NORTHERN POWERGRID

Delivering on our promises

Stakeholder report 2017-18

Performance snapshot[1]

Network

Network	Actual 2017-18	Trend[2]
Number of customers	3.9m	▲
Total DNO network length	96,024km	▲

Reliability & Availability

Reliability and Availability			Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Customer interruptions[4]	Northeast	Inc. exceptional events	50.1			▲
		Exc. exceptional events	49.7	58.6	Achieved	▲
	Yorkshire	Inc. exceptional events	50.5			▲
		Exc. exceptional events	46.8	64.7	Achieved	▲
Customer minutes lost[4]	Northeast	Inc. exceptional events	41.4			▲
		Exc. exceptional events	39.9	52.7	Achieved	▲
	Yorkshire	Inc. exceptional events	37.7			▲
		Exc. exceptional events	33.1	55.2	Achieved	▲
Incentive performance reward/(penalty) – IIS[5]		£m	**£22.3m**			
		£/customer bill	**£2.68**			

Customer Satisfaction

Customer Satisfaction		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Overall Broad Measure of Customer Satisfaction score out of ten (rank out of six)[6]		8.63 (4th)	8.2	Achieved	▶◀
Incentive performance reward/(penalty) – BMCS[7]	£m	**£2.97m**			
	£/customer bill	**£0.36**			

Connections

Connections		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Time-to-quote (days)[8]		7.9	8.2	Achieved	▼
Time-to-connect (days)[8]		49.6	42.1	Missed	▼
Incentive performance reward/(penalty) – connections lead time	£m	**£0.09m**			
	£/customer bill	**£0.01**			
Incentive on Connections Engagement penalty – ICE (if applicable)	£m	**Nil**			
	£/customer bill	**Nil**			

Social Obligations

Social Obligations		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Individual Stakeholder Engagement and Consumer Vulnerability (SECV) score out of ten (rank out of six)		7.5 (2nd)			▲
Incentive reward	£m	**£1.89m**			
	£/customer bill	**£0.23**			

Financials

Financials		Northeast	Yorkshire	Overall
Unrestricted domestic tariff charge		£80.67	£67.28	
Total expenditure	£m	£157.3m	£196.7m	**£354.0m**
	% of cost allowances	95%	89%	**91%**
	% of cost allowances (ED1 to date)	96%	92%	**94%**
	% of allowed revenue	63%	61%	**62%**
Dividends paid[9]		£22.7m	£29.8m	**£52.5m**
Gearing[10]		49.4%	46.8%	**60.0%**
Credit rating[11]		A3/A/A-	A3/A/A-	**Baa1/A/BBB+**
Notional RoRE (including holdco debt for overall) (vs Ofgem assumption of 6%)[12]		8.8%	8.4%	**8.3%**

Innovation

In the year, we spent our full £4.1m Network Innovation Allowance. Our diverse innovation portfolio contains 26 projects that span our four innovation priorities for ED1: building our smart grid, delivering smart meter benefits, developing our digital services and improving affordability.

Safety

Our long-term safety performance is strong and continues to place us in the leading pack among our peers. We narrowly missed our annual headline safety target for Northern Powergrid as a whole in 2017-18, measured by the Occupational Safety and Health Administration (OSHA) rate – 0.35 against a target of 0.31 – representing eight reportable incidents in a workforce of more than 2,700.

Environmental Impact

We achieved our oil leakage and business carbon footprint targets for 2017-18. We are also ahead of our target in putting overhead lines underground in National Parks (NP) and Areas of Outstanding Natural Beauty (AONB) in the ED1 period to date.

Notes:
1 All financial figures in 2012/13 prices and refer to Northern Powergrid overall unless otherwise stated. The performance of each licensee is shown in the Annex to this report.
2 Trend ▲ getting better ▼ getting worse ▶◀ staying the same since 2016-17.
3 Ofgem target (see sections in the main body of the report for performance against our own targets).
4 Unplanned & unweighted figures. Indicative figures as at July 2018, figures still to be confirmed by Ofgem.
5 Excluding Guaranteed Standards payments.
6 Broad Measure of Customer Satisfaction (BMCS) rank indicative only based on monthly data. Final ranking to be confirmed by Ofgem.
7 Does not include SECV reward.
8 LVSSA (single minor connections).
9 Dividends paid figures for Northeast, Yorkshire and Overall relate to dividends from the licensee companies in the year.
10 Gearing figures for Northeast and Yorkshire relate to gearing of the licensee companies. Overall gearing relates to the Northern Powergrid group and includes debt over and above the licensee companies that was utilised to fund the distribution business.
11 Credit ratings for Northeast and Yorkshire relate to scores for three credit rating agencies (Moody's/Standard and Poor's/Fitch) for the licensee companies. Overall relates to Northern Powergrid Holdings Company.
12 In setting the price control, Ofgem assumed a base RORE of 6% with the opportunity for companies to exceed or fall below this depending on performance. Ofgem is currently revising the basis upon which RORE is calculated, which will result in a recalculation of these figures.

CEO foreword

I'm pleased to report a strong performance in 2017-18, the third year of the eight-year price control that takes us to 2023. We're pleased to remain on track to give our customers more for less – which is the promise we made at the outset. We continue to deliver across our key output areas, all while keeping costs inside the tough allowances set by our regulator.

Our 'more for less' commitment included a 10% price cut for customers from day one, followed by:
— shortening power cuts by 20% and reducing the number of times they occur by 8%;
— a 30% reduction in lead times for new connections;
— 50% lower accident rates;
— a 15% reduction in oil leakage; and
— a 10% improvement in our carbon footprint.

We expect to meet, and in many cases exceed, our targets. As we approach the halfway stage in the price control, we are on track or ahead of plan in most cases. Some of the commitments we made still require us to improve some more, but our plans are well established.

Our performance on power cuts continues to be a highlight for us. Our current performance levels represent a 26% reduction in the number of power cuts and a 38% reduction in their duration since the start of the period, achieving our Ofgem targets whilst also performing at levels that would achieve the regulatory targets we were set for 2023. It's fair to say that we have generally enjoyed favourable weather conditions in recent years, but those numbers are reflective of genuine underlying improvement.

And we haven't had it at all our own way. The winter storms in the early part of 2018 were a reminder of the impact that adverse weather can have. They also served to demonstrate the marked improvement in resilience that our team has achieved over the medium term – in both our network and our back office systems. You can count on us to remain focused on finding further improvements throughout the period.

Customer service is the area where we have most distance still to travel to achieve our goals. Our aim is to give our customers the best levels of service in the industry. We have improved significantly since the start of the period but our improvement in 2017-18 levelled off after a few years of improvement. But there is more to come as we move into a phase where we will capitalise on some customer-facing technology investments we have made in the past few years.

Making the powergrid and the way we operate it smarter and more flexible remains one of our top strategic priorities. Our transition to a Distribution System Operator (DSO) is key to our sector's contribution to the low carbon agenda – and we intend to be a leader in that respect. To that end, we are delivering the smart grid investments we set out in our plan, modernising our network's control and monitoring capabilities. Flexible solutions such as active network management are being deployed as business-as-usual to reduce costs and release network capacity for customers. Alongside this, our systems and processes are ready for us to start realising the benefits of smart meters for our customers. It's an exciting time to be running a power network.

As all this unfolds, we continue to engage with our stakeholders to fine tune our plans; an approach that remains central to ensuring that our long-term business plan delivers for our customers.

At the same time as evolving our network, we continue to invest in our organisation to manage emerging risks on behalf of our customers. Cyber security is one of the top priorities in that respect. We have significantly stepped up our IT security defences over the last two years and we expect that trend to continue.

Regionally, we believe we have a significant role to play in the development of the Northern Powerhouse. We are a major employer and take our responsibility very seriously to recruit a diverse workforce that can serve our customers today, whilst playing our part in supporting education across our region to develop the workforce of the future. We see this as part of our role in the region to support the fundamentals of economic growth.

We're proud of what we've achieved so far for our customers – and are looking forward to building on the foundation we've built to go further.

Phil Jones
Chief Executive

We distribute power to 3.9 million homes and businesses through our network of more than 63,000 substations, almost 60,000 miles of overhead lines and underground cables, spread over 9,650 square miles.

Your at a glance guide

What we do

Northern Powergrid is responsible for the electricity network that keeps the lights on for 8 million customers across the Northeast, Yorkshire and northern Lincolnshire.

Our dedicated team of more than 2,700 employees operate 24 hours a day, 365 days a year – no matter what the circumstances – to maintain a safe, reliable and efficient electricity supply.

Our customers pay their energy supplier for the electricity they use. A small proportion of the money they pay as part of their electricity bill comes to us to cover the cost of keeping the network running safely, reliably and efficiently.

Our customers

We're committed to looking after our customers and you'll read in this report about what we're doing to improve customer service, support our local communities, and look after vulnerable customers when they need us the most.

Our stakeholders

We work with our stakeholders to shape our plans to make sure that our services continue to respond to the evolving needs of the regions we serve. As part of our annual business planning process, we hold a series of focused stakeholder sessions where we discuss challenges that we're facing and seek input as well as inviting views more broadly on what they think we should prioritise. We have found this approach extremely valuable in helping guide our business planning.

Our region

We are proud of the vital role that Northern Powergrid plays in the infrastructure of the north of England. We play an active role in supporting the development of the regional growth agenda through our support of Business North, our sponsorship of the Northern Energy Taskforce, and through our Infrastructure North utility partnership with Northern Gas Networks, Yorkshire Water and Northumbrian Water.

This report

Back in 2014, we published our business plan for 2015-2023. This plan set out what we aim to achieve in this eight-year period for which our regulator, Ofgem, has set what we are allowed to earn. You can access our plan at **yourpowergridplan.com**

We are three years into the eight-year period covered by our plan and we're making good progress across the range of commitments we made. In this report, we provide an update on how we're doing against our business plan commitments that run through to 2023.

You can access more information on Environment and Innovation, Connections Engagement and Stakeholder Engagement and Consumer Vulnerability by visiting: **northernpowergrid.com/yourpowergrid**

The energy system is changing – more renewable generation; energy storage; electric vehicles; smart meters and appliances – all require a more flexible and actively managed Powergrid.

You can find out more on how we are gearing up for the future at: northernpowergrid.com/yourpowergrid

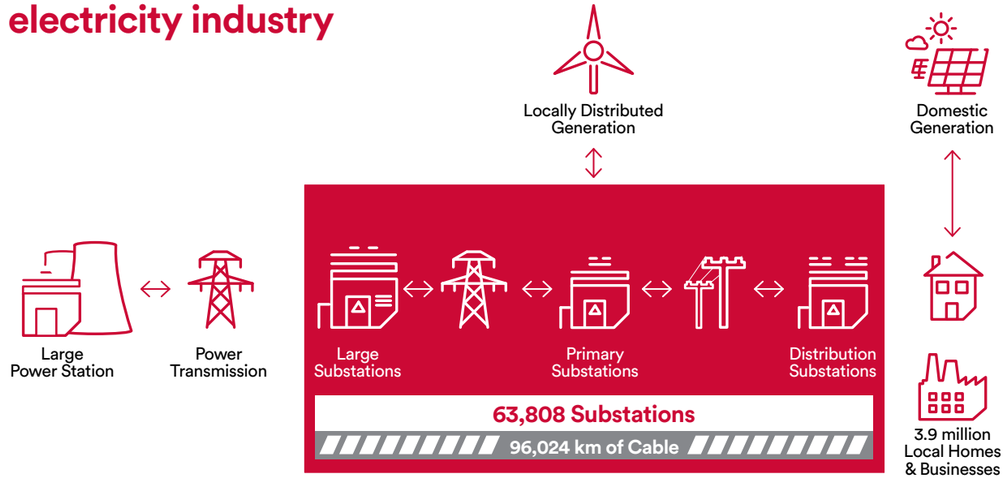
Northern Powergrid at a glance

8 million
customers.

Over 2,700
employees.

3.9 million
homes and businesses powered.

Where we fit in the electricity industry



Running a safe and secure network

“Given the importance of the service we deliver, our customers and stakeholders rightly expect us to set the very highest standards in running a safe and secure network.”

Geoff Earl
Director of Safety, Health and Environment

The safety of our staff, our customers and our communities is of paramount importance to us. We remain one of the safest businesses in our sector and we are on track to achieve our RIIO-ED1 safety targets.

Our commitments

Keeping our customers, employees and contractors safe is our number one priority. Our long-term safety performance is strong and places us in the leading pack among our peers. 2017-18 was a disappointing year in terms of performance against our headline accident rate targets but we remain on track to halve our accident rate during this eight-year regulatory period, having achieved a 19% reduction to date. We have continued to raise awareness in both educational and agricultural settings around the dangers of mishandling electricity, and we continued to support the safe roll-out of smart meters across our region.

How we’ve done in 2017-18

We narrowly missed our headline safety target which is measured by the Occupational Safety and Health Administration (OSHA) rate – scoring 0.35 against a target of 0.31. That score translates into eight incidents for a workforce of more than 2,700. We also received a minor enforcement notice relating to excavations performed by a contractor organisation. Pleasingly our 2018-19 performance to date is much improved.

Driver safety is also a priority and since the start of this regulatory period we’ve seen an improvement in the rate of preventable vehicle accidents (PVAs). In 2017-18 we incurred 29 PVAs from a fleet of vehicles that covers more than 21 million miles each year. We continued to invest in driver training, vehicle telematics and in-cab cameras and we expect to see this further improve driver safety.

Our campaign to raise awareness about the potential dangers of electricity expanded again this year. Our school safety awareness programme has now reached 32,723 children across 259 schools, which is a 16% increase on 2016-17, although below our ambitious target of 40,000 children. Our Crucial Crew partnership with the police, fire brigade and drugs awareness teams reached around 41,000 children and we launched our new website, Education, replacing our previous website, Fusebox, offering educational resources for children about the dangers of electricity if not handled correctly.

We also continue to engage with the agricultural community and road hauliers to raise awareness of the dangers associated with operating large vehicles near overhead lines. We attended the major agricultural shows across our region, hosting a stand staffed by representatives from different areas of our business. We carried out live demonstrations of overhead line work and what to do if your vehicle comes into contact with overhead lines. We were also able to reach over 80% of hauliers in our region by presenting at various road haulage conferences throughout the year.

The roll-out of smart meters is a huge national programme and presents a safety risk on our network if not done properly. We have put in place safety training requirements and standards for anyone installing smart meters on our network and participated in industry best practice sharing to make sure that as the smart meter roll-out programme picks up pace, it does so safely.

As well as making sure that our network and people are safe, we want to make sure that our IT network is secure against cyber threats. We have significantly upgraded our cyber capabilities to make our network more resilient. This has caused us to spend more than we expected when we wrote our business plan, however, we are planning to offset these costs with efficiency savings to ensure we keep our costs down for customers.

Looking ahead

We will always be looking to improve our safety performance, increase awareness about the importance of safety around our powergrid infrastructure and improve cyber security. Internally, this means continued vigilance, training and strict reporting mechanisms. Externally, we will continue to deliver our awareness programmes but always with a view to doing more.

32,723 children
engaged about staying safe around the electricity distribution network.

776 field engagement visits
conducted by our senior managers during the year.

80% of road hauliers
engaged about moving large vehicles near overhead lines.

