes by DNO.

3.22. In our RIIO-ED1 strategy decision, we outlined that we expect DNOs to develop, and make available, policies for assessing candidate projects and for interacting and supporting relevant stakeholders as necessary. This should improve stakeholders' understanding of how to access this allowance under RIIO-ED1 and help support them from initial project application to delivery.

[35] https://www.ofgem.gov.uk/sites/default/files/docs/notice_-_environment_report_guidance_2.pdf
[36] On a 2012-13 price basis. See Electricity Distribution Price Control Review, Final Proposals - Incentives and Obligations, 7 December 2009, 145/09, pp. 48.
[37] This figure has been calculated from the national average level of customer willingness to pay for the undergrounding of 1.5 per cent of overhead lines in AONBs and National Parks.

Figure 3.2: DPCR5 km of underground line installed by DNO[38]



Business Carbon Footprint (BCF)

3.23. DNOs are required to report on their BCF, the carbon emissions related to their business operations, on an annual basis.[39] Table 3.2 shows a league table of the percentage changes in DNOs' BCF by network area measured against a baseline year of 2010-2011, excluding electricity distribution losses. Table 3.2 also shows the DNOs' SF_6 emissions as part of their overall BCF (excluding distribution network losses) and the percentage change in annual SF_6 emissions over the period.[40] A more detailed annual breakdown, which also includes figures for all DNOs, is provided in the supporting data file in Appendix 3.

[38] LPN does not have an undergrounding allowance.
[39] Further information on categories DNOs are required to report against can be found here: http://www.ghgprotocol.org/standards/corporate-standard
[40] Sulphur hexafluoride (SF_6) is used in the insulation of switchgear equipment. It poses an environmental risk if it leaks as it is a very potent greenhouse gas.

Table 3.2: BCF league table for 2010-2015 (tCO_2e – excluding losses) also showing the SF_6 emissions component [41]

DNO	2010-11 Baseline	2014-15	Total Reduction (2010-15)	Total SF_6 emitted (tCO2e) (2010-15)	SF_6 - change in annual emissions (2010-15)
ENWL	‡37,737	24,415	-35%	‡17,692	-93%
SPD*	34,235	24,549	-28%	7,379	13%
EPN	‡44,659	32,539	-27%	8,573	-20%
NPGY	35,809	28,807	-20%	11,948	-39%
LPN	‡23,869	19,776	-17%	2,853	-52%
WMID	‡34,175	29,723	-14%	8,464	359%
SPN	‡27,394	25,025	-9%	1,990	-18%
EMID	‡31,576	30,172	-4%	4,798	24%
NPGN	23,397	22,745	-3%	4,421	-54%
SWest	‡22,819	23,753	2%	19,972	-39%
SWales	‡14,563	18,330	23%	8,842	67%
SSEH	36,022	45,131	25%	6,106	60%
SSES	30,989	39,784	28%	34,763	22%
SPMW*	15,806	26,026	65%	14,208	15%

3.24. This shows that DNOs have achieved varying degrees of BCF change over the DPCR5 period. Seven DNO network areas saw significant reductions in their BCF, with ENWL top of the BCF league table. For both SSEPD's network areas (SSEH and SSES) BCF increased significantly over the period, with the biggest changes occurring in the last year. Two key factors contributed to this increase - operational transport and fuel combustion. SSEPD's published BCF report highlights an increase in staff within their areas resulting in an increase in operational transport, as well as the need to run a diesel generator for six months during repair of a subsea cable.[42]

3.25. The largest increase for a single network area was for SPMW. This was offset by a reduction in SPEN's other network area (SPD) and was largely caused by a change in the estimated allocation between the two areas following an internal review by SPEN. Overall, SPEN's BCF was broadly unchanged over the DPCR5 period.

3.26. We expect DNOs to focus on managing their carbon emissions. We have identified DNO-wide consistency issues relating to reporting of BCF. We will work with DNOs to strengthen and improve consistency of reporting between DNOs before reporting under RIIO-ED1 commences.

[41] The BCF values provided exclude emissions due to distribution losses. The figure provide for % emissions reduction corresponds to the reduction over the price control period - 2010-11 to 2014-15.
‡These values have been restated. Three DNOs (eight licensees) applied to adjust their baselines and were allowed to do so as they provided appropriate justification.
*The marked change in BCF largely resulted from adjustments to the estimated allocation between SPEN's network areas (SPD and SPMW) following an internal review. Overall, SPEN's BCF was broadly unchanged over the DPCR5 period.

[42] https://www.ssepd.co.uk/WorkArea/DownloadAsset.aspx?id=5633

3.27. Across DNOs as a whole, SF_6 emissions reduced during DPCR5 however, by DNO group the results were more mixed. Three of the six DNO groups achieved a reduction in their SF_6 emissions in 2014-15 compared to the baseline year 2010-11. SPEN, SSEPD and WPD all saw their SF_6 emissions increase overall.

Other environmental activities

3.28. DNOs report on a number of other environmental-related activities performance, including on SF_6 and oil leakage mitigation schemes.

3.29. DNOs use oil-based fluids as electrical insulators on certain cables and report data on leakage from these cables, which can be detrimental to ecosystems. The supporting data file in Appendix 3 provides detailed data on oil leakage rates over DPCR5. The majority of DNOs' top up rates decreased, with the exception of UKPN. UKPN note this increase and that a project is in place to replace poor performing cable sections.

3.30. DNOs may report costs and volumes for dedicated mitigation schemes for both oil leakage and SF_6. While all DNOs reported some oil mitigation schemes, only three of the 14 DNOs reported any dedicated SF_6 mitigation measures. SF_6 accounts for a significant proportion of DNOs' BCF and we will continue to take an interest in DNOs' activities to reduce emissions during RIIO-ED1.

Customers

Broad Measure of Customer Service

3.31. We introduced the BMCS in April 2012. It replaced the telephony incentive that ran for the first two years of DPCR5.[43] The BMCS is much wider in scope than the telephony incentive and is intended to encourage DNOs to provide good customer service to all customers and successfully engage with stakeholders. There are three components to the incentive; a customer satisfaction survey, a complaints metric and a stakeholder engagement incentive.

Customer satisfaction survey

3.32. The customer satisfaction survey monitors DNOs' performance in three customer categories:

- **Interruptions**: Customers that have experienced a planned interruption or had contact with the DNO during an unplanned interruption.
- **Connections**: Customers who have received an alteration/connection quotation or received a completed connection.
- **General Enquiries**: Customers who made an enquiry of the DNO where a service has then been provided or a job has been completed (eg tree-cutting or substation maintenance).

3.33. The survey asks customers about the service provided and they are asked to score the DNO from 1 to 10 with 10 indicating the highest level of satisfaction. DNOs can be rewarded up to 0.8% of base revenue, depending on how well they perform against the target.[44] DNOs can also be penalised up to 0.5 % of base revenue, if they perform poorly.

3.34. Although the BMCS was introduced in 2012-13, it had been run for 6 months in the previous year on a trial basis (albeit with no financial penalties or reward).

3.35. Most DNOs saw customer satisfaction increase significantly over the past few years, with WPD in particular consistently delivering the highest levels of customer satisfaction. A more detailed breakdown of customer satisfaction can be seen in the Table 3.3 below.

Table 3.3: DNO Overall Customer Satisfaction Scores (out of 10) during DPCR5

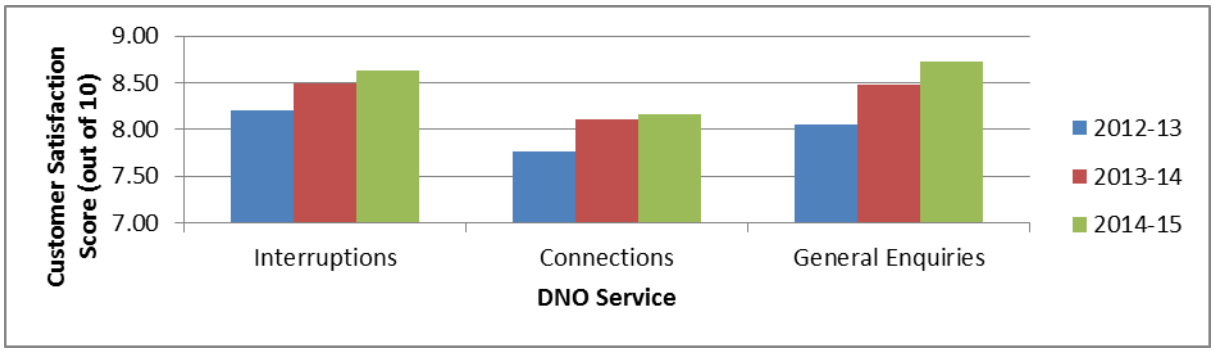
	2012-13	2013-14	2014-15
ENWL	7.59	8.08	8.28
NPGN	7.79	8.18	8.19
NPGY	7.81	8.07	8.26
WMID	8.31	8.63	8.69

[43] The telephony incentive was designed to encourage and incentivise good performance on the DNOs' telephony services to customers. The total DPCR5 revenue exposure under the telephony incentive was +1.3 and -6.7 RoRE basis points.
[44] The target is based on average industry performance.

	2012-13	2013-14	2014-15
EMID	8.46	8.76	8.77
SWALES	8.59	8.72	8.80
SWEST	8.59	8.74	8.74
LPN	7.29	7.98	8.27
SPN	7.78	8.17	8.44
EPN	7.82	8.21	8.49
SPD	7.77	8.29	8.39
SPMW	7.91	8.37	8.40
SSEH	8.35	8.46	8.65
SSES	7.89	8.10	8.05
Average (target)	8.00	8.34	8.46

3.36. As shown in Figure 3.3, customer satisfaction varies between customer categories. Connection customers are the least satisfied with the service provided. However DNOs are making changes to improve performance. From 2012-13 to 2014-15, satisfaction levels amongst this group of customers rose by 5% from (7.76 out of 10 to 8.16 out of 10).

Figure 3.3: Annual average industry customer satisfaction survey score during DPCR5 for each DNO service



Complaints metric

3.37. The complaints metric is designed to drive DNOs to resolve complaints quickly and effectively. The incentive measures performance against four indicators to derive a total Complaint Metric Score:

- percentage of complaints resolved in one day;
- percentage of complaints resolved in 31 days;
- percentage of repeat complaints; and
- percentage of Energy Ombudsman decisions against the DNO.

3.38. DNOs can be penalised up to 0.5% of base revenue for poor performance. There are no rewards for good performance. The target is set at the industry upper quartile performance level. Table 3.4 states the DNOs' complaints metric scores from 2012-13 to 2014-15.

Table 3.4: DNO Complaint Metric Scores during DPCR5

	2012-13	2013-14	2014-15
ENWL	15.01	6.52	5.85
NPGN	7.65	7.06	6.53
NPGY	7.07	6.24	6.04
WMID	2.93	1.53	1.39
EMID	2.63	1.51	1.56
SWALES	4.42	2.06	1.92
SWEST	3.87	1.71	1.97
LPN	15.23	9.33	5.98
SPN	8.32	11.66	5.70
EPN	7.87	10.22	6.28
SPD	15.88	6.95	3.92
SPMW	9.11	7.25	4.37
SSEH	9.53	7.17	4.63
SSES	13.82	14.31	10.24
Upper Quartile (target)	5.08	3.10	2.46

3.39. Since the incentive started, WPD has performed best at handling complaints. There have also been improvements at an industry level. For example, the percentage of complaints unresolved after 1 day has reduced from 55% in 2012-13 to 35% in 2014-15. We have made changes to the RIIO-ED1 complaints metric to drive further improvements in this area.[45]

Stakeholder engagement incentive

3.40. The Stakeholder engagement incentive encourages DNOs to engage with a range of stakeholders to inform how they run their business. Performance is assessed by an independent panel. The panel assess each company and assign a score out of 10. The panel comprises experts in stakeholder engagement from a range of different industries.[46] The DNOs' scores are highlighted in Table 3.5.

Table 3.5: Stakeholder engagement incentive scores during DPCR5

Stakeholder Engagement Scores (out of 10)	2012-13[47]	2013-14[48]	2014-15[49]
ENWL	7.9	6.45	6.1

[45] Our decision on the RIIO-ED1 Complaints Metric, can be found in our RIIO-ED1 Strategy Decision; https://www.ofgem.gov.uk/ofgem-publications/47068/riioed1decoutputsincentives.pdf
[46] https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/stakeholder_engagement_14-15_decision_letter_dnos_0.pdf
[47] https://www.ofgem.gov.uk/sites/default/files/docs/2013/12/report_2012-13_electricity_stakeholder_engagement_panel_final.pdf
[48] https://www.ofgem.gov.uk/publications-and-updates/electricity-distribution-stakeholder-engagement-incentive-results-2013-14
[49] https://www.ofgem.gov.uk/publications-and-updates/decision-stakeholder-engagement-incentive-2014-15-electricity-distribution

NPG	7.85	7.65	7.65
WPD	8.4	8.05	8.75
UKPN	7.15	6.55	5.85
SPEN	-[50]	6.65	6.5
SSEPD	6.85	5.5	5

3.41. Since the start of the incentive, we have seen improvements in performance. Most DNOs now have a robust stakeholder engagement strategy and can demonstrate commitment to stakeholder engagement at a board level. We consider that this is beginning to have an impact on organisational culture. However, there is still considerable progress to be made. In particular, the panel has encouraged the DNOs to:

- better consider how stakeholder engagement could address the long term, strategic issues facing the organisation;
- capture the benefits that their engagement delivers (both to them and to stakeholders); and,
- share learning and best practice across the industry.

3.42. In RIIO-ED1 the stakeholder engagement incentive will also include an assessment of how well the DNOs respond to the needs of vulnerable consumers.

Connections

3.43. Getting a new connection to the local distribution networks is crucial – it allows businesses to begin trading, new homes to be inhabited and renewable energy to be generated.

3.44. From 2011-15, a total of over a million connections were completed by DNOs and independent connection providers (ICPs) in Great Britain.[51] The total cost to the DNO of enabling these connections was £1,719 million. The supporting data file in Appendix 3 gives further details on the connection costs and volumes.

3.45. Improving the service provided to connection customers was a key focus of DPCR5. To deliver this we:

- drove DNOs to facilitate effective competition;
- introduced guaranteed standards of performance that required companies to provide specified connection services within maximum timescales; and,
- introduced incentives for DNOs to improve the service provided to connection customers (eg the customer satisfaction survey highlighted earlier in this chapter).

Competition in Connections

[50] SPEN was not scored for 2012-13 because it did not meet our assessment of minimum requirements.
[51] We introduced new connection reporting requirements in 2011. We therefore do not have this data for 2010-11.

3.46. Customers have a choice about who can connect them to the DNO's network. Instead of a DNO, a customer can choose to use an alternative provider for some connections work known as "contestable work". Effective competition should lead to lower prices, better service and more innovation. If competition is not allowed to develop then customers could lose out.

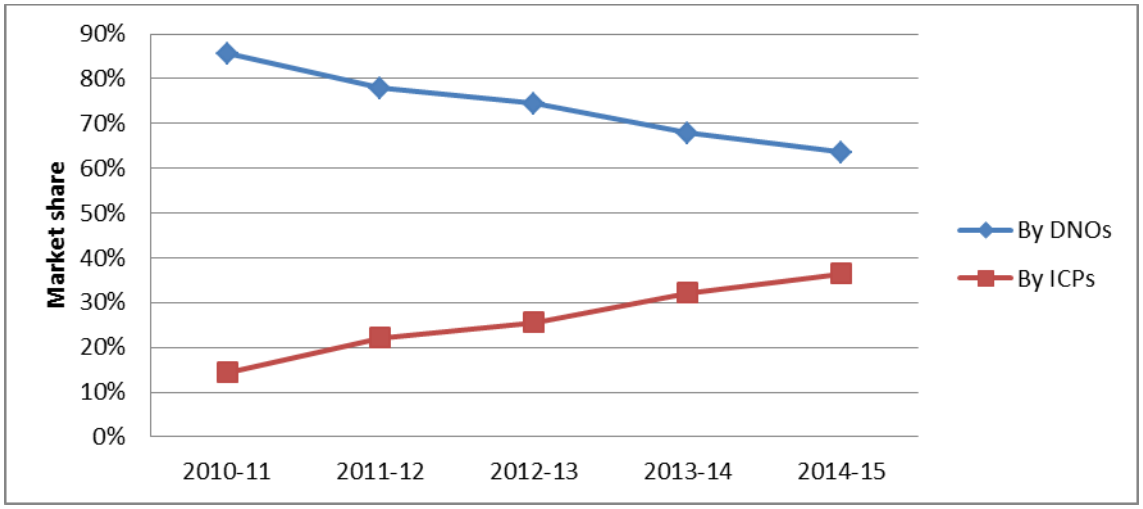
3.47. As part of DPCR5, we implemented measures to facilitate competition.[52] For example splitting the market into different market segments, allowing the DNOs to earn a regulated margin (of 4%) in market segments where we consider that competition could develop and allowing DNOs to earn an unregulated margin in market segments where they could demonstrate that there was effective competition. We are currently reviewing the connection margins earned by DNOs during DPCR5 to ensure that they are consistent with the DNOs' licence conditions.

3.48. These measures were successful in developing effective competition in some DNO regions and in some parts of the market. Figure 3.4 demonstrates that since 2010 there has been an increase in the percentage of connections completed by ICPs. However there are sections of the market where effective competition has not developed. For example, competition for smaller connections has not developed as much as it has for unmetered and larger connections.

3.49. Competition has also developed differently across DNO regions. ENWL were particularly effective at changing their procedures and practices to support competition. More detail on the percentage of work completed by ICPs, for different types of connections, can be found in the supporting data file in Appendix 3.

[52] https://www.ofgem.gov.uk/publications-and-updates/completion-competition-test-process

Figure 3.4: The percentage of exit points provided by DNOs and ICPs during DPCR5



3.50. To understand why effective competition had not developed in some areas, last year we carried out a review of the electricity connections market.[53] The review identified several problems relating to the DNOs' role in the connection process that restrict competition.[54] To address this we introduced a new licence condition and code of practice. We will review the market again in 18 months to assess whether our remedies have been successful.[55]

Performance against licence conditions

3.51. The Electricity Act 1989 and the electricity distribution licence require DNOs to meet certain conditions when connecting customers to the network.[56] During DPCR5 we took enforcement action against several DNOs for failing to comply with these conditions. These are summarised in Table 3.6 below. The majority of disputes that we determined during DPCR5 were also in relation to the DNOs' connection services.

[53] https://www.ofgem.gov.uk/publications-and-updates/findings-our-review-electricity-connections-market
[54] We also opened an investigation into whether SSEPD breached the Competition Act. https://www.ofgem.gov.uk/publications-and-updates/investigation-whether-sse-has-infringed-requirements-chapter-ii-competition-act-1998-andor-article-102-treaty-functioning-european-union-respect-points-connection
[55] More information on our work introducing competition in connections can be found on our website https://www.ofgem.gov.uk/electricity/distribution-networks/connections-and-competition/competition-connections
[56] Performance against Standard Licence Condition 15 (SLC 15) relates to the timeliness of the provision of non-contestable connection services work that can only be carried out by the host DNO licence holder, to third-party connection providers. Standard condition 15A is the guaranteed standards for electricity connections. DNOs are required to meet the standards in 90 per cent of all cases in each quarter and failure to meet this constitutes a breach of licence condition 15A.

Table 3.6 - Connections enforcement action undertaken during DPCR5

Date	DNO	Case Type	Enforcement Action
13-Apr-11	ENWL	Too slow providing connection quotations.	Penalty of £100,000
13-Apr-11	Central Networks [57]	Too slow providing connection quotations. Did not have appropriate systems to monitor performance.	Penalty of £400,000
13-Apr-11	SHEPD	Too slow providing connection quotations. Did not have appropriate systems to monitor performance.	Penalty of £500,000
30-May-14	SSEPD	Too slow providing connection quotations.	Recognised failures and made a charitable payment of £750,000

3.52. We will continue to monitor the performance provided to connection customers during RIIO-ED1 to ensure that it meets the minimum standards. We also introduced several new incentives to drive DNOs to continue to make improvements.

Reliability and resilience

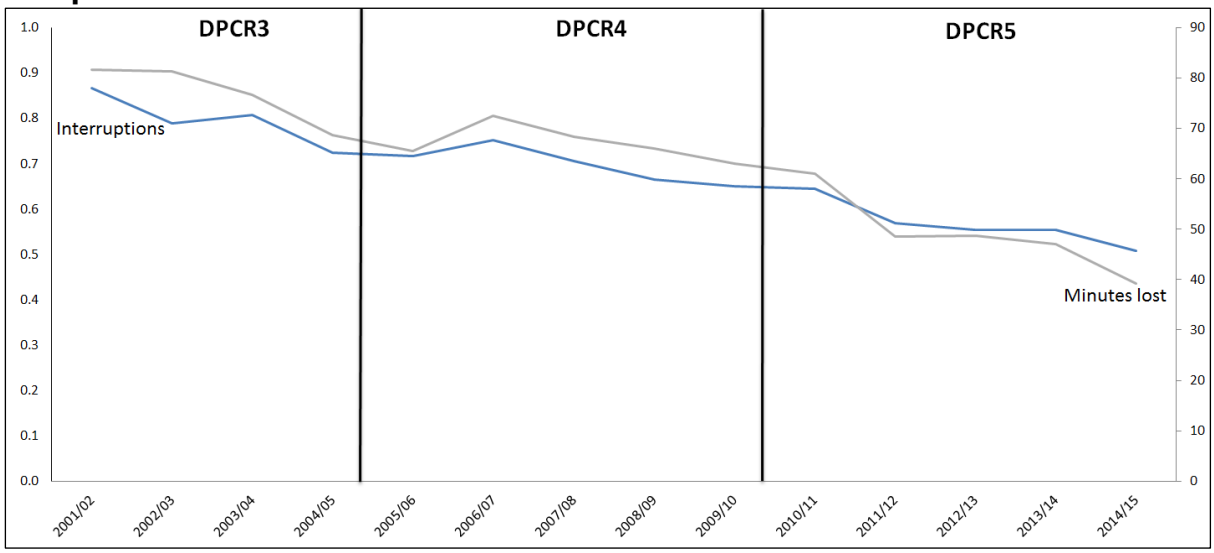
3.53. DNOs invest in their network to increase reliability and resilience against severe weather and to protect the network from the effects of climate change. This includes protecting substations from large but infrequent flood events, increasing resistance to periods of extreme weather, and preparing for the transition to a low carbon economy. All of these measures are aimed at reducing the impact of interruptions and increasing the overall security of supply, as seen in our annual sustainable development publication.[58]

Interruptions

3.54. As shown in Figure 3.5, the IIS has driven a 40% improvement in the average number of power cuts and a 46% improvement in the duration of power cuts across GB since 2002.

[57] The two Central Network DNOs were bought by WPD in 2011. They are now referred to as WPD East Midlands and WPD West Midlands.
[58] https://www.ofgem.gov.uk/about-us/how-we-work/promoting-sustainability/sustainability-reporting

Figure 3.5: Number and duration of interruptions across GB, excluding exceptional events[59]



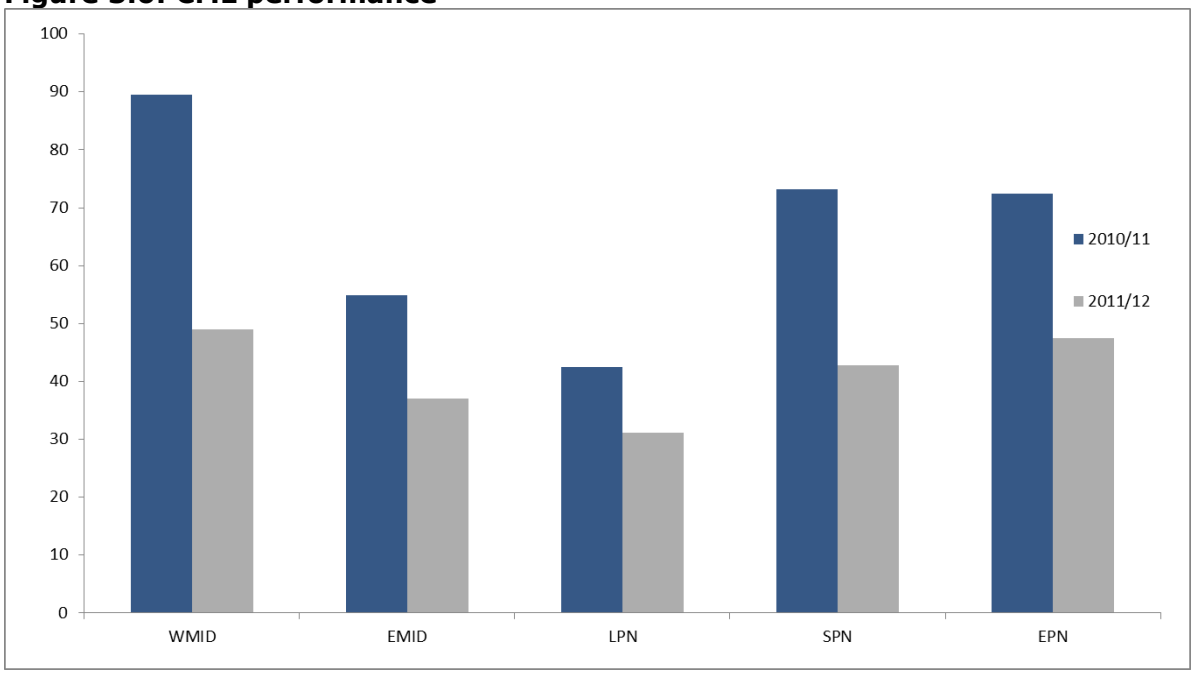
3.55. Between 2009-10 and 2014-15, Customer Interruptions (CIs) have reduced by 20% and Customer Minutes Lost (CMLs) by 30%. For each customer interrupted, the average number of minutes lost has reduced from 97 in 2009-10 to 77 in 2014-15. All DNOs met or exceeded their targets in 2014-15; further detail on DNOs' performance against targets is given in the supporting data file in Appendix 3.

3.56. The IIS incentivises DNOs to improve the reliability on their network, penalising underperformance and rewarding those who beat their targets; over DPCR5 the DNOs earned a total of £611 million in rewards. Early in the price control, WPD bought the two midlands licence areas, and the UKPN licence areas were bought by the Cheung Kong Group from EDF. In both instances there was a step change in approach to fault restoration, resulting in improved CML performance. (Figure 3.6). These licence areas earned the majority (65%) of the total rewards.

3.57. Improved reliability has also resulted in a huge improvement in interruptions lasting longer than 18 hours: these have reduced by 90% from 39,037 in 2010-11 to 3,905 in 2014-15.[60]

[59] Exceptional events are times of adverse weather or action by third parties that impact the networks, which is out of the control of the DNO. These events must meet pre-determined thresholds to be excluded from final performance values.
[60] These figures do not include interruptions of 18 hours or longer that occurred during exceptional events.

Figure 3.6: CML performance



3.58. During Christmas 2013, GB was hit by a number of storms which caused extensive damage to the electricity distribution networks. In total, around two million customers were without power; almost half experienced long interruptions, some lasting over five days. As a result, two DNOs agreed to make charitable donations in recognition of their poor performance in communicating with customers and restoring supplies as quickly and safely as possible. All DNOs have reviewed their operational practices and shared learning across the industry to allow better preparation for future events.

Performance against the standards of performance (excluding connections)

3.59. The Guaranteed Standards specify minimum levels of service expected of the DNOs in a range of circumstances. If a DNO fails to meet a standard, the affected customer(s) may be entitled to a payment.[61] A DNO may decide to pay more than they are required to, or make payments even where they have not failed a standard.

3.60. During DPCR5, the DNOs paid out just over £11 million under the Guaranteed Standards; almost half of this amount was paid out in the 2013-14 year. Three quarters of all payments were made for interruptions during normal or severe weather conditions. The average payment was around £30 for mandatory payments, and £72 for ex gratia payments. Further detail is provided in the supporting data file in Appendix 3.

[61] https://www.ofgem.gov.uk/sites/default/files/docs/2015/04/ofg581_guarantee_standards_booklet_updated_april15_english_web_0.pdf

Worst served customers

3.61. The worst served customer (WSC) mechanism aimed to encourage DNOs to improve the service for those customers experiencing large numbers of higher voltage interruptions over a number of years.[62] With a total allowance of £42 million (2007-08 price base), DNOs were incentivised to develop WSC improvement schemes which result in a 25% reduction in WSC interruptions and maintain expenditure within a £1,000 per WSC cap.

3.62. One DNO, LPN, had no allowance or qualifying customers for worst served customer improvement schemes given its underground network. Four of the remaining 13 DNOs did not utilise the WSC mechanism: NPGN, NPGY, SPMW and SPD. The nine which did claimed 19% of the total allowance and developed a total of 108 improvement schemes, with 15 of these closing out in 2015. These 15 schemes led to a 31% reduction in the number of WSC interruptions for four DNOs, an estimated reduction of 30,428 customer interruptions over three years.

3.63. In total, 12 of the 15 closed-out schemes met the 25% performance criteria with improvement of between 25% and 91%. Three of the schemes, although showing benefits for WSC, did not meet the 25% threshold and therefore the DNOs were not able to recover the full costs associated with these schemes. Details for all 15 closed-out schemes are shown in the supporting data file in Appendix 3.

3.64. A similar exercise will be completed in subsequent years for the 93 schemes (across nine DNOs) still to close out.

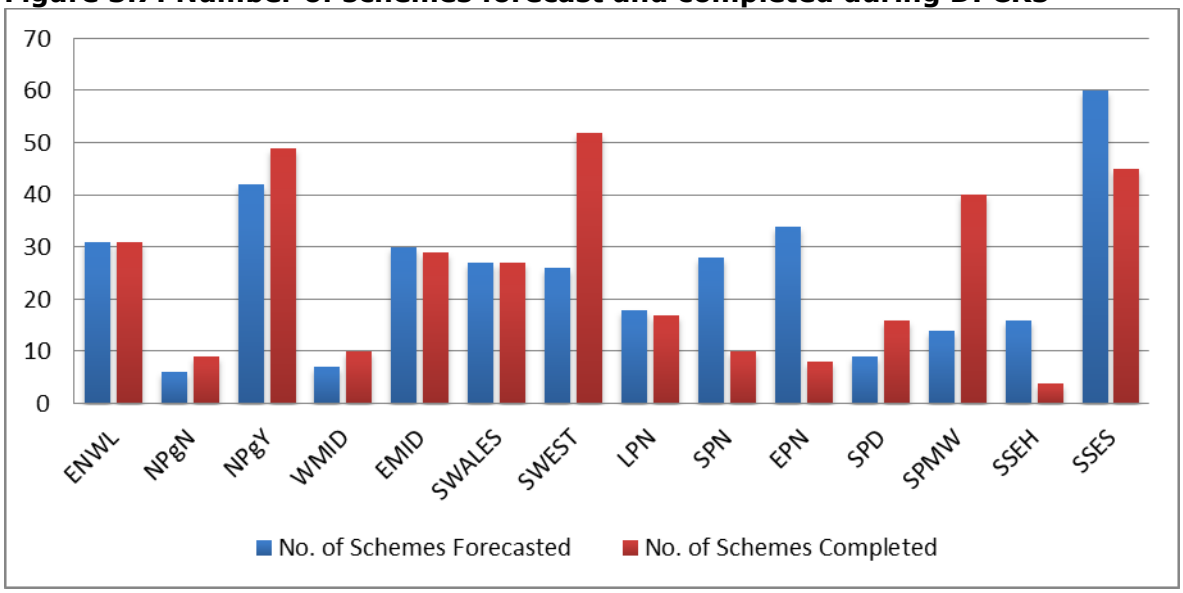
Flooding

3.65. Flooding is a major risk for the electricity network, particularly to electricity substations as flooding may cause outages and damage to substation assets. Following the 2007 summer floods, which impacted more than 55,000 homes and businesses across UK, DNOs were prompted to review their measures to mitigate flood risk. The aim of this was to improve their network resilience to flooding and better adapt to the effects of the climate change as the likelihood of flooding events will increase. The DNOs have established programmes of work to improve substation resilience to flooding.

3.66. In DPCR5 we included funding for schemes that would improve the networks' substation flood resilience.

[62] A customer experiencing on average at least 5 higher voltage interruptions per year over 3 years, including a minimum of 3 higher voltage interruptions in each year.

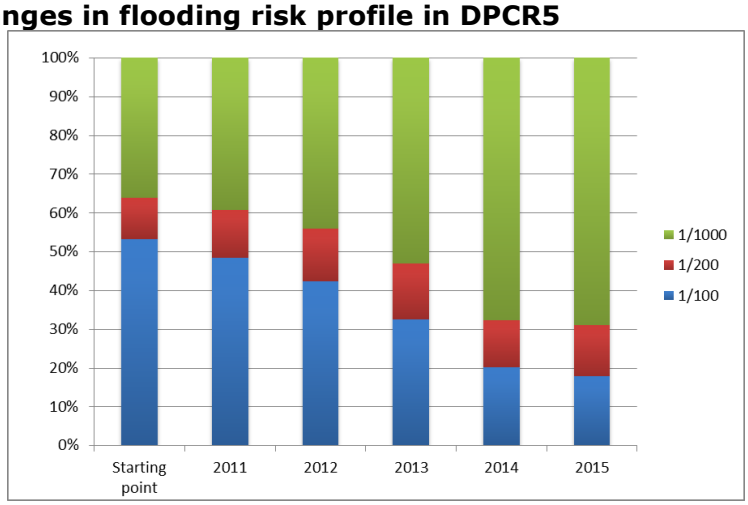
Figure 3.7: Number of schemes forecast and completed during DPCR5



3.67. Figure 3.7 shows the number of flood mitigation schemes that DNOs forecast in their DPCR5 business and the number of schemes they have actually completed by the end of DPCR5. Most DNOs delivered (or over-delivered) on their forecast. However two of UKPN's DNOs and both of SSEPD's DNOs have delivered significantly fewer schemes than they forecast. We also have concerns that some DNOs may have reduced the scope of their works or changed the technical solutions give the extent to which companies have underspent our assumptions for expenditure on reducing flood risk.

3.68. We expect that DNOs will review their progress in delivering their obligations with regards to flooding in DPCR5 and if there is any outstanding work, they will address this promptly in RIIO-ED1 without additional funding from consumers. This is in addition to schemes forecasted for RIIO-ED1.

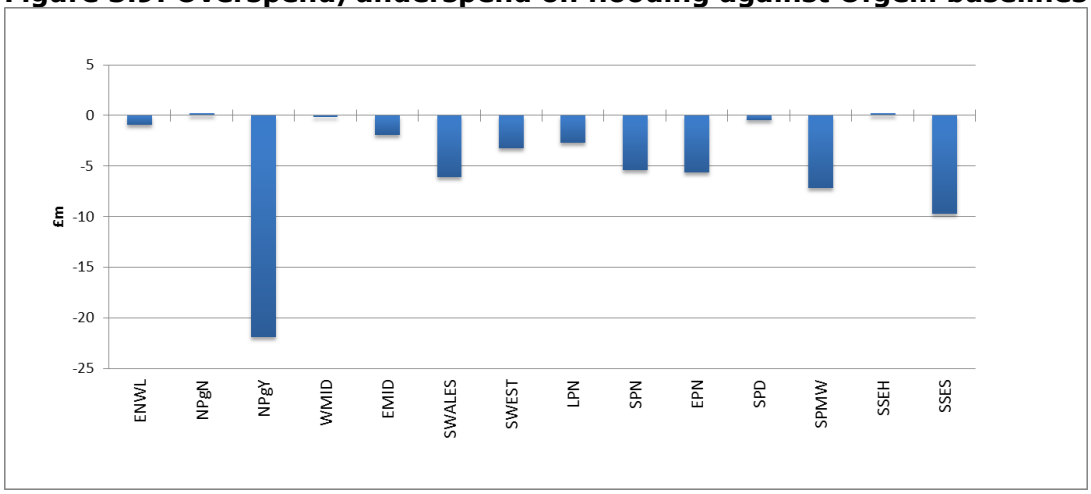
Figure 3.8: Changes in flooding risk profile in DPCR5



3.69. Figure 3.8 shows that, over DPCR5, GB-wide substation resilience to flooding has improved. The number of substations in the '1/100' risk category has been reduced, with a corresponding increase in the number of substations in the '1/1000' category. At the

beginning of DPCR5 price control, there were approximately 3.3m customers supplied by substations that were in the '1/100' risk category. At the end of DPCR5 this number was reduced to approximately 1.1m.[63]

Figure 3.9: Overspend/underspend on flooding against Ofgem baselines



3.70. We welcome cases where DNOs have delivered their intended flood risk reduction at lower cost but are concerned by cases where DNOs have both under delivered and underspent the cost baselines. Recent events in Lancaster and Cumbria have highlighted the continued importance of improving flooding resilience. We have written to the DNOs asking how they assessed their flood risk obligations and their plans for rectifying any under-delivery. We expect companies to work closely with the relevant agencies to ensure their flood defence plans are kept up to date and are delivered in a cost-efficient manner.

ESQCR

3.71. The Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002 specify safety standards DNOs (and their contractors) must adhere to on their networks. Conditions 17 and 18 specify the minimum requirements for vertical and horizontal clearances of overhead lines. Our cost baselines for DPCR5 including assumptions which covered the costs of the ESQCR programmes that were agreed with the Health and Safety Executive (HSE).

3.72. DNOs appear to have made good progress in completing their ESQCR work during DPCR5. Some DNOs have used new techniques which have revealed volumes of additional work that need to be carried out and have agreed programmes with the Health and Safety Executive (HSE) to address these in RIIO-ED1.

[63] Figures are based on the 2010-15 data which has passed our data quality criteria; hence this should be viewed as close to actual representation. Some project completion dates were based on estimates.

Networks

Network Output Measures

3.73. During the DPCR5 price control review we placed a strong emphasis on the need for DNOs to develop and commit to delivering suitable network output measures in return for the revenues they receive from customers under the price control settlement. Observing the performances against the agreed network output measures allows us to distinguish between those companies that have innovated and found ways to deliver what customers need and expect more efficiently, and those that have deferred investment at the expense of network health and/or performance.

3.74. These output measures ensure that DPCR5 provides value for money to customers, and complement other measures discussed earlier in this chapter.

3.75. The network output measures have encouraged DNOs to improve the way they plan and operate their networks and we have observed a shift in the focus on long-term asset stewardship, as investment are driven by the needs (risk) of the network, as well as continued improvements and innovations in asset management and network planning techniques.

3.76. We have decided to retain the Network Output Measures (NOMs) for RIIO-ED1 under the name 'Network Assets Secondary Deliverables' (see the supporting data file in Appendix 3).

Health Indices

3.77. The Health Index (HI) is a DNO-specific composite measure of an assets age, condition, fault history and probability of failure. Asset categories range from HI1, which are new or "as new" assets at the beginning of their asset lives, to HI5 which are towards the end of their asset lives. HI4 and HI5 assets may require replacement or refurbishment intervention.

3.78. HI categorisation only applies to a subset of DNO assets for which condition information is available.[64] There were some differences between DNOs in terms of which assets were in scope for DPCR5.

3.79. For the purposes of measuring the reduction in risk for each DNO, the HI scores for all assets are converted into "risk points", which take into account the cost of replacing an asset and the relative risk of an asset failing.

3.80. As part of DPCR5 Final Proposals we published agreed HI forecasts for 31 March 2015 "with intervention" and "without intervention". The difference between these profiles is the required reduction in asset risk or risk point delta.

[64] Table 2.1 (page 13)
https://www.ofgem.gov.uk/sites/default/files/docs/2012/03/nadpr_rigv3_tracked%5B1%5D.pdf

3.81. The requirement on DNOs in DPCR5 is to deliver a programme of work or "risk delta" that is consistent with the change in the level of asset health risk funded by its customers through the DPCR5 settlement.

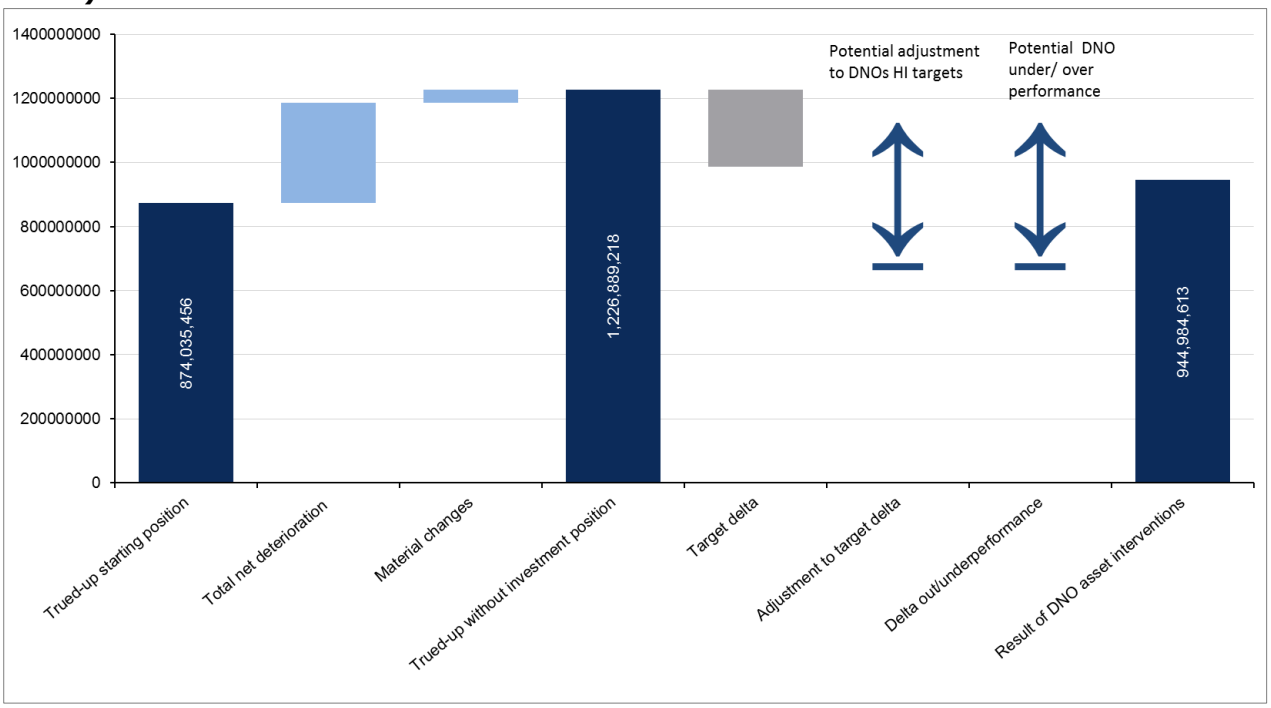
3.82. As part of our DPCR5 close out for the HI NOMs we will carry out detailed analysis to assess whether companies have delivered an appropriate level of risk reduction and whether there needs to be any adjustment to their revenue where they have failed to do so. This analysis will include rebasing the required reduction in risk or risk point delta to take account of any material changes made by the DNOs during the period (Eg changes to their input data or asset management methodology). This rebasing will ensure that there is a fair assessment of performance that properly takes account of such material changes.

3.83. We have carried out an initial risk points assessment based on the DNOs' reported data prior to any rebasing for material. This suggests that most DNOs have delivered the unadjusted risk points delta. Our view of performance will be updated for the rebasing and may change as a result.

3.84. Figure 3.10 is a waterfall diagram that shows the movements in risk over DPCR5. The first column shows DNOs' starting level of asset risk (risk points) at 1 April 2010. The second and third columns show the impact of asset deterioration and material changes. These combine to give the give the level of risk at 31 March 2015 without investment. The fifth column shows the risk reduction target. The grey area is the original requirement. The arrows show that we will need to adjust the level of risk reduction to reflect material changes. The seventh column is marked by an arrow to show that the extent of outperformance or underperformance. This is still to be determined as part of our close out process and will be influenced by the rebasing for material changes as well as other analysis we will carry out to assess DNOs' performance. The final column shows the final level of risk at the end of DPCR5 with investment.

3.85. This chart highlights that the final performance of the DNOs will be dependent on the extent of rebasing that is necessary to reflect DNOs material changes to their HIs during DPCR5 as well as other elements of our performance assessment.

Figure 3.10 Health Index - indicative DPCR5 performance prior to rebasing (all DNOs)



Load Indices

3.86. Under the load indices, DNOs were required to reach an absolute level of loading risk for their distribution networks. DNOs were incentivised to mitigate load risk by managing the number of primary substations classed as 'overfirm' ie where the maximum demand on a substation equals or exceeds firm capacity.

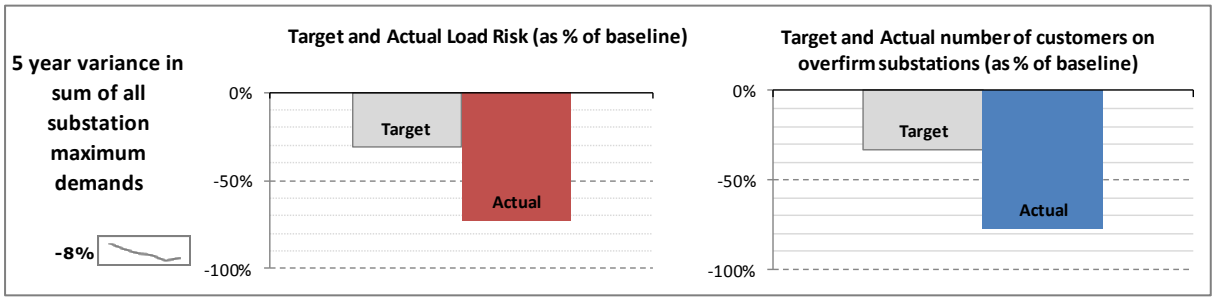
3.87. Based on the reported data and prior to any rebasing to take into account changes between forecast and actual, all DNOs have beaten their requirement for load risk (Figure 3.11) and all but SPD beat this before the fifth year of DPCR5 (see data per DNO in supporting data file in Appendix 3). Although the DPCR5 targets for NPGN, NPGY and LPN allowed an increase in load risk, these DNOs still achieved a significant reduction in risk. We will review this data in detail as part of the DPCR5 closeout performance assessment of the NOMs to verify the DNOs final positions.

3.88. Based on reported data, all DNOs have reduced the numbers of customers on overfirm substations. Figure 3.11 shows that for all DNOs forecasting a reduction in numbers of customers on overfirm substations, all achieved this, and for the six DNOs forecasting an increase, all still achieved significant reductions. In total, 80% fewer customers are on overfirm substations in 2015 than in 2010.

3.89. This positive result was framed against the economic recession before and within DPCR5, an increasing contribution of embedded generation and the impact of energy efficiency levels. As a proxy for these macro and micro economic factors, Figure 3.11 shows how the sum of all substation maximum demands reduced by 8% for all DNOs over the 5 years of DPCR5. Please note that the maximum demand value shown is a sum of reported maximum demand for each substation. Reported maximum demand can be a mix of summer and winter maximum demands for different substations, depending on the season in which each substation is most constrained.

3.90. DNOs followed a range of approaches for managing demand such as innovative solutions to demand issues and demand reduction at sites requiring reinforcement as well as conventional requirements. The lower load growth gave the DNOs the opportunity to utilise lower cost interventions such as active load management and load transfers.

Figure 3.11 LI - Indicative DPCR5 performance prior to rebasing (all DNOs)



Workforce renewal

3.91. Ofgem, alongside the DNOs and Energy & Utility Skills, identified that a key challenge for DPCR5 would be an ageing workforce. We assumed that £213 million (2007/08 price base) in expenditure was needed for workforce renewal (WFR) in DPCR5. The WFR mechanism aimed to encourage DNOs to recruit and train new staff and upskill existing staff in order to replace leavers from the operational workforce.

3.92. We consider the mechanism has been successful. Over the five years of DPCR5, 92% of the allowance was claimed by the 14 DNOs, at least 50% of all leavers were replaced with new recruits (according to full time equivalent figures) and all the DNOs developed comprehensive upskilling programs for existing staff. For example, ENWL, NPG, WPD and UKPN built or upgraded specialist training centres; ENWL, WPD and SPEN introduced apprentice, graduate or other specialist training programs; and ENWL and UKPN developed new recruitment and training governance. There was a trend amongst DNOs to bring training in-house, develop a strategy for upskilling and to embed workforce renewal within business-as-usual.

3.93. Given the progress made in DPCR5, workforce renewal is treated differently in the next price control, RIIO-ED1. Instead of a separate mechanism, workforce renewal is integrated within overall totex allowance.

4. DPCR5 as a stepping stone to RIIO

Chapter Summary

How DPCR5 helped set the scene for RIIO, focusing on some of the key features of these two price controls.

Introduction

4.1. DPCR5 saw the introduction of a number of price control mechanisms which have become key features of the new RIIO price control framework. This chapter provides an overview of these mechanisms and explains how we have built on the developments at DPCR5 to develop a price control framework which will deliver even better value for GB consumers.

Equalisation of efficiency Incentives

4.2. In previous price controls, if DNOs made a saving in operating expenditure they received the full benefit for five years and consumers would benefit from lower levels of annual expenditure thereafter due to a price control reset. However, companies would only benefit from about a third of any savings in capital expenditure and consumers would get most of the benefit through lower charges. This encouraged companies to find capital expenditure solutions where operational expenditure could have been used.

4.3. DPCR5 was the first price control to tackle this by ensuring that that companies faced the same incentive strength for all network investment, network operating costs and associated programme or project overheads. We retained a stronger incentive for business overheads such as HR and corporate centre costs. This approach has been a success and has now been extended so that the same incentive strength applies to all of totex in the RIIO price controls. Ofwat has since followed by adopting totex for its 2015-20 price controls and other regulators are considering adopting a similar approach in other countries.

4.4. Recent developments on the electricity networks have already begun illustrate the benefit of adopting the totex approach. Network companies are now considering innovative solutions such as active management of their networks, the use of demand side response or using batteries as alternatives to expanding the network. Finding innovative solutions is vitally important as the energy sector adapts to the low carbon economy. For example, DNOs still need to invest in new connections, but they must also develop new ways to operate the network to manage changing usage patterns. The totex approach gives them the right incentives to do this, and we will keep challenging them to think creatively as we move towards smarter grids.

Broad Measure of Customer Service

4.5. The BMCS was introduced in 2010 following findings of the RPI-X@20 review and the recognition that DNOs needed to improve their customer service. There are three components to the BMCS, all subject to a reward or penalty.

4.6. The BMCS resulted in real changes in how DNOs interact with their customers and the mechanism was reintroduced at RIIO-ED1 with minor adjustments to fully reflect the

new framework. The scope of the BMCS was also incorporated in the RIIO price controls for electricity transmission, gas transmission and gas distribution network operators. The key changes made to the BMCS at RIIO-ED1 are:

- the introduction of consumer vulnerability as a key element of the stakeholder engagement scheme to reflect the new RIIO-ED1 output;
- changes in how targets are set, with new targets based on levels achieved by high performing companies across a range of organisations, not just DNOs; and,
- the introduction of bigger rewards and penalties to further encourage good performance.

Competition and performance for connections

Engagement with connection customers

4.7. During DPCR5 we established an annual series of DG Forums[65] to discuss DG stakeholders' experiences of connecting to the network. In response, the DNOs developed their own annual "DG workplans" to outline how they would address the issues raised at the events. This process was effective in getting DNOs to understand and address DG stakeholders' issues.

4.8. For RIIO-ED1 we formalised this process and established the Incentive on Connections Engagement. The Incentive on Connections Engagement (ICE) drives DNOs to provide good customer service to larger, or more complex, connection customers. Under this incentive DNOs need to provide evidence that they have engaged with connection stakeholders and responded to their needs. If DNOs fail to do this, they could incur a financial penalty.

Timeliness of connections

4.9. In 2011 we introduced the Connection GSOPs.[66] The Connection GSOPs established minimum timescales for the DNOs to complete tasks (eg issuing quotations, contacting customers to schedule works and completing works). The Connection GSOPs were effective in establishing minimum timescales to complete connection tasks, but it did not incentivise the DNOs to reduce the time taken to provide connection services. For RIIO-ED1 we therefore decided to introduce the Time to Connect Incentive. This provides a financial incentive for the DNOs to reduce the time taken to issue a quotation and the time taken to complete a connection (for smaller connections only).

[65] Since 2013 the DNOs have organised the DG Fora through the Energy Networks Association (ENA) - http://www.energynetworks.org/events/networking-workshops-and-fora/overview
[66] https://www.ofgem.gov.uk/sites/default/files/docs/2010/09/connections-gsop-guidance-sept_0809.pdf

Competition in Connections

4.10. As part of the DPCR5 price control we introduced measures to improve the conditions for competition. Collectively these measures are referred to as the 'competition test processes. These measures were successful in developing effective competition in some, but not all, parts of the electricity distribution connections market. In 2014 we launched a review into the electricity distribution connections market. The findings were published in January 2015.[67]

4.11. For RIIO-ED1 we retained some of the DPCR5 arrangements (eg allowing the DNOs to earn a regulated margin of 4%), but we also introduced a new Competition in Connections Code of Practice[68] and licence condition[69] to address the specific issues that were identified in our market review. We have committed to reviewing whether these remedies were successful in spring 2017.

Interruptions Incentive Scheme (IIS)

4.12. The IIS was introduced at DPCR3 and has been continually reviewed and refined over time. As shown in Chapter 3, the scheme has been very successful in reducing the number and duration of power cuts experienced by GB consumers since 2002 by 41% and 52% respectively.

4.13. We made a number of changes to the IIS at RIIO-ED1. These include changes to targets to ensure that these remain challenging for the DNOs and the introduction of a cap on the amount of money which DNOs can earn as a reward, to protect customers from their network operators earning an excessive amount of money under the incentive.

Network Output Measures

4.14. At DPCR5 (and TPCR4) we introduced network output measures (NOMs). The NOMs are a set of indicators designed to measure the health of a DNOs assets. In particular, through the NOMs we can measure:

- the health of assets (the Health Index - HI);
- how much load is placed on certain assets (the Load Index - LI); and
- the faults experienced on the networks (fault rates).

4.15. You will find more details on the NOMs in Chapter 3.

4.16. The introduction of the NOMs meant that it was now possible to distinguish between genuine efficiencies achieved by DNOs as a result of good asset management from bad management practices and under-delivery. The NOMs have been a broad success in terms of driving behavioural changes and encouraging DNOs to manage their assets more efficiently.

[67] https://www.ofgem.gov.uk/publications-and-updates/findings-our-review-electricity-connections-market
[68] https://www.ofgem.gov.uk/sites/default/files/docs/2015/07/cic_code_of_practice_decision_0.pdf
[69] https://www.ofgem.gov.uk/publications-and-updates/competition-connections-modification-standard-licence-conditions-electricity-distribution-licence

4.17. As a result, we decided to retain the NOMs at RIIO-ED1 under the name 'Network Assets Secondary Deliverables'. However, where DNOs had individual methodologies in place to define and measure the health of their assets during DPCR5, for RIIO-ED1 the DNOs are required to develop a common methodology.[70] In addition, we also introduced a criticality index (CI) which measures the consequences of a failure and a Risk Index which is a monetised risk measure, determined from the combination of the Health Index and Criticality Index.

4.18. These significant developments will help ensure that DNOs continue to manage their assets efficiently for the benefit of consumers and increase transparency and accountability. The LIs have also proven a useful tool in developing an understanding of asset loading and there is further work to be done as part of RIIO-ED1 to put in place formal requirements and deliverables on the DNOs.

Flooding

4.19. The DPCR5 Price Control was set against the backdrop of a series of major floods affecting the GB population. Flood resilience became a big issue on the national agenda, with the Department of Energy and Climate Change (DECC) driving improvements in flood defences at the national level.

4.20. As a result, we introduced specific requirements relating to the flood resilience of substations as part of the DPCR5 settlement. DNOs were asked to report their activity in terms of flood mitigation schemes and to complete flooding risk surveys for each substation. As outlined in Chapter 3, DNO performance in this area varies widely, with some companies not completing their flood risk reduction programme for DPCR5.

4.21. Flooding poses a continuing threat to the safe and reliable operation of electricity networks. For RIIO-ED1, we have asked DNOs to present evidence of how they are assessing and managing risks linked to extreme weather and climate change including flooding. We will continue to monitor the companies' performance in this area throughout RIIO-ED1.

Innovation

4.22. The increased take-up of low carbon initiatives such as DG, demand side management, electric space heating, electric vehicles and electricity storage mean that we can expect significant changes in the distribution networks and how we use them. Prior to the introduction of the IFI and LCN Fund at DPCR4 and DPCR5 respectively, DNOs were not incentivised to develop and test out innovative solutions or technologies. The aim of £500m LCN Fund was to encourage the DNOs to use the DPCR5 period to try out new technology, operating and commercial arrangements. The LCN Fund has proven successful in kick-starting innovation across the networks, as outlined in Chapter 3.

4.23. The IFI and LCN Fund have been replaced by the Network Innovation Allowance (NIA) and the Network Innovation Competition (NIC) for RIIO-ED1. The NIA provides

[70] You will find more details on the Common Network Asset Indices Methodology here: https://www.ofgem.gov.uk/publications-and-updates/consultation-distribution-network-operators-dnos-common-network-asset-indices-methodology

limited funding for DNOs to fund smaller technical, commercial, or operational projects and prepare submissions for the NIC. Up to £81m per year is available through the Electricity NIC to both DNOs and transmission companies, meaning increased competition in terms of access to funding. We also plan to review innovation funding arrangements in 2016 and we will be looking for clear evidence of how emerging learning on smart solutions will be deployed by the DNOs as business as usual.

4.24. Distribution losses, as explained in Chapter 3, are an important part of DNOs' environmental impact, due to the carbon emissions associated with the production of this energy. Financially, losses are also important to consumers as they pay for them in their energy bills.

4.25. A variety of factors can affect the magnitude of network losses and we do not believe that there is currently a reliable source of data common to all DNOs for measuring losses. Owing to measurement and data issues, we decided not to activate this mechanism in DPCR5.[71] For the final two years of DPCR5, reporting focused instead on the individual actions DNOs undertake to manage them.

4.26. Under RIIO-ED1 there is a licence condition on DNOs to manage losses to a level as low as reasonably practicable. As part of this new condition DNOs are required to publish a Distribution Losses Strategy on their websites which report on measures they will undertake to fulfil this obligation.

4.27. We will continue to monitor DNOs' losses performance in RIIO-ED1 and we have taken steps to enhance the monitoring of losses and improve consistency in reported activities and benefits. For example, through strengthened reporting under the RIGs and the introduction of an annual, public-facing Environment Report. DNOs are also expected to work towards establishing a losses baseline and a measurement methodology, to allow for a future losses incentive mechanism in RIIO-ED2. The introduction of smart meters should help facilitate this.

Data quality

4.28. The availability of high quality data is crucial for introducing price control arrangements which deliver value for money for consumers. It is a key factor for us, both in terms of how we assess the companies' costs when we set the price control and how we monitor their performance and if they are delivering their outputs.

4.29. Within this context, we have introduced new requirements on the DNOs at RIIO-ED1 under the DAG to ensure that all data collected by the companies and submitted to us is of high quality. However, we are concerned with the quality of data submitted by some of the DNOs to us throughout the DPCR5 period. We are currently doing further work in this area to determine our next steps.

[71] http://www.ofgem.gov.uk/Networks/ElecDist/Policy/losses-incentive-mechanism/Documents1/1A_Decision_Losses_DPCR5_161112.pdf

Appendices

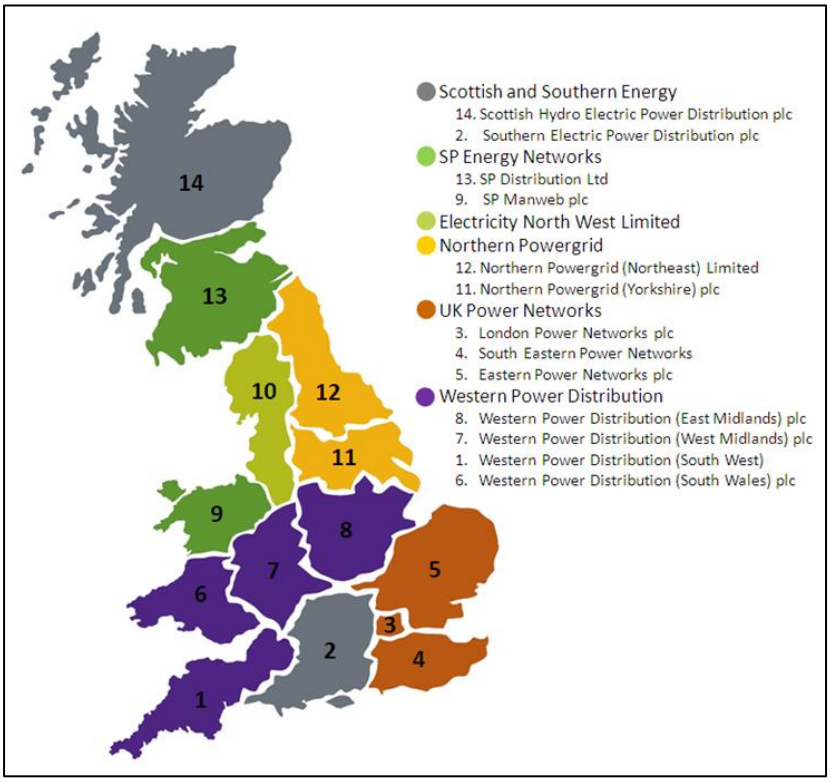
Index

Appendix 1 – Background on electricity distribution

The role of the electricity distribution networks

1.1. The electricity distribution networks carry electricity from the transmission network to industrial, commercial, and domestic users. They cover the network from 132,000 volts down to the Low Voltage network. [72] Homes and businesses connect directly to the distribution network, as well as some generators. There are 14 Distribution Network Operators (DNOs) in Great Britain, owned by six companies (Figure A1.1).

Figure A1.1: DNO licence areas and groups



1.2. Since they are natural monopolies, we regulate the money that DNOs can recover from consumers and incentivise them to innovate, and improve their efficiency and quality of service. We expect DNOs will deliver a safe and reliable supply, and respond effectively to complaints, queries, and requests for new connections.

1.3. DNOs charge for the use of their network and the cost of connecting new users to the network. DNOs do not charge customers directly for using the network, but charge suppliers who include the distribution charges in customers' energy bills. Due to inherent

[72] In Scotland the 132kV network forms part of the Transmission network.

differences in distribution networks across the country, charges may vary by location. Distribution costs in 2014-15 accounted for about 8% of an annual dual fuel bill – roughly £93 in 2012-13 prices, for a typical household.

1.4. Although suppliers are often seen as the primary point of contact for customers, DNOs have a number of key customer interactions. This is often limited to ensuring customers receive a safe and reliable supply of electricity. During power cuts, it is the DNOs that supply information on the location and duration of the fault, provide special assistance to customers on the priority services register, and liaise with other bodies (local councils, charities etc.) to ensure vulnerable customers are protected.

1.5. As part of their licence, the DNOs have several obligations to customers, including maintaining security of supply[73], providing connections, and operating in an efficient, economic, and non-discriminatory manner.

Key DNO characteristics and elements of the DPCR5 price control arrangements

1.6. Allowances for each DNO to spend are set ahead of the price control. For DPCR5 these allowances were broken down into specific areas of spend, such as network investment, network operating costs, and costs for various supporting activities. The total amount spend across GB is set out in Table A1.1.

Table A1.1 GB Network figures

Category	2010-11	2011-12	2012-13	2013-14	2014-15
Customers	29,050,657	29,184,812	29,281,411	29,316,829	29,424,457
Network Length*	792,266	795,405	789,963	789,314	792,649
Overhead	*282,435*	*281,791*	*280,266*	*276,663*	*275,885*
Underground	*509,213*	*512,992*	*509,074*	*511,993*	*516,098*
Other	*618*	*622*	*624*	*659*	*666*
Total Expenditure†	*£2,734*	*£2,863*	*£3,042*	*£3,318*	*£3,362*
Network investment	*£1,108*	*£1,157*	*£1,452*	*£1,610*	*£1,708*
Network operating costs	*£585*	*£574*	*£611*	*£680*	*£619*
Closely Associated Indirects	*£561*	*£544*	*£541*	*£592*	*£583*
Business Support	*£352*	*£332*	*£306*	*£305*	*£303*
Non-operational Capex	*£97*	*£147*	*£138*	*£138*	*£153*
Units distributed‡	305,369	300,217	302,208	299,957	301,728
* All lengths given in km	† £m in 2012-13 prices		‡GWh		

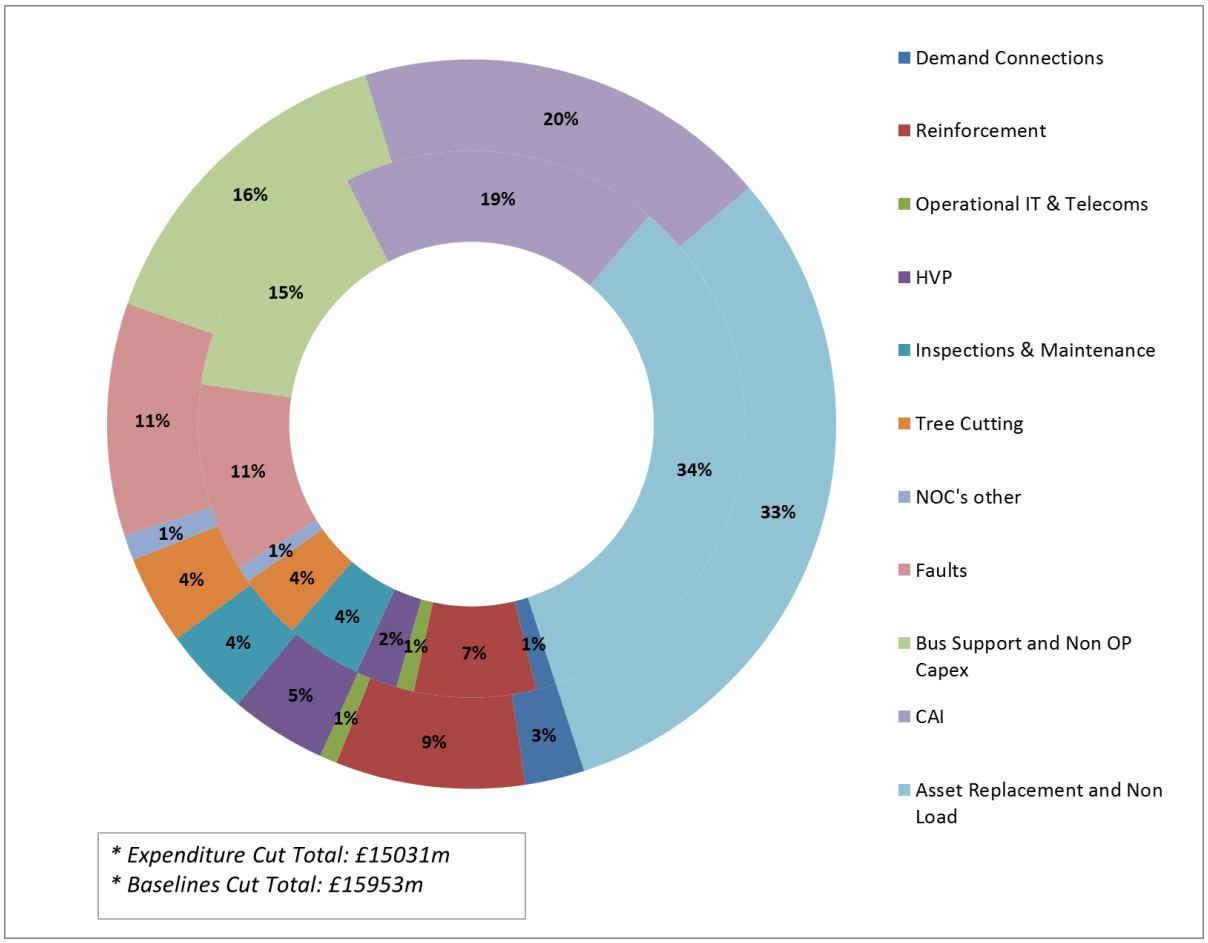
1.7. There are a number of incentives in place that encourage better performance in specific areas, such as the reliability of the network and the customer service provided by the DNOs. Targets are set for performance in these areas; DNOs receive a financial reward for beating their targets, and are penalised for missing them.

[73] DNOs must ensure that the network is designed, maintained and operated to ensure security of supply, with specific technical standards set out in detail in ENA standard P2/6.

Appendix 2 – Additional detail on DNO expenditure during DPCR5

2.1. The make-up of DNOs' actual expenditure has broadly matched our baselines for DPCR5. The areas that show the greatest movements are those more closely related to wider economic conditions such as High Value Project and Connections expenditure.

Figure A2.1: Composition of DNOs Expenditure: outer circle represents Ofgem Cost Baselines and inner – DNOs expenditure in % and 2012-13 prices



2.2. Expenditure on asset replacement is primarily driven by the condition of the DNO's assets. During DPCR5 asset replacement was the largest area of expenditure making up 27% of totex. The term asset replacement covers replacement of assets, refurbishment and associated civil works.

2.3. Reinforcement is carried out to create additional capacity on the network. During DPCR5, there has been a larger than expected underspend against Ofgem baselines for reinforcement, with it accounting only for 7% of totex. The main driver for this was the economic downturn in the UK which led to lower demand for electricity and smaller volumes of new demand connection.

2.4. Fault related expenditure was atypically high during 2013-14. This was partly due to an unusually high number of storms during the 2013 Christmas period.

Table A2.1: Actual DNOs Totex and Cost Baselines by year in DPCR5.

Totex Actual Expenditure and Baselines in £m in 12/13 prices										
DNO	2011		2012		2013		2014		2015	
	Actual	Ofgem Baseline	Actual	Ofgem Baseline	Actual	Ofgem Baseline	Actual	Ofgem Baseline	Actual	Ofgem Baseline
ENWL	217	264	238	281	237	278	244	242	258	247
NPgN	123	172	125	171	174	180	199	185	208	182
NPgY	171	231	180	233	229	229	234	233	271	242
WMID	233	253	284	261	268	275	319	280	317	283
EMID	218	253	261	264	300	289	324	284	353	282
SWALES	117	124	115	129	133	133	130	132	134	135
SWEST	164	171	166	186	175	190	192	194	180	195
LPN	203	243	180	244	203	238	217	220	209	219
SPN	244	241	219	246	212	236	225	234	185	246
EPN	363	358	317	343	309	335	355	334	346	347
SPD	170	182	191	193	179	208	204	219	209	214
SPMW	187	240	213	234	226	256	251	248	279	251
SSEH	99	135	123	131	121	128	115	127	123	132
SSES	225	319	251	322	278	326	308	321	290	311
Total DPCR5	2734	3185	2863	3237	3042	3301	3318	3252	3362	3286
% difference	86%		88%		92%		102%		102%	

2.5. DNOs have experienced less growth in input prices than was initially expected. Additionally, due to a slowdown of the economic activity in the UK, some areas were impacted more than others:

- In network investment, demand connections have experienced a sharp fall in the expected expenditure with DNOs underspending by 58% against their cost baselines.

- Additionally, reinforcement and high value projects were underspent by 9% and 45% respectively against their cost baselines.

Table A2.2: Key Areas of Over and Underspend

DNO Group	Asset Replacement						Faults					
Year	2011	2012	2013	2014	2015	£m	2011	2012	2013	2014	2015	£m
ENWL	67%	83%	81%	85%	72%	-84	110%	103%	109%	111%	106%	9
NPg	70%	86%	138%	114%	120%	48	100%	87%	97%	101%	98%	-8
WPD	86%	88%	113%	116%	101%	22	71%	67%	92%	101%	95%	-69
UKPN	97%	83%	85%	88%	69%	-57	120%	106%	113%	142%	107%	74
SP	69%	91%	97%	114%	122%	2	126%	112%	101%	111%	93%	16
SSE	77%	83%	96%	101%	95%	-54	78%	109%	100%	122%	117%	10
DNO Group	**Reinforcement**						**Inspections & Maintenance**					
ENWL	30%	53%	57%	97%	157%	-20	90%	80%	100%	85%	82%	-7
NPg	18%	34%	70%	108%	172%	-35	137%	141%	147%	150%	179%	26
WPD	27%	23%	17%	60%	69%	-29	113%	107%	106%	122%	92%	15
UKPN	45%	58%	64%	108%	112%	-98	137%	142%	128%	130%	121%	51
SP	48%	67%	48%	74%	163%	-46	84%	106%	88%	119%	87%	-2
SSE	41%	57%	105%	125%	88%	-30	72%	64%	64%	68%	68%	-36
DNO Group	**Legal & Safety incl. ESQCR**						**Tree Cutting**					
ENWL	47%	57%	63%	117%	156%	-12	63%	64%	55%	67%	62%	-9
NPg	97%	93%	123%	216%	408%	25	76%	86%	103%	110%	103%	-4
WPD	79%	76%	77%	115%	192%	-1	107%	115%	125%	140%	128%	40
UKPN	91%	68%	72%	112%	127%	-10	72%	77%	77%	69%	74%	-40
SP	118%	233%	255%	248%	224%	56	76%	80%	70%	77%	78%	-25
SSE	251%	254%	341%	294%	249%	39	67%	76%	105%	105%	108%	-10

2.6. Table A2.2 shows key areas of over and underspend relating to Network Investment and Network Operating Costs, which together make up 66% of totex. The percentage figures in the table depict DNOs performance against their cost baselines. The monetary figure "£m" highlights the amount underspent or overspent in the particular area.

Reopeners

2.7. Ofgem introduced re-opener mechanisms for costs that were uncertain at the time of establishing DPCR5. There have been two reopeners to date and the additional allowed costs for the two reopeners are included in our analysis. The re-openers were for costs associated with Rising and Lateral Mains (RLM) requested by SPD and SPMW and permitting under the Traffic Management Act 2004 (TMA) requested by UKPN.

2.8. There are a number of re-openers and logging up mechanisms that need to be settled as part of DPCR5 close out. We will be able to trigger downward load related expenditure and HVP expenditure reopeners for a number of the DNOs, where their expenditure is significantly less than we expected and meets pre-defined triggers for reopening their price controls.

Appendix 3 – Supporting data file

Available at:

https://www.ofgem.gov.uk/publications-and-updates/electricity-distribution-company-performance-2010-2015