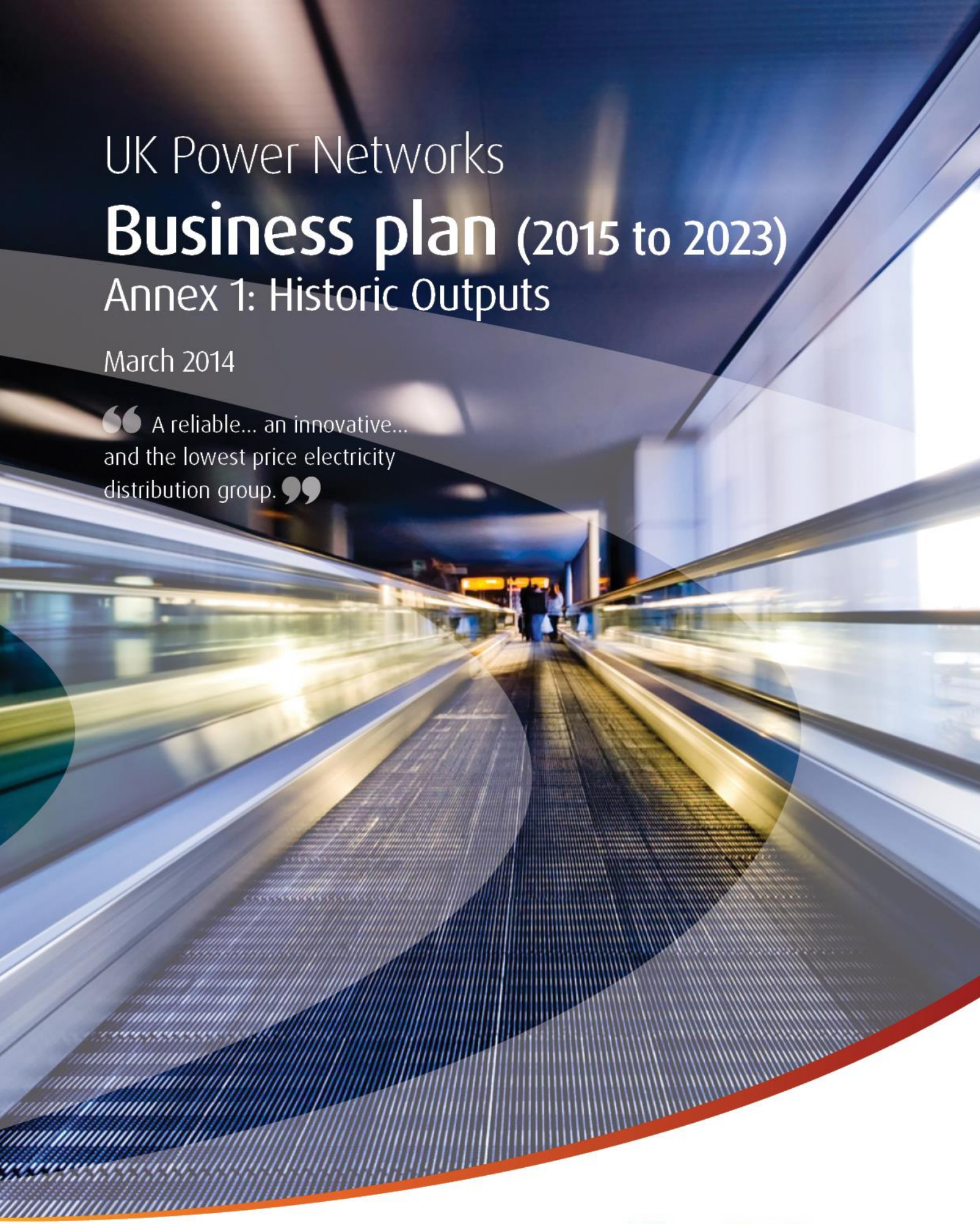


UK Power Networks

Business plan (2015 to 2023)

Annex 1: Historic Outputs

March 2014

"A reliable... an innovative... and the lowest price electricity distribution group."

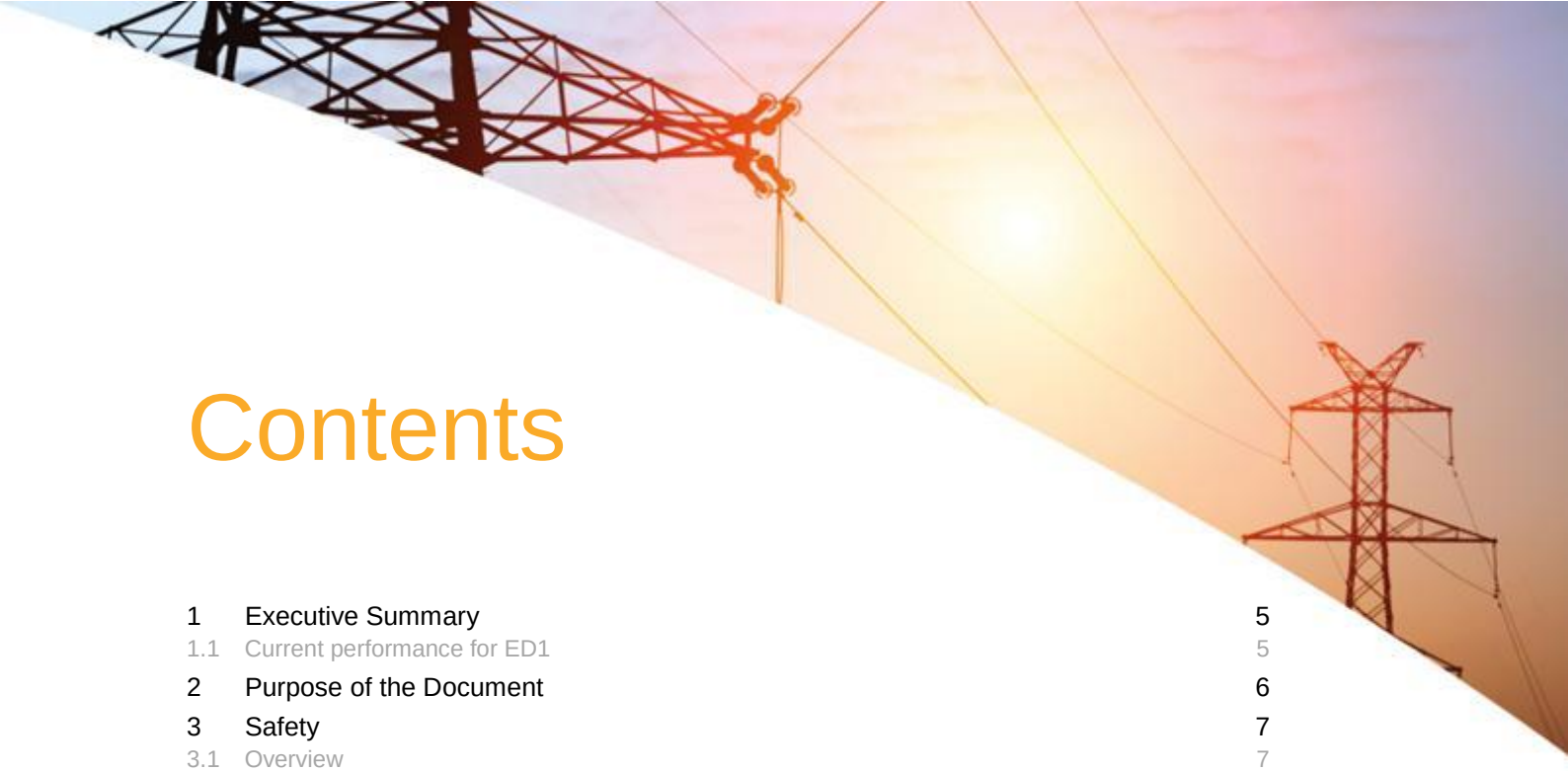
ukpowernetworks.co.uk

UK Power Networks
Delivering your electricity

Document History

Version	Date	Revision Class	Originator	Section Update	Details
1.0	03/02/2014	Minor	Adrian Searle	N/A	Initial version (ED1 July 2013 Submission baseline)
1.1		Minor	Adrian Searle	N/A	Added note beneath Document History table regarding reconciliation to the un-scaled costs.
1.2	06/03/2014	Major	Robert Friel	Sections 5,6,10 and 11	Updated costs including diversions expenditure as NLRE. HI, LI outputs updated for latest forecasts. CI/CML comparisons updated to reflect 12/13 industry performance. Innovation section includes new Tier 2 projects won in Dec 2013

Contents



Contents

1 Executive Summary

1.1 Current performance for ED1

UK Power Networks was created in October 2010 and since then has transformed its business strategy and performance, with significant benefits for customers. In the first three years of the current price control period (2010-2015):

- Our operational focus has delivered a step change in Customer Interruptions (EPN 25 per cent, LPN 25 per cent and SPN 34 per cent better than target) and Customer Minutes Lost (EPN 28 per cent, LPN 18 per cent and SPN 40 per cent better than target)
- Our investment programme has exceeded the agreed targets for network health (EPN 93 per cent, LPN 60 per cent and SPN 82 per cent delivered after only 60 per cent of the period)
- We have optimised our network reinforcement programme for the impact on demand of the global economic crisis to both exceed targets and reduce expenditure to achieve cost savings which will be shared with customers. The number of heavily loaded sites at the end of 2012/13 are as follows: EPN: 25 compared to a target of 56; LPN: 17 compared to a target of 21; SPN: 25 compared to a target of 40. UK Power Networks never automatically executes its investment plans as approved by the regulator, we always update them for changing economic conditions to make sure we are only doing work that is really necessary for the benefit of customers
- Our refocusing of the business on customer service has improved our average customer satisfaction score for faults, connections and general enquiries from 7.13 to 8.06 – although we recognise our customer service performance still requires further improvement. We have launched a business transformation programme at considerable expense to our shareholders to modernise our processes and systems to allow us to realise these gains
- We believe that we are the most innovative DNO group. Our London network already utilises many 'smart grid' techniques on a business-as-usual basis, including meshed networks, high levels of automation and control, and contracted demand side reduction. We have the largest portfolio of major innovation projects of any DNO group

This track record of improvement is second to no other UK DNO, particularly considering that UK Power Networks operates in the most challenging, fastest growing, and highest cost part of the country, including London.

2 Purpose of the Document

This document describes the performance of UK Power networks against existing performance outputs. The areas covered include:

Area	Performance measures
Safety	Lost time Incidents Total Recordable Injuries Public Safety
Customer Satisfaction	Telephony Performance Broad Measure of Customer Satisfaction Customer Survey Complaints
Network Performance	Customer Interruptions (CI) Customer Minutes Lost (CML) Worst Served Customers
Asset Health	Health Index Load Index
Connections	Guaranteed Standard of Performance Average Time to Quote Average Time to Connect
Social Obligations	Discretionary reward scheme
Environment	Business Carbon Footprint SF6 Emissions Oil Leakage Underground of overhead lines in areas of outstanding natural beauty and National Parks
Low Carbon Economy	IFI Low carbon networks fund
Expenditure	Load Related Investment Non Load Related investment Network Operating Costs Indirect Costs Non-operational Capex

Details of our forecast performance can be found in Annex 2: Forecast Outputs.

3 Safety

3.1 Overview

Ensuring the safety of the public, our employees and contractors is our highest priority. Safety relates to the physical, mechanical and electrical safety of network assets. We are bound by the framework and obligations set out in the Health and Safety Legislation to ensure that our network assets do not present a safety risk to the public, our employees and contractors. This is enforced through the Health and Safety Executive (HSE), the national safety regulator. The key measures of our safety performance are:

- Lost Time Incidents (LTIs) for employees and contractors; and
- Total Recordable Injuries (TRIs)

Since acquisition by our current owners, we have been on a journey to improve our safety performance. This has resulted in significant improvement in our accident rate and injuries to the public as shown below.

3.2 Employee and Contractor Safety

Total Reportable Injuries table shows that in 2011, the accident rate for employees declined considerably.

Table 1 Accident rate for employees

	Past Performance				
Rate per 100,000 hours worked	2008/09	2009/10	2010/11	2011/12	2012/13
Employee Accident Rate	1.93	2.32	1.72	0.99	1.14
Lost Time Injury Rate	n/a	n/a	0.21	0.12	0.15

Lost Time Incidents Employees

Table 2 Total lost time incidents (LTIs) and total recordable injuries (TRIs) Employees

	Past Performance				
	2008/09	2009/10	2010/11	2011/12	2012/13
EPN					
Lost Time Incidents (LTIs)	20	7	11	5	3
Total Recordable Incidents (TRIs)	85	123	83	57	48
LPN					
Lost Time Incidents (LTIs)	2	6	0	2	5
Total Recordable Incidents (TRIs)	30	29	24	14	22
SPN					
Lost Time Incidents (LTIs)	11	11	3	4	6
Total Recordable Incidents (TRIs)	70	67	15	33	34

Table 3 Total lost time incidents (LTIs) and total recordable injuries (TRIs) Contractors

	Past Performance				
	2008/09	2009/10	2010/11	2011/12	2012/13
EPN					
Lost Time Incidents (LTIs)	6	16	7	6	4
Total Recordable Incidents (TRIs)	59	102	47	38	33
LPN					
Lost Time Incidents (LTIs)	6	4	4	3	11
Total Recordable Incidents (TRIs)	35	25	22	16	30
SPN					
Lost Time Incidents (LTIs)	9	7	5	4	2
Total Recordable Incidents (TRIs)	32	27	34	15	11

We have made significant progress in reducing lost time injuries and recordable injuries in EPN and SPN which are now at a similar level to LPN.

Importantly, our approach to safety is wider than solely reducing LTIs and TRIs. We have put significant effort into ensuring and promoting the health of all those who work for us. We have delivered improved health and safety outcomes over the current planning period through a rage of initiatives including:

- Continued communications efforts and incentives, including the issue of a booklet to all staff, A Year of Learning – 2011 Edition, containing information and lessons from incidents;
- Networks Occupational Health and Wellbeing Strategy;
- Launch of the Fitness to Work assessments for all of our operational staff; and
- Monitoring incidents with the public

We also support other preventative measures including a flu vaccination programme that is available to all staff. We have also arranged 'office walk-arounds' by physiotherapists to promote good posture. These improvements have been achieved through continued communication efforts and incentives.

3.3 Public Safety

Public Injuries can result from incidents arising from causes outside the network operators control (such as injuries in road traffic accidents involving collisions with overhead line poles) and those within the network operator's control (such as injuries resulting from slips trips and falls around streetworks).

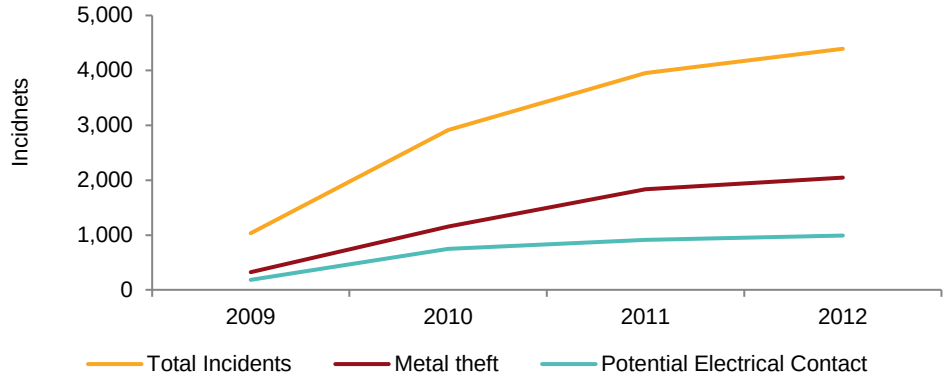
Where they could have been due to our action or inaction we define these as being of internal cause. Other incidents where the public deliberately or accidentally come into contact with the network in a manner outside our control such as road traffic accidents are excluded. These have been separately identified since 2011.

Table 4 Public Injuries

	2009/10	2010/11	2011/12	2012/13
Injuries to Members of Public - Total (All Causes)	202	202	217	183
Injuries to Members of Public - Internal Cause Only			87	43

The Electricity Safety, Quality and Continuity Regulations (ESQCR) set out the requirements we must meet to maintain a safe network and require that we assess the risk others of all of our overhead lines substations. Safety clearances, the heights and distances from other objects for overhead lines is a key element of this and most of the ESQCR expenditure to date has been to meet updated standard.

Figure 1: Reportable Incidents under ESQC Regulations



We have seen a significant rise in incidents reportable under the ESQCR along with the increase in the risk of metal theft, however the number of RIDDOR dangerous occurrences has remained constant at around 50.

We also have assets in public places including underground boxes in street pavement used to configure low voltage networks that supply homes and offices. A small number of failures have resulted in injuries to members of the public and while the risk is very low we are working with the HSE to better identify the condition of the c114,000 (EPN c37,100, LPN c47,700 SPN c29,200) underground link boxes and outdoor pillars we operate.

Overhead conductors also pose a public safety risk particularly where there are opportunities for the public to come into contact for example if buildings, fencing or materials are erected or stored in close proximity to or underneath overhead wires, where overhead lines cross arable farmland or where climbable trees are close to overhead lines. Where inspections identify issues these are rectified through our ESQCR expenditure.

It is also important that we monitor the corrosion and failure of fittings that hold conductors and corrosion of the conductors themselves to prevent conductors falling. Not only does this result in physical risk of the heavy conductor but there are electrical safety risks to people or animals if the conductor does not break but becomes accessible and close to the ground.

Despite our improved performance, we recognise that we can make our business safer. Our approach to achieving this is based on collecting information and continually reassessing our approach with a view improving outcomes and being recognised as an industry leader in safety practice and management both for employees and the public.

3.4 Metal Theft

Whilst access to live equipment is difficult and requires deliberate action, this has not stopped an increase in the theft of metal resulting from high prices for scrap metal. Table 5 to Table 7 below show the activity since we started reporting consistent information in 2011/12.

Metal theft is particularly an issue in EPN and SPN areas where more remote locations and easier travel where visitors are infrequent making theft less likely to be detected whilst it is in progress. We have implemented increased substation security inspection patrols as shown in Table 8 below as a deterrent and this has contributed to a reduction in thefts in 2012/13. In the last year we have seen an increase in substation theft in LPN (whilst still being a fifth of that in EPN or SPN) and will continue to monitor and review and increase random inspections if required.

Stolen earthing conductors can represent a significant risk from to the public and our staff were a fault to occur on a network without intact earthing present due to the very high voltages that can occur. We have implemented processes and procedure to address stolen earthing metalwork safely while mitigating this risk and minimising the number and duration of interruptions to customers. The resulting impact in CI and CML is also show in Table 5 to Table 7. We have reduced the impact in EPN by approximately half and have reduced SPN CIs by almost 70% and almost halved CMLs. LPN CI and CML increased with the number of substation thefts but this was from an extremely low level.

Table 5 Metal Theft EPN

EPN Metal Theft Instances	2011/12	2012/13
Underground Cables	55	35
O/H lines	42	33
Distribution Substations	1164	1030
Other Substations	17	11
CI Impact	0.91	0.43
CML Impact	0.60	0.35

Table 6 Metal Theft LPN

LPN Metal Theft Instances	2011/12	2012/13
Underground Cables	5	6
O/H lines	0	0
Distribution Substations	81	205
Other Substations	1	0
CI Impact	0.02	0.15
CML Impact	0.05	0.13

Table 7 Metal Theft SPN

SPN Metal Theft Instances	2011/12	2012/13
Underground Cables	25	17
O/H lines	75	60
Distribution Substations	1048	715
Other Substations	48	0
CI Impact	1.51	0.48
CML Impact	1.17	0.60

Table 8 Inspections to counter Theft

Number of Substation Inspections	2011/12	2012/13
EPN	1347	1457
LPN	1232	4
SPN	1765	1315

4 Customer satisfaction

4.1 Overview

We take customer service very seriously. This is evidenced by our vision of reaching top-third performance amongst the 14 distribution networks in the area of customer service. Many of our employees are in day-to-day contact with our customers including in relation to connections, supply interruptions, general inquiries, complaints as well as a range of stakeholder engagement activities. We therefore recognise the importance of customer interface and management in the provision of our services.

Over the current planning period, customer satisfaction has been measured by the following indicators:

- The telephony response survey – this, as its name implies, is a narrow measure focused on quality of telephone responses in terms of speed of response, usefulness of information provided and politeness. This ceased to apply from 2012/13; and
- The Broad Measure of Customer Satisfaction (BMCS). As its name suggests, the BMCS is intended to gauge a much broader measure of customer satisfaction than the telephony measure. The BMSC commenced in 2012/13, replacing the telephony response measure. Key components of the BMCS include the:

  Customer satisfaction survey. This focuses on understanding how satisfied customers are with our approach and processes for managing supply interruptions, network connections and general enquiries. The results from each type of customer contact are weighted to give an overall score.; In DPCR5 these weightings are Supply Interruptions (40 per cent), Connections (40 per cent) and General Enquiries (20 per cent);

  Complaints metric. This focuses on the number of unresolved and repeat complaints and complaints referred to the Ombudsman; and

  Stakeholder engagement. This focuses on customers' views on our approach to stakeholder engagement.

4.2 Telephony performance

The following paragraphs describe our telephony performance contact. These show that we have reduced our average telephone answer times by 30%, achieving improved results in the Ofgem telephone survey.

Table 9 Telephony Performance

EPN	Number of Calls	Average Time to Answer (seconds)	Abandoned Calls	% Abandoned
2010/11	544,196	38	14,228	2.6%
2011/12	384,625	26	7,710	2.0%
2012/13	382,631	25	9,254	2.4%

LPN	Number of Calls	Average Time to Answer (seconds)	Abandoned Calls	% Abandoned
2010/11	298,971	36	8,144	2.7%
2011/12	206,121	24	4,146	2.0%
2012/13	229,878	26	5,744	2.5%

SPN	Number of Calls	Average Time to Answer (seconds)	Abandoned Calls	% Abandoned
2010/11	383,939	38	9,494	2.5%
2011/12	261,057	27	5,977	2.3%
2012/13	273,578	24	6,825	2.5%

Table 10 Quality and speed of telephony response survey 2008-2012

	Past Performance				
Quality and Speed of Response	2008	2009	2010	2011	2012
EPN	4.16	4.19	4.22	4.30	4.48
LPN	4.03	3.98	4.11	4.15	4.37
SPN	4.03	4.00	4.18	4.24	4.48

Customer satisfaction

The tables below show our performance under the BMCS in each of customer satisfaction and complaints handling on DPCR5 basis.

In RIIO-ED1 the Customer satisfaction metric will change, with the connections element applying to minor connections and the three elements being separately incentivised. On this basis our performance is shown below for the two years of data available.

Table 11 The broad measure of satisfaction (BMCS) across our three DNOs

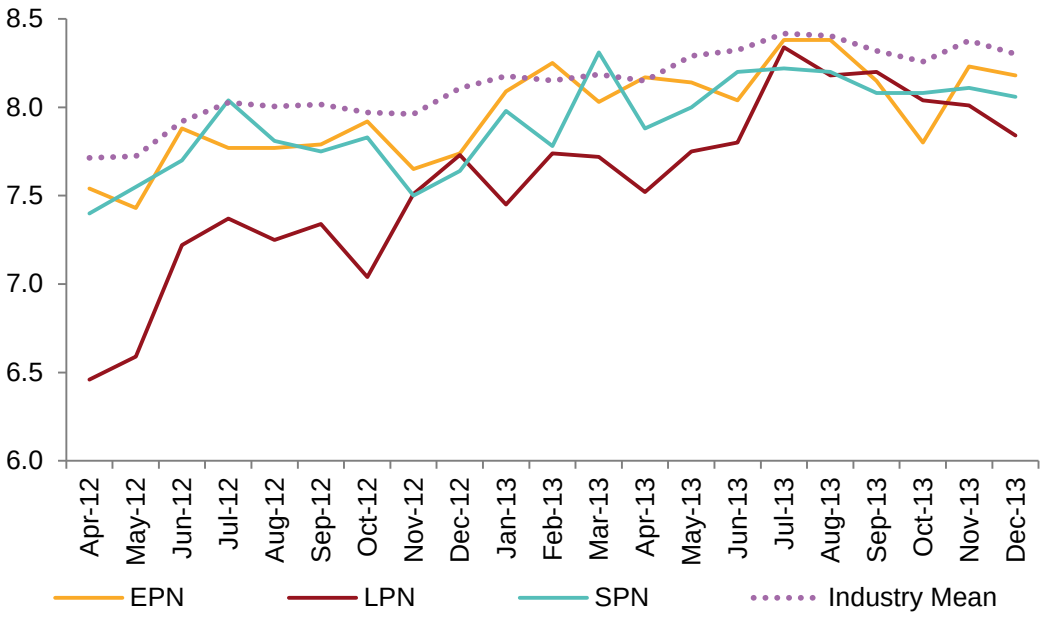
EPN	DPCR5 Basis		RIIO-ED1 basis	
	2012	2013	2012	2013
Broad Measure	7.67	7.82	7.56	7.69
Supply Interruptions	8.09	8.11	8.09	8.11
Connections	7.35	7.34	7.29	7.21
General Enquiries	7.47	8.23	7.47	8.23

LPN	DPCR5 Basis		RIIO-ED1 basis	
	2012	2013	2012	2013
Broad Measure	7.11	7.29	6.95	7.26
Supply Interruptions	7.64	7.56	7.64	7.56
Connections	6.68	7.23	6.54	7.24
General Enquiries	6.95	6.87	6.95	6.87

SPN	DPCR5 Basis		RIIO-ED1 basis	
	2012	2013	2012	2013
Broad Measure	7.47	7.78	7.33	7.65
Supply Interruptions	7.98	7.92	7.98	7.92
Connections	7.03	7.47	6.94	7.30
General Enquiries	7.36	8.11	7.36	8.11

Figure 2 shows how our three networks have fared against the industry average since the introduction of the measure in 2012.

Figure 2: The monthly performance scores of our three networks against the industry Broad Measure of Customer Satisfaction survey



We are disappointed that despite our improvements in fault restoration (see section 5) and focus on improving telephony service, our performance under the BMCS is below the industry average.

We are particularly disappointed by our connections and general enquiries performance and recognise that this is an area for improvement.

Our overall score were affected by the poor performance at the beginning of 2012. We have made substantial improvements which can be seen in the monthly scores which had climbed towards an overall score of 8 in EPN and SPN and 7.7 in LPN, as a result of our focus on connections and general enquiries performance.

4.3 Complaints Metric

The tables below detail the number of complaints and complaints taken up by the ombudsman. We have made progress in reducing the number of complaints since 2010, whilst also improving our resolution performance.

Table 12 Complaints Volumes

EPN	2009	2010	2011	2012	2013
Number of customer complaints	5,963	1,384	2,003	672	4,344
Number of complaints taken up by ombudsman	31	11	27	16	4

LPN	2009	2010	2011	2012	2013
Number of customer complaints	2,652	3,425	1,115	425	2,075
Number of complaints taken up by ombudsman	23	31	24	10	4

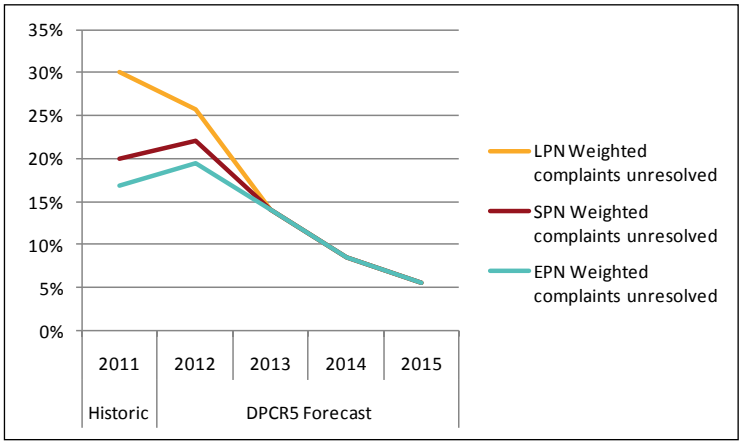
SPN	2009	2010	2011	2012	2013
Number of customer complaints	5,867	788	1280	504	2,957
Number of complaints taken up by ombudsman	27	11	27	15	5

UKPN	2009	2010	2011	2012	2013
Number of customer complaints	14,482	5,597	4,398	1601	9,376
Number of complaints taken up by ombudsman	81	53	78	41	13

The complaints metric focuses on the % complaints not resolved in 1day and 31 days, the % repeat complaints and complaints to the ombudsman found against the distributor.

The chart below shows the overall complaints metric % score. We are targeting a 65 per cent reduction in complaints that exceed these thresholds by the end of 2015.

Figure 3: Performance and forecast against the Broad Measure metrics



The tables below give our historic complaints performance based on the DCPR5 approach. In DPCR5, ombudsman findings against the DNO are measured as a percentage of the number of cases taken up by the ombudsman.

Table 13 Complaints Metric Performance – DPCR5 measure

EPN	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	26%	17%	15%	8%	8%	6%
% unresolved after 1 working day	72%	73%	61%	59%	60%	50%
% unresolved after 31 calendar days	16%	8%	9%	10%	8%	5%
% repeat complaints	7%	16%	7%	0.1%	0.1%	0.0%
% Ombudsman findings against DNO	63%	0%	17%	0%	0%	0%

LPN	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	23%	30%	23%	15%	8%	6%
% unresolved after 1 working day	74%	75%	63%	60%	60%	50%
% unresolved after 31 calendar days	22%	7%	10%	13%	8%	5%
% repeat complaints	8%	16%	10%	0.1%	0.1%	0.0%
% Ombudsman findings against DNO	33%	67%	46%	33%	0%	0%

SPN	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	21%	20%	18%	8%	8%	6%
% unresolved after 1 working day	63%	63%	61%	58%	60%	50%
% unresolved after 31 calendar days	20%	10%	7%	12%	8%	5%
% repeat complaints	9%	17%	7%	0.1%	0.1%	0.0%
% Ombudsman findings against DNO	33%	17%	33%	0%	0%	0%

Under the RIIO-ED1 the ombudsman measure will be changed to measure these as a percentage of the number of complaints, to address the issue that this does not recognise the volume of complaints, for example a single complaint and finding against the DNO can score more highly (negative) than multiple findings against from an even larger number of referrals. The complaints measures will, in addition to the change in the ombudsman complaints metric definitions change, gain different weightings.

	DPCR5 Weighting	RIIO-ED1 Weighting
% unresolved after 1 working day	10%	10%
% unresolved after 31 calendar days	20%	30%
% repeat complaints	50%	50%
% Ombudsman findings against DNO	20%	10%

Using these weightings methodology UK Power Networks' complaints overall scores will be as below.

Table 14 Complaints Metric Performance – RIIO-ED1 measure

EPN	Past Performance			Forecast Performance		
	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	15%	18%	12%	10%	8%	7%
% unresolved after 1 working day	72%	73%	61%	64%	60%	50%
% unresolved after 31 calendar days	16%	8%	9%	12%	8%	5%
% repeat complaints	7%	16%	7%	0.2%	0.1%	0.0%
% Ombudsman findings against DNO as percentage of total complaints	0.08%	0.00%	0.60%	0.08%	0%	0%

LPN	Past Performance			Forecast Performance		
	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	18%	18%	14%	11%	8%	7%
% unresolved after 1 working day	74%	75%	63%	63%	60%	50%
% unresolved after 31 calendar days	22%	7%	10%	14%	8%	5%
% repeat complaints	8%	16%	10%	0.3%	0.1%	0.0%
% Ombudsman findings against DNO as percentage of total complaints	0.06%	0.36%	1.18%	0.08%	0%	0%

SPN	Past Performance			Forecast Performance		
	2010	2011	2012	2013	2014	2015
Complaints Metric (overall)	17%	18%	12%	11%	8%	7%
% unresolved after 1 working day	63%	63%	61%	58%	60%	50%
% unresolved after 31 calendar days	20%	10%	7%	12%	8%	5%
% repeat complaints	9%	17%	7%	0.1%	0.1%	0.0%
% Ombudsman findings against DNO as percentage of total complaints	0.04%	0.16%	0.99%	0.00%	0%	0%

In the last year we have made significant progress in addressing the number of repeat complaints, but we must continue to focus on resolving complaints more quickly.

5 Network performance

5.1 Overview

Network performance relates to the reliability and availability of supply to our customers. There are two key measures that track performance in this area being:

- Customer Interruptions (CIs): a measure of the average number of power cuts experienced per hundred customers per year
- Customer Minutes Lost (CML): a measure of the time in minutes that a customer on average will be without power in a year

Since acquisitions by our current owners in 2010, we have invested in the reliability of our network and changed the way we work. This has led to significant performance improvements in this area, reducing the number and duration of power interruptions experienced by our customers. We expect to outperform all regulatory targets and deliver a more reliable service to our customers over the current period.

5.2 Performance Improvement

The key driver of our performance improvement since 2010 is the implementation of our quality of supply strategy. This comprises two complementary strategies designed to reduce the number of network failures and ensure a reliable service for customers, being:

- CI Strategy: Reducing the number of power interruptions. This focuses on

  Reducing the number of circuit breakers that fail to operate fast enough by regularly 'exercising' circuit breakers remotely.

  Reviewing and enhancing the opportunities for automatic restoration using remote controlled switches to reduce the number of customers affected sustained interruptions

  Managing the London interconnected LV networks to improve their resilience in the event of high voltage faults where they maintain customer supplies.

- CML Strategy: Reducing the duration of supply interruptions. This focuses on improvement in duration of interruptions through:

  Remote control: Increased investment in remote control infrastructure and improving the reliability of existing systems provides control centre staff with more options to reconfigure high voltage networks for rapid supply restoration. In particular, we have made investments in additional remote control equipment in the EPN and SPN networks to enable remote switching thus avoiding the dispatch of field staff to restore supplies. We are also removing defects from our networks to ensure that remote controlled devices operate at the maximum possible efficiency.

  Improved first response times: Changing our working patterns to better match the volume and timing of fault calls received. We have also improved first responder time to attend incidents and increased our use of back-feeding techniques to restore supplies to customers. Across all of our networks, we now deploy skilled Distribution Supply Technicians to provide immediate on site capability to identify the problem, reconfigure the network and where appropriate apply local generators to restore supply. We have improved staff accountability and the daily monitoring of performance with a strong focus on preventing long duration interruptions. We have done this by daily monitoring and reporting of high impact incident particularly those where customers are off for long durations, with the focus moving from 18hrs through 12 hrs to 8 hrs. We have also used simple measure of customer value (an interruption is worth about £10 per customer per hour) to help field staff understand more readily the value of getting customers restored more quickly, for example by making and earlier decision on using generation.

Improved reporting: Reviewing our quality of fault reporting and training programmes to ensure accuracy and consistency. We have also developing an integrated automated reporting system to provide readily accessible

Planned interruptions to supply are incurred where it is not feasible or economic to provide alternative supplies to customers while essential work is carried out on the distribution network. As a result our planned interruption levels have always been low and this was reflected in the CI and CML targets for planned interruptions. Over the DPCR5 period the planned CI and CML have slightly exceeded these target levels. Targets for planned and unplanned were combined during the DPCR4 period to 2010.

The figures below show our performance on CIs and CMLs across our networks from 2007/08 to 2012/13 and our forecast performance until the end of the current regulatory period.

Figure 4: LPN CI Performance

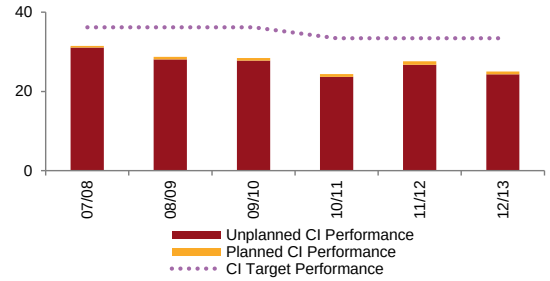
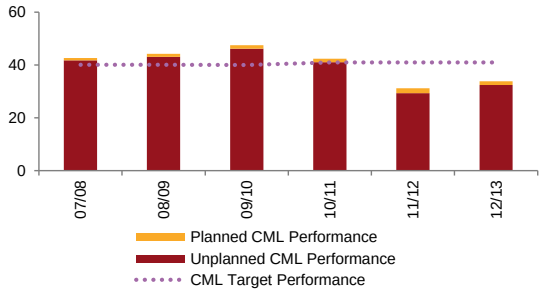


Figure 5: LPN CML Performance



In LPN our CI performance is 25% ahead of target and our CML performance 17% ahead of target. Unplanned CML performance has improved 30% during DPCR5 as we have increased our focus on improving restoration times and reducing long interruptions.

Figure 6: SPN CI Performance

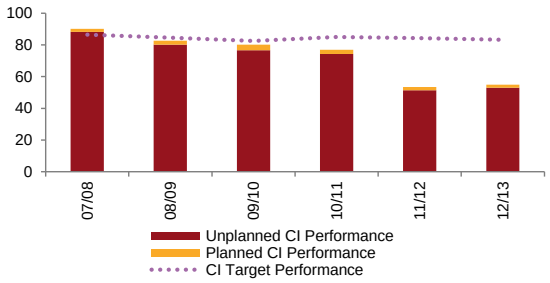
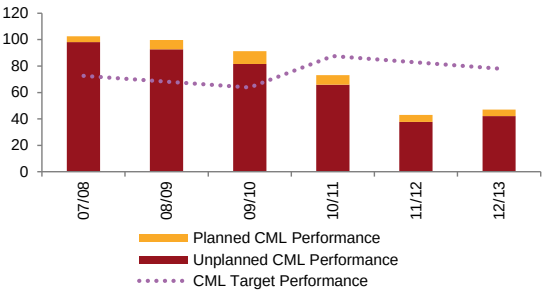


Figure 7: SPN CML Performance



In SPN our CI performance is 40% ahead of target and our CML performance 34% ahead of target. Unplanned CI performance had improved by 31% as a result of deploying more remote control and fast automated restoration. Unplanned CML performance has improved 48% during DPCR5 as we have increased our focus on improving restoration times and reducing long interruptions.

Figure 8: EPN CI Performance

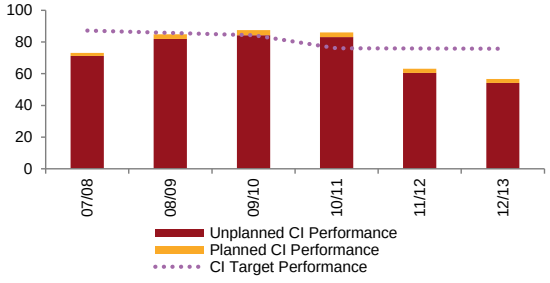
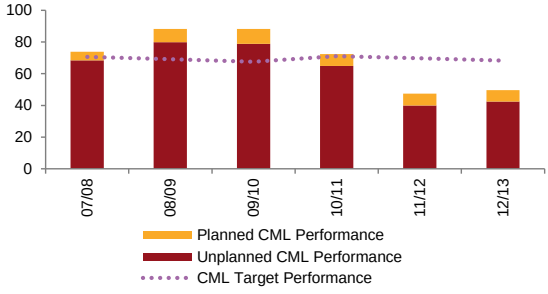


Figure 9: EPN CML Performance



In EPN our CI performance is 25% ahead of target and our CML performance 28% ahead of target. Unplanned CI performance had improved by 36% as a result of deploying more remote control and fast automated restoration. Unplanned CML performance has improved 46% during DPCR5 as we have increased our focus on improving restoration times and reducing long interruptions.

The following considers the changes in performance at a voltage level, including exceptional events, to illustrate where we have made significant changes in performance.

In Figure 11 for LPN the 132kV exceptional event in where three 132kV cables were damaged at the same time in Dartford in 2009/10 is clearly identifiable. The significance of LV performance compared to HV performance in LPN is clearly visible when compared to SPN and EPN.

Figure 10: LPN unplanned CI performance by voltage

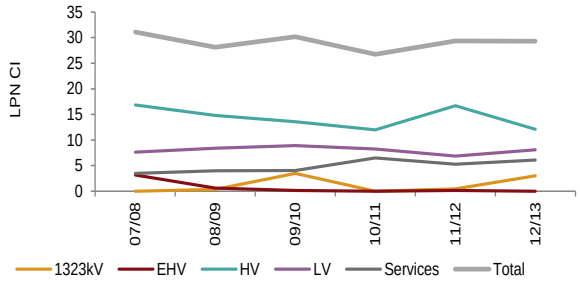
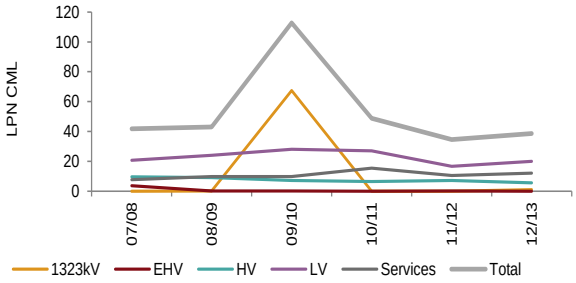


Figure 11: LPN unplanned CML performance by voltage



In SPN the figures below clearly show the step change improvements made in HV performance through the introduction in automation and the improvements in restoration performance for LV faults.

Figure 12: SPN unplanned CI performance by voltage

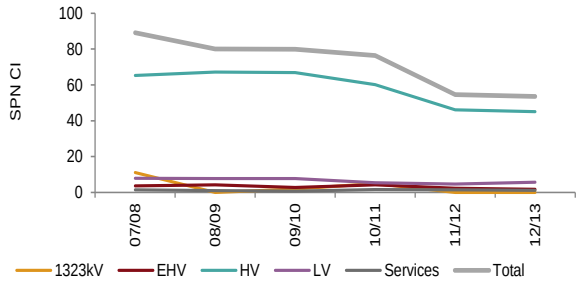
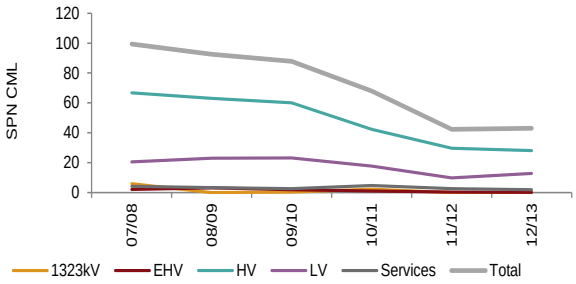


Figure 13: SPN unplanned CML performance by voltage



In EPN the data shows the significant improvement in HV performance, with automated restoration reducing both CI and CML.

Figure 14: EPN unplanned CI performance by voltage

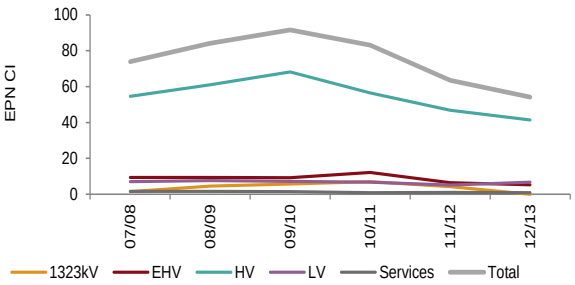
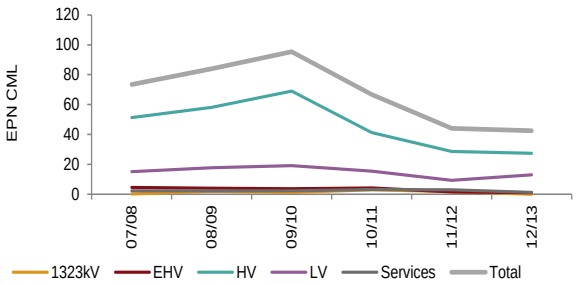


Figure 15: EPN unplanned CML performance by voltage



Worst Served Customers

In DPCR5, worst served customers are those defined has having 15 high voltage incidents over a three year period, with at least three in each year. The worst served customers are typically supplied by overhead line networks.

LPN has no worst served customers as a result of it 11kV networks being entirely underground.

Table 15 Worst Served Customer Performance

DPCR5 - 15 interruptions over 3 years		2010/11	2011/12	2012/13
EPN	#	927	3,234	3,747
SPN	#	3,011	1,644	2,249

RIIO-ED1 - 12 interruptions over 3 years		2010/11	2011/12	2012/13
EPN	#	n/a	9,951	11,750
SPN	#	n/a	3,842	11,258

During DPCR5 to date, UK Power Networks has identified opportunities that meet the incentive criteria to address service to 727 worst served customers in EPN and 1634 customers in SPN under the DPCR5 incentive.

The RIIO-ED1 threshold for worst served customers reduces to 12 interruptions over three years. This will allow further schemes to be identified affecting larger groups of customers, which will make improve the potential for justifying investments to address any underlying network issues within the worst served customer framework.

Duration of the longest interruptions

Where customers experience an electricity supply interruption lasting more than 18 hours, they are entitled to a compensation payment under the Electricity Guaranteed Standards of Performance. This standard will become more challenging in the 2015 to 2023 period as customers will be entitled to compensation following 12 hour supply interruptions. Our focus will be to minimise the number of these incidents, so that long duration outages become increasingly rare for all customers.

We have made reducing long duration interruptions a major part of our quality of supply daily performance reviews. The original focus on eliminating as far as possible 18 hour interruptions and this has since moved to focus on 8 and 12 hour interruptions in anticipation of the revised guaranteed standard.

Figure 16 to Figure 18 below show the performance improvements we have made since the end of DPCR4.

This performance represents an overall 97% reduction in 18 hour interruptions, 88% reduction in 12 hour interruptions and a 77% reduction in 8 hour interruptions.

Figure 16: EPN Long duration interruptions

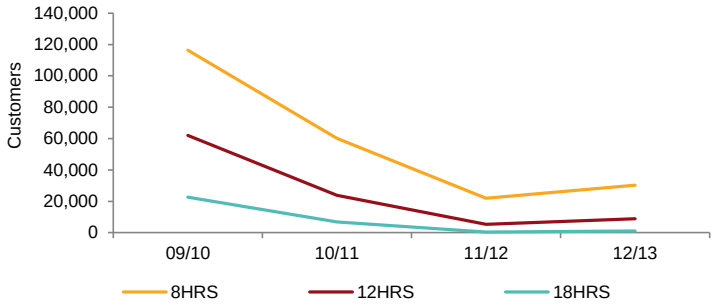


Figure 17: LPN Long duration interruptions

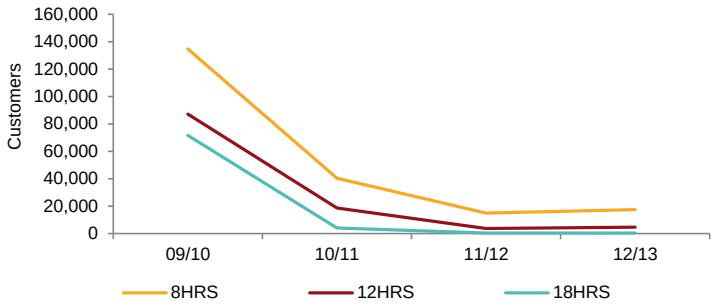
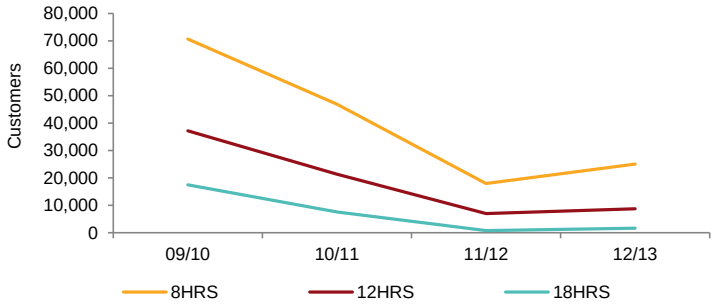


Figure 18: SPN Long duration interruptions



Comparisons with other DNO Networks

The following assessment was carried out using 12/13 IIS data.

The levels of customer interruptions are driven by inherent network design and configuration, although this can be managed through remote control restoration switching systems restoring customers automatically.

LPN has the lowest level of CIs of any DNO, which is in part due to its entirely underground network design but also because investments in remote control over the last ten years result in 40% of customers affected by faults on high voltage systems being restored automatically restored inside 3 minutes. This fast restoration rate means that most of LPN's CML performance is driven by LV underground networks and this is reflected in the higher CML/CI average interruption duration.

EPN and SPN have the 5th and 7th lowest average restoration times in 2012/13, with the significant improvements in restoration performance we have achieved being largely maintained. SPN improved by 34 minutes per customer from 114 minutes in 2008/09 to 80 minutes in 2011/12 but this fell slightly to 86 min in 2012/13. EPN has improved by 26 minutes per customer from 101 minutes to 75minutes in 2011/12 though this fell back to 88 minute in 2012/13.

In terms of 12 hour interruptions in 2012/13 LPN had a more challenging year going from the 4th lowest number in 2011/12 of 12 hour interruptions (which was a significant achievement in an entirely urban network) to 11th, EPN remained 5th lowest and SPN had the 8th lowest number of 12 hour interruptions (down from 7th).

Table 16 Industry CI and CML Performance

12/13 IIS by Group	ENWL	CE	UKPN	SP	SSE	WPD
CI (50% planned)	46.20	68.61	45.56	42.88	65.76	59.65
CML (50% planned)	48.96	67.51	43.49	44.27	68.16	37.78
No of 12hr or more Interruptions (Group average DNO)	13540	13793	7870	5095	8486	2843
% of 12hr or more Interruptions	1.19%	1.08%	0.70%	0.79%	0.62%	0.20%

UK Power Networks' improvements in service to interruptions in supply have ensured that our customers receive an excellent level of overall interruptions performance have the second lowest number of customer interruptions and the lowest interruptions duration of all the network operator groups.

Our investments over the past 10 years in automatic restoration, remote control and our improved focus on restoration have resulted in the third lowest CI performance and the best CML performance.

We also have the third lowest proportion of customers interrupted over 12 hours as a percentage of the number of customers interrupted.

6 Asset Performance

6.1 Overview

This section covers the output measures that consider the condition (Health Index) and utilisation of the network (Load Index).

6.2 Asset Health Index

As part of the current Distribution Price Control Review (DPCR5), Ofgem introduced the Health Index as an output measure of asset condition. For each of our licensed networks progress is monitored as a percentage against the forecast improvement in health the agreed investment programme was designed to deliver, using Ofgem's scoring approach.

Table 17 HI delivery as percentage of agreed HI improvement

	2011	2012	2013	2014	2015
EPN	29.7%	68.1%	93.4%	119.9%	139.7%
LPN	12.7%	29.6%	60.3%	79.8%	118.4%
SPN	33.4%	56.6%	82.0%	100.2%	115.8%

Table 18 HI delivered through asset replacement

	2011	2012	2013	2014	2015
EPN	20.1%	36.5%	60.0%	85.3%	103.4%
LPN	12.5%	27.6%	51.6%	68.0%	102.4%
SPN	22.6%	42.2%	64.5%	80.8%	95.3%

Table 19 HI delivered through asset refurbishment

	2011	2012	2013	2014	2015
EPN	9.6%	31.5%	33.4%	34.6%	36.3%
LPN	0.1%	2.0%	8.7%	11.8%	16.0%
SPN	10.9%	14.4%	17.5%	19.4%	20.5%

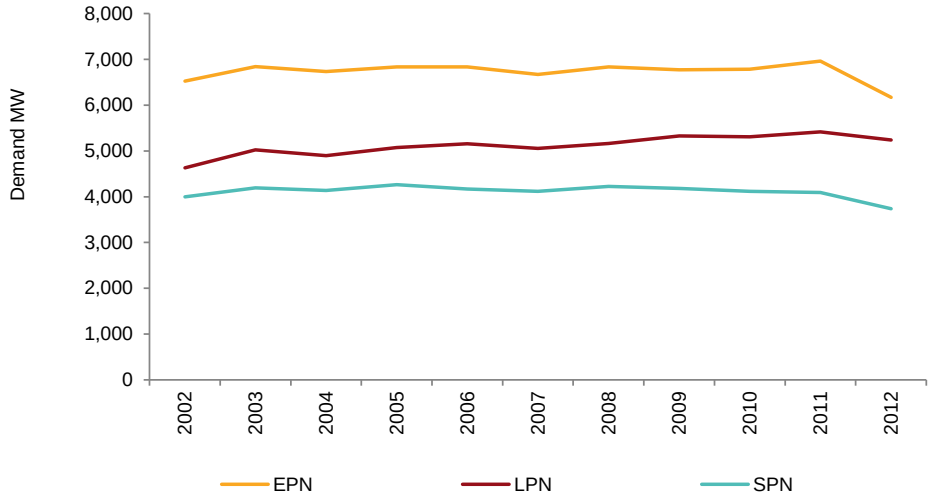
Additional refurbishment of overhead tower lines (replacement of corroded tower steelwork and the fittings that hold the insulators and conductors) has contributed to a strong performance in EPN and SPN. Good progress has been made in LPN in the delivery of low voltage and 11kV distribution assets, but delays to major infrastructure programmes (those that deliver 11kV primary substation switchgear, and EHV and 132kV asset replacement) have affected the overall delivery position for LPN. It is anticipated that this will be recovered later in the DPCR5 period. We have revised our final delivery position to reflect our updated expenditure forecast for 2013/14 and 2014/15.

6.3 Load Index

System maximum demand (MW) (load) is the maximum demand, placed on the electrical distribution network system at any time or within a specific time period such as a month. Maximum demand is an indication of the network capacity required by customers. Increased load at certain points of the network is the primary driver of load related capital expenditure on the networks.

Maximum demand is primarily driven by the growth in new domestic, commercial and industrial customers, offset by efficiency improvements in the existing customer base, such as more efficient electrical appliances. Weather patterns also affect the observed maximum demand, with cold winters increasing demand for heat. The maximum demand data presented in Figure 19 is corrected for this variation using statistical means. It should be noted that 2010/11 was an exceptionally cold period at the time of system maximum demand (a 1 in 30 year cold spell) and the correction mechanism is not able to fully correct the demand for these exceptional circumstances, leading to what appears to be a large drop in demand between 2010/11 and 2011/12.

Figure 19 Maximum Demand MW



The network maximum demand in EPN and SPN remained relatively constant between 2003 and 2009, since when we have observed a declining network maximum demand, the current economic circumstances not driving growth to offset efficiency improvements and reduced consumption driven by the higher energy costs customers are facing.

LPNs load grew over the period 2003 to 2009 and has since levelled out or reduced slightly. This difference reflects the different demand mix, with a lower proportion being driven by commercial demand.

The picture presented by the network maximum demand does not show how demand changes at a local level. This is in part because the local demands do not all occur at the same time, so the sum of their individual maximum demands are larger than the network maximum demand, an effect known as diversity. Load related reinforcement is driven by these local changes, which can be driven by changes in customer demands or specific new connections. Some of these costs are borne by new connectees and some by existing customers through use of system charges.

To measure the ability of the local network to meet the maximum demand on it, each of our electrical assets groups (E.g. substation) have a Load Index rating from 1 to 5 which measures their loading relative to their capacity. 'LI1' represents sites with significant spare capacity and 'LI5' captures sites that are fully utilised and require investment. Table 20 shows the Load Index bands used in DPCR5 and that we use to assess when reinforcement is required.

Table 20 Load Index bands

	% of Rated Capacity	
LI Band	Lower bound	Upper Bound
LI1	0	70%
LI2	70%	85%

LI3	85%	100%
LI4	100%	<500MWh
LI5	100%>500 MWh	

For LI 4 and LI5 UK Power Networks' LI bandings consider the amount of load over the rated capacity, accounting for both the magnitude of MW over the rated capacity and the duration that occurs for. Assessments are carried out for these substations to ensure that we meet the security of supply standards before deciding which sites require reinforcement. In this way we ensure that the networks we operate continue to deliver the service our customers require ensuring best use of the infrastructure to meet the demands placed on it, both in the short term and longer term by making investment decisions at the right time.

The table below shows the LI bands for all DNOs based on their own LI frameworks (based on 2012 reports).

Table 21 Industry LI performance 2011/12

	Starting position (Oct 10 if known)	Original Forecast for 2015 with investment	2012 - Current view July 2013	Forecast Outturn 2015 July 2013
	LI4+LI5	LI4+LI5	LI4+LI5	LI4+LI5
ENWL	47	30	34	48
NPgN	5	9	5	3
NPgY	18	13	8	6
WMID	59	35	26	13
EMID	118	115	27	21
SWALES	4	5	3	1
SWEST	6	8	7	2
LPN	28	21	24	17
SPN	59	40	32	25
EPN	87	56	39	25
SPD	25	9	32	15
SPMW	33	10	28	13
SSEH	17	22	18	19
SSES	16	14	8	7

In LPN we have already increased the net firm capacity of the substations by 98MVA more than our forecast for 2015. The sum of peak demands has reached the same demand as was forecast for 2015 in London, but we not experiencing the same MWh above 100% that we forecast. This has resulted in an overall reduction in the number of LI4 and 5 since 2010, but this is expected to increase again by the beginning of RIIO-ED1.

In EPN we have already increased the net firm capacity of our substations by 254 MVA more than was forecast for 2015 but have also seen a significant reduction in maximum demand, which has resulted in the significant drop in the number of LI4 and 5 substations below that forecast in 2010.

In SPN we have already installed the net increase in capacity that was forecast for 2015 (11MVA above) and have also seen a reduction in maximum demand result in few LI4 and 5 substations than forecast in 2010.

Table 22 shows EPN's, LPN's and SPN's progress against the LI scores monitored by Ofgem over the current period and our latest forecast performance for the current period. We are forecasting a slight increase in the number of LI4 and LI5 sites in EPN and SPN at the end of DPCR5 than we forecast in our July 2013 business plan but these remain well ahead of our targets.

Table 22 UK Power Networks' LI performance and forecast future performance

UK Power Networks number of LI 4&5 sites	Initial LI performance at commencement of DPCR5	Target LI performance at end of DPCR5	Forecast LI performance at end of DPCR5
EPN	87	56	25
LPN	28	21	17
SPN	59	40	25

UK Power Networks continues to use network capacity more effectively than the other DNOs whilst maintaining the one of the best overall performance in terms of energy delivery in the UK (see Section 5).

Table 23 Firm Capacities and Maximum Demand by DNO

	Sum of Firm Capacities			Sum of Substation MDs		
	2010	2010 forecast for 2015	2012	2010	2010 forecast for 2015	2012
LPN	8854	9246	9344	7483	7241	7219
SPN	10262	10623	10634	7993	7757	7393
EPN	16283	17146	17400	12924	12839	11855

Distributed Generation

Table 24 EPN DG Connected MW

EPN MW connected	2010/11	2010/11	2011/12	2012/13
Onshore wind	0.4	0.3	4.2	127.6
Offshore wind	172.8	0.0	0.0	334.0
Tidal stream & wave power	0.0	0.0	0.0	0.0
Biomass & energy crops (not CHP)	0.0	0.0	0.0	0.0
Hydro	0.0	0.0	0.0	0.0
Landfill gas, sewage gas, biogas (not CHP)	1.0	10.7	0.3	22.5
Waste incineration (not CHP)	0.0	0.0	0.0	0.0
Photovoltaic	0.4	7.2	99.5	79.4
Micro CHP (domestic)	0.0	0.0	0.0	0.0
Mini CHP (<1MW)	3.2	1.2	1.9	4.2
Small CHP (>=1MW, <5MW)	0.0	12.8	2.7	6.8
Medium CHP (>=5MW, <50MW)	0.0	0.0	0.0	0.0
Large CHP (>=50MW)	0.0	0.0	0.0	0.0
Other generation	0.0	2.3	12.9	0.4
Total	177.8	34.4	121.5	574.9

EPN has seen a significant increase in the connection of photovoltaic generation, with nearly 200MW connected in DPCR5, more than any other form of generation other than the large offshore wind farms connected in 2010 and 2012/13 (DPCR4).

Table 25 LPN DG Connected MW

LPN MW Connected	2010/11	2010/11	2011/12	2012/13

Onshore wind	0.0	0.1	0.0	0.5
Offshore wind	0.0	0.0	0.0	0.0
Tidal stream & wave power	0.0	0.0	0.0	0.0
Biomass & energy crops (not CHP)	0.0	0.0	0.0	0.0
Hydro	0.0	0.0	0.0	0.0
Landfill gas, sewage gas, biogas (not CHP)	0.0	0.0	0.0	0.0
Waste incineration (not CHP)	0.0	0.0	90.0	0.0
Photovoltaic	1.2	0.9	16.0	6.6
Micro CHP (domestic)	0.0	0.0	1.1	0.6
Mini CHP (<1MW)	2.3	4.4	4.4	7.9
Small CHP (>=1MW, <5MW)	0.0	0.0	1.8	2.4
Medium CHP (>=5MW, <50MW)	0.0	0.0	0.0	8.4
Large CHP (>=50MW)	0.0	0.0	0.0	0.0
Other generation	0.8	0.0	13.3	0.4
Total	4.3	5.4	126.5	26.8

LPN has seen a significant increase in waste incineration generation, but has also seen 24.6MW of photovoltaic generation and 19MW of mini CHP connected, significantly higher than either EPN or SPN.

Table 26 SPN DG Connected MW

SPN MW Connected	2010/11	2010/11	2011/12	2012/13
Onshore wind	0.1	0.0	0.0	4.6
Offshore wind	0.0	300.0	0.0	0.0
Tidal stream & wave power	0.0	0.0	0.0	0.0
Biomass & energy crops (not CHP)	0.0	0.0	0.0	0.0
Hydro	0.0	0.0	0.0	0.0
Landfill gas, sewage gas, biogas (not CHP)	0.0	1.2	0.0	0.0
Waste incineration (not CHP)	0.0	0.3	21.0	0.0
Photovoltaic	0.7	6.0	37.5	21.4
Micro CHP (domestic)	0.0	0.0	0.0	0.0
Mini CHP (<1MW)	0.6	0.4	0.9	0.1
Small CHP (>=1MW, <5MW)	1.4	0.0	0.0	2.0
Medium CHP (>=5MW, <50MW)	0.0	0.0	0.0	0.0
Large CHP (>=50MW)	0.0	0.0	0.0	0.0
Other generation	68.0	0.7	0.0	1.2
Total	70.7	308.6	59.5	29.3

SPN has seen one large 300MW wind farm connect in 2011. Again a significant amount of photovoltaic (66MW) generation has connected since 2012.

7 Connections

7.1 Overview

UK Power Networks is committed to making it easier for customers to connect to its networks – this is an important element of achieving its vision of reaching top-third performance amongst the 14 distribution networks in the area of customer service.

We support the competition in the provision of connection services as a key efficiency driver in this area. We also support the Government's commitment to climate change and a low carbon economy – which are driving connection of new technology, including electric vehicles and embedded generation devices such as solar photovoltaic systems, to our networks. We recognise the role in facilitating all types of connections to our network.

Since formation in 2010 we focused on improving connection services by undertaking a number improvement initiatives including:

- The redesigned our website to include improved information on the connection process, including timeframes, information requirements, customer choice to use third party providers. This will assist customers understand the choices they have, the information we need and our commitments to them;
- The introduction of a web based self-service system. This will speed up the process for less complex connection enquiries by enabling customers to create an illustrative quotation; and
- Stakeholder engagement to understand what our stakeholders and customers, including third party providers, consider to be the priority areas for improvement in the areas of connection services.

To achieve our vision of reaching top-third performance amongst the 14 distribution networks in the area of customer service we are implementing an End-to-End connection Project which will deliver benefits in the current planning period and provide a basis for improvement in the overall transformation project. This project is part of the wider transformation project.

7.2 Guaranteed Standards of Performance

The key performance measures for connection services, as set out in UK Power Networks' licence conditions and Electricity (Connections Standards of Performance) Regulations 20101 and Distributed Generation (DG) Standards of Performance Direction[2] are:

- Timeframes for the provision of information and design;
- Timeframes for finalisation of works and energisation of connections; and
- Competition test. This provides that DNOs can earn unregulated margin on their competitive activities if they pass a competition test.

[1] Electricity (Connections Standards of Performance) Regulations 2010. Statutory Instrument 2088. Found at: http://www.legislation.gov.uk/uksi/2010/2088/contents/made?view=plain

[2] Direction under paragraph 15a.16 Of Standard Condition 15a (Connection Policy And Connection Performance) of the Electricity Distribution Licence

Where UK Power Networks fails to meet these standards it must make compensation payments.

Our overall performance against these standards is covered by Licence Condition 15A of the Distribution Licence, which requires a minimum performance of 90%. 2011/12 was the first full reporting year, during which UK power Networks achieved 99.9% compliance against the standards. This corresponded to 140 failures with payments of £17,380 over the reporting year. In 2012/13 we achieved 99.7% compliance although this resulted in 387 failures with payments of £36,715.

Table 27 Connections Guaranteed Standards of Performance

		Regulatory Year 2011/12			Regulatory Year 2012/13		
		%	#	£	%	#	£
Metered Quotation Standards	EPN	99.9	35	£4,490	99.5	64	£11,000
	LPN	99.7	15	£1,610	99.7	17	£2,130
	SPN	99.6	35	£4,460	99.6	34	£3,100
Other Metered Standards	EPN	99.9	15	£2,210	99.9	19	£4,795
	LPN	99.9	4	£1,585	99.9	5	£430
	SPN	99.9	8	£1,445	99.8	19	£5,980
Unmetered Standards	EPN	99.9	10	£720	99.5	49	£1,530
	LPN	100	3	£150	99.5	34	£1,100
	SPN	100	1	£10	99.3	40	£1,350
Payment Penalties	EPN	-	11	£550	-	48	£2,400
	LPN	-	0	£0	-	11	£550
	SPN	-	3	£150	-	47	£2,350
Total		-	140	£17,380		387	£36,715

7.3 Time to Connect

In RIIO-ED1 the average time to connect will be the primary connections output. This will measure the time taken from enquiry to quote (Time to Quote ATtQ) and from quote acceptance to delivery (Time to Connect ATtC). The information below is based on performance gathered by Ofgem data over the period from 1 April 2011, including 18 months of quotations data and six months of completions data.

Table 28 Average Time to Connect

Time to Quote Days	DNO Average	Upper Quartile	UK Power Networks Target	EPN Current	LPN Current	SPN Current
Low voltage single services	46	42	42	42	49	49
Low voltage multiple services	57	53	53	54	70	64

Table 29 Average Time to Quote

Time to Quote Days	DNO Average	Upper Quartile	UK Power Networks Target	EPN Current	LPN Current	SPN Current
Low voltage single services	9.1	8.2	8.2	10.1	9.7	10.4
Low voltage multiple services	14.5	11.7	11.7	15.6	16.1	17.9

EPN is currently delivering a time to connect service close to the industry upper quartile and better than the industry average. The performance of LPN and SPN is below average. We believe we can learn from the differences to ensure we deliver upper quartile performance in RIIO-ED1.

We have further to improve to meet our goal of upper third performance in quotations, being behind the average in all areas. We believe the improvements and online service plans we have developed will address this shortfall.

7.4 Competition in Connections

In June 2012, we submitted our Competition Notice to Ofgem that demonstrates that we have effective competition in connections across our three networks. We have worked hard to remove barriers to allow competition to flourish.

We originally submitted a Competition Notice covering six market segments for each of our service areas; (i) metered demand Low Voltage (LV) work, (ii) metered demand High Voltage (HV) work, (iii) metered demand HV and Extra High Voltage (EHV) work, (iv) Distributed Generation (DG) HV and EHV work, (v) unmetered Local Authority (LA) work and (vi) unmetered Private Finance Initiative (PFI) work.

We were successful in having the following market segments passed; metered Distributed Generation (DG) High Voltage (HV) and Extra High Voltage (EHV) work and unmetered connections Private Finance Initiatives (PFI).

In their decision Ofgem noted that UK Power Networks had made a 'step change' in our approach to addressing issues raised as barriers to competition but that some of the changes were very recent. Ofgem also noted that they had not seen enough evidence that it was easy for customers to choose a competitive alternative and that responses to their consultation indicated that in some low value sub-segments competitive alternatives may not exist.

We made a further application in April 2013 for regulation to be lifted in six of the remaining segments and have now been successful in five segments. We made a further application in December 2013 for two of the remaining four segments.

7.5 Connections activity

The following table describe overall connections activity volumes. Connections with an element of apportionment are those where some of the connection cost has been charged to use of system charges, reflecting an additional element of capacity added for which the customer does not bear the full cost according to the connections charging rules.

Table 30 EPN Connections Activity

EPN Connections Volumes	2010/11	2011/12	2012/13
Connection Volumes - no element of apportionment (projects)	369	9,325	7,474
Connection Volumes - element of apportionment (projects)	-	625	423
Unmetered Connections (projects)	10,071	7,684	5,500
Total	10,440	17,634	13,397

Table 31 LPN Connections Activity

LPN Connections Volumes	2010/11	2011/12	2012/13
Connection Volumes - no element of apportionment	296	5,069	2,907
Connection Volumes - element of apportionment	-	63	65
Unmetered Connections	1,929	4,217	3,599
Total	2,225	9,349	6,571

Table 32 SPN Connections Activity

SPN Connections Volumes	2010/11	2011/12	2012/13
Connection Volumes - no element of apportionment	296	6,740	5,120
Connection Volumes - element of apportionment	-	100	186

Unmetered Connections	1,477	11,412	8,807
Total	1,773	18,252	14,113

The tables above illustrate that connections activity is still volatile year on year in the current economic climate, with the increases in projects completing in 2012/13 dropping off again form the activity in 2011/12. However we are seeing some growth in LPN and SPN in the number of larger projects included in those with an element of apportionment to DUoS charges which typically is a result of larger project requiring higher voltage reinforcement.

Table 33 EPN Exit Point increases

EPN Connections Volumes	2010 to 2013
Connection Volumes - no element of apportionment (projects)	42,009
Connection Volumes - element of apportionment (projects)	1,702
Unmetered Connections (projects)	23,255
Exit points adopted from ICPs	5,772
Total	72,738

In EPN we have connected an additional 72,738 exit points over the first three years of DPCR5, 60% of which 60% were metered exit points.

Table 34 LPN Exit Point increases

LPN Connections Volumes	2010 to 2013
Connection Volumes - no element of apportionment (projects)	36,489
Connection Volumes - element of apportionment (projects)	2,194
Unmetered Connections (projects)	9,745
Exit points adopted from ICPs	1,582
Total	50,010

In LPN we have connected an additional 50,010 exit points over the first three years of DPCR5 of which 77% were metered exit points.

Table 35 SPN Exit Point increases

SPN Connections Volumes	2010 to 2013
Connection Volumes - no element of apportionment (projects)	25,695
Connection Volumes - element of apportionment (projects)	1,800
Unmetered Connections (projects)	21,696
Exit points adopted from ICPs	19,553
Total	68,744

In SPN we have connected an additional 68,744 exit points over the first three years of DPCR5 of which 40% were metered exit points.

The comparison illustrates the significantly higher proportion of metered connections activity in London relative to the number of metered exit points (1.7% of metered exit points in LPN compared to 1.2% in EPN and SPN).

The number of exit points adopted from ICPs is growing as competition develops. This has been particularly notable in SPN, where 19,533 exit points were adopted from ICPs compared to 27,495 we have connected, representing 41% of the metered exit points connected.

8 Social Obligations

8.1 Overview

UK Power Networks understands that electricity is an essential service, which is recognised by customers as being highly important as it underpins both their social and economic lifestyles. The basic customer requirement is an affordable price and dependable service. UK Power Networks is committed to ensuring that it meets these basis requirements for all customer groups especially those that are vulnerable to supply interruptions (vulnerable customers) and or fuel poor. It is also committed to improving reliability of supply to customers located in worst served areas of our networks – these are often remote areas. Further details can be found in Annex 5: Social Commitments.

8.2 Vulnerable consumers

UK Power Networks maintains its Priority Services Register (PSR), which captures important information on vulnerable customers in order to assist it in providing services to these customers. There are currently around 280,000 vulnerable customers on its PSR. As a respected corporate citizen, we are committed to do everything possible to identify and support our vulnerable customers. Therefore, over the last two years we have improved the services offer to our vulnerable customers which now include:

- Flagging vulnerable customers on our systems so that we can easily identify vulnerable customers affected by power cuts, including the type of vulnerability. We have three categories medical need, disability; and other.
- Provision of a dedicated priority number which provides customers with an immediate point of contact;
- A welcome pack for all vulnerable customers, which includes luminous stickers with contact details and practical advice on preparing for a power cut;
- Real time updates offered by way of call backs or SMS;
- British Red Cross service offered to provide blankets, hot food and drinks during prolonged power cuts
- Making mobile generators available care homes, critically ill customers and those with a medical dependency;
- Providing hotel and meal allowance in certain circumstances
- Offering home visit from engineer before leaving site
- We have a proactive approach to calling known vulnerable customers when the power goes off.

In addition to taking updates through the automatic feed from suppliers, to promote our PSR we have:

- Clear advice on who is eligible and how to register on our website
- A formal business relationship with the British Red Cross who actively promote our PSR
- Customer Champions who attend site during challenging incidents identify vulnerable customers and offer the service where appropriate
- Our contact centre training includes how to identify possible vulnerable customers and promote the service as part of their engagement.
- Fact sheets (including audio and braille versions) are available in Libraries, from the British Red Cross and through Citizens Advice Bureaux

We are exploring ways to share customer data with other responders under the Civil Contingencies Act. We have developed a number of management reports that are automatically generated from our incident management system during system emergencies. These reports identify current incidents and customers on our Priority Services Register that are affected by incidents and are suitable for sharing with Local Authorities. These have been used in adverse weather to allow a co-ordinated response and have allowed local authorities to identify vulnerable customers not at the time registered with us. We make available to Local Authority Emergency Planning Teams access to web pages that shows information on all current incidents (power cuts affecting more than two customers) and planned works occurring over the next two days. With the planned outage information from this webpage the local authority emergency planners can contact us for more information as required on planned events so that they can make arrangements for additional care for their vulnerable customers.

The Discretionary Reward Scheme (DRS) was the primary incentive mechanism in DPCR4 for activities that delivered social benefits beyond their licence obligations. The DRS was a voluntary incentive split into three main categories (corporate social responsibility, wider communication strategies and priority customer care). The categories alternated each year and a reward of up to £1 million per annum was available across all DNOs. We were awarded £300k in 2007 for our work on vulnerable customers, £350k in 2008 for exceeding our obligations to our local communities to mitigate the environmental and social impacts of electricity networks, £50k in 2009 for our priority customer care initiatives with the British Red Cross.

Ofgem consulted on the future of the DRS in light of the Broad Measure of Customer Satisfaction (BCMS) and decided that since the BMCS incentive (particularly the stakeholder engagement element) was being introduced in April 2012, an additional incentive on the DNOs in this area was unnecessary. Therefore in March 2012 we discontinued the DRS for the remainder of DPCR5

8.3 Fuel poor

Fuel poor customers are those who would need to spend 10 per cent of their income on fuel to maintain an adequate level of warmth (21 degrees in the main living area, and 18 degrees for other occupied rooms). It is estimated that approximately 5 million[3] households in the UK may be fuel poor.

In December 2012 we organised a Vulnerable and Fuel Poor focus group in London. A number of stakeholders attended where we discussed the issue of fuel poverty and explored ways that as a DNO we could support our fuel poor customers. We have agreed to become formal sponsors of National Energy Action (a national charity focussed on the eradication of fuel poverty).

In addition to using the NEA to promote our Priority Services Register to fuel poor customers, we are considering a number of actions to use our relationship to better profile the areas where the needs of our customers are greatest and then consider how we can use this to promote advice on energy efficiency and our priority services.

UK Power Networks is committed to assisting to help customers to reduce their energy consumption and be sustainable particularly in an era of climate change Awareness.

1. NEA estimate November 2011

9 Environment

9.1 Overview

UK Power Networks is committed to reducing the impact of its activities and networks on the environment and continuing to delivering environmental improvements. We fully support our statutory environmental responsibilities under the *Electricity Act 1989*, to mitigate the environmental impact of all of our activities.

Our environmental management system is certified to ISO14001, an internationally recognised standard. This involves setting clear environmental objectives and targets, as well as monitoring and regularly reporting on how well we meet them. We are constantly looking for better ways improve the way we operate and to protect the environment.

Currently, Ofgem uses the following key performance indicators to measure our environmental performance:

Network losses - The energy that is lost as it passes across our network, from the National Grid to the end customer. This comprises both technical and non-technical losses;

Business Carbon Footprint (BCF) - The level of carbon dioxide emissions resulting from of our operations such as through the fuel used by our vehicles, energy consumed in our premises; and

Length of overhead line removed within areas of outstanding natural beauty and national parks – This is the reduction in the visual impact of our network in designated areas of the countryside.

We provide annual performance data to Ofgem on a number of environmental indicators including oil leakage and sulphur hexafluoride leakage.

9.2 Business Carbon Footprint

We have made good progress in reducing our business carbon footprint (BCF) through reducing our buildings and business and operational transport energy usage. Fugitive emissions relate to SF6 emissions which we have controlled whilst the volume in service has increased as discussed in section 9.3 below.

We have reduced our EPN BCF by 25%.

Table 36 EPN business carbon footprint (tonnes CO_2 equivalent)

EPN	2010	2011	2012	2013
Buildings energy usage	14,636	15,276	14,716	14,659
Operational Transport	19,556	15,115	14,636	13,393
Business Transport	5,075	3,812	2,835	2,129
Fugitive Emissions	3,107	1,936	1,697	1,697
Fuel Combustion	4,387	4,134	2,977	3,235
Total Business Carbon Footprint (tCO2e)	46,761	40,272	36,861	35,114

We have reduced the LPN BCF by 27%.

Table 37 LPN business carbon footprint (tonnes CO_2 equivalent)

LPN	2010	2011	2012	2013
Buildings energy usage	8,463	8,533	7,376	7,208
Operational Transport	9,504	7,346	7,113	6,509
Business Transport	3,288	2,469	1,837	1,379
Fugitive Emissions	741	1,028	454	635
Fuel Combustion	2,289	2,157	1,553	2,000
Total Business Carbon Footprint (tCO2e)	24,285	21,533	18,333	17,731

We have reduced the SPN BCF by 22% despite an increase in fuel combustion associated with standby generation.

Table 38 SPN business carbon footprint (tonnes CO_2 equivalent)

SPN	2010	2011	2012	2013
Buildings energy usage	7,162	7,406	6,474	6,805
Operational Transport	14,063	10,870	10,525	9,631
Business Transport	3,701	2,780	2,068	1,553
Fugitive Emissions	1,123	430	478	315
Fuel Combustion	2,861	2,696	1,941	4,342
Total Business Carbon Footprint (tCO2e)	28,911	24,181	21,486	22,645

9.3 SF6

Sulphur Hexafluoride is an important gas that replaced oil as an electrical insulator in modern equipment. It makes equipment cheaper, safer and smaller. However it is an exceptionally strong greenhouse gas so we aim to use it where appropriate and manage the leakage of gas from equipment and will replace badly leaking equipment if necessary. We have managed to reduce the leakage in LPN and SPN despite an increase in the volume in service.

Table 39 EPN SF6

EPN		2009/10	2010/11	2011/12	2012/13
SF6 Bank	kg	25,089	26,890	30,482	30,926
SF6 Emitted	kg	65	81	71	71
SF6 Emitted as a Percentage of SF6 Bank	%	0.26%	0.30%	0.23%	0.23%

Table 40 LPN SF6

LPN		2009/10	2010/11	2011/12	2012/13
SF6 Bank	kg	34,447	42,059	41,567	41,038
SF6 Emitted	kg	31	43	19	27
SF6 Emitted as a Percentage of SF6 Bank	%	0.09%	0.10%	0.05%	0.06%

Table 41 SPN SF6

SPN		2009/10	2010/11	2011/12	2012/13
SF6 Bank	kg	14,906	16,710	17,276	18,670
SF6 Emitted	kg	47	18	20	13
SF6 Emitted as a Percentage of SF6 Bank	%	0.31%	0.11%	0.12%	0.07%

9.4 Oil leakage

UK Power Networks operates 2317km of 33kV, 66kV and 132kV (809m in LPN, 703km in SPN and 805km in EPN) cables that are insulated by pressurised oil. This technology was used before the advent of solid polymeric insulation materials and is found in major urban areas. If the lead sheath around these cables corrodes or is damaged then they can leak oil into the environment. The importance of some of these cables means that we have to try to keep them in service while we detect and repair leaks. The amount of oil leakage is dependent on how easy it is get access to the damaged cable and the volume of oil in the type of cable affected. We have introduced new approaches that allow leakages to be detected and repaired more quickly reducing oil leakage significantly and we have a programme to replace those sections that are economic with the aim of reducing leakage over time and we take these out of service as and when the network develops and they become redundant.

Table 42 EPN Oil Leakage

EPN		2010/11	2011/12	2012/13
Cable Fluid in service	Fluid ltrs	1,976,478	1,976,478	1,963,578
Fluid Used to Top-up Cables	Fluid ltrs	63,118	58,243	43,860
Fluid Used to Top-up Cables as a Percentage of Mass in Service	%	3.2%	2.9%	2.2%

Table 43 LPN Oil Leakage

LPN		2010/11	2011/12	2012/13
Cable Fluid in service	Fluid ltrs	3,118,479	3,118,479	3,108,579
Fluid Used to Top-up Cables	Fluid ltrs	99,113	117,960	104,456
Fluid Used to Top-up Cables as a Percentage of Mass in Service	%	3.2%	3.8%	3.4%

Table 44 SPN Oil Leakage

SPN		2010/11	2011/12	2012/13
Cable Fluid in service	Fluid ltrs	1,967,766	1,967,766	1,984,440
Fluid Used to Top-up Cables	Fluid ltrs	51,556	32,849	43,639
Fluid Used to Top-up Cables as a Percentage of Mass in Service	%	2.6%	1.7%	2.2%

9.5 Undergrounding in Areas of Outstanding Natural Beauty and National Parks

Since DPCR4 an allowance has been provided for undergrounding of overhead lines in Areas of Outstanding Natural Beauty and National Parks. This expenditure is logged up over the period of the price control and recovered in future years. This only applied to UK Power Networks' EPN and SPN networks as there are no applicable networks in LPN. EPN had an allowance of £5.6m (2007/08 prices) and SPN had an allowance of £6.6m (2007/08 prices)

In EPN we have spent £1.99m undergrounding 20.3km of overhead line.

Table 45 EPN Undergrounding

EPN	2009/10	2010/11	2011/12	2012/13
Length of OHL removed within AONB (km)	8.2	2.6	6.2	11.4

In SPN we have spent £1.65m undergrounding 18.3km of overhead line.

Table 46 SPN Undergrounding

SPN	2009/10	2010/11	2011/12	2012/13
Length of OHL removed within AONB (km)	32.1	10.1	1.5	6.7

9.6 Losses

Losses represent the difference between the electrical energy metered entering the distribution system from National Grid and that billed to customers. These losses comprise of a technical component which is the energy that turns to heat as electricity flows though the distribution system and a proportion that is as a result of illegal consumption and inaccuracies in the process of reconciling the energy billed to customers with that entering the distribution system. These inaccuracies are a result of the difference in the timing of accurate meter readings. Energy entering the distribution system is metered in near real time whereas customer meters record energy used over time. The electricity market settlements system contains both firm and estimated customer bills, with more of the estimates becoming accurate over time. This process can take two years to complete. These inaccuracies can be significant and are the reason Ofgem has decided not to activate the DPCR5 losses incentive mechanism. As smart meters are rolled out a much more accurate picture of distribution losses should be possible.

As at April 2013 the losses for UK Power Network DNOs were as shown below. The 2010/11 losses should not be subject to further change but the 2011/12 and 2012/13 are still subject to further reconciliation and would be expected to increase.

Table 47 Losses

	EPN	LPN	SPN		Combined
2010/11 Performance					
Units Exiting (GWh)	35,603	29,669	20,951		86,222
Loss (GWh)	2,466	1,796	1,524		5,786
Loss %	6.93%	6.05%	7.27%		6.71%
2011/12 Performance					
Units Exiting (GWh)	34,285	28,937	20,082		83,304
Loss (GWh)	2,296	1,536	1,361		5,193
Loss %	6.70%	5.31%	6.78%		6.23%
2012/13 Performance					
Units Exiting (GWh)	31,835	26,757	18,566		77,158
Loss (GWh)	2,133	1,579	1,179		4,891
Loss %	6.70%	5.90%	6.35%		6.34%

10 Innovation

10.1 Overview

Innovation is core to the success of our business – we are committed to continually implementing new ideas or methods that improve the way we operate our business and transport electricity. We use innovation to deliver our vision, improve our customer satisfaction, deliver cost efficiencies, optimise investment and network planning and meet the challenges of the low carbon economy and keep customers' bills down.

The regulatory framework for the DPCR5 encourages innovation through the following key mechanisms:

- Low Carbon Networks (**LCN**) fund. This has two tiers:

  Tier one - allows DNOs to recover a proportion of expenditure incurred on small scale projects. This is based available annual funding of £16 million across all DNOs; and

  Tier two provides funding of up to £64 million, allocated on an annual basis following competitions held by Ofgem, for flagship projects.

- Innovation Funding Incentive (**IFI**) programme which allows DNOs to pass through to customers 80% of the cost of eligible IFI projects, up to the limit of 0.5 per cent of their of allowed annual revenue. IFI funding is provided on a use it or lose it basis and eligible IFI projects are those that are primarily focused on the technical development of the networks, to deliver value (e.g. financial, quality of supply, environmental, safety) to consumers.

A regulatory allowance is therefore provided for tier one of the LCN fund and the IFI programme, whereas funding provided under tier two of the LCN fund is allocated annually by Ofgem on a competitive basis. Competitive funding is also subject to successful delivery of key stages / milestones of a project, which provide additional assurance for customers that the investment is efficient.

Over the current period, UK Power Networks has significantly increased expenditure on innovation. Total innovation related expenditure (LCNF tier 1 and 2 and IFI) is shown below (in nominal prices).

Table 48 Total Innovation Expenditure

	2009/10	2010/11	2011/12	2012/13
Total Innovation Expenditure (£million)	3.3	5.7	11.4	15.8

Total innovation expenditure has risen from £3.3m in 2008/09 to £15.8m in 2012/13, corresponding to 1.2% of allowed revenue in 2012/13. IFI and LCNF Tier 1 expenditure has risen to £5.4m in 2012/13 corresponding to 0.4% of revenue. The remaining expenditure relates to LCNF Tier 2 and has risen from £1.1m to £10.4m. The efficiency and value of this expenditure was tested through the LCNF Tier 2 competition test.

A short summary of the investments we have made under each the LCN fund and IFI is provided below. Further information of our expenditure on IFI related projects is set out in our Innovation Strategy.

10.2 LCNF Tier 1

To date, five projects have been registered:

- Short-term energy storage on the distribution network (June 2010) – the focus of this project is investigating the use storage, as an alternative to traditional network reinforcement, to provide additional network capacity (thermal or voltage support) for limited periods where the demand is uncertain.

- Distribution network visibility (September 2010) – the focus of this project is assessing the benefits of collecting, utilising and visualising available network data to improve our operational and investment decisions e.g. to improve time required to connect new customers.
- LV current sensor technology evaluation (December 2011) – this is our first collaborative project (with Western Power Distribution). It evaluates a range of network monitoring solutions that can help us understand the available network capacity to enable us to minimise customer disruption or delay when low-carbon technologies are deployed future.
- Validation of Photovoltaic (PV) connection assessment tool (January 2012) – this project tests the validity of our new planning tool, which assesses the impact of concentrations of small scale generation on our networks e.g. solar panels, enabling us to provide a better and faster service to our customers.
- Smart urban low voltage network (July 2012) – this is a collaborative project with TE Connectivity, to develop a new solid-state switching technology for use these networks. This will increase flexibility with respect to remote switching and re-configuration of the LV network. Solid-state switching technology provides greater visibility of power flows on the network, using the near real-time communications and built in sensors. This enables extensive load monitoring so we can better understand the live state of the LV network and will allow better planning an operation of the low voltage network in future.

As the projects above have developed there has been a significant increase in expenditure as shown below.

Table 49 LCNF Tier 1 Innovation Expenditure

LCNF Tier 1	2009/10	2010/11	2011/12	2012/13
EPN	0.0	0.4	0.3	0.8
LPN	0.0	0.3	0.3	0.9
SPN	0.0	0.2	0.2	0.6
Total	0.0	0.9	0.8	2.3

10.3 LCNF Tier 2

To date, five projects have been awarded funding:

- Low carbon London (October 2010) – This was our first flagship project. Ofgem awarded us £24.9 million of the available £64 million (to all DNOs) to pursue smart network initiatives – focused on innovative ways to deliver sustainable electricity to businesses and communities in a low carbon future[4]. We have contributed an additional £5 million to support this project;
- Flexible plug and play (November 2011) - This was our second flagship project. Ofgem awarded us £6.8 million to trial innovative technical and commercial solutions in order to provide cheaper and faster connections of renewable generation, such as wind power, to the electricity distribution network; and
- Smarter Network Storage – (December 2012). This project proposes to install a larger scale (6 MW / 10 MWh) storage plant to solve a network constraint and to investigate additional revenue streams for providing network services. Electricity storage could provide value for customers by reducing the need for network reinforcement and has wider system benefits such as providing network services such as reserve and response to help balance electricity supply and demand.

[4] http://lowcarbonlondon.ukpowernetworks.co.uk/our-ambition/

- Flexible Urban Networks – Low Voltage (December 2013) - Ofgem awarded UK Power Networks £6.53 million to trial the use of power electronic devices, for the first time in the UK, on the low voltage electricity network. This will enable us to transfer spare capacity across traditional network barriers, making the network more resilient and facilitating the forecasted growth in electric vehicle charging, heat pumps and microgeneration on our network.
- Vulnerable Customers and Energy Efficiency – Ofgem awarded UK Power Networks £3.3 million to trial energy efficiency and demand-side response (DSR) with fuel poor and vulnerable customers. The project will provide DNOs with evidence-based learning on the extent that this small, but socially important group, can engage in DSR and energy savings activities, ensuring they are part of the low-carbon transition, and enabling savings on their bills.

The majority of the LCNF Tier 2 expenditure has been associated with Low Carbon London in LPN, with Flexible Plug and Play and Smarter Network Storage contributing to expenditure in EPN in 2012/13.

Table 50 LCNF Tier 2 Innovation Expenditure

LCNF Tier 2	2009/10	2010/11	2011/12	2012/13
EPN	0.0	0.0	0.2	4.4
LPN	0.0	1.2	7.7	6.1
SPN	0.0	0.0	0.0	0.0
Total	0.0	1.2	7.9	10.4

10.4 IFI projects

Our spending on IFI projects can be summarised into three high level areas:

- Innovation and our current assets
- Managing customer demand through innovation
- Using innovation to release extra capacity in our networks

Table 51 IFI Innovation Expenditure

IFI	2009/10	2010/11	2011/12	2012/13
EPN	1.7	1.6	1.2	1.2
LPN	0.8	1.1	0.8	1.2
SPN	0.8	0.9	0.7	0.7
Total	3.3	3.6	2.8	3.1

10.5 Business as Usual Innovation

Importantly, we have incorporated innovation into our business as usual systems and processes. Table 52 below summarises how we have applied innovation to drive continuous improvements and step changes in performance across all areas of the Business.

Table 52 Application of innovation to improve the way we work across all areas of our business

Decision making	**We have enhanced our decision making processes by applying innovation to improve our data quality and models**
Health and safety	We have improved our safety culture and overall performance by drawing on best practice from within and beyond our own industry. Amongst other things, we have Undertaken a Safety Climate Survey, in conjunction with the Health and Safety Laboratory. Started to roll out a behavioural safety programme across the company
Customer service	We have extended the range of customer communication channels. For example, we now used Twitter to keep customers updated during power cuts. This is an effective tool for communicating with customers given the use of smart phones and has been received positively

Cost efficiencies	We have Implemented a new performance management framework. This improves accountability for the delivery of targets by ensuring that these targets are cascaded appropriately throughout the business at an individual level and that delivery of targets is linked to the company bonus structure. Undertaken a unit cost project that improves cost forecasting. By ensuring the cost of network expenditure is clearly visible and actively tracked we have been able to identify where unit costs can be reduced
Asset management	We have improved our asset management process through improved asset monitoring and condition and performance. Reducing customer power interruptions is our top priority. While our London network has the advantage of underground cabling reducing fault rates, EPN and SPN have a mix of both underground cables and overhead lines. We launched the Overhead Line Incipient Fault Detection project to trial fault.

11 Expenditure

11.1 Overview

This section reviews our expenditure, excluding pensions costs, against allowances.

Our traffic management costs, being those streetworks costs associated with meeting the requirements of the Traffic Management Act (2004) have been seperately identifed.

The table below details the activities covered by the different cost categories.

Expenditure building block	Definition
Load related capex	Required to maintain the overall network risk, based on assessment of network utilisation as measured by the LI. Includes expenditure required to: • Reinforce the network to facilitate new load growth (both demand and generation) • Connect new customers to the network • Provide the required capacity to operate the network securely and efficiently
Non load related capex	Involves activities focused on achieving the following through replacement, refurbishment and maintenance activities: • Maintaining the health of our assets • Minimizing customer interruptions • Ensuring safety of our networks • Accessing private land and reroute networks • Compliance with the Electricity Safety Quality and Continuity of Supply Regulations (ESQCR)
Network operating costs (Opex)	Relates to activities undertaken on the distribution network for: • Network inspection and maintenance • Repairing asset faults • Managing vegetation including tree cutting to ensure sufficient clearance from infrastructure
Indirect costs Closely Associated Indirect Business Support Costs	Costs closely associated indirects are those with supporting direct operations such as : • Management and Supervision • Planning and Design • Vehicles and Transport • Stores Costs associated with business support costs (back office costs) include: • Human Resources • Non-operational training • Finance and regulation • Property management • Information technology

Expenditure building block	Definition
Non-operational capex	Associated with new and replacement assets which are not distribution system assets such as • IT • Vehicles • Property • Tools

11.2 Overall Expenditure (Table 57)

In the following sections expenditure greater than the DPCR5 allowance is coded as red and expenditure that is within allowances is highlighted in green.

This section gives a high level overview of expenditure type against allowances. A more detailed discussion of the elements making up each expenditure type is included in the subsequent sections. All costs and allowances exclude pensions and traffic management charges which are separately discussed.

Total expenditure for the current price control period is expected to be within allowances by £160m (4%). The lower than forecast expenditure in 2010/11 through 2012/13 will be offset by higher expenditure in 2013/14 and 2014/15.

Operational Expenditure (OPEX) has been above allowances for all our DNO networks in the first three years of the current price control period and while we expect to reduce costs in the remaining years of DPCR5, overall costs are forecast to be £113m 14% above allowances.

Operating costs in EPN are expected to be 7% above allowances and LPN and SPN are expected to overspend by 20% and 24% respectively. This is in part due to the change in to reporting all fault costs including replacement of faulted assets against operational fault expenditure.

TMA costs are those streetworks costs associated with meeting the requirements of the Traffic Management Act (2004). These costs result from both capex and opex activities. These are reported separately as streetworks permitting has come in across London and an additional allowance of £7.1m (2007/08 prices) was secured through a reopener in 2012. Total costs for TMA activities are expected to be within allowances.

Operational Expenditure is discussed in more detail in Section 11.3.

Capex expenditure has been below allowances for the first three years of DPCR5 but is expected to rise for the final two years, with overall expenditure being within allowances by £280m 15%. SPN capex expenditure is expected to be within allowances by 23%, LPN capex expenditure within allowances by 16% and EPN capex expenditure within allowances by 6%.

A more detailed explanation of capex costs is included in Section 11.4.

Indirect costs, discussed further in Section 11.5 were significantly during reduced by our Indirect Cost Efficiency Programme between 2009/10 and 2012/13 from £278m to £208m, 12% below allowances. EPN is 8% below allowance, SPN 11% below allowance and LPN 20% below allowance. Costs will rise as we seek to increase front line field supervision as part of our drive to improve both safety and productivity.

Non-operational capex is expected to be £24.2m (15%) above allowances over the DPCR5 period due to the costs of separation of IT systems from EDF Energy as discussed in section 11.6, business transformation costs and increased vehicle and transport costs arising from the insourcing of groundworks contracts in SPN and LPN.

We are expecting to spend £2.5m on smart metering within DPCR5, for which no allowance was made.

11.3 Operation Expenditure Opex (Table 58)

Operating costs (opex) includes fault response and repair, inspections and maintenance of the network, the cutting of trees around overhead lines and the costs of electricity consumed in operational substations.

Faults expenditure has been 20% above allowances for the first three years of DPCR5. UK Power Network has focused on improving our fault restoration performance, making improvements of over 25% between 2009/10 and 11/12. This has had a cost in additional field staff response costs and additional generation costs. Excavation and reinstatement costs represent a significant proportion of these costs and we have insourced a proportion of this activity in SPN as part of an initiative to reduce the costs as fault costs here have been 49% above allowances over the first three years. With the forecast overspend in SPN in 2014/15 being reduced to 3%, the insourcing of groundworks has been extended to LPN. LPNs 2012/13 costs include £1.2 million of atypical costs associated with constraints on daytime working during the Olympic games period which resulted in higher overtime and temporary generation costs.

Fault costs have also increased due to the change in regulatory reporting to include of the costs of replacement for failed equipment to ensure greater consistency, which it has not been possible to reflect in the allowances.

Underlying fault costs are expected to improve over the remainder of DPCR5 but the savings forecast in July have been offset by the costs of the severe weather experienced during the winter of 2013/14 resulting in an overall expenditure forecast to be £83m, 18% above allowances.

Inspection and maintenance costs are forecast to be £59m (36%) above allowances. The majority of the overspend is in EPN (£45m) and is a consequence of verifying and addressing a significant backlog of outstanding defects.

Tree cutting costs are incurred in EPN and SPN to maintain safe clearances between overhead lines and trees to maintain resilience in high winds and prevent trees posing a potential safety risk. We are expecting to underspend allowances by £40m (26%) as a result of our managed service contracts.

Operational electricity expenditure is expected to be £12m above allowances, as a consequence of consumption being billed post separation from EDF Energy.

11.4 Capital Investment Capex (Table 59)

This section covers load related and non-load related investment in the electricity distribution network. High value projects are accounted for in both load and non-load expenditure and are discussed separately at the end of this section.

Load Related Expenditure

Our network loading is forecast to be within our load index targets even though our Load related expenditure is expected to be £268m (35%) within allowances. Some reinforcement schemes have been able to be deferred due to the reduction in demand associated with the difficult economic conditions experienced since the DPCR5 plans were agreed in 2009. We believe that it is right to defer investment where it is not been necessary to meet our Load index targets as under the regulatory sharing incentive in DPCR5, 55% of the associated revenue is returned to customers. This ensures that reinforcement when it is eventually needed is best suited to the circumstances at that time.

Connections related capex net of customer contributions is forecast to be 35% within allowances. There are significant differences across our three distribution networks with EPN expenditure being 15% above allowances, LPN 30% within allowances and SPN 69% within the allowance.

General reinforcement expenditure is forecast to be £122m (29%) within allowance, with the majority of this being in EPN (£79m).

Non-Load Related Expenditure

Overall non load related capex is expected to be £13m (1%) within allowances, with EPN £99m (23%) above allowances, LPN within allowances by £23m (7%) and SPN within allowances by £88m (20%).

Asset replacement expenditure is expected to be within allowances by £53m (7%) with EPN expenditure being over allowance by £58m (24%), LPN within allowances by £38m (15%) and SPN within allowances by £72m (28%). This is an excellent performance as we have delivered more than our target asset health improvement for this expenditure.

This is offset by expenditure on non-load related other (mainly legal and safety and operational IT and telecoms) of £77m (233% of allowance) and expenditure of £18m above allowances to meet the Electricity, Safety, Quality and Continuity Regulations (ESQCR), concerned primarily with overhead line safety clearances and is incurred in EPN and SPN with a deminimis expenditure in LPN.

There were no allowances for Quality of Supply expenditure in DPCR5. UK Power Networks will invest £33m over the DPCR5 period, including the costs of providing remote control on distribution switchgear.

Diversions expenditure is expected to exceed allowances by £7.3m.

High Value Projects

High value projects were established to separately account for projects with expenditure in DPCR5 of over £15m (2007/08 prices).

BT 21C expenditure is to replace hard wired protection communications circuits currently provided by BT which will not be able to be maintained once BTs systems move to fully fibre optic systems by 2018. It is intended to replace these with dedicated communications circuits built into upgraded overhead lines or through dedicated leased 'dark fibre'. The original programme has been delayed as a result of the postponement of reconductoring projects for overhead line reinforcement where synergies were expected. In DPCR5 we expect to spend £31.9m.

Table 53, Table 54 and Table 55 detail the progress in EPN, LPN and SPN respectively for the projects originally forecast for DPCR5.

Table 53 EPN High Value Projects

EPN Project/Scheme Name	Investment Driver	Expected Outcome
Reinforcement of the Lawford/Rayleigh 132kV double Circuit (PNB, PUD,PAE)	General Reinforcement	No expenditure forecast – reinforcement need has not arisen
Proposed Marston 132/33kV Grid S/S - 2 x 90MVA	General Reinforcement	Expenditure in DPCR at £5.8m
Parker Avenue 132/33kV Grid S/S - install grid transformers and 132kV circuits (2x90MVA)	General Reinforcement	No expenditure forecast – reinforcement need has not arisen
Norwich/Earlham 132 kV switchboard and 132kV Cable scheme	Fault Level Reinforcement	Expenditure £30.3m in DPCR5
Eaton Socon 132kV GSP - 3rd SGT and new 132kV GIS switchboard	General Reinforcement	Expected to start in DPCR5 and complete in RIIO-ED1. £4.1m expenditure in DPCR5, £13.3m in RIIO-ED1 completing in 2017/18
Rye House 132kV Grid S/S - Replace switchgear	Fault Level Reinforcement	Project no longer required
BT21C	BT21CN	Expenditure in DPCR5 forecast at £19.7m

Table 54 LPN High Value Projects

LPN Project/Scheme Name	Investment Driver	Expected Outcome
Willesden - Taylors Lane Gibbons Rd link tunnel & FFC Replacement	Asset Replacement	£12.6m expenditure in DPCR5
Construct Finsbury Mkt-Osborn St-Wellclose-Brunswick Wharf Cable Tunnel, Finsbury Mkt-Brunswick Wharf Tunnel: Install 3x132kV ccts	General Reinforcement	Projects combined £5.1 million expenditure in 2014 and 2015
St Pancras: Substation asset replacement and uprating	Asset Replacement	Expected cost £6.4m in DPCR5
Osborn St: Establish new Osborn Street 'B' 132/11kV Substation	General Reinforcement	Expected £19.1m expenditure in DPCR5

LPN Project/Scheme Name	Investment Driver	Expected Outcome
Seacoal Lane (Limeburner Lane): Establish new 132/11kV Substation	General Reinforcement	£21.0m expenditure completing in DPCR5
Brunswick Osborn street tunnel	General Reinforcement	£33.0m expenditure in DPCR5

Table 55 SPN High Value Projects

SPN Project/Scheme Name	Investment Driver	Expected Outcome
PO Route Rebuild	Asset Replacement	Project re phased to include reinforcement and route removal: Expected £5.6m in DPCR5 and £31m proposed in RIIO-ED1
West Weybridge - Replace 132kV Switchgear	Asset Replacement	£13.7m expenditure in DPCR5
BT21C	BT21CN	£12.2m expenditure in DPCR5
SPN: Ashford - Sellindge - 33kV Reinforcement	General Reinforcement	£7.7m expenditure in DPCR5

11.5 Indirect Costs (Table 60)

Indirect costs cover the management and support functions that support operational activities on the network. Closely associated indirect costs are those that directly support operational activities, for example the operational line management and supervision costs, planning, design and project management, network records, vehicles and transport running costs and stores costs. Business support costs include the back office functions of finance, IT, CEO and regulation costs.

The Indirect cost Efficiency programme implemented in UK Power Networks to reduce indirect costs has been successful in reducing the costs of both closely associated indirect costs and business support costs from 15% above allowances in 2010/11 to 18% under allowances in 2012/13 and we expect to outperform allowances by 11% over DPCR5.

Included in the closely associated indirect costs are the workforce renewal costs for recruiting and up skilling operational technicians and engineers. We have a strong commitment to ensuring our workforce is appropriately trained and has sufficient people coming through to maintain a skilled and experience field force and we have spent £6.1m (17%) more than our allowance on these activities in the first three years of the DPCR5 price control.

11.6 Non Operational Capex (Table 61)

Non-operational capex is investment in new tools, vehicles, property and IT.

Over the first three years of DPCR5 expenditure on vehicles was below allowances by £4.2m (19%). We are forecasting that expenditure will be over allowances by £10.5m (29%) by the end of DPCR5. As part of the indirect cost efficiency programme the vehicle fleet was rationalised and reduced in size but costs will be increase by the insourcing f groundworks contracts..

Expenditure on tools is within allowances by 10% over the first three years and we expect to be within allowances at the end of DPCR5.

Property costs have been within allowances for the first three years but we expect costs to increase in the final two years of DPCR5 and exceed allowances by £1.4m (5%).

Separation of our IT systems from EDF Energy has resulted in our IT investment exceeding in allowances by £48m (220% of allowances) over the first three years of DPCR5. The overspend will reduce in 2013/14 and 2014/15, out turning £49m (74%) above allowances.

11.7 Smart Metering

There were no allowances for smart metering although some expenditure will be incurred during DPCR5. This is shown in Table 56 below. This shows the total costs expected and the element of which is funded from allowances.

Table 56 DPCR5 Smart metering costs

2012/13 prices	2010/11	2011/12	2012/13	2013/14	2014/15	Total Costs
EPN	-	-	-	0.3	0.8	1.1
LPN	-	-	-	0.2	0.7	0.8
SPN	-	-	-	0.1	0.4	0.6
UKPN total	-	-	-	0.5	1.9	2.5

Table 57 Overall Expenditure

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total																		
Opex	190.4	155.5	(34.8)	176.4	154.6	(21.8)	178.5	156.1	(22.5)	194.1	156.0	(38.1)	155.3	159.5	4.2	894.7	781.7	(113.0)
Capex	318.8	407.5	88.6	252.2	404.0	151.7	293.4	382.1	88.6	367.8	363.1	(4.7)	420.4	376.5	(43.9)	1,652.7	1,933.1	280.4
Indirects	278.6	241.3	(37.4)	242.2	239.4	(2.7)	208.0	237.0	29.0	222.7	233.9	11.2	227.7	239.3	11.6	1,179.2	1,190.9	11.7
Non op Capex	20.5	32.0	11.5	52.4	31.5	(20.9)	45.6	30.7	(14.8)	35.2	30.7	(4.5)	27.8	32.3	4.5	181.4	157.2	(24.2)
TMA	4.0	4.7	0.7	2.2	4.3	2.1	3.7	4.4	0.7	3.8	4.4	0.5	3.2	4.4	1.2	17.0	22.1	5.1
Smart metering	-	-	-	-	-	-	-	-	-	0.5	-	(0.5)	1.9	-	(1.9)	2.5	-	(2.5)
	812.3	840.9	28.7	725.5	833.8	108.3	729.3	810.2	81.0	823.6	787.9	(35.6)	834.5	812.1	(22.4)	3,925.0	4,085.0	160.0
EPN																		
Opex	90.7	77.8	(12.9)	82.6	78.2	(4.5)	81.8	78.6	(3.2)	89.8	77.8	(12.0)	74.8	79.8	5.0	419.7	392.2	(27.5)
Capex	142.2	164.8	22.6	110.2	151.4	41.2	120.2	145.4	25.2	170.3	145.0	(25.3)	168.3	153.7	(14.6)	711.1	760.3	49.1
Indirects	122.5	100.4	(22.0)	104.8	99.8	(5.0)	90.5	97.9	7.4	89.8	99.3	9.4	92.2	101.5	9.3	499.8	499.0	(0.9)
Non op Capex	7.4	12.4	5.0	22.8	12.6	(10.3)	17.4	12.2	(5.2)	10.4	11.9	1.5	10.2	11.9	1.6	68.3	60.8	(7.4)
TMA	1.2	1.2	(0.0)	0.8	1.1	0.4	1.4	1.1	(0.3)	1.3	1.1	(0.3)	1.1	1.1	(0.0)	5.8	5.6	(0.2)
Smart metering	-	-	-	-	-	-	-	-	-	0.3	-	(0.3)	0.8	-	(0.8)	1.1	-	(1.1)
	363.9	356.5	(7.4)	321.2	343.0	21.8	311.3	335.2	23.9	361.9	335.1	(26.8)	347.5	348.0	0.5	1,705.8	1,717.8	13.1
LPN																		
Opex	45.9	35.6	(10.3)	41.1	35.2	(5.9)	44.0	35.8	(8.2)	47.4	36.5	(10.9)	37.6	37.2	(0.4)	216.0	180.2	(35.7)
Capex	77.1	123.4	46.3	61.8	127.6	65.8	89.0	120.9	31.9	109.4	102.3	(7.1)	141.6	99.0	(42.6)	478.9	573.3	94.4
Indirects	72.1	72.5	0.4	63.2	71.2	8.0	56.8	71.2	14.4	63.2	69.6	6.4	64.2	70.7	6.5	319.6	355.2	35.6
Non op Capex	6.2	8.9	2.7	15.4	8.1	(7.4)	12.3	7.8	(4.5)	14.9	8.2	(6.8)	10.9	9.3	(1.6)	59.8	42.3	(17.5)
TMA	2.1	2.9	0.8	1.2	2.6	1.4	1.9	2.7	0.8	2.2	2.7	0.5	1.8	2.7	0.9	9.1	13.6	4.4
Smart metering	-	-	-	-	-	-	-	-	-	0.2	-	(0.2)	0.7	-	(0.7)	0.8	-	(0.8)
	203.3	243.3	40.0	182.6	244.5	61.9	204.1	238.5	34.3	237.3	219.3	(18.1)	256.8	219.0	(37.8)	1,084.2	1,164.5	81.2

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
SPN																		
Opex	53.8	42.2	(11.6)	52.8	41.3	(11.5)	52.7	41.7	(11.0)	56.9	41.6	(15.2)	43.0	42.5	(0.4)	259.1	209.3	(49.7)
Capex	99.6	119.3	19.7	80.3	125.0	44.7	84.2	115.7	31.5	88.1	115.8	27.7	110.5	123.8	13.3	462.7	599.6	136.9
Indirects	84.1	68.4	(15.7)	74.1	68.5	(5.6)	60.7	67.9	7.2	69.6	64.9	(4.6)	71.3	67.0	(4.3)	359.8	336.7	(23.1)
Non op Capex	6.9	10.7	3.9	14.1	10.9	(3.3)	15.8	10.7	(5.1)	9.9	10.6	0.7	6.6	11.1	4.5	53.4	54.1	0.7
TMA	0.7	0.6	(0.1)	0.3	0.6	0.3	0.4	0.6	0.2	0.3	0.6	0.2	0.3	0.6	0.3	2.0	2.9	0.9
Smart metering	-	-	-	-	-	-	-	-	-	0.1	-	(0.1)	0.4	-	(0.4)	0.6	-	(0.6)
	245.0	241.1	(3.9)	221.6	246.2	24.6	213.8	236.6	22.8	224.9	233.6	8.7	232.2	245.1	12.9	1,137.5	1,202.6	65.7

Table 58 Operational Expenditure

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total																		
Faults	117.2	88.4	(28.8)	103.4	87.4	(16.0)	106.29	88.8	(17.5)	122.3	90.3	(32.0)	81.4	92.9	11.5	530.6	447.8	(82.8)
Insp. & Maint.	43.0	31.4	(11.6)	44.7	31.9	(12.8)	43.11	32.4	(10.7)	43.6	32.9	(10.7)	46.4	33.4	(13.0)	220.8	162.0	(58.7)
Electricity	7.6	3.1	(4.5)	4.2	3.1	(1.1)	5.33	3.2	(2.1)	5.3	3.2	(2.1)	5.3	3.3	(2.0)	27.8	16.0	(11.9)
Treecutting	22.6	32.6	10.0	24.0	32.1	8.1	23.81	31.7	7.9	22.9	29.5	6.6	22.2	30.0	7.8	115.6	155.9	40.3
	190.4	155.5	(34.8)	176.4	154.6	(21.8)	178.55	156.1	(22.5)	194.1	156.0	(38.1)	155.3	159.5	4.2	894.7	781.7	(113.0)
EPN																		
Faults	51.7	42.5	(9.2)	42.6	43.1	0.4	45.76	43.61	(2.1)	52.1	44.2	(7.9)	36.0	45.7	9.7	228.2	219.0	(9.2)
Insp. & Maint.	20.6	10.6	(10.0)	21.8	10.8	(11.1)	17.65	10.92	(6.7)	18.5	11.1	(7.4)	21.1	11.3	(9.9)	99.7	54.6	(45.1)
Electricity	3.4	1.9	(1.6)	1.9	1.9	0.0	2.58	1.91	(0.7)	2.6	1.9	(0.6)	2.6	2.0	(0.6)	13.0	9.6	(3.5)
Treecutting	15.0	22.8	7.8	16.3	22.4	6.2	15.84	22.14	6.3	16.6	20.6	4.0	15.1	20.9	5.9	78.8	109.0	30.2
	90.7	77.8	(12.9)	82.6	78.2	(4.5)	81.83	78.59	(3.2)	89.8	77.8	(12.0)	74.8	79.8	5.0	419.7	392.2	(27.5)

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
LPN																		
Faults	29.9	23.4	(6.5)	27.4	22.8	(4.7)	27.80	23.24	(4.6)	30.7	23.7	(6.9)	21.6	24.2	2.7	137.4	117.3	(20.0)
Insp. & Maint.	13.3	11.6	(1.7)	12.4	11.8	(0.6)	14.56	11.94	(2.6)	15.1	12.1	(3.0)	14.3	12.3	(2.0)	69.7	59.7	(10.0)
Electricity	2.7	0.6	(2.0)	1.2	0.6	(0.6)	1.66	0.64	(1.0)	1.7	0.6	(1.0)	1.7	0.7	(1.0)	8.9	3.2	(5.7)
Treecutting	-	-	-	0.0	-	(0.0)	0.03	-	(0.0)	-	-	-	0.0	-	(0.0)	0.0	-	(0.0)
	45.9	35.6	(10.3)	41.1	35.2	(5.9)	44.05	35.82	(8.2)	47.4	36.5	(10.9)	37.6	37.2	(0.4)	216.0	180.2	(35.7)
SPN																		
Faults	35.5	22.5	(13.0)	33.4	21.6	(11.8)	32.73	21.93	(10.8)	39.6	22.4	(17.2)	23.8	23.0	(0.8)	165.0	111.4	(53.6)
Insp. & Maint.	9.2	9.3	0.1	10.5	9.4	(1.1)	10.90	9.55	(1.4)	9.9	9.7	(0.2)	11.0	9.8	(1.1)	51.4	47.7	(3.7)
Electricity	1.5	0.6	(0.9)	1.1	0.6	(0.5)	1.10	0.65	(0.5)	1.1	0.7	(0.4)	1.1	0.7	(0.4)	5.9	3.2	(2.7)
Treecutting	7.6	9.8	2.1	7.8	9.7	1.9	7.94	9.55	1.6	6.3	8.9	2.6	7.1	9.0	2.0	36.7	46.9	10.2
	53.8	42.2	(11.6)	52.8	41.3	(11.5)	52.67	41.67	(11.0)	56.9	41.6	(15.2)	43.0	42.5	(0.4)	259.1	209.3	(49.7)

Table 59 Capex Expenditure

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total																		
Net connections capex	24.4	17.3	(7.1)	5.9	17.3	11.4	1.6	17.3	15.7	10.2	17.5	7.2	10.1	17.9	7.8	52.2	87.2	35.0
General reinforcement plus	46.5	96.3	49.8	44.8	78.3	33.5	44.9	81.0	36.2	58.8	79.7	20.9	107.7	89.1	(18.6)	302.7	424.5	121.8
High Value Projects	18.7	62.2	43.5	22.1	71.2	49.1	37.9	52.4	14.5	25.5	30.0	4.5	32.1	31.4	(0.7)	136.3	247.2	110.9
Load Related	89.6	175.7	86.1	72.8	166.8	94.0	84.4	150.7	66.4	94.5	127.2	32.7	149.8	138.4	(11.5)	491.2	758.8	267.7
Asset replacement	159.4	156.1	(3.3)	115.2	151.8	36.6	120.7	144.6	23.9	161.3	150.6	(10.7)	149.5	155.7	6.1	706.1	758.8	52.7
Diversions	17.1	16.1	(1.0)	21.0	15.3	(5.6)	15.9	15.0	(0.9)	12.0	15.5	3.5	21.8	18.5	(3.3)	87.7	80.4	(7.3)
QOS	6.4	-	(6.4)	5.6	-	(5.6)	15.8	-	(15.8)	3.9	-	(3.9)	1.6	-	(1.6)	33.3	-	(33.3)
ESQCR	23.8	26.0	2.3	15.0	25.2	10.2	12.3	24.8	12.5	27.4	24.4	(3.0)	26.0	22.0	(4.0)	104.5	122.4	17.9
Rising mains and laterals	0.3	-	(0.3)	0.5	-	(0.5)	1.6	-	(1.6)	1.7	-	(1.7)	2.4	-	(2.4)	6.4	-	(6.4)
HILP and CNI	1.4	-	(1.4)	0.4	-	(0.4)	1.4	-	(1.4)	1.6	-	(1.6)	4.6	-	(4.6)	9.5	-	(9.5)
Flooding	0.1	4.3	4.3	0.8	4.3	3.5	2.9	4.1	1.2	3.3	4.0	0.7	4.2	4.5	0.3	11.4	21.3	9.9
BT 21st Century incl HVP	0.8	3.8	3.0	0.3	6.2	5.9	6.9	12.3	5.4	14.3	14.2	(0.1)	11.5	16.0	4.5	33.8	52.5	18.7
Technical losses and other	4.8	3.4	(1.4)	3.4	4.2	0.9	2.9	4.4	1.4	3.1	4.8	1.7	3.1	3.3	0.2	17.2	20.1	2.9
Non-load-related other	12.3	8.1	(4.2)	9.9	8.0	(1.9)	16.8	6.4	(10.4)	36.1	5.6	(30.5)	34.5	4.9	(29.7)	109.6	32.9	(76.7)
High Value Projects	2.9	14.0	11.1	7.4	22.0	14.7	11.8	19.8	8.0	8.6	16.8	8.2	11.4	13.4	2.0	42.0	86.0	43.9
Non Load Related	229.2	231.7	2.5	179.4	237.2	57.7	209.1	231.3	22.3	273.2	235.9	(37.4)	270.6	238.2	(32.4)	1,161.5	1,174.3	12.8
Total	318.8	407.5	88.6	252.2	404.0	151.7	293.4	382.1	88.6	367.8	363.1	(4.7)	420.4	376.5	(43.9)	1,652.7	1,933.1	280.4
EPN																		
Net connections capex	11.3	4.7	(6.6)	4.6	4.8	0.1	1.0	4.7	3.7	5.4	4.9	(0.5)	5.3	4.9	(0.4)	27.6	24.0	(3.7)
General reinforcement plus	13.0	44.9	31.9	20.2	37.3	17.1	15.6	36.7	21.1	30.3	38.0	7.7	39.1	40.5	1.4	118.2	197.4	79.2
High Value Projects	14.5	28.3	13.8	10.1	24.8	14.7	8.7	17.8	9.1	2.8	15.7	13.0	3.5	24.3	20.8	39.6	110.9	71.3
Load Related	38.8	77.9	39.1	35.0	66.9	31.9	25.38	59.2	33.8	38.5	58.6	20.2	47.8	69.7	21.9	185.5	332.3	146.9
Asset replacement	68.4	53.7	(14.7)	45.6	51.0	5.3	51.7	48.9	(2.8)	74.5	45.7	(28.8)	60.4	43.7	(16.6)	300.6	243.0	(57.7)
Diversions	11.2	9.5	(1.7)	10.3	9.5	(0.7)	7.6	9.6	1.9	6.8	9.6	2.7	12.0	9.6	(2.4)	48.0	47.8	(0.2)
QOS	0.9	-	(0.9)	3.2	-	(3.2)	10.9	-	(10.9)	1.7	-	(1.7)	0.6	-	(0.6)	17.2	-	(17.2)

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
ESQCR	14.4	12.5	(1.9)	8.6	11.1	2.5	9.3	10.7	1.4	18.7	10.3	(8.5)	17.1	9.2	(7.9)	68.1	53.8	(14.3)
Rising mains and laterals	0.0	-	(0.0)	0.2	-	(0.2)	0.1	-	(0.1)	0.4	-	(0.4)	0.6	-	(0.6)	1.3	-	(1.3)
HILP and CNI	-	-	-	-	-	-	0.0	-	(0.0)	0.7	-	(0.7)	3.5	-	(3.5)	4.2	-	(4.2)
Flooding	0.1	1.8	1.8	0.7	1.9	1.3	1.2	1.8	0.7	1.4	1.7	0.3	1.3	1.8	0.6	4.6	9.1	4.5
BT 21st Century incl HVP	0.7	3.1	2.5	0.2	4.5	4.2	5.5	7.2	1.8	9.0	8.3	(0.7)	5.8	9.5	3.7	21.2	32.6	11.4
Technical losses and other	3.2	1.9	(1.2)	1.7	1.8	0.2	1.8	1.8	0.0	1.9	1.8	(0.1)	1.5	1.8	0.3	10.1	9.2	(0.8)
Non-load-related other	4.5	4.2	(0.2)	4.8	4.1	(0.6)	6.8	3.1	(3.7)	15.6	2.7	(12.9)	15.0	2.1	(12.9)	46.6	16.3	(30.3)
High Value Projects	-	-	-	-	0.5	0.5	-	3.1	3.1	0.9	6.3	5.4	2.8	6.3	3.4	3.7	16.2	12.5
Non Load Related	103.4	86.9	(16.5)	75.2	84.5	9.3	94.8	86.2	(8.6)	131.8	86.3	(45.4)	120.5	84.0	(36.5)	525.7	427.9	(97.7)
Total	142.2	164.8	22.6	110.2	151.4	41.2	120.2	145.4	25.2	170.3	145.0	(25.3)	168.3	153.7	(14.6)	711.1	760.3	49.1
LPN																		
Net connections capex	8.3	2.5	(5.9)	(2.2)	2.5	4.7	(1.7)	2.5	4.2	2.1	2.5	0.4	2.2	2.5	0.3	8.7	12.4	3.7
General reinforcement plus	8.2	27.5	19.4	12.2	19.0	6.8	18.4	23.7	5.3	14.2	24.4	10.2	41.3	28.9	(12.4)	94.4	123.6	29.2
High Value Projects	4.1	33.4	29.3	10.5	46.3	35.8	23.9	34.5	10.6	21.9	12.7	(9.2)	28.6	0.6	(28.0)	89.0	127.5	38.5
Load Related	20.7	63.4	42.8	20.5	67.7	47.2	40.60	60.7	20.1	38.2	39.6	1.4	72.1	32.0	(40.0)	192.1	263.5	71.4
Asset replacement	47.5	51.3	3.8	33.0	44.4	11.3	33.1	44.7	11.7	51.4	53.5	2.1	52.1	61.3	9.2	217.1	255.2	38.1
Diversions	0.6	1.0	0.4	1.1	0.8	(0.2)	1.7	0.7	(0.9)	1.7	0.7	(1.0)	2.6	1.1	(1.6)	7.7	4.4	(3.3)
QOS	0.5	-	(0.5)	0.5	-	(0.5)	0.3	-	(0.3)	0.5	-	(0.5)	0.4	-	(0.4)	2.2	-	(2.2)
ESQCR	-	-	-	-	0.1	0.1	-	0.1	0.1	-	0.1	0.1	-	0.1	0.1	-	0.5	0.5
Rising mains and laterals	0.1	-	(0.1)	0.0	-	(0.0)	0.1	-	(0.1)	-	-	-	-	-	-	0.2	-	(0.2)
HILP and CNI	1.4	-	(1.4)	0.4	-	(0.4)	1.4	-	(1.4)	0.3	-	(0.3)	0.5	-	(0.5)	4.0	-	(4.0)
Flooding	0.0	1.1	1.1	0.1	1.0	0.8	1.1	1.0	(0.2)	1.6	0.8	(0.7)	1.4	1.1	(0.3)	4.2	4.9	0.7
BT 21st Century incl HVP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical losses and other	0.4	0.6	0.2	1.2	0.6	(0.6)	0.6	0.6	(0.0)	0.7	0.6	(0.1)	1.1	0.6	(0.5)	4.0	3.0	(1.0)
Non-load-related other	5.8	2.1	(3.7)	2.8	1.7	(1.0)	3.4	1.4	(2.0)	9.0	1.3	(7.7)	7.5	1.3	(6.2)	28.5	7.8	(20.7)
High Value Projects	0.1	3.8	3.7	2.1	11.2	9.1	6.8	11.7	5.0	6.0	5.6	(0.4)	4.1	1.6	(2.4)	19.1	34.1	15.0
Non Load Related	56.4	60.0	3.6	41.2	59.8	18.6	48.4	60.3	11.9	71.2	62.7	(8.5)	69.6	67.0	(2.5)	286.8	309.8	23.0

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total	77.1	123.4	46.3	61.8	127.6	65.8	89.0	120.9	31.9	109.4	102.3	(7.1)	141.6	99.0	(42.6)	478.9	573.3	94.4
SPN																		
Net connections capex	4.8	10.1	5.3	3.5	10.1	6.6	2.3	10.1	7.8	2.8	10.1	7.3	2.6	10.4	7.8	15.9	50.8	34.9
General reinforcement plus	25.3	23.8	(1.5)	12.3	22.0	9.7	10.8	20.7	9.8	14.3	17.3	3.0	27.3	19.7	(7.6)	90.0	103.5	13.5
High Value Projects	0.1	0.5	0.4	1.5	0.1	(1.4)	5.3	0.1	(5.2)	0.8	1.5	0.7	(0.0)	6.5	6.5	7.7	8.7	1.0
Load Related	30.2	34.4	4.2	17.3	32.2	14.9	18.40	30.9	12.5	17.8	28.9	11.1	30.0	36.6	6.7	113.6	163.0	49.4
Asset replacement	43.4	51.1	7.6	36.6	56.5	19.9	35.9	50.9	15.0	35.4	51.4	16.1	37.1	50.7	13.6	188.3	260.6	72.3
Diversions	5.3	5.5	0.2	9.6	4.9	(4.7)	6.6	4.8	(1.8)	3.4	5.1	1.7	7.2	7.9	0.7	32.1	28.2	(3.9)
QOS	5.0	-	(5.0)	2.0	-	(2.0)	4.7	-	(4.7)	1.7	-	(1.7)	0.6	-	(0.6)	13.9	-	(13.9)
ESQCR	9.3	13.5	4.2	6.4	14.0	7.5	3.0	14.0	10.9	8.7	14.0	5.3	9.0	12.7	3.8	36.4	68.2	31.8
Rising mains and laterals	0.3	-	(0.3)	0.3	-	(0.3)	1.4	-	(1.4)	1.2	-	(1.2)	1.8	-	(1.8)	4.9	-	(4.9)
HILP and CNI	-	-	-	-	-	-	0.0	-	(0.0)	0.6	-	(0.6)	0.7	-	(0.7)	1.3	-	(1.3)
Flooding	0.0	1.5	1.4	0.0	1.5	1.4	0.6	1.3	0.7	0.3	1.5	1.1	1.5	1.6	0.1	2.5	7.3	4.7
BT 21st Century incl HVP	0.1	0.6	0.5	0.1	1.8	1.7	1.4	5.1	3.6	5.3	6.0	0.7	5.6	6.5	0.9	12.5	19.9	7.3
Technical losses and other	1.2	0.8	(0.3)	0.5	1.8	1.4	0.5	1.9	1.5	0.5	2.4	1.9	0.5	0.8	0.4	3.1	7.9	4.8
Non-load-related other	2.0	1.7	(0.3)	2.3	2.1	(0.3)	6.6	1.9	(4.7)	11.5	1.5	(9.9)	12.1	1.5	(10.6)	34.6	8.8	(25.7)
High Value Projects	2.8	10.2	7.4	5.2	10.3	5.1	5.0	4.9	(0.1)	1.7	4.9	3.2	4.5	5.5	0.9	19.3	35.7	16.4
Non Load Related	69.4	84.9	15.5	63.0	92.8	29.8	65.8	84.8	19.0	70.3	86.9	16.6	80.5	87.2	6.7	349.0	436.6	87.5
Total	99.6	119.3	19.7	80.3	125.0	44.7	84.2	115.7	31.5	88.1	115.8	27.7	110.5	123.8	13.3	462.7	599.6	136.9

Table 60 Indirect Costs

Closely Associated Indirect costs include workforce renewal, which is detailed separately in a subsequent table.

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total																		
Closely Associated	154.0	152.5	(1.5)	127.7	150.4	22.7	127.7	148.0	20.3	149.3	142.9	(6.4)	151.4	147.2	(4.1)	710.1	741.0	31.0
Business Support	98.3	88.8	(9.5)	88.6	89.0	0.5	72.6	89.0	16.4	68.3	91.0	22.6	71.4	92.1	20.7	399.2	449.9	50.6
CA Atypical	25.1	-	(25.1)	17.6	-	(17.6)	4.2	-	(4.2)	0.3	-	(0.3)	0.3	-	(0.3)	47.5	-	(47.5)
BS Atypical	1.3	-	(1.3)	8.3	-	(8.3)	3.5	-	(3.5)	4.7	-	(4.7)	4.7	-	(4.7)	22.4	-	(22.4)
	278.6	241.3	(37.4)	242.2	239.4	(2.7)	208.0	237.0	29.0	222.7	233.9	11.2	227.7	239.3	11.6	1,179.2	1,190.9	11.7
EPN																		
Closely Associated	70.2	63.2	(7.0)	57.7	62.6	4.9	56.8	61.2	4.3	61.4	61.5	0.1	62.5	63.1	0.5	308.6	311.5	2.9
Business Support	40.4	37.3	(3.2)	36.9	37.2	0.2	31.1	36.8	5.7	26.9	37.8	10.9	28.1	38.5	10.4	163.4	187.4	24.0
CA Atypical	11.0		(11.0)	6.7		(6.7)	1.1		(1.1)	-		-	-		-	18.8	-	(18.8)
BS Atypical	0.8		(0.8)	3.5		(3.5)	1.5		(1.5)	1.6		(1.6)	1.6		(1.6)	9.0	-	(9.0)
	122.5	100.4	(22.0)	104.8	99.8	(5.0)	90.48	97.9	7.4	89.8	99.3	9.4	92.2	101.5	9.3	499.8	499.0	(0.9)
LPN																		
Closely Associated	34.7	45.9	11.3	30.0	44.8	14.8	32.22	44.6	12.4	41.0	42.7	1.6	41.3	43.9	2.7	179.2	221.9	42.8
Business Support	30.2	26.5	(3.6)	26.1	26.4	0.3	21.64	26.5	4.9	21.1	27.0	5.8	21.9	26.8	4.9	120.9	133.3	12.3
CA Atypical	7.0		(7.0)	4.9		(4.9)	2.02		(2.0)	-		-	-		-	13.9	-	(13.9)
BS Atypical	0.2		(0.2)	2.3		(2.3)	0.93		(0.9)	1.1		(1.1)	1.1		(1.1)	5.5	-	(5.5)
	72.1	72.5	0.4	63.2	71.2	8.0	56.81	71.2	14.4	63.2	69.6	6.4	64.2	70.7	6.5	319.6	355.2	35.6

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
SPN																		
Closely Associated	49.1	43.4	(5.8)	40.0	43.1	3.0	38.64	42.2	3.6	46.9	38.7	(8.2)	47.6	40.2	(7.3)	222.3	207.6	(14.7)
Business Support	27.7	25.0	(2.7)	25.5	25.4	(0.1)	19.90	25.7	5.8	20.3	26.2	5.9	21.4	26.8	5.4	114.9	129.2	14.3
CA Atypical	7.0		(7.0)	6.1		(6.1)	1.08		(1.1)	0.3		(0.3)	0.3		(0.3)	14.8	-	(14.8)
BS Atypical	0.2		(0.2)	2.5		(2.5)	1.10		(1.1)	2.0		(2.0)	2.0		(2.0)	7.8	-	(7.8)
	84.1	68.4	(15.7)	74.1	68.5	(5.6)	60.73	67.9	7.2	69.6	64.9	(4.6)	71.3	67.0	(4.3)	359.8	336.7	(23.1)

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			2014/15		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Workforce renewal element																		
EPN	6.1	4.3	(1.7)	6.0	4.7	(1.3)	5.5	3.5	(1.9)	4.7	3.7	(1.0)	5.3	4.0	(1.3)	27.5	20.2	(7.3)
LPN	4.0	3.6	(0.4)	3.7	3.6	(0.2)	3.5	2.8	(0.7)	3.8	3.4	(0.5)	3.7	3.6	(0.1)	18.8	16.9	(1.9)
SPN	4.1	4.7	0.5	4.8	4.3	(0.5)	3.9	4.0	0.1	4.2	3.9	(0.4)	5.1	4.0	(1.2)	22.2	20.8	(1.4)
Total	14.2	12.6	(1.6)	14.5	12.6	(1.9)	12.9	10.3	(2.6)	12.7	10.9	(1.9)	14.2	11.5	(2.6)	68.5	57.9	(10.6)

Table 61 Non Operational Capex

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
Total																		
Vehicles	3.9	7.4	3.5	3.4	7.3	3.9	10.3	7.1	(3.2)	16.1	7.1	(9.0)	13.2	7.5	(5.7)	46.9	36.4	(10.5)
Tools	3.7	5.2	1.5	3.9	5.2	1.3	6.2	5.0	(1.2)	5.0	5.0	0.0	5.0	5.3	0.3	23.7	25.7	1.9
Property	5.0	5.9	0.9	4.8	5.8	1.0	3.1	5.7	2.6	9.8	5.7	(4.2)	7.6	5.9	(1.7)	30.4	29.0	(1.4)
IT	8.6	13.5	4.9	44.3	13.2	(31.1)	34.5	12.9	(21.7)	15.9	12.9	(3.1)	11.2	13.7	2.4	114.6	66.0	(48.6)
Allocations/?	(0.7)	-	0.7	(4.0)	-	4.0	(8.6)	-	8.6	(11.7)	-	11.7	(9.2)	-	9.2	(34.2)	-	34.2
	20.5	32.0	11.5	52.4	31.5	(20.9)	45.6	30.7	(14.8)	35.2	30.7	(4.5)	27.8	32.3	4.5	181.4	157.2	(24.2)

2012/13 prices	2011/12			2011/12			2012/13			2013/14			2014/15			DPCR5		
£m	Actual	Allowed	Var	Actual	Allowed	Var	Actual	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var	Forecast	Allowed	Var
EPN																		
Vehicles	1.5	2.8	1.3	1.1	2.8	1.7	2.7	2.7	0.1	4.5	2.7	(1.8)	6.1	2.7	(3.4)	15.8	13.8	(2.0)
Tools	1.7	2.3	0.6	2.1	2.3	0.2	1.9	2.2	0.4	1.9	2.2	0.3	1.9	2.2	0.3	9.5	11.3	1.8
Property	0.9	2.3	1.5	1.7	2.4	0.6	1.5	2.3	0.7	1.3	2.2	0.9	0.7	2.2	1.5	6.2	11.4	5.3
IT	3.7	5.0	1.3	19.5	5.0	(14.5)	14.4	4.9	(9.6)	6.8	4.8	(2.0)	4.8	4.8	(0.0)	49.2	24.4	(24.7)
Allocations/?	(0.3)		0.3	(1.7)		1.7	(3.1)		3.1	(4.0)		4.0	(3.2)		3.2	(12.3)	-	12.3
	7.4	12.4	5.0	22.8	12.6	(10.3)	17.4	12.2	(5.2)	10.4	11.9	1.5	10.2	11.9	1.6	68.3	60.8	(7.4)
LPN																		
Vehicles	1.1	1.9	0.8	1.1	1.7	0.6	2.4	1.7	(0.7)	4.8	1.7	(3.0)	2.7	2.0	(0.8)	12.1	9.0	(3.0)
Tools	0.9	1.3	0.4	0.9	1.2	0.3	1.8	1.2	(0.6)	1.6	1.2	(0.4)	1.6	1.4	(0.2)	6.8	6.4	(0.5)
Property	1.6	1.1	(0.4)	2.2	1.0	(1.2)	1.0	1.0	(0.0)	7.8	1.1	(6.8)	6.5	1.2	(5.3)	19.1	5.4	(13.7)
IT	2.9	4.5	1.6	12.6	4.1	(8.5)	10.0	4.0	(6.1)	4.5	4.1	(0.4)	3.1	4.7	1.6	33.1	21.4	(11.7)
Allocations/?	(0.3)		0.3	(1.4)		1.4	(2.9)		2.9	(3.8)		3.8	(3.0)		3.0	(11.4)	-	11.4
	6.2	8.9	2.7	15.4	8.1	(7.4)	12.3	7.8	(4.5)	14.9	8.2	(6.8)	10.9	9.3	(1.6)	59.8	42.3	(17.5)
SPN																		
Vehicles	1.3	2.7	1.4	1.2	2.7	1.6	5.3	2.7	(2.6)	6.9	2.7	(4.2)	4.4	2.8	(1.6)	19.1	13.7	(5.4)
Tools	1.1	1.6	0.5	0.8	1.6	0.8	2.6	1.6	(1.0)	1.5	1.6	0.1	1.5	1.6	0.2	7.4	8.0	0.6
Property	2.6	2.4	(0.2)	0.9	2.4	1.6	0.6	2.4	1.9	0.7	2.4	1.7	0.4	2.5	2.1	5.1	12.2	7.0
IT	2.0	4.0	2.0	12.2	4.1	(8.2)	10.1	4.0	(6.0)	4.7	4.0	(0.7)	3.3	4.1	0.8	32.3	20.2	(12.1)
Allocations/?	(0.2)		0.2	(0.9)		0.9	(2.6)		2.6	(3.8)		3.8	(3.0)		3.0	(10.6)	-	10.6
	6.9	10.7	3.9	14.1	10.9	(3.3)	15.8	10.7	(5.1)	9.9	10.6	0.7	6.6	11.1	4.5	53.4	54.1	0.7