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 38

Increase awareness in our communities of the dangers of electricity if not handled properly.
On Track

Promptly resolve any network safety issues arising from the smart meter roll-out.
On Track

Keep safety as a central driver of investment decisions and appraisals.
On Track

Remain a leading safety performer, meeting all requirements and halving our accident rate by 2023.
On Track

Reduce the impact of metal theft, including improving substation security.
On Track

Our performance measures	2016-17 actual	2017-18 actual	2017-18 target	Annual status	2018-19 target	ED1 target	Trend
OSHA rate	0.34	**0.35**	**0.31**	Missed	0.31	0.22	▼
RIDDOR rate	0.20	**0.24**	**<0.10**	Missed	<0.10	<0.10	▼
School-age pupils reached by our school safety programme	28,246	**32,723**	**40,000**	Missed	40,000	40,000	▲
High voltage overhead line contacts by HGVs, construction vehicles and farm machinery	37	**33**	**<20**	Missed	<20	<20	▲
Electrical safety promotion at agricultural shows (days)	8	**8**	**8**	Achieved	8	8	▶◀

▲ improving ▼ worsening ▶◀ staying the same

Training
Our senior management received mental health awareness training.

29
Preventable vehicle accidents across a fleet covering more than 21 million miles each year.

Order of distinction
awarded by the Royal Society for the Prevention of Accidents for our long-term safety performance.

Committed to keeping the lights on

"We continue to make good progress in investing to improve the performance of our network and to modernise it for the future smarter world for our customers."

Mark Drye
Director of Asset Management

Power cuts impact the lives of our customers. We're making our network more reliable and our response to power cuts faster to cut down the amount of time our customers are without power.

Our commitments

We committed to reducing the number of power cuts our customers experience by 8% and the amount of time the power is off by 20% during the eight-year RIIO-ED1 regulatory period. We're pleased to report that, for the third year in a row, we've outperformed these targets. We also committed to making our network more resilient and we're not only ahead of our target for this, we're planning to go even further in ED1 than our original plan.

How we've done in 2017-18

We outperformed our headline commitments of 8% fewer and 20% shorter power cuts, achieving 26% fewer and 38% shorter power cuts in 2017-18 (relative to our ED1 business plan baseline). We achieved this through investment in smart technology such as automatic fault restoration and remote control, alongside increasing our use of temporary mobile generation. We also continue to see the benefits of our localised operating model which keeps our teams near our customers so that we can respond more quickly and effectively when required.

When a power cut does happen, we aim to get power restored within 12 hours. In 2017-18, the amount of customers who experienced a power cut which lasted longer than 12 hours fell by 3.1%.

We continued to make our network more resilient to flooding by delivering flood defences at 64 sites – ahead of our target of 31 – taking our total to 119 for the regulatory period to date. Our original commitment was 141 sites (plus 15 from the previous price control period); however, since then new national guidelines (ETR138) and our own review of flood maps in our region means we've added 98 sites to our programme. We now plan to upgrade flood defences at 254 sites by 2023, significantly more than in our ED1 business plan.

Some customers experience more problems with their power than others and we're aiming to improve these underperforming areas of our network. On our high voltage network, we've targeted use of Automated Power Restoration Systems (APRS) technology, which automatically reconfigures the network in response to faults. In 2017-18, we installed the technology at 46 substations, taking our ED1 total to 126. We're on track to roll out APRS solutions to 306 substations by 2023. On the low voltage network, we're deploying smart fuses and distance to fault technology.

On our journey towards a customer-led smart grid, we're making sure there's enough network capacity for customers to connect low carbon technologies (LCTs) such as solar panel systems and electric vehicles. We're reviewing peak demand across all major substations and calculating future demands to make sure we have enough capacity for new connections. We are also deploying our replicable Active Network Management Solution in Driffield and our programme to reduce voltages at our substations so that more distributed generation can connect onto the network. So far our voltage reduction programme has released over 1.6GW of capacity for the connection of LCTs on our network.

Although the national smart meter roll-out programme is running significantly behind forecast, we're ready to deliver benefits for customers. We secured connection to the national central systems in November 2017 and the first set of smart meters has been registered, although the number of second generation meters installed in our region remains low.

Looking ahead

The next step is to build on what we've achieved and to make these service levels the new normal for our customers. We're looking for ways to use new technology and innovative solutions to improve our service further as we transition to our new role as distribution system operator. Once we start to receive a meaningful amount of smart meter data, we will use it to give us more information about management of power cuts and to plan our investments.

26% fewer
unplanned power cuts.

38% shorter
unplanned power cuts.

Smart Meter
We're SMETS2
Smart Meter ready!

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 39

Restore electricity within 12 hours. (If we don't, make enhanced and automatic payments to all customers (with extra for our vulnerable customers).
✓ Delivered

Planned power cuts to leave customers without power for less time, particularly during winter.
✓ On Track

Maintain the underlying health of the asset base and report on it annually.
✓ On Track

Reduce the average length of unplanned power cuts by 20% by 2023.
✓ Ahead

Achieve 8% fewer unplanned power cuts by 2023.
✓ Ahead

Target network improvements for our worst-served customers.
✓ On Track

Ensure adequate network capacity for customers wanting to connect.
✓ On Track

Increase the resilience of the network to flooding.
✓ Ahead

Stretch Target:
Additional 98 sites added to our ED1 programme

Use smart meter alarm information to improve network performance and the information we provide to customers.
✓ On Track

Our performance measures	2016-17 actual	2017-18 actual	2017-18 target	Annual status	2018-19 target	ED1 target	Trend
Unplanned customer minutes lost (Northeast)[1]	37.6	**39.9**	**52.7**	✓ Achieved	51.7	47.9	▼
Unplanned customer minutes lost (Yorkshire)[1]	35.0	**33.1**	**55.2**	✓ Achieved	54.1	50.0	▲
Unplanned customer interruptions (Northeast)[1]	50.3	**49.7**	**58.6**	✓ Achieved	58.3	57.1	▲
Unplanned customer interruptions (Yorkshire)[1]	47.4	**46.8**	**64.7**	✓ Achieved	63.7	60.0	▲
Planned customer minutes lost (Northeast)[1]	7.4	**4.8**	**9.2**	✓ Achieved	7.4	6.3	▲
Planned customer minutes lost (Yorkshire)[1]	3.0	**3.3**	**5.0**	✓ Achieved	3.9	3.4	▼
Planned customer interruptions (Northeast)[1]	3.0	**2.1**	**3.6**	✓ Achieved	3.1	2.7	▲
Planned customer interruptions (Yorkshire)[1]	1.2	**1.3**	**1.8**	✓ Achieved	1.5	1.3	▶◀
Cumulative number of permanent flood defences installed[2]	55	**119**	**113**	✓ Achieved	192	254	▲

[1] Excluding exceptional events. Targets set by Ofgem. 2017-18 based on Ofgem's indicative figures as at July 2018, final figures still to be confirmed by Ofgem.
[2] Targets shown based on stretch targets. Original ED1 business plan target was 141 in total.

▲ improving ▼ worsening ▶◀ staying the same

126 substations
with APRS installed to improve performance.

98 sites
added to our ED1 flood defence programme.

1.6GW
of capacity released for customers to connect generation via voltage reductions in the ED1 period to date.

Major Incident Management Plans

Always open for business – no matter what the circumstances.

We are responsible for keeping the electricity distribution network running safely, reliably and efficiently. We are open for business every hour of every day, 365 days a year – no matter what the circumstances.

During 2018, storms like 'The Beast from the East' caused disruption to thousands of homes and businesses across our region. We monitor weather conditions 24/7 so we know when a weather front is coming and our Major Incident Management Plans kick in. In partnership with emergency services and local resilience forums, we coordinate our response so that we can support our customers and restore supplies as soon as possible.

The success of our response is built on the commitment of our teams. During these events, our front line operations teams head out into the storms to begin repairing the network and our network control, dispatch and customer contact teams, assisted by support from the wider business, work extra shifts to support them. We use our customer support vehicles to support the communities affected and deploy specialist equipment, including helicopters, to help us quickly pinpoint the damage on the overhead network.

The Distribution Network Operators (DNOs) in the UK and Ireland are also part of an arrangement called NEWSAC. This arrangement allows for companies to send staff to another DNOs region to help in their restoration efforts when required. Since the start of the ED1 period we have exported 8,306 staff hours to help other UK network operators and have also provided support further afield. In September 2017, we sent a small group of our most experienced engineers to the British Virgin Isles, at the request of Government, to assist with the response to Hurricane Irma.

Electrical connections in tower blocks

Improving electrical connections in high-rise tower blocks.

We take our responsibility to operate a safe electricity distribution network very seriously. In the lead up to publishing our ED1 business plan, we reviewed the elements of electricity supply to multi-occupancy high-rise properties at 4,000 locations in our region. Based on the outcome of this review, we committed to refurbish the network within 125 multi-occupancy high-rise properties at a cost of £7.2m over the eight-year period.

Our programme is running to plan. We are currently finalising a contract with Leeds City Council that will result in the refurbishment of 48 properties. We have identified a further 24 properties for which a contract will be awarded in 2019. We will continue working with local councils to identify the properties that require work across our distribution service area to deliver on our commitment.

Focused on improving customer service

“We’ve invested in both our people and technology – expanding our Customer Service team and providing new digital channels for customers.”

Neil Applebee
Director of People
& Customer Service

We continue to develop new and improved services for our customers and we’re delighted that to see that reflected in our customer satisfaction scores.

Our commitments

We’re committed to making sure our customers get the best possible service. During 2017-18, we expanded our customer Contact Centre team, enhanced our Quality Framework coaching tool for delivering 10/10 customer conversations and invested in technology to improve the services we offer.

How we’ve done in 2017-18

We’re pleased to have maintained a score of 86.3% in 2017-18, which represents a 5% improvement since April 2015.

We continue to explore ways to make it easier for our customers to get in touch with us and access the information they need. We’ve taken on new frontline team members in our Contact Centre, enabling us to increase the number of incoming calls we answer within five rings by 2.2% and increase the number of unplanned power cut calls answered by 1.7%. We experienced a significant increase in calls due to the effects of the ‘Beast from the East’ storm-front and other severe weather events. We have also experienced higher call volumes as customers become more familiar with the national ‘105’ power cut number.

If one of our vulnerable customers registered on our Priority Services Register calls in, we make sure that they are put straight through to a dedicated member of our customer service team and bypass the Interactive Voice Response (IVR) system. This way we are able to provide a tailored service that responds to their specific needs during a power cut.

We are also finding new ways to use digital technology to improve the service our customers receive. We launched our web chat facility in October 2017 for our general enquiries services, receiving an average customer satisfaction score of 9.1 out of 10. We are exploring ways to deploy this functionality across more of our service lines.

In August 2017 we introduced our Customer Relationship Management (CRM) knowledgebase tool to give customers quick and easy answers to their questions and in January 2018 we added new functionality to our CRM system to support our customer service teams during power cuts. Now our advisors can see a customer’s history, enabling us to offer them a more personalised service and to prioritise support for our vulnerable customers.

During a power cut, customers need accurate and timely information. Our Quality Framework helps coach our customer service advisors in how to consistently deliver 10/10 customer conversations. We are using several communication channels including a proactive text messaging service, social media platforms and loading bespoke messaging onto our telephony service which recognises customers in specific post codes that may be affected by a power cut. To support this, we continue to gather customer information, making sure our approach adheres to the recently introduced General Data Protection Regulation (GDPR). We now hold 55% of our customers’ mobile telephone numbers and 62% of email addresses, enabling us to proactively provide our customers with updates.

Customers who prefer a self-service approach are using tools on our website and telephony system to interact digitally without speaking to a customer service advisor.

Looking ahead

Our aim is to improve our level of customer satisfaction even further so that we’re a leader amongst our Distribution Network Operator (DNO) peers. Our primary areas of focus will be the level of service we deliver during the connections process and continuing to improve the speed of complaint resolution. We will also continue to explore new ways to use our CRM system to improve our customers’ experiences.

21st
within Top 50 companies for customer service.

46%
of customers using 105 number – up from 16% in 2016-17.

62%
of customer email addresses held.

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 48

Use web-based technology to upgrade our process for general enquiries and minor engineering works.
✓ Delivered

Continue to improve the quality and speed of our complaint resolution.
✓ On Track

Make customer service more reliable, better communicated and backed by slicker processes. Be faster, at no extra cost.
✓ On Track

Provide better information to customers experiencing power cuts through voice or digital communication channels.
✓ On Track

Use technology to enable our Contact Centre to move from being largely reactive to mostly proactive.
✓ On Track

Make it easier for our customers to keep in touch - via internet, mobile, meetings, phone, email, social media, or text.
✓ On Track

Our performance measures	2016-17 actual	2017-18 actual	2017-18 target	Annual status	2018-19 target	ED1 target	Trend
BMCS Overall	86.3%	**86.3%**	**84.0%**	✓ Achieved	>85.0%	>85.0%	▶◀
BMCS power cuts	87.7%	**87.5%**	**84.0%**	✓ Achieved	>85.0%	>85.0%	▼
BMCS General Enquiries	88.9%	**89.4%**	**84.0%**	✓ Achieved	>85.0%	>85.0%	▲
Percentage of unplanned power cut contacts answered	98.5%	**97.7%**	**99.0%**	✗ Missed	99.0%	99.0%	▼
Percentage of unplanned power cuts calls answered within 20 seconds	90.9%	**90.6%**	**90.0%**	✓ Achieved	90.0%	90.0%	▼
Complaints resolved within 1 day	65.2%	**71.8%**	**80.0%**	✗ Missed	80.0%	80.0%	▲
Complaints resolved within 31 days	91.1%	**93.3%**	**95.0%**	✗ Missed	95.0%	95.0%	▲

▲ improving ▼ worsening ▶◀ staying the same

86.3%
customer satisfaction overall.

9.1/10
customer satisfaction rating for web chat facility.

55%
of customer mobile numbers held.

Innovation

“The electrification of heat and transport makes this one of the most interesting times in our industry for a generation. By investing in projects such as InTEGRel, e4Future, Silent Power and Micro Resilience we are ensuring that we do not simply cope with the transition, we use it to improve the costs and services to customers.”

Iain Miller
Head of Innovation

Our vision is to be at the forefront of innovative technology, solutions and thinking in the energy sector; harnessing innovation to provide our customers with world-class, affordable services.

Our priorities

Our innovation programme plays a vital role in how we’re responding to external changes and new demands, improving services for our customers and addressing emerging risks. The four core innovation priorities that we outlined in our business plan for the RIIO-ED1 regulatory period remain the same. They are:

— Developing a smarter and more flexible power grid;
— Delivering benefits from smart meters;
— Continuing our move to web-based and digital enabled services; and
— Addressing issues of affordability.

How we’ve done in 2017-18

We have significantly expanded our innovation portfolio since the start of the ED1 period. In 2017-18 we spent all of our £4.1m Network Innovation Allowance (NIA) across a portfolio of 26 projects.

The impact of innovation can be seen right across our business, improving services and reducing costs for customers. For example:

— **Safety:** Fleet vehicle telematics is helping to improve driver safety – in 2017-18 we incurred only 29 preventable vehicle accidents in our fleet which covers 21 million miles.
— **Reliability:** Automatic Power Restoration Systems (APRS) on our high-voltage network and distance-to-fault and fault prediction technology at low voltage are helping to reduce the impact of power interruptions for our customers. We are also trialling the use of drones for network inspections.
— **Environment:** We are seeing benefits from our use of Perfluorocarbon Tracers (PFT) to identify leaks from oil-filled cables, saving 23,250 litres of oil in the ED1 period to date. Voltage reduction at our substations has released more than 1.65GW of capacity on local networks for the connection of low carbon technologies.
— **Connections:** Our replicable Active Network Management solution will release capacity and reduce costs for customers with the new system due to be fully live in 2018-19.
— **Customer Service:** Our roll-out of more web-based services and our customer relationship management system are improving customer satisfaction levels, up 5% since the start of the ED1 period.
— **Vulnerable Customers:** Deployment of 40 domestic batteries has reinforced the benefits and business case for roll-out to our most vulnerable customers.

Most of the work we’ve done on developing smarter and more flexible power grids has focused on building the technical and commercial capabilities for our transition to the role of Distribution System Operator (DSO). This is a key part of our innovation portfolio. This year we talked extensively with our stakeholders about becoming a DSO, what it means for them and how we can make best use of new flexibility services. Alongside our £83m smart grid enablers programme, our Micro Resilience (battery technology), Silent Power (mobile storage) and Activating Community Engagement (incentivising reduction in power usage at peak times) projects continued to pave the way for our transition. You can read more about the transition to a smarter and more flexible energy system on page 22.

To ensure we remain at the forefront of innovation, we have continued to build strong partnerships with leading Russell Group academic research institutions including Newcastle University and leading innovative organisations such as Nissan. We have been able to access funding from other sources including our participation in e4future, a £9.8m Innovate UK-funded project exploring the use of electric vehicles to supply power to the grid.

Looking ahead

We will continue to use our innovation portfolio to improve services for customers and prepare for a smarter and more flexible energy system. In particular, we will explore further whole energy system projects to understand how the electricity, heat and transport sectors can work more effectively together.

26
innovation projects.

£4.1m
(100%) of our Network Innovation Allowance spent in 2017-18.

We have a broad and balanced ED1 innovation programme, aligned to our four core innovation priorities – here are some of our key innovation projects...

Smart Grids

Silent Power
Clean and reliable mobile power

Micro Resilience
Virtual power plant using CLNR battery technology

Pole Leakage Detector
Clear visual identification of damage

Drones
Evaluating within and beyond visual line of sight deployment

Customer-Led
Distribution System DSO market and industry architectures

Vehicle-to-Grid
Electric vehicle users providing services to the energy system

Smart grid enablers
Increasing communications and control capabilities

Active Network Management
Deploying a new replicable method to connect more generation

IntEGRel
Heat and whole energy system flexibility demonstrator (gas and electricity)

Digital Services

AutoDesign
Web-enabled automated design

Lightning Protection Tool
Lightning strike prediction

Activating Community Engagement/Gendrive
Gamification to enable domestic demand side response including electric vehicles

Affordability

Foresight
Enhancing LV cable management

Resilient homes
Enhanced resilience for those most vulnerable

Holistic Fault Detection
HV fault prediction

Alternative cut-outs
New fuse technology

Smart Meters

Data systems
Power cut and efficient network development solutions

Using Foresight to deliver better services for our customers

One of the most important responsibilities we have as a network operator is to keep the lights on for our customers. We continue to invest in our network to make it more resilient to power cuts and, when power cuts do happen, we work very hard to get the power back on as quickly as possible. We are also innovating – our Foresight project has the potential to radically change our approach by helping us to predict faults and respond before they even occur.

We aren’t able to inspect the condition of our underground network the way we can for our overhead lines. As part of our Foresight innovation project we are installing sensors on our network to monitor underground cables and provide us with information on voltage irregularities; the early warning signs that a fault may occur. We can then target upgrades in that area of the network before a fault occurs, improving service levels for our customers and reducing costs by avoiding reactive fault repairs.

Caring for the most vulnerable

“We have always taken our role supporting vulnerable customers seriously, but with so much change going this has never been so important. It’s really important that everybody in society benefits from the move to a smart flexible energy system.”

Patrick Erwin
Policy & Markets Director

The North of England has some of the highest levels of vulnerability across the UK. We have invested in training our staff and improving our processes to make sure that our services evolve alongside the needs of our customers.

Our commitments

In our ED1 plan we committed to make it easier for our Priority Services Register (PSR) customers to contact us directly, to strengthen our referral networks and expand our partnerships so that we can better respond to the needs of our most vulnerable customers. We made good progress against our commitments in 2017-18 and delivered training to all of our staff to help them better understand and respond to vulnerability. We also stepped up the delivery of our investment programmes to improve electrical safety in high-rise tower blocks in our region.

How we’ve done in 2017-18

We worked hard in 2016-17 to better understand vulnerability in our regions with a review suggesting that up to 60% of our customers could be vulnerable in some way. We have built on that in 2017-18, ensuring that our PSR recruitment targets those who are most in need, recognising the specific circumstances of each customer. We’re training our team to recognise vulnerability and to respond appropriately, developing a vulnerability training programme with Money Advice Trust and National Training Academy which all staff took part in.

We proactively contact our PSR customers during a power cut to let them know that we’re aware of the problem and to discuss the support available. If a PSR customer calls us, their call is routed straight through to our call handlers. We introduced a vulnerability matrix for Contact Centre call handlers to guide them through how the needs of our vulnerable customers evolve during longer duration power cuts and how our support can change in response. We introduced tools to support customers with specific communications needs such as BrowseAloud for those who require online reading support and Language Line for customers with a first language other than English.

We have 800,000 customers signed up to our PSR and we regularly check our data records are up to date. We’re working with our referral network of 170 local organisations in our most vulnerable communities to raise awareness of our PSR and this led to a 193% increase in online PSR applications in the year.

Partnering with charities, community groups and other third sector organisations is key to providing effective support. We developed our Powergrid Cares programme, adding Relate, a nationwide counselling organisation, to the programme which already includes Citizens Advice Leeds, Citizens Advice Newcastle and Green Doctor. Together we’ve delivered training on vulnerability, relationship management and energy efficiency. We also ran 11 local community events to raise awareness of our PSR, discuss challenges facing our customers and the further support we can offer.

In November 2017 we launched our Partnering Communities Fund. The fund offers grants of up to £10,000 for projects that tackle fuel poverty, promote energy efficiency, educate communities about the dangers of Carbon Monoxide or electrical safety, encourage interest in Science, Technology, Engineering and Maths (STEM) subjects or promote the PSR. We received 33 applications, seven of which were awarded grants.

Our progress this year has been recognised by Ofgem who awarded us second position (out of the six electricity distribution companies) in the 2017-18 Stakeholder Engagement and Customer Vulnerability reward scheme, up from third position last year.

Looking ahead

We will develop our existing partnerships and create new ones with charities and community groups in the areas where our most vulnerable customers live, and make sure we engage trusted partners to deliver our programmes. We will continue to improve the way we reach those most at risk and continue our investment in training our staff to recognise vulnerabilities during any contact with our customers.

191,376
new PSR customers.

60%
of our region is potentially classified as vulnerable.

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 46

Route calls from PSR customers directly to Contact Centre advisors, bypassing automated messaging.
Delivered

Build partnerships with organisations to help us deliver our social programme.
On Track

Promote and raise awareness of our Priority Services Register to and with other partner organisations.
On Track

Enhance our training for front-line staff providing additional support for Priority Services customers.
On Track

In conjunction with local authorities, identify socially-deprived areas and prioritise our support towards them during a power cut.
On Track

With others, explore the feasibility of community-level aggregated-demand response in return for a community rebate.
On Track

Introduce friends and family register and ‘good neighbour’ scheme to support vulnerable customers.
On Track

Explore the possibility, with Northern Gas Networks, of upgrading to electrical connections in high-rise tower blocks for safety reasons.
On Track

Explore solutions to connect rural communities to the network.
On Track

Provide more customer support vehicles along with more services in them.
On Track

Our performance measures

Face-to-Face

Events
– Meetings
– Workshops
– Conferences
– Community Events

Expert panels
Stakeholder panel, social issues and DSO expert groups

500+ People engaged
46 Members
12 Meetings per year

Digital

600 webinar views
95% webinar satisfaction
over 100 stakeholders accessing incident data

Social Media

9,297 Facebook followers
66% increase from 2016-17
19,934 Twitter followers
+ 23% increase from 2016-17
6,395 Linkedin followers
+ 46% increase from 2016-17

Newsletters and Updates

2,800+ Recipients

Areas of Research

15,000+ engaged

- Customer satisfaction
- PSR satisfaction
- Stakeholder satisfaction
- Priorities
- Willingness to pay
- Future consumers
- Electrical losses
- Risk
- Unplanned power cuts
- Flooding
- Hard to reach – rural safety

Online community
1,706 Active members discussed 30 topics

29%
of households in our region have a person with a long-term health problem.

16%
of our customers are living in fuel poverty.

2nd
place ranking in Ofgem’s Stakeholder Engagement and Customer Vulnerability (SECV) scheme.

Supporting our region

Through our Community Energy Seed Fund we are able to partner with local communities to offer support for projects ranging from generation connection projects to affordability and energy efficiency initiatives.

As part of the fund we partnered with Community Action Northumberland (CAN), an organisation that supports the region's most vulnerable people through their Warm Hub network. We delivered fuel poverty and energy training that is now provided by volunteers to around 1,000 people a month through Warm Hubs. We also developed an energy advice magazine and hosted 6 energy roadshows to help people check their energy tariffs.

Drones offer us a new perspective

This year, we trained 10 of our Northern Powergrid staff to operate drones for inspections of the network.

Traditionally we have inspected our overhead line network via foot patrols. We have over 400,000 wooden poles and almost 28,000km of overhead line on our network so covering this ground is a significant undertaking in terms of both time and cost.

As part of our innovation activity, we now have the facility to inspect overhead lines remotely using drones, capturing digital images and doing so at a lower cost than manual patrols. We are working on the ability to live-stream the images from the drones straight back to our control centres which will save us even more time. The technology also opens the door for us to improve our inspection capabilities, for example, we are exploring the use of 3D site surveys for substation modelling and to give us greater insight into coastal erosion.

Connecting our customers

"The improvement we have made to the service we provide our connections customers will continue in earnest to achieve our performance targets and reach our aim of being at the forefront of connections customer satisfaction."

Andy MacLennan
Business Development Director

Our connections customers continue to shape the range of services that we offer. We are pleased that we have achieved a 7% improvement in connections customer satisfaction since the start of the period and we are targeting further improvements.

Our commitments

In our RIIO-ED1 business plan we committed to reshape our connections processes, improving the services we provide for our customers. During 2017-18, we worked with stakeholders to develop our plans to improve our services and reduce the time it takes to connect a customer to our network. We made changes to our connections input services to encourage more competition in the market and introduced Assessment and Design (A&D) fees to deliver fairer charges for our customers.

How we've done in 2017-18

Our long-term connections customer satisfaction performance continues to trend positively, achieving a 7% improvement since the start of the ED1 period, however our 2017-18 score of 84.3% narrowly missed our target of 85%.

In our ED1 business plan we committed to reduce connections lead times by 30%. We achieved Ofgem's incentive target for the time taken to provide a quote to single-premises connection customers but missed the target for those looking for two to four connections and for the time taken to connect them. We are investing more time at the start of the quotation process (including an optional face-to-face site visit), we have sourced new connections service providers and we're reviewing our internal systems to continue to improve our service. We remain confident of hitting our business plan targets.

The biggest change this year was the introduction of Connection Offer Expenses (or A&D fees) for medium and large connections customers in line with new national legislation. The new service has already resulted in fairer charges for our customers as all customers now pay for their own quotation requests whereas previously the costs of all quotation requests were paid only by the customers who accepted quotations and received a connection.

We engaged with connections stakeholders in 2016-17 to develop our Incentive on Connections Engagement (ICE) plan with 26 actions, all of which we completed in 2017-18. We improved the speed of information provision on fault levels and protection and introduced a 'Low Carbon Gateway' with clear reference points about connecting low carbon technologies (LCTs). After repeating the exercise this year, we have 17 actions in our 2018-19 plan.

The work we've done around our connections engagement was well received by our customers and meant we received no penalty from Ofgem under the ICE mechanism.

For customers who want to connect low carbon technology, we regularly update our network capacity heat maps so they have the most up-to-date information. We have released over 1.6GW of capacity for the connection of LCTs through our work on voltage reduction at our primary substations and we started to deliver our replicable Active Network Management (ANM) system for customers in Driffield, Yorkshire which will reduce the cost of connecting to the network – the first project will go live in 2018-19.

We're committed to supporting competition in connections and improving the range of options available to our customers. Our connection input services team continued to streamline our input services, allowing Independent Connections Providers (ICPs) and Independent Distribution Network Operators (IDNOs) to compete more freely. We supported this through ICP and IDNO workshops where we provided information and support. We also strengthened our fully independent quality assurance audits for all connections to our network regardless of whether it is Northern Powergrid work or via ICPs and in some instances we carried out elements of work for ICPs and IDNOs where they lacked sufficient accreditations.

Looking ahead

We plan to launch our Customer Relationship Management (CRM) system for small connection works in 2019, alongside continuing to improve our internal processes. As always, we'll talk to our stakeholders to make sure we're offering small, medium and large connections customers the range of services they need.

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 41

Better payment terms – customers will not need to pay as far in advance.
Delivered

Provide a better service for non-contestable elements of work – regularly publishing key indicators.
Delivered

Introduce a web-based system to help customers understand the capacity on our network and the likely cost of connection.
Delivered

Provide more flexible quotations, including online self-service and faster quotes.
On Track

Implement a tailored service for large projects, including 'account management' where needed or requested.
On Track

Reduce end-to-end connection timescales for small works by more than 30%.
Behind – recoverable

Our performance measures	2016-17 actual	2017-18 actual	2017-18 target	Annual status	2018-19 target	ED1 target	Trend
Customer satisfaction rating for connections quotations	84.6%	**84.3%**	**>85%**	Missed	>85%	>85%	▼
Customer satisfaction rating for connections delivery	84.3%	**84.4%**	**>85%**	Missed	>85%	>85%	▲
Average time-to-quote (LVSSA)[1]	5.5	**7.9**	**8.2**	Achieved	8.2	8.2[2]	▼
Average time-to-quote (LVSSB)[1]	8.8	**16.5**	**11.7**	Missed	11.7	11.7[2]	▼
Average time-to-connect (LVSSA)[1]	48.5	**49.6**	**42.1**	Missed	42.1	42.1[2]	▼
Average time-to-connect (LVSSB)[1]	56.6	**58.3**	**52.7**	Missed	52.7	52.7[2]	▼
Connections quotations standard success rate	99.8%	**99.3%**	**>99.8%**	Missed	>99.8%	>99.8%	▼
Connections delivery standard success rate	99.8%	**99.6%**	**>99.9%**	Missed	>99.9%	>99.9%	▼

[1] Ofgem target
[2] Connections lead time targets for the second half of the eight-year ED1 period are currently being reviewed by Ofgem and will be reset.

▲ improving ▼ worsening ▶◀ staying the same

26
ICE actions complete in 2017-18, with a further 17 planned for 2018-19.

7%
improvement in connections customer satisfaction since April 2015.

84.3%
Small works connections customer satisfaction.

Rolling out our smart energy programmes

"Through collaboration and innovation we are ensuring that customers benefit from the increasingly low carbon energy system."

Jim Cardwell
Head of Policy Development

We continue to play our part in the national drive to build a smart flexible energy system, with our plan to invest £83m in smart grid enabling technology, as well as supporting the smart meter roll out.

Our commitments

As the transition to more efficient, affordable and low carbon energy continues, we're committed to delivering real benefits for our customers. This year has seen the roll-out of our smart grid accelerate, supported by a wide range of innovation projects alongside making sure our systems and processes are ready to make the most of smart meter data.

How we've done in 2017-18

So far, the adoption of low carbon technologies (LCTs) across our region has been lower than expected when we wrote our RIIO-ED1 business plan, which means we haven't needed to reinforce our network to accommodate these new technologies to the extent we expected. However we are supporting customers who want to connect LCTs to our network and have introduced initiatives to make this easier and less expensive. We are committed to exploring alternatives to traditional reinforcement including tendering for flexible solutions as alternatives to bigger cables and transformers.

One of our key initiatives focuses on freeing up capacity on our network so customers can connect. We've almost completed our major substation voltage reduction initiative which has released over 1.65GW of capacity on local networks. We've also reviewed our network design policies to incorporate new technologies, release capacity and incorporate learning from our innovation projects. Active Network Management (ANM) equipment is being installed at various sites in Driffield and is set to go live in 2018-19, a solution that can then be replicated across our network.

Our £83m smart grid investment programme is an important part of our transition to a Distribution System Operator (DSO). This will see us manage a smarter and more flexible energy system supporting more electric vehicles, renewable generation and storage. We're innovating to improve our control of the network and collecting technical information on how it is operating which, together with upgraded network communications, means we're able to provide a more active network and better respond to customer needs. We have had to navigate some technical challenges in the early part of the ED1 period which goes with the territory of breaking new ground, and whilst this has put us behind our original plan, we're now moving from piloting solutions into widespread roll-out of new smart grid technology.

This year saw the completion of our Activating Community Engagement (ACE) project. This project used a mobile gaming app to actively engage communities to make changes to how and when they use electricity, awarding prizes based on savings or changes to energy usage. The valuable insights from this project are being shared within the industry and applied to other innovation projects.

Although the national smart meter roll-out programme is running behind, we are well set to use the data it has started to provide to deliver benefits for our customers through improved services and network planning. We connected to the national central smart meter system (DCC) in November 2017 and our systems and processes are in place, making use of smart meter data from the second generation (SMETS2) meters installed in our region so far.

Looking ahead

Our investment in our smart grid will continue to increase during the ED1 period. We're also developing innovation projects to test new ways to use smart meter data as the roll-out accelerates.

1.65GW
of capacity created for connection of LCTs on local networks.

£83m
Smart Grid enablers investment programme in ED1 (2012-13 prices).

Our business plan commitments

For more, see Annex 2:
An update on our commitments in detail – page 44

Invest £52m in smart grid network reinforcement that pays back by 2023 through avoiding £86m of traditional reinforcement – a net saving of £34m compared with traditional reinforcement methods.

On Track

Provide opportunities for customers to participate in demand-side response to reduce the cost of running the network.

On Track

Modify our trading and customer service systems to realise benefits from the new smart meter data.

On Track

Use smart meter data to optimise network investment and reduce losses.

On Track

Trial the potential for combining smart grids and smart meter data to provide additional information services.

On Track

Establish a dedicated team of technical staff to perform timely modifications to our equipment when they are needed to enable the smart meter installation to proceed.

On Track

Invest £83m in smart grid enabling technology that, as a minimum, pays for itself by 2031 – the more likely result will be a much larger saving, possibly as high as £400m-£500m.

Behind – recoverable

Our performance measures	2016-17 actual	**2017-18 actual**	**2017-18 target**	Annual status	2018-19 target	ED1 target	Trend
Smart meter intervention performance (Category A and B defects)[1]	87%	**86%**	**90%**	Achieved	90%	90%	▶◀

▲ improving ▼ worsening ▶◀ staying the same

[1] Our smart meter intervention target is based on achieving an agreed level of service on Ofgem's 2% assumption of defect rates for all smart meter installations. We have received twice as many defect reports than forecast but only narrowly missed the target.

ACE project
mobile energy usage app innovation project completed.

Smart meter ready
systems connected to central DCC system in November 2017.

Our transition to a Distribution System Operator

New technology and digitisation are driving unprecedented change in the way energy is created and used as we move to a low carbon economy. We need to make sure that our network is able to safely and securely support these changes whilst maintaining high standards of reliability for our customers.

The industry is responding to this change by transitioning from a traditional Distribution Network Operator (DNO) to a Distribution System Operator (DSO) model. At Northern Powergrid, we are helping to shape this transition to ensure it delivers value for our customers.

What does DSO mean?

Operating as a DSO means we work with customers who are able to be flexible with when they generate or use electricity. In doing so we aim to support more low-carbon generation, reduce system costs and improve overall energy system efficiency for all customers.

Our existing duties as a DNO already require us to operate an efficient local electricity system – this encompasses many aspects of DSO – however, there are a number of industry options for how elements of this role could develop in the future around how we make the whole system more efficient. We are engaging with our stakeholders and actively participating in dialogue with the industry, Ofgem and Government on how this should be developed.

Why do we need DSO?

We are going through a revolution in the way that electricity is produced and consumed. Traditionally, the distribution network was designed for one-way delivery of electricity. Starting with generation at large power stations, moving through the transmission network to the distribution network and finally to homes and businesses. But over the last few years, customers and the energy industry have made some big changes:

- Decarbonisation of generation: Less coal and more wind and solar are being used to power our homes.
- Decentralisation of energy sources: Electricity generation units are moving from the traditional model of large power stations on the transmission network to commercial and domestic generation connected to the local distribution powergrid.
- Digitisation of technologies: Most things are becoming ‘smarter’ in society (e.g. home entertainment and heating controls) and in industry (e.g. technology to automate processes and control network assets).

The system used to be operated such that electricity generation followed demand (or use). As people used more, we were able to generate more.

However, low-carbon generation is different. It is less flexible. We are less able to simply turn it on or off because the source is often weather dependent and more intermittent (for example solar panels and wind farms). This means that the system needs to be more flexible to support customers by matching demand to available generation and have the ability to cope with a more dynamic two-way flow of power on the network.

What does DSO mean in practice?

DSO requires active management of the network in real time, agreeing contracts with customers to support the grid in flattening peaks of high demand on the system. In this way, we can reward customers for their support which helps us delay or avoid the need to reinforce the network, which in turn helps to minimise costs for our customers.

This means getting the most from network assets that make up the local grid. Like any system, there are physical limitations to the amount of capacity available to accommodate new requirements. Through the use of smart grid technology and our flexibility contracts with customers we are able to maximise the available headroom on the network. There is still a place for building new network capacity; but we only do that when it is cheaper than flexible alternatives.

Looking ahead

By the end of 2018 we will have shared our detailed plan for the development of DSO, marking a milestone in our engagement with our stakeholders. Our smart grid enablers programme will continue to ramp up as we deploy more advanced control and communications capability onto the network to enable DSO. We will also deploy our new replicable Active Network Management (ANM) system in Driffield and test the market for customers to provide flexibility services.

Our approach to DSO covers three areas – scoping the future, getting on with it and building new capabilities – we are already well underway with the transition.

1. **Scoping the future – addressing the big open questions of market design, industry architecture and required solutions**
   A significant proportion of the 26 projects in our innovation portfolio are focused on exploring opportunities for customer and system flexibility and system resilience from new technologies such as electric vehicles, storage and smart meters. For example, our Customer Led Distribution System innovation project is helping gather evidence on future customer behaviours to inform the most appropriate market design and industry structure for the future energy system.

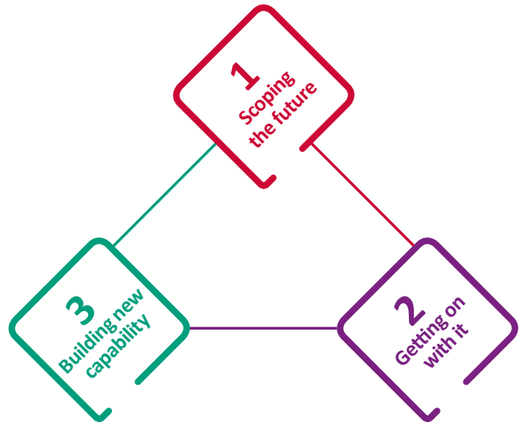
2. **Getting on with it – making progress with the transition to DSO**
   We are already well underway with our transition to DSO. Our approaches are evolving and we are expanding our service offerings for customers. The roll-out of our Active Network Management (ANM) solution at Driffield is providing scalable capability to connect more generation at least cost as an alternative to conventional reinforcement. We are committed to seeking market flexibility services from customers as an alternative to all new network reinforcement requirements of significant value, with our near-term flexibility requirements due to be published later this year.

3. **Building new capabilities – laying down the foundations**
   Our £83 million smart grid enablers investment is a flagship programme within our ED1 (2015-23) business plan – providing the base control and communications capability to deliver more active network control and customer solutions for different areas of our grid. In addition, we are continuing to develop new competencies through our innovation programme, for example through the re-use of a large (2.5MW) battery from our Customer-Led Network Revolution (CLNR) project. This has allowed us to participate in the frequency response market with partners, building understanding of the provision of services to the national Electricity System Operator.

We are shaping the future with our stakeholders

We have engaged extensively with our stakeholders in the year to inform our plans and ensure a customer-led transition to DSO

During 2018, we held three bespoke events (in London, Leeds and York) designed for different audiences to invite a wide base of input into our plans for DSO. Stakeholder feedback has proved to be extremely valuable and we will publish our DSO development plan by the end of the year which will form the basis of further continued dialogue with our stakeholders.



Active Network Management (ANM)

Active Network Management is unlocking the future.

ANM is an important part of our future plans. We are installing technology on our network that provides real-time information on the levels of electricity demand and generation that is coming on to the network, providing intelligence on how close the distribution network is to its capacity limits. If the network begins to approach its limits, our ANM system limits the amount of generation to within safe working limits. To enable this, we agree contracts with our generation customers that allow us to limit their generation when required; in return we are able to offer them more cost-effective connections as we avoid the need to invest in reinforcing our network through traditional means, which has traditionally involved installing new cables and substations.

Our ANM scheme in Driffield is on a 66kV section of our network that is considered to be operating at full capacity in relation to embedded generation connections. However, through ANM we are able to actively manage exports from generation customers in order to provide them with cost-effective connections to the distribution network. Our Driffield scheme is ground-breaking for us, as it is our first replicable scheme, meaning that we now have a standardised solution that we can roll out anywhere this situation occurs on our network.

Digger Derrick joins the fleet

We've introduced a new vehicle to our fleet – a first of its kind in the UK – which will transform the way we carry out live overhead line replacement on our network.

Currently, replacing spans of overhead line involves multiple vehicles. For some of our jobs we need to use diggers, vehicles with elevated working platforms and cranes, as well as the vans needed to get our teams and their equipment to site. The Digger Derrick means we can do all of this with a single vehicle – reducing costs for customers and our carbon footprint. Plus, the Digger Derrick is fully insulated so we can do most of our work with the network live, meaning we don't need to turn off the power for our customers.

Protecting the environment

"We will always seek to minimise the environmental impact of our business. We owe it to the communities we have the privilege to serve."

Geoff Earl
Director of Safety,
Health and Environment

The dedication of our teams and the innovative use of emerging technology helped us deliver another year of environmental protection improvements. We are confident of not only meeting, but exceeding many of our business plan commitments for the 2015-2023 period.

Our commitments

We set ourselves ambitious environmental targets in our business plan for the eight-year RIIO-ED1 regulatory period. These included significant improvements across all the main areas against which we measure our environmental impact. We're pleased to report that during 2017-18 we have continued to reduce our Business Carbon Footprint (including SF_6 gas leakage) and the amount of oil leakage to ground. Our investment in putting overhead lines underground in Areas of Outstanding Natural Beauty (AONBs) and National Parks also remains on track.

How we've done in 2017-18

In our business plan, we committed to reducing the amount of oil leakage to ground from our network by 15% by 2023. We're already significantly outperforming this target through our work replacing fluid-filled cables, proactive response to leakage incidents and using technology such as perfluorocarbon detection. In 2017-18, we achieved a 44% reduction against our ED1 business plan baseline and we have set a stretch target to achieve a 47% reduction by the end of the period.

This year we replaced 28.2km of fluid-filled cables, taking our total to 68.1km replaced in ED1 so far. This puts us slightly behind our target (by 7.5%) but we have plans in place to make sure we meet our commitment to replace 134km and then exceed that, delivering 206km by the end of the period.

We reduced our Business Carbon Footprint by 13% during 2017-18 – a 34% improvement for the ED1 period so far. We've done this by reducing the miles travelled by our fleet vehicles, supported by our investment in vehicle telematics that gives feedback on how economically our vehicles are being driven. We're also introducing electric vehicles into our fleet and installing charging points at our offices.

Sulphur Hexaflouride (SF_6) emissions are a significant contributor to carbon footprint and in 2016-17 we set ourselves a tighter target to limit SF_6 losses to 100kg or less and, by using thermal imaging technology to detect leaks and then repairing them quickly, we lost only 98kg in 2017-18.

We've continued our programme to reduce energy losses on our network. We keep losses in mind when designing our network and install oversized cables and low-loss transformers (where necessary) to minimise losses. This year we began using low-voltage monitoring equipment on areas of our network that experience high energy losses and accelerated our programme to replace high-loss transformers with low-loss alternatives. We have invested in loss-reducing larger electricity cables which has saved us 2,477MWh so far this period and we forecast that by 2023 we'll have saved up to 10,500MWh in total – enough electricity to power 700 homes for a year.

Over the last three years we have worked closely with representatives of the National Parks and AONBs to put our overhead cables underground in some of the most beautiful areas in our region. Since 2015, we have moved 43.7km of cable underground, 7.1km (19%) more than planned. We're now planning to put a total of 120km of cable underground by the end of the period – 20km more than we originally committed to.

Looking ahead

Building on the progress we've made so far, we'll carry on investing in our fluid-filled cable replacement programme and trial the use of innovative 'self-healing' cables to further reduce the amount of oil that leaks into the ground. We will also continue using the data produced by vehicle telematics across our fleet to keep reducing our Business Carbon Footprint.

13.8km

of overhead line undergrounded across National parks in 2017-18.

2,477MWh

saved through use of larger electricity cables.

Our business plan commitments

For more, see Annex 2: An update on our commitments in detail – page 42

Underground around 100km of overhead line in Areas of Outstanding Beauty (AONBs).

✓ Ahead

Stretch Target: underground an additional 20km.

Reduce our business carbon footprint by 10% by 2023.

✓ Ahead

Reduce oil/fluid leakage to ground by 15% by 2023.

✓ Ahead

Stretch Target: 47% reduction by the end of ED1.

✓ On Track

Deliver faster and higher quality street works reinstatement when we dig up the street.

✓ On Track

Maintain SF_6 losses as the volume of gas in our switchgear assets increases.

✓ Ahead

Stretch Target: reduce SF_6 losses to 100kg by the end of ED1.

Make sure reduction of electrical losses is explicitly factored into investment decisions for a wider range of assets.

Replace 134km of fluid-filled cables and use perfluorocarbon tracers (PFTs) to quickly replace leaks.

✗ Behind – recoverable

Stretch Target: to replace 206km by 2023.

Continue to operate a full revenue protection service.

Withdrawn

Our performance measures	2016-17 actual	2017-18 actual	2017-18 target	Annual status	2018-19 target	ED1 target	Trend
Cumulative kilometres of overhead lines undergrounded in protected landscape	29.9	**43.7**	**36.6**	✓ Achieved	74.6	120[1]	▲
Carbon footprint (inc contractors)	45,528[2]	**39,535**	**58,409**	✓ Achieved	57,713	53,730	▲
Oil loss from all sources (litres)	36,791	**29,562**	**50,963**	✓ Achieved	30,750	28,325[3]	▲
Street Works Quality	93%	**94%**	**>90%**	✓ Achieved	>90%	>90%	▲
SF_6 lost to atmosphere (kg)	114	**98**	**112**	✓ Achieved	100	100[4]	▲
Cumulative kilometres of fluid-filled cables replaced	39.9	**68.1**	**73.6**	✗ Missed	125.4	205.7[5]	▲
Number of Environment Agency reportable incidents each year	10	**8**	**27**	✓ Achieved	26	22	▲

[1] Target shown based on stretch targets. Stretch target represents an additional 23% in our undergrounding of overhead lines in protected landscapes. Original ED1 business plan target was 97.9km.
[2] 2016/17 carbon footprint restated to address an error in the numbers submitted to Northern Powergrid by a contractor organisation.
[3] Target shown based on stretch targets. Stretch target represents a 47% reduction of oil loss from all sources for the ED1 period. Our original ED1 business plan target was a 15% reduction (45,258l in 2023).
[4] Target shown based on stretch targets. Stretch target represents a further 10% reduction in SF_6 lost to atmosphere against our original ED1 business plan target (112kg in 2023).
[5] Target shown based on stretch target. Stretch target represents an additional 54%(72km) of fluid-filled cable replacement for the ED1 period. Our original business plan target was 133.6km.

▲ improving ▼ worsening

44%

reduction in oil/fluid leakage (RIIO-ED1 to date).

34%

reduction in Business Carbon Footprint (RIIO-ED1 to date).

28.2km

of fluid-filled cable replaced during the year.

Financing and resourcing our business

"We know that sensible cost control is a high priority for our customers, so our prices dropped in 2015 and we apply innovation, technology and sound management to keep them fair for the future."

Tom Fielden
Finance Director

Delivering more for less for our customers is the foundation of our business plan and it is why we are working hard to deliver a low-cost, high-quality services.

Our commitments

We're committed to delivering top quality service for the lowest possible cost. Customers consistently tell us that the price they pay for their electricity is their top priority, so in April 2015, we reduced our prices by 14% – exceeding our 10% commitment. Our average domestic customer bill for 2017-18 was £72.83 (in 2012-13 prices), meaning customers paid around 20p per day for their 24/7 electricity service.

As one of the largest employers in the regions we serve, we committed to creating 1,000 new jobs during the ED1 period and we're pleased to report that we're ahead of our target.

How we've done in 2017-18

We promised to deliver more for less in our business plan, which means tight control of our costs and carrying out continuous cost-efficiency reviews. This is increasingly important as the landscape of the UK energy industry evolves – we're moving to a low carbon economy and the way customers source and use energy is changing. This means as well as keeping prices low and service levels high, we need to change how we operate and we're doing that through innovation.

Our innovation programme has gained momentum this year and includes projects like Foresight, which aims to prevent faults from occurring before they inconvenience our customers, and another that seeks to install batteries in the homes of our most vulnerable customers to provide electricity should a power cut occur. You can read more about this and other innovation projects on pages 14-15.

Northern Powergrid is part of the Berkshire Hathaway Energy group (part of Berkshire Hathaway Inc). The way we finance the business is guided by Berkshire Hathaway's long-term approach to its investments – to reinvest profits into improving services for customers. We have the strongest credit rating of all the 'wires-only' businesses which means we can achieve competitive rates on financing to fund our £4bn investment programme.

We directly employ more than 2,700 people across our region and many more through contracted services. We're proud of our diverse team that helps us deliver a great service to our customers every day. Our commitment was to create 1,000 new jobs by 2023 and we've recruited 424 new roles so far since the start of ED1. As part of this we've recruited the next generation of engineering trainees and craft apprentices to maintain and upgrade our network. In 2017-18 we created 167 new jobs, 68 of which were part of our training programme, plus 18 trainee engineers completed their training during the year and took on full-time roles within our organisation. We also recruited cyber apprentices who will focus on safeguarding our company from the threat of cyber attack.

We published our Gender Pay Gap report in March 2018 that showed our male employees are paid 21.5% more per hour than our female employees. Historically, like the rest of the energy industry, the jobs in our company have attracted many more men than women. That doesn't create a gender pay gap all by itself, but the fact that men make up a much larger proportion of the people pursuing the higher-paid technical and professional roles does fuel the gap. That is not something we are happy about. We want to see it change because we recognise the benefits that a diverse workforce can bring to our business and the local economies we support. But we know it cannot happen overnight. We are actively playing our part in changing that by working with schools to make Science, Technology, Engineering and Maths (STEM) subjects equally attractive to everybody at school age and working with the higher education sector to better market technical and engineering courses to all school leavers.

Looking ahead

We will continue to make sure every investment delivers value for our customers. We aim to achieve our regulatory and internal targets while investing in innovation to improve our day-to-day operations and prepare for future demands on the network. We'll also continue building a skilled and diverse workforce that is able to respond to the challenges of the future while keeping our network safe and secure.

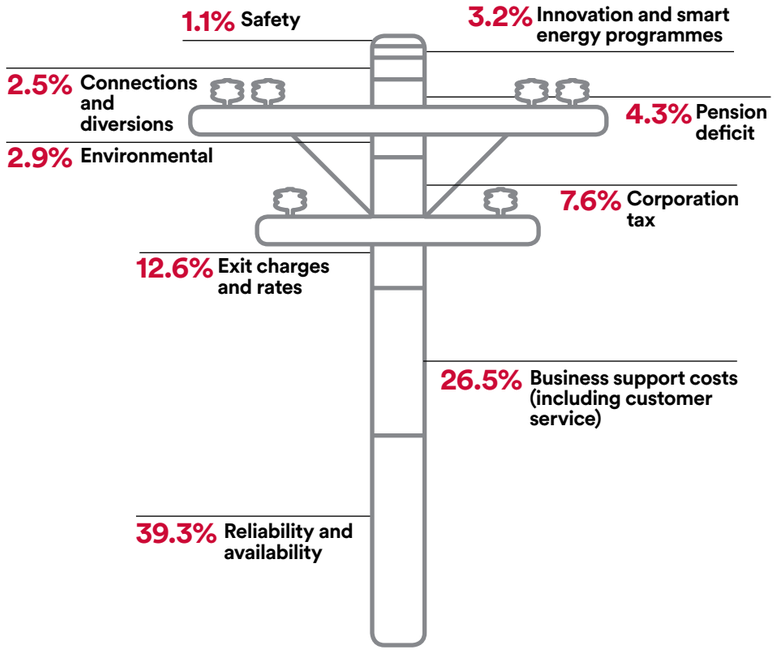
167
new jobs created in 2017-18.

£4bn
investment programme financed at competitive rates.

14%
How much we reduced our bill in 2015.

Sound financial management underpins our ability to offer more for less and we will continue to make sure that every investment delivers value for our customers.

Here is a breakdown of our costs for 2017-18



Commitments

For more, see Annex 2: An update on our commitments in detail – page 44

We will deliver an immediate 10% price reduction at the start of the period.

✓ Delivered

We expect to create 1,000 job opportunities in the organisation during the ED1 period.

✓ On Track

Over 2,700
employees.

1,000
new recruits targeted by 2023.

Northern Powergrid partners with Nissan for 6 year innovation journey

This year we established a six year partnership with Nissan to explore the potentially radical impact that the mass adoption of electric vehicles, batteries and other technologies could have on energy networks.

If all the cars in Britain were electric, they would have enough battery capacity between them to supply the country's electricity needs for a day and a half. Through innovation projects we are exploring vehicle-to-grid charging and examining the scope for vehicle batteries to be part of the way the energy system is kept in balance.

Another of our projects in partnership with Nissan is looking at developing battery storage solutions for medically dependent customers, trialling solutions for giving them the vital security of an uninterrupted electricity supply. The project is exploring the deployment of second life electric-vehicle batteries into properties where residents have additional electrical needs directly related to the operation of critical medical equipment. This will provide back-up and improve resilience for some of our most vulnerable customers.

Working near our assets

"We provide help and advice to customers who need it when they are working near our assets."

Nick Gill
Operations Director

There are times when people need our help to work near or around our assets when undertaking their own projects. This ranges from individuals working on their homes to companies making big investments in new infrastructure.

Typically these situations include requests:
- for physical covers for overhead lines (shrouding);
- to physically move our assets (either temporarily or permanently);
- to share one of our wood poles (e.g. for a telephone line);
- for safety advice about working near our assets, including where our underground cables are, and
- to temporarily switch off the power while work is undertaken near our assets.

Our objective
When giving help and advice for work taking place near our assets, we aim to meet all our statutory duties and aim to give excellent customer service.

Our performance
Those who need to work near our assets rated us for four major service lines: cable plans; disconnections; diversions; and shrouding.

Our customers continue to give us scores in excess of 9/10 for our services in relation to cable plans and shrouding. Our customers give us lower ratings for disconnections and diversions, which are more complex services, with longer lead times. We continue to focus on the standard of our communication in these areas to keep customers informed of the progress of their works.

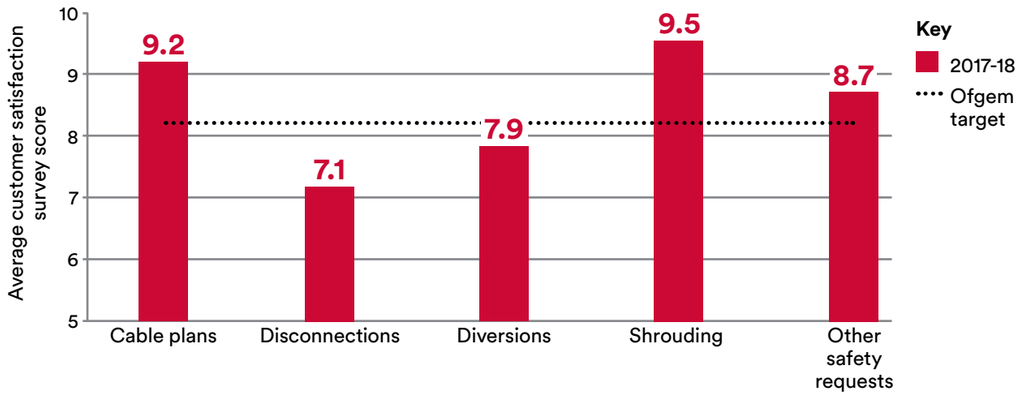
Improving our service
Our improvement plans are in line with the commitments we made in our ED1 business plan – to make our services quicker, easier and more convenient for our customers.

Disconnections is our priority area for improvement and in 2018 we expanded our Customer Relationship Management (CRM) system to include our disconnection quotation service. We expect this to drive improvements in customer service and lead times in 2018-19.

We are also making it easier for our customers to contact us by expanding our contact channels. In October 2017, we piloted live web chat which our customers rated 9.1/10 in terms of satisfaction.

Looking ahead
We will embed the new technology based process improvements in disconnections and focus on improving lead times – a key priority for our customers. Following the success of live web chat, we will explore more ways to deploy this functionality across our key service lines in 2018-19.

How our customers scored us (out of 10)



Performance snapshot – Northeast[1]

Network

Network		Actual 2017-18	Trend[2]
Number of customers		1.6m	▲
Total DNO network length		41,705km	▲

Reliability & Availability

Reliability and Availability		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Customer interruptions[4]	Inc. exceptional events	50.1			▲
	Exc. exceptional events	49.7	58.6	Achieved	▲
Customer minutes lost[4]	Inc. exceptional events	41.4			▲
	Exc. exceptional events	39.9	52.7	Achieved	▲
Incentive performance reward/(penalty) – IIS[5]	£m	£8.8m			
	£/customer bill	£2.68			

Customer Satisfaction

Customer Satisfaction		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Overall Broad Measure of Customer Satisfaction score out of ten (rank out of fouteen)[6]		8.72 (10th)	8.2	Achieved	▶◀
Incentive performance reward/(penalty) – BMCS[7]	£m	£1.52m			
	£/customer bill	£0.46			

Connections

Connections		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Time-to-quote (days)[8]		8.0	8.2	Achieved	▼
Time-to-connect (days)[8]		53.8	42.1	Missed	▼
Incentive performance reward/(penalty) – connections lead time	£m	£0.03m			
	£/customer bill	£0.01			
Incentive on Connections Engagement penalty – ICE	£m	Nil			
	£/customer bill	Nil			

Social Obligations

Social Obligations		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Individual Stakeholder Engagement and Consumer Vulnerability (SECV) score out of ten (rank out of six)		7.5 (2nd)			▲
Incentive reward	£m	£0.77m			
	£/customer bill	£0.23			

Financials

Financials		Total
Unrestricted domestic tariff charge		£80.67
Total expenditure	£m	£157.3m
	% of cost allowances	95%
	% of cost allowances (ED1 to date)	96%
	% of allowed revenue	63%
Dividends paid[9]		£22.7m
Gearing[10]		49.4%
Credit rating[11]		A3/A/A-
Notional RoRE (excluding holdco debt) (vs Ofgem assumption of 6%)[12]		8.8%

Innovation

In 2017-18 we spent £1.8m on Innovation projects in our Northeast licensee, funded by our Network Innovation Allowance. Our diverse innovation portfolio contains 26 projects that span our four innovation priorities for ED1: building our smart grid, delivering smart meter benefits, developing our digital services and improving affordability.

Safety

Our long-term safety performance is strong and continues to place us in the leading pack among our peers. We narrowly missed our annual headline safety target for Northern Powergrid as a whole in 2017-18, measured by the Occupational Safety and Health Administration (OSHA) rate – 0.35 against a target of 0.31 – representing eight reportable incidents in a workforce of more than 2,700.

Environmental Impact

We achieved our oil leakage and business carbon footprint targets in our Northeast licensee for 2017-18. We are also ahead of our target in putting overhead lines underground in National Parks and Areas of Outstanding Natural Beauty in the ED1 period to date.

Notes:
1 All financial figures in 2012/13 prices and refer to Northern Powergrid overall unless otherwise stated.
2 Trend ▲ getting better ▼ getting worse ▶◀ staying the same since 2016-17.
3 Ofgem target (see sections in the main body of the report for performance against our own targets).
4 Unplanned & unweighted figures. Indicative figures as at July 2018, figures still to be confirmed by Ofgem.
5 Excluding Guaranteed Standards payments.
6 Broad Measure of Customer Satisfaction (BMCS) rank indicative only based on monthly data. Final ranking to be confirmed by Ofgem.
7 Does not include SECV reward.
8 LVSSA (single minor connections).
9 Dividends paid figure relates to dividends from the licensee company in the year.
10 Gearing figures for Northeast relates to gearing of the licensee company.
11 Credit ratings relate to scores for three credit rating agencies (Moody's/Standard and Poor's/Fitch) for the licensee company.
12 In setting the price control, Ofgem assumed a base RORE of 6% with the opportunity for companies to exceed or fall below this depending on performance. Ofgem is currently revising the basis upon which RORE is calculated, which will result in a recalculation of these figures.

Performance snapshot – Yorkshire[1]

Network

Network		Actual 2017-18	Trend[2]
Number of customers		2.3m	▲
Total DNO network length		54,319km	▲

Reliability & Availability

Reliability and Availability		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Customer interruptions[4]	Inc. exceptional events	50.5			▲
	Exc. exceptional events	46.8	64.7	Achieved	▲
Customer minutes lost[4]	Inc. exceptional events	37.7			▲
	Exc. exceptional events	33.1	55.2	Achieved	▲
Incentive performance reward/(penalty) – IIS[5]	£m	£13.5m			
	£/customer bill	£2.68			

Customer Satisfaction

Customer Satisfaction		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Overall Broad Measure of Customer Satisfaction score out of ten (rank out of fouteen)[6]		8.56 (12th)	8.2	Achieved	▶◀
Incentive performance reward/(penalty) – BMCS[7]	£m	£1.44m			
	£/customer bill	£0.29			

Connections

Connections		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Time-to-quote (days)[8]		7.8	8.2	Achieved	▼
Time-to-connect (days)[8]		47.1	42.1	Missed	▼
Incentive performance reward/(penalty) – connections lead time	£m	£0.06m			
	£/customer bill	£0.01			
Incentive on Connections Engagement penalty – ICE	£m	Nil			
	£/customer bill	Nil			

Social Obligations

Social Obligations		Actual 2017-18	Target 2017-18[3]	Status	Trend[2]
Individual Stakeholder Engagement and Consumer Vulnerability (SECV) score out of ten (rank out of six)		7.5 (2nd)			▲
Incentive reward	£m	£1.12m			
	£/customer bill	£0.22			

Financials

Financials		Total
Unrestricted domestic tariff charge		£67.28
Total expenditure	£m	£196.7m
	% of cost allowances	89%
	% of cost allowances (ED1 to date)	92%
	% of allowed revenue	61%
Dividends paid[9]		£29.8m
Gearing[10]		46.8%
Credit rating[11]		A3/A/A-
Notional RoRE (excluding holdco debt) (vs Ofgem assumption of 6%)[12]		8.4%

Innovation

In 2017-18 we spent £2.3m on innovation projects in our Yorkshire licensee funded by our Netrwork Innovation Allowance. Our diverse innovation portfolio contains 26 projects that span our four innovation priorities for ED1: building our smart grid, delivering smart meter benefits, developing our digital services and improving affordability.

Safety

Our long-term safety performance is strong and continues to place us in the leading pack among our peers. We narrowly missed our annual headline safety target for Northern Powergrid as a whole in 2017-18, measured by the Occupational Safety and Health Administration (OSHA) rate – 0.35 against a target of 0.31 – representing eight reportable incidents in a workforce of more than 2,700.

Environmental Impact

We achieved our oil leakage and business carbon footprint targets in our Yorkshire licensee for 2017-18. We are also ahead of our target in putting overhead lines underground in National Parks and Areas of Outstanding Natural Beauty in the ED1 period to date.

Notes:
1 All financial figures in 2012/13 prices and refer to Northern Powergrid overall unless otherwise stated.
2 Trend ▲ getting better ▼ getting worse ▶◀ staying the same since 2016-17.
3 Ofgem target (see sections in the main body of the report for performance against our own targets).
4 Unplanned & unweighted figures. Indicative figures as at July 2018, figures still to be confirmed by Ofgem.
5 Excluding Guaranteed Standards payments.
6 Broad Measure of Customer Satisfaction (BMCS) rank indicative only based on monthly data. Final ranking to be confirmed by Ofgem.
7 Does not include SECV reward.
8 LVSSA (single minor connections).
9 Dividends paid figure relates to dividends from the licensee company in the year.
10 Gearing figures for Yorkshire relates to gearing of the licensee company.
11 Credit ratings for Northeast and Yorkshire relate to scores for three credit rating agencies (Moody's/Standard and Poor's/Fitch) for the licensee company.
12 In setting the price control, Ofgem assumed a base RORE of 6% with the opportunity for companies to exceed or fall below this depending on performance. Ofgem is currently revising the basis upon which RORE is calculated, which will result in a recalculation of these figures.

Our performance measures explained

Our performance snapshots on the inside front cover and on pages 34 and 35, set out one-page summaries of our key measures of performance in the year.

Based on engagement with our stakeholders we have gone further than the minimum requirements in our disclosure and presentation of information to rise to the challenge of greater transparency in our performance reporting. For example, in addition to reporting our actual performance against targets, we have included our relative ranking position among the other British distribution network operators, our performance trends, the financial incentive rewards/penalties we have earned/incurred along with the impact of those incentives on an average domestic customer bill.

We hope you find what we've done useful. Below is a glossary explaining the meaning of each of the measures included in our performance snapshots.

Number of customers		Number of customers electricity is distributed to in Northern Powergrid's licensee areas: Northeast and Yorkshire.
Total DNO network length		The total kilometres of overhead lines, underground lines and subsea cables used to distribute electricity to Northern Powergrid customers in its two licensee areas: Northeast and Yorkshire.
Customer interruptions	Including exceptional events	The number of customers whose supplies have been interrupted per 100 customers per year over all incidents where an interruption of supply lasts for three minutes or longer, excluding reinterruptions to the supply of customers previously interrupted during the same incident, including any interruptions caused by exceptional events. An exceptional event is an event which is beyond the reasonable control of the licensee but does not include weather conditions which are reasonably expected to occur.
	Excluding exceptional events	As above, but excluding any interruptions caused by exceptional events.
Customer minutes lost	Including exceptional events	The duration of interruptions to supply (or the average customer minutes lost per customer per year) where an interruption of supply lasts for three minutes or longer. It includes any interruptions caused by exceptional events.
	Excluding exceptional events	As above, but excluding any interruptions caused by exceptional events.
IIS – Incentive performance reward/ (penalty)	£	Electricity distribution companies are incentivised on the number and duration of network supply interruptions versus a target derived from benchmark industry performance. This figure represents the financial reward/(penalty) earned or measured on network interruptions in Ofgem's Interruption Incentive Scheme (IIS).
	£/domestic customer bill	How much the above incentive reward (or penalty) will add to (or take off) the bill for an average domestic consumer in 2019-20.
Overall Broad Measure of Customer Satisfaction Score		Northern Powergrid's Broad Measure of Customer Satisfaction (BMCS) score and rank on Ofgem's customer satisfaction measure. It is based on a customer satisfaction survey and is designed to drive improvements in the quality of the overall customer experience by capturing and measuring customers' experiences of contact with their electricity distribution company.
BMCS – Incentive performance reward/ (penalty)	£	Value of the Ofgem Broad Measure of Customer Satisfaction (BMCS) reward/ (penalty), a financial incentive on customer satisfaction, excluding stakeholder engagement rewards.
	£/domestic customer bill	How much the above incentive reward (or penalty) will add to (or take off) the bill for an average domestic consumer in 2019-20.
Time-to-quote (days)		The average number of days from a connection application being received to a connection quote being issued for single low-voltage minor connections (LVSSA).
Time-to-connect (days)		The average number of days from acceptance of a connection quote by a connectee to the completion of the necessary electrical works, to the point it would be possible to energise (subject to installation of an appropriate meter), for single low-voltage minor connections (LVSSA).

Incentive performance reward/ (penalty) – connections lead time	£	Value of the time to connect financial incentive for single low-voltage minor connections (LVSSA) and two to four minor connections (LVSSB).
	£/domestic customer bill	How much the above incentive reward (or penalty) will add to (or take off) the bill for an average domestic consumer in 2019-20.
Incentive on Connections Engagement (ICE) penalty (if applicable)	£	Value of the Ofgem ICE penalty: a connections engagement financial incentive for major connections customers (metered demand connections, metered distributed generation and unmetered connections).
	£/domestic customer bill	How much the above incentive penalty will take off the bill for an average domestic consumer in 2019-20.
Stakeholder Engagement and Consumer Vulnerability (SECV)		Northern Powergrid's Stakeholder Engagement and Consumer Vulnerability (SECV) score and rank as part of Ofgem's customer satisfaction measure.
Incentive reward (SECV)	£	Value of the Ofgem SECV reward, a stakeholder engagement financial incentive.
	£/domestic customer bill	How much the above incentive reward will add to the bill for an average domestic consumer in 2019-20.
Unrestricted domestic tariff charge (for a typical domestic customer)		The distribution element of the bill for an average domestic consumer in 2017-18, excluding the cost of a special rebate given by some electricity distribution companies in 2014 and 2015 (in accordance with the government 2013 Autumn statement) to help reduce energy bills. The average domestic consumer is assumed to use 3,100kWh per annum. The calculation assumes 365 days in a year.
Total expenditure	£	This is Ofgem's regulatory total expenditure (or 'Totex') measure, which includes many of the costs incurred by electricity distribution companies, but excludes costs over which companies have no control, and which also nets off proceeds from the sale of assets. This measure is used as the basis for calculating how much the company has spent on operating and investing in its distribution business, and companies are incentivised to minimise it while at the same time delivering all the required outputs.
	% of cost allowances	How much the company has spent of its Totex allowances for the year. If the percentage is lower, a company has either been successful in reducing how much it costs to deliver its outputs, or has not delivered some of its outputs (which would lead to a reduction in its future allowed revenues).
	% of allowed revenue	How much of its allowed revenues a company used to fund its Totex expenditure, before covering other day-to-day costs that are excluded from Totex and repayments of previous investments.
Dividends paid		Dividends paid in the year.
Gearing		A ratio measuring the extent to which a company is financed through borrowing. Ofgem calculates gearing as the percentage of net debt relative to the Regulatory Asset Value (RAV).
Credit rating		An evaluation of a potential borrower's ability to repay debt. Credit ratings are calculated from financial records including and current assets and liabilities. There are three major credit rating agencies (Standard & Poor's, Fitch and Moody's) who use broadly similar credit rating scales, with D being the lowest rating (highest risk) and AAA being the highest rating (lowest risk). The companies regulated by Ofgem typically have a credit rating of BBB, BBB+, A- or A.
Actual Return On Regulatory Equity – RORE (vs Ofgem assumption of 6%)		The return on regulated equity (RORE) measures how much a company has earned on previous investments in its regulatory assets (RAV) that have been funded by shareholders in the regulatory settlement. This starts with the base return which Ofgem allowed, to reflect the cost of equity in capital markets, and is adjusted for the value earned via any incentive schemes to reflect performance, and any difference between how much the company's debt finance cost compared to Ofgem's assumption. Ofgem's calculation of this figure assumes a notional gearing of 65% (which is above our actual gearing level). It is stated in real terms, i.e. before inflation is added.
OSHA rate		In the USA the Occupational Safety and Health Administration (OSHA) accident rate records reportable work-related accidents including major incidents leading to absence from work and also less severe injuries where employees may experience restricted work duties or have prescription drugs issued as treatment or therapy. The OSHA rate is presented as reportable cases per 200,000 man hours. See www.osha.gov
RIDDOR rate		A UK accident rate that measures the number of accidents that are reportable under the UK's Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR). These accidents are reportable to the HSE and include fatal, major injury and lost-time accidents resulting in over seven days absence from work. See http://www.hse.gov.uk/riddor

An update on our commitments in detail

Safety	Commentary	Status
Increase awareness in our communities of the dangers of electricity if not handled properly.	Our programme to raise awareness of the dangers of electricity expands every year. In 2017/18 we continued to engage with young people through our diverse school safety awareness programme for primary and secondary schools including our 'Crucial Crew' programme in partnership with the Police, Fire Brigade and Drugs awareness teams (reaching 41,000 young people). We also operate our Education website (previously called Fusebox) that provides an online interactive resource for children to access our safety messages and issued 6,301 children with health and safety scout badges. We are committed to raising awareness of the risk that overhead power lines pose to farmers, road hauliers and contractors. During the year we refreshed our 'Look Up – Its Live' campaign, as well as supported the ENA 'Look Out – Look Up' promotion at the start of 2018. We exhibited at the major agricultural shows in the region, attended by over 260,500 visitors, and delivered electrical safety presentations at student induction days at major agricultural training colleges. We also presented to members of both the Fleet Transport Association and the Road Haulage Association at their regional conferences in the year, reaching 80% of hauliers through the campaign. Social media is a key part of our safety campaigns. During the year our presence continued to increase, issuing over 2,800 newsletters and reaching 9,000 Facebook followers (a 66% increase in the year).	On Track
Remain a leading safety performer, meeting all requirements and halving our accident rate by 2023.	Our long-term safety performance remains strong, maintaining our place amongst the leaders in the industry and keeping us firmly on track to achieve our headline commitment to halve our accident rate by 2023. Whilst we have reduced our accident rate by 19% so far in ED1 (relative to our ED1 business plan baseline), 2017/18 was a disappointing year relative to our annual targets, missing our OSHA accident rate target (0.35 against our target of 0.31 – 8 reportable incidents) and our RIDDOR accident rate target (0.24 against our target of 0.1 – 6 reportable incidents). We also incurred a minor HSE enforcement notice related to two excavations carried out by a contractor organisation. We continue to reinforce our safety culture, driving safety standards through leadership engagement and our safety champions programme. We maintained strong driving performance in 2017-18, incurring only 29 preventable vehicle accidents across a fleet covering ca. 21 million miles, assisted by our investment in fleet vehicle telematics and in-cab cameras. More information on OSHA and RIDDOR measures can be found in the glossary.	On Track
Promptly resolve any network safety issues arising from the smart meter roll-out.	The rollout of millions of smart meters to customers by energy suppliers in our region presents a safety risk if the installation is not done properly. To mitigate this risk, we only permit operatives acting on behalf of energy suppliers to install smart meters on our network if they have gone through a training and competency assessment. Since 2016 we have required that staff of any meter operator who are or will be installing smart meters on our network attend our training programme with over 500 completing the course to date. We believe that establishing and maintaining these high standards will reduce the number of safety issues associated with the smart meter rollout. We have well established processes in place for responding to issues identified with meter installations and any problems identified to date have been investigated and resolved promptly. Our industry leading web-based appointments system, launched in 2017, continues to receive positive feedback, avoiding repeat visits for customers by coordinating work between meter operators and our service providers. We continue to participate in industry working groups to ensure that our programme benefits from best practices in preparation for the forecasted increase smart meter roll-out volumes.	On Track

Safety	Commentary	Status
Reduce the impact of metal theft, including improving substation security.	Levels of metal theft from our network remain low due, in part, to the low price of copper, but also the work we have done with scrap metal dealers and the police. We continually review our approach to mitigate and respond to theft and have a team that focuses on reviewing and reinforcing substation sites that we consider vulnerable, achieving a reduction in the number of vulnerable sites since the start of ED1. In 2017-18 we continued to improve the resilience of our substation sites, installing new electric fences at three of our high-risk major substations. We also educated 32,723 children through our schools programme on the danger of metal theft.	On Track
Keep safety as a central driver of investment decisions and appraisals.	Safety remains a central driver of our decision-making processes whether we are operating, extending, maintaining, repairing or replacing the network. Our asset investment policy is underpinned by the principles of developing safe, efficient, coordinated and economical electricity systems that sustainably serve the needs of our stakeholders. We have continued to comply with all legal, regulatory and environmental requirements without compromising the safety of our employees, customers or the public. In 2017-18, as part of our safety and health improvement activity, we replaced over 38,164 service cut-outs, a 9% increase on the previous year, removing 1,352 units that did not comply with (ESQCR) safety standards. All known historical high-voltage overhead line ground clearance issues have been rectified with any new instances included in our annual programme for remediation. We also made good progress with resolving low voltage line non-conformances, with 80% of the programme now complete (427 sites in 2017-18).	On Track

Reliability & Availability	Commentary	Status
Restore electricity within 12 hours – and if we don't, make enhanced and automatic payments to all customers (with extra for our vulnerable customers).	We moved to the 12-hour power restoration guaranteed standard and implemented our automatic payment policy at the start of the RIIO-ED1 period. In the event of a failure against the guaranteed standard we make enhanced payments above the mandated amount (of £75) paying £100 (an additional £25) to our customers or £200 (an additional £125) for vulnerable customers. We are making good progress against the 12-hour restoration standard. In 2017-18 we reduced the number of customers experiencing greater than 12-hour power cuts by 3.1%. We will continue with our strategic and targeted investments to the network to support our performance improvement in this area over the eight-year period including effective deployment of mobile generation where possible to restore supplies on an interim basis.	Delivered
Planned power cuts to leave customers without power for less time, particularly during winter.	Customer satisfaction for our planned power cut service is very high with our customers scoring us at 89.7% in 2017-18 (an improvement of 4.1 percentage points since the start of the period), ranking 1st place in the industry. Planned power cuts are only scheduled for (the eight) daylight hours, and during the worst winter months, planned to last for no longer than 4.5 hours. In 2017-18, 97.8% of planned power cuts lasted no longer than eight hours and in the winter months 82.5% of planned power cuts ended within our 4.5 hour target. We will continue to pursue further improvements against these standards in the remainder of the period.	On Track
Maintain the underlying health of the asset base and report on it annually.	Our investment plans target ageing and highly-loaded assets in order to reduce the risk of failure. We remain on track to deliver our business plan targets for the eight-year RIIO-ED1 period, tracking slightly ahead of Ofgem's asset health and criticality index measure for the period to date. In 2017-18 we were marginally behind plan due to delays in commissioning some high-value EHV/132kV assets but we expect to recover this position as we progress through the RIIO-ED1 period.	On Track
Reduce the average length of unplanned power cuts by 20% by 2023.	We have significantly improved performance year-on-year and continue to make good progress towards our 2023 target. We continue to invest in automatic fault restoration technology, remote control and we are increasing our deployment of temporary generation alongside leveraging our nine-zone operating structure. Our 2017-18 performance exceeded our ED1 period-end target of a 20% reduction in the average length of power cuts, achieving a 38% reduction against our ED1 business plan base line (33% in Northeast and 43% in Yorkshire).	Ahead
Achieve 8% fewer unplanned power cuts by 2023.	During the year we have delivered further network performance improvements through our asset replacement programmes and investment in automatic fault restoration technologies. Despite some unfavourable weather conditions, including 'the Beast from The East' storms, our 2017-18 performance represented a 26% improvement (19% in Northeast and 34% in Yorkshire) against our ED1 business plan base line, outperforming our ED1 period-end target of an 8% reduction. We will work to consolidate this level of service and continue to build on it in the remainder of the eight-year period.	Ahead

An update on our commitments in detail (continued)

Reliability & Availability	Commentary	Status
Target network improvements for our worst-served customers.	We continue to target improvements to underperforming areas of our network. We focus on the 20 worst performing circuits on our network in each of our licensees, implementing improvements including installing (where possible) automatic power restoration system (APRS) technology that enables automatic reconfiguration of the network in response to faults. At low voltage we analyse fault performance and identify the worst performing low-voltage areas of our network to target our improvement activity. This analysis allows us to deploy low-voltage automatic restoration devices including our dual fuse devices and auto re-closers onto areas of our network that experience high volumes of non-damage, intermittent faults. This technology is also being developed to reliably identify the location of faults as part of our restoration activity.	On Track
Ensure adequate network capacity for customers wanting to connect.	Our commitment covers three key areas. Firstly, to ensure that our network is efficiently developed to accommodate forecast underlying growth in load and generation. Secondly, to provide the means to help customers identify areas where they can connect quickly and at low cost. And thirdly, to release capacity on the network where it is possible to do so by reclaiming unused capacity from existing customers or by reducing the set-point voltages at our primary substations to enable the connection of more solar PV generation to the LV network. We reforecast future loads annually and we are currently working on a project to refine these forecasts to accommodate future uncertainty in the growth of low carbon technologies, particularly electric vehicles. This project takes future energy scenario forecasts for load and generation and applies these to our networks to help us identify the potential requirement for reinforcement or customer flexibility solutions to address hot spots. It will extend our forecasts to include all of our distribution substations (i.e. HV/LV substations). We publish and update monthly load and generation availability maps (heat maps) that show the capacity available on our network for new load and generation connections respectively. We have also developed an Active Network Management scheme, currently being implemented in Driffield, Yorkshire, that once implemented will be rolled out on a phased basis to release further capacity for the connection of generation in areas that are identified as constrained (i.e. red) on our heat maps. We also continue to progress well with our voltage reduction programme, releasing voltage headroom to allow the connection of more solar PV generation whilst maintaining the network within voltage limits. In ED1 to date we have released over 1.6GW of capacity via voltage reductions at our primary substations. We approached 45 customers during the year to explore the release of capacity from their connection agreements (142MW in total) however, none of the customers agreed to a reduction in this year's exercise.	On Track
Increase the resilience of the network to flooding.	After a slow start to the RIIO-ED1 period, we are now ahead of schedule after we upgraded the defences at 64 sites (25 Northeast and 39 Yorkshire) in 2017-18; more than double our target for the year. This takes us to 119 sites reinforced during the period. In our RIIO-ED1 business plan we committed to improving the resilience at 141 sites as well as completing 15 sites that remained from the previous price control period. Since making that commitment there have been a number of severe flooding events that triggered a national review of flood resilience as well as causing us to carry out our own analysis. The result is that we have expanded our programme to target improvements at an additional 98 sites, 45 sites that were identified as part of the national flood resilience report and 53 new sites from our own flood analysis. This takes the total number of sites targeted for improvement during the RIIO-ED1 period to 254. We remain on track to complete our original RIIO-ED1 commitment of 141 during the next year and complete the total programme of 254 by 2023. **Stretch target – additional 98 sites added to our ED1 programme.**	Ahead

Reliability & Availability	Commentary	Status
Use smart meter alarm information to improve network performance and the information we provide to customers.	The national smart meter programme has experienced significant delays since the start of the period. We achieved connection to the national central smart meter system in November 2017 and we are now processing data received from smart meters albeit at very low volumes due to the small number of second generation (SMETS 2) meters installed on our network to date. Our internal readiness to realise benefits for customers is on-track and we are confident that as the smart meter roll-out ramps up, our systems and processes will allow us to use the information to improve the services we offer to our customers.	On Track

Connections	Commentary	Status
Better payment terms – customers will not need to pay as far in advance.	Our connections customers told us that they would prefer to pay for their connection closer to the start of the works, rather than over a month in advance. In 2015-16 we implemented a payment process that allows small works connections customers to pay for their connections up to 12 days before the works begin. We are continuing to engage with our customers and will keep our payment terms under review during the period to ensure they are fair and reflect customer needs.	Delivered
Provide a better service for non-contestable elements of work – regularly publishing key indicators.	We established our Connections Input Services team in 2015 to serve Independent Connections Providers (ICPs) and Independent Distribution Network Operators (IDNOs), alongside implementing new streamlined competition in connections (CIC) processes. We publish key performance metrics for our range of input services on our website to report how we are performing to our stakeholders. During 2017-18 we continued to review and improve our non-contestable services. This included reducing our input services for ICPs and IDNOs to enable ICPs to compete for work across all voltages in our distribution service areas, running workshops on data access and self-determination of points of connection for ICPs and launching interactive end-to-end process maps on our dedicated CIC webpage, that provides guidance and useful information to guide ICPs through the process of connecting to our network. We also introduced independent quality assurance visits to verify the standard of work done by Northern Powergrid, its contractors and ICPs. This significantly improved the quality, consistency and compliance of network connections. In October, we responded to requests from ICPs and IDNOs to carry out contestable offsite works on behalf of ICPs/IDNOs in instances where either the ICP doesn't hold the relevant scope of accreditations to carry out the contestable works themselves, or where the IDNO does not wish to appoint an ICP to carry out the offsite contestable works. We continue to run our monthly ICP surgeries and additional subject specific workshops, engaging with our stakeholders to develop our service further in this area.	Delivered
Introduce a web-based system to help customers understand the capacity on our network and the likely cost of connection.	In 2016-17 we introduced interactive generation and demand heat maps on our website. These webpages detail what capacity is available on our network, give a description of any network constraints that would affect connections and set out our guide prices and payment periods for typical jobs. We update our availability heat maps and contracted capacity register each month.	Delivered
Provide more flexible quotations, including online self-service and faster quotes.	Last year we updated our online services to provide customers with more information on pricing, timescales and capacity. This, along with our guided online process allows customers to complete much more of their connections application themselves. Our fast-track connections process makes it easier and quicker for customers to turn a budget estimate into a firm quote. We also significantly improved our service alterations process for our customers, giving them the option to obtain a quote online or request a pre-quote site visit ahead of receiving a connection quote. We are increasing the flexibility and reduced the cost of connecting to our network in constrained areas by deploying Active Network Management (ANM). We first deployed an ANM scheme to avoid most of the costs associated with large amounts of generation capacity in the last price control period and have now developed a replicable scheme that we are deploying at the end of 2018 for the first time in Driffield, East Yorkshire. New government legislation was introduced on 6 April 2018 to allow all network companies to pass on the cost of providing connection quotations (Connection offer expenses) via charging Assessment and Design (A&D) fees which would otherwise have been paid for by only those customers who accept quotations and proceed with works. We introduced charges in line with the legislation which has resulted in fairer charges for customers and a 30% reduction in enquiries as a result of fewer speculative applications.	On Track

An update on our commitments in detail (continued)

Connections	Commentary	Status
Implement a tailored service for large projects, including 'account management' where needed or requested.	In 2016-17 we rolled out a single point of contact model to connections customers for large projects to guide them through the application and delivery process, allowing customers to liaise with a dedicated individual member of our team. Over the course of the next year we will introduce structured account management for our major business-to-business customers and key stakeholders (including Local Authorities) providing them with a named point of contact in the business.	On Track
Reduce end-to-end connection timescales for small works by more than 30%.	Whilst we missed three of the four connections lead-time targets at an overall level in 2017/18, we are now investing more time up front in the quotations process (including our option of a site visit) to avoid delays later in the process. Performance on time to connect continues to be impacted by jobs where customers are not in a position to receive the work or request extended periods of time between connection offer and completion of the work. Positively, our BMCS performance was ahead of the Ofgem target of 82% in both licence areas. We achieved 85.5% in Northeast, 1.5 percentage points ahead of our 84% business plan target, however we narrowly missing out on this in Yorkshire, scoring 83.4%. While we are currently behind the targets we set in our plan, we remain confident that we will achieve the 30% reduction in connections timescales by the end of the period.	Behind – Recoverable

Environment	Commentary	Status
Underground around 100km of overhead line in Areas of Outstanding Beauty (AONBs).	We are making good progress against our commitment in the area of visual amenity which was to underground 100km of overhead line in Areas of Outstanding Beauty (AONBs) across our regions. Since the start of the RIIO-ED1 period (April 2015) we have undergrounded 43.7km of cable, 7.1km (19%) more than the targets we set in our plan. We accelerated this programme in response to stakeholder feedback and in 2016-17 committed to spend an additional £2.0m in this area offsetting underspend from the previous regulatory period to deliver an additional 20km of undergrounding during the RIIO-ED1 period. **Stretch target – underground an additional 20km (120km in total).**	Ahead
Reduce our business carbon footprint by 10% by 2023.	We are continuing to reduce our Business Carbon Footprint (BCF). During 2017-18 we achieved a 13% year-on-year reduction in BCF (including the BCF of our contractors), which has taken our overall reduction for the RIIO-ED1 period to date to 34%. Alongside reducing fleet mileage via vehicle telematics we have adopted a strategy of using battery powered mobile generators (where possible) as opposed to diesel based generators which is helping us deliver our reliability and customer service targets whilst minimising environmental impact. We are also starting to introduce electric vehicles onto our fleet, where appropriate. At the moment the technology isn't sufficiently advanced to allow us to start replacing our heavy industrial vehicles but we are introducing electric vehicles as pool cars and we are installing electric vehicle charging points at our offices across the region. We also continue to focus on Sulphur Hexafluoride (SF_6) reduction using thermal imaging technology to detect leaking switchgear.	Ahead
Reduce oil/fluid leakage to ground by 15% by 2023.	We are already performing at a level significantly beyond that required to achieve our original 15% RIIO-ED1 commitment for oil/fluid leakage, achieving a 44% reduction, relative to our original business plan baseline. This significant improvement has been driven by our cable replacement programme, deployment of new technology such as perfluorocarbon (PFT) leak detection and dedicated management focus on leaking fluid-filled cable circuits. Looking ahead we expect our use of a self-healing cables additive to further reduce oil leakage from cables as well as improve network performance. We are continuing to work towards a stretch target to deliver a 47% reduction in oil filled cable leakage by the end of ED1, relative to our original business plan baselines. **Stretch Target: reduce oil/fluid leakage to ground by 47%**	Ahead

Environment	Commentary	Status
Deliver faster and higher quality street works reinstatement when we dig up the street.	Our street works performance continues to be strong. We achieved our annual target for 2017-18 in relation to local authority street works quality inspections (94% against our target of 90%) and we completed 99% of works within the timescales agreed. Through continued focus on working with our employees and our service providers, we remain confident of maintaining our performance levels and achieving our eight-year RIIO-ED1 targets. During 2018, the Department for Transport initiated a project to implement a centralised digital service for the management and coordination of all street works by the end of 2019. We have plans in place to adjust our systems and processes to ensure compliance with the new requirements.	On Track
Maintain SF_6 losses as the volume of gas in our switchgear assets increases.	In 2016-17 we set a more aggressive plan to contain SF_6 leakage and set a stretch target for 2017-18 to reduce leakage from 112kg to 100kg (a 10% reduction) at the same time as the amount in service on our network increases and then maintain that level throughout the ED1 period, outperforming our original RIIO-ED1 target. We achieved our stretch target, losing just 98kg of SF_6 in 2017-18, enabled by deploying state-of-the-art thermal imaging technology to accurately pinpoint leaks and target equipment for repair or replacement. We will deliver our improvement plans in this area with a view to establishing this level of performance as our new minimum standard. **Stretch target – reduce SF_6 losses to 100kg by the end of ED1**	Ahead
Make sure reduction of electrical losses is explicitly factored into investment decisions for a wider range of assets.	At the start of the period we changed our policies around how we design our network and purchase our equipment to explicitly factor losses into our decisions. Our design engineers review the merits of each investment project and the types of equipment that we install to take account of electrical losses in the solutions that they design. For example we install oversized conductors and transformers (where required) along with low-loss transformers to reduce losses. In 2017-18, we commenced our roll-out of low voltage monitoring equipment to high loss areas of our network, accelerated asset replacement of our high-loss (pre-1958) transformers and provided training for our design staff in losses assessment. Over the last three years, we have also invested in larger electricity cables in order to reduce energy losses. Overall, we have saved 2,477MWh in ED1. We forecast that using larger cables to deliver electricity will help us save up to 10,500MWh in total by 2023, enough electricity to power 700 homes for a year.	On Track
Replace 134km of fluid-filled cables and use perfluorocarbon tracers (PFTs) to quickly replace leaks.	The combination of fluid-filled cable replacement and faster detection and repair of leaks means we are already significantly outperforming our oil/fluid loss targets for the period and further reducing our environmental impact. The length of fluid-filled cables replaced in RIIO-ED1 to date is marginally (7.5%) behind our original phased profile due to balancing customer requirements with outages to complete the required work. We have plans in place to replace the targeted cable circuit sections and expect to exceed our original target by 54% by the end of the period (replacing 205.7km compared to our original target of 133.6km). **Stretch target: deliver 206km of fluid-filled cable replacement by the end of ED1 (an additional 72km on our business plan commitment).**	Behind – Recoverable
Continue to operate a full revenue protection service.	In 2015 we informed our stakeholders that we intended to cease providing a revenue protection service for energy suppliers following the decision from our key service provider in our region to withdraw from this activity. This meant it was no longer practical for us to provide this optional service cost-effectively for suppliers and as we received no objections, we stopped providing the service in April 2016.	Withdrawn

Finance	Commentary	Status
We will deliver an immediate 10% price reduction at the start of the period.	We delivered a 14% price reduction to domestic customers in April 2015, the start of the RIIO-ED1 period. The underlying base revenues that we are allowed to earn remain flat (excluding the effects of price inflation) but our prices will move during the period according to the way that the regulatory price control mechanism works and a number of other factors such as annual expenditure, performance against Ofgem's incentive mechanisms, changes in charging methodologies for the industry, allowed cost of capital and lengthening of the period over which we recover our investment (from 20 years to 45 years).	Delivered

An update on our commitments in detail (continued)

Finance	Commentary	Status
We expect to create 1,000 job opportunities in the organisation during the ED1 period.	We remain on track for our commitment to create 1,000 job opportunities in the region. During the year we created 167 job opportunities; these were split between recruitment of technical engineering trainees through our workforce renewal programme (68) and new hires in other positions throughout our organisation (99). This takes our total recruitment since April 2015 to 424 (with 240 through our workforce renewal programme) against our eight-year target to have created 1,000 jobs. We have broadened our trainee programmes on offer to include opportunities in other departments such as Finance, IT and Procurement. In April 2017 we recruited our first Cyber Apprentices as part of a new Government pilot scheme (which Northern Powergrid is part of) that aims to build the skills we need to protect the nation's critical national infrastructure from cyber threats and attacks.	On Track

Smart grids	Commentary	Status
Invest £52m in smartgrid network reinforcement that pays back by 2023 through avoiding £86m of traditional reinforcement – a net saving of £34m compared with traditional reinforcement methods.	Requirements for reinforcement in the RIIO-ED1 period to date have continued to be below forecast due to the uptake of low carbon technologies being at the low end of expectations. We have completed the first stage of our voltage control programme to avoid £25m of traditional reinforcement through adjusting primary transformer tap changer set points to create voltage headroom. We have developed our policies around lower voltage innovative solutions such as distribution transformer On Load Tap Changers (OLTC), HV and LV in-line regulators and shunt capacitors and expect to roll out these types of technologies over the remainder of ED1. Work is on-going installing Active Network Management (ANM) equipment at various Northern Powergrid sites in Driffield and our programme of works to reduce HV busbar voltage (20kV and 11kV reduced by ca. 200 volts) at major substations to provide additional headroom for generation connections is now largely complete. These schemes will allow us to defer reinforcement investment to later in the period as more distributed generation is connected.	On Track
Provide opportunities for customers to participate in demand side response to reduce the cost of running the network.	We are developing our flexibility strategy, engaging with our customers to make more efficient use of the network through means other than traditional reinforcement when load in a specific area approaches capacity. We committed in 2018 to test the market through a third party platform that will allow asset operators to publish information so that flexibility services can be procured should a constraint in that area arise. In the short term, we expect to procure a small range of flexibility products in specific locations on a trial basis, scaling this up across the network in future years as constraints appear. The Activating Community Engagement (ACE) project, led by Northern Powergrid in partnership with a consortium including GenGame Ltd, Open Energy, Serious Games International and Newcastle University, came to an end in 2017-18 after three years. This residential demand side response (DSR) project has educated people about their energy usage and actively engaged communities to make small changes to how and when they use electricity in exchange for winning prizes for themselves or local groups. Going forward, it is our intention to use the learning we have developed during ACE on other innovation projects where community engagement is required.	On Track
Modify our trading and customer service systems to realise benefits from the new smart meter data.	The central national IT infrastructure for smart meters went live in 2017 and we achieved connection to the system in November 2017, two months ahead of the mandated deadline. At present there is limited smart meter data available to us due to the low volume of second generation (SMETS 2) smart meters installed on our network. However, the volume will increase significantly over the next few years. We remain well placed to realise benefits for customers when smart meter data does become available, receiving a Green rating from the Department of Business, Energy and Industrial Strategy (BEIS) for our support for the roll-out. We have adjusted our processes and systems to take advantage of the small number of alerts and alarms available to provide enhanced services for our customers, for example prompt response to power cuts and network irregularities. We have a number of other projects in progress to integrate new smart meter data with our customer service and network management systems to further expand our services.	On Track

Smart grids	Commentary	Status
Use smart meter data to optimise network investment and reduce losses.	Whilst the national smart meter roll-out programme has continued to experience delays, our own internal smart meter systems have been ready to receive new smart meter data from late November 2017. We are now processing data alerts as part of our services for customers but have received a limited amount due to low volumes of second generation (SMETS 2) meters. We have projects ready to implement to make more advanced use of smart meter data as it starts to become available.	On Track
Trial the potential for combining smart grids and smart meter data to provide additional information services.	The delayed national roll-out of smart meters has reduced the available data set for us to conduct trials to explore the combination of smart meter and smart grids data, however we continue to review the expected functionality and benefits offered by smart meter data and are looking at a number of different ways it could be used. As part of our innovation portfolio, we are developing project trials with our academic partners to test our ideas and expect to have projects scoped during 2018 and running during 2019 ready for the anticipated increase in smart meter data volumes.	On Track
Establish a dedicated team of technical staff to perform timely modifications to our equipment when they are needed to enable the smart meter installation to proceed.	Our service providers resolve defects identified through the smart meter roll-out on our behalf. In order to ensure that this arrangement delivers high quality levels of service for our customers we meet regularly with our providers to agree improvements to managing defects, reporting and resolving safety issues. Our industry leading, web-based appointment system allows meter operators to co-ordinate their visits to customer premises at the same time that our service providers are on-site resolving meter defects. This ensures minimal disruption to our customers and is receiving positive feedback. We have continued to experience significantly higher smart meter defect rates than Ofgem's original forecast (3.74%). Our service level agreement (SLA) performance for defect resolution is 82% for Category A and 90% for Category B (both against targets of 90%), having resolved almost twice as many defects than forecast.	On Track
Invest £83m in smart grid enabling technology that, as a minimum, pays for itself by 2031 – the more likely result will be a much larger saving, possibly as high as £400m-£500m.	Our investment in smart grid enabling infrastructure was a key pillar of our ED1 business plan and remains a key enabler for our transition to the role of Distribution System Operator (DSO). Our programme is upgrading the control units in our substations to make the network compatible with modern digital communications along with establishing the communication network from our control centres to those units. This investment will give us greater ability to control and analyse how our network is operating in real-time to respond to the uptake in low carbon technologies. In many cases our programme is breaking new ground which has meant that we have had to navigate a number of technical challenges in the initial specification, procurement and pilot phases. So far in ED1 we have spent £7.5m on smart grid enablement (behind the £29.2m assumed in our ED1 business plan); however, we are now moving into wide spread roll-out on our network which will continue to ramp up over the RIIO-ED1 period and we remain confident that we will deliver our commitment for the ED1 period. We are also starting to deliver our replicable Active Network Management (ANM) system for customers, the first of which we expect to commission during 2018-19 in Driffield, Yorkshire.	Behind – Recoverable

Social obligations	Commentary	Status
Route calls from Priority Services customers directly to Contact Centre advisors, bypassing automated messaging.	Since 2016, all of the calls we receive from customers on our Priority Services Register bypass our automated messaging service and go directly through to a member of our Contact Centre team so that we can respond to their specific needs as quickly as possible. During 2017-18, we introduced a comprehensive suite of tools to support our vulnerable customers with specific communications needs including services such as BrowseAloud text-to-speech and 'language line' translation. Our vulnerable customers tell us that one of the most important things we can do during a power cut is to keep them proactively informed and that their needs change throughout the duration of a power cut. During the year we developed a set of proactive communication services to respond to this and we are measuring our performance in respect of these new services in 2018.	Delivered

An update on our commitments in detail (continued)

Social obligations	Commentary	Status
Build partnerships with organisations to help us deliver our social programme.	We have continued to expand our projects with charities, community groups and other third sector organisations to deliver more support for vulnerable customers. In 2017-18, we added Relate to our Powergrid Cares programme alongside existing members, Citizens Advice (Leeds and Newcastle) and Green Doctors, trialling training for our staff in vulnerability, relationship management and energy efficiency. We also ran eleven local community roundtable events to raise awareness of our Priority Services Register and to discuss the challenges facing our customers and the further support we can offer. In November 2017 we launched our Partnering Communities Fund. The fund makes grants of between £1,000 and £10,000 (total available of £50,000) for projects that tackle fuel poverty, promote energy efficiency, educate communities about the dangers of carbon monoxide and electrical safety, encourage interest in STEM (Science, Technology, Engineering and Maths) subjects or promote our Priority Services Register. We received 33 applications and seven were awarded grants to deliver projects over the coming year. We are looking to merge funds with Northern Gas Networks in 2018 to ensure a more holistic approach in our operating area and the maximum possible impact for our shared customers. Our initiatives are having an impact. We have seen a significant increase in PSR activity adding around 191,000 new PSR customers in 2017-18, an increase of 27%. We have also seen a 97% increase in the number of hits on our Powergrid Cares website.	On Track
Promote and raise awareness of our Priority Services Register to and with other partner organisations.	We extended our PSR referral partnerships in 2017-18 and engaged with over 170 local organisations in our most vulnerable communities through workshops and communications. We simplified our PSR materials to have more impact and shared them with our established referral organisations including health, mental health, job centres, fire and rescue organisations. As a result, we received 515 PSR referrals from our partnerships in the year and online PSR applications increased by 193%. These partnerships have also helped us get closer to some of our hard to reach communities where we have previously struggled. They have also helped us to identify the most vulnerable communities in our region and tailor our PSR campaigns accordingly.	On Track
Enhance our training for frontline staff providing additional support for Priority Services customers.	During 2017-18 we designed and delivered a bespoke face-to-face and online vulnerability training programme for all Northern Powergrid employees. The training was developed in collaboration with experts from Money Advice Trust, who are regarded as best practice leaders in vulnerability within the financial services sector, and National Training Academy, experts in online training. We have been able to demonstrate the impact the training has had on our colleagues' knowledge and confidence in supporting customers in vulnerable situations. The training will be included as part of our new-starter induction process and we will carry out refresher training every three years thereafter. As well as training our people to deliver high-quality services for our vulnerable customers, we have issued a PSR toolkit to all of our staff. The toolkit outlines the support services available to our customers and makes it quicker and easier to get customers the support they need.	On Track
In conjunction with local authorities, identify socially-deprived areas and prioritise our support towards them during a power cut.	Following the significant enhancements we made in 2016-17 to the data we hold on social deprivation, we have continued to evolve our approach to engaging with customers so that our services and interactions are better tailored to their specific needs. We have used our improved knowledge to shape our priority service partnerships, expanding the scope of our existing partnerships and introducing a new partner (Relate). Access to up-to-date, relevant information to support a major incident is critical for our work with our resilience partners and stakeholders. During 2017-18 we expanded our stakeholder mapping to include over 120 users, including Local Authorities, the NHS, Citizens Advice and local housing authorities. These maps allow us to better coordinate incident response, giving our partners access to the information needed to support local communities. We are currently exploring overlaying additional information onto the maps, such as the locations of our customers on our Priority Services Register, foodbanks, schools and universities to further improve our collective response during power cuts.	On Track

Social obligations	Commentary	Status
With others, explore the feasibility of community-level aggregated-demand response in return for a community rebate.	Our Activating Community Engagement (ACE) innovation project, led by Northern Powergrid in partnership with a consortium including GenGame Ltd, Open Energy, Serious Games International and Newcastle University, came to an end in 2017-18 after three years. The close down report is currently being drafted and learning dissemination events have been taking place. This residential demand side response (DSR) project has educated people about their energy usage and actively engaged communities to make small changes to how and when they use electricity in exchange for winning prizes for themselves or local groups. Going forward, it is our intention to use the learning we have developed during ACE on other innovation projects where community engagement is required.	On Track
Introduce friends and family register and 'good neighbour' scheme to support vulnerable customers.	In 2016-17, we improved our online and paper-based Priority Services Register (PSR) application processes so that people who need to add a friend or relative can do so. During 2017-18 we reviewed our approach to third party referrals to ensure it is in line with best practices in relation to data protection, maintaining our duty of care to known vulnerable customers by placing them on the PSR but awaiting contact with the customer before signing-off consent to share their data with partners.	On Track
Explore the possibility, with Northern Gas Networks, of upgrading to electrical connections in high-rise tower blocks for safety reasons.	Our £7.2m investment programme is running throughout the RIIO-ED1 period to refurbish our assets within 125 multi-occupancy high-rise properties in our regions. We are on track to deliver our RIIO-ED1 commitment and we are currently finalising a contract with Leeds City Council that will result in the refurbishment of 48 properties in the Leeds City Council area. We have identified a further 24 properties for which a contract for completion of works will be awarded in 2019. We will continue working with local councils to identify the properties that require work across our distribution service area. Our project with Northern Gas Networks, Newcastle City Council and Newcastle University researching the sustainability of urban high-rise living at five tower blocks in Newcastle identified that residents were in favour of carrying out real-time monitoring of their electricity and gas use through the installation and on-going use of smart meters. We are continuing to explore how best to follow up with the project participants once smart meters have been rolled out to these properties.	On Track
Explore solutions to connect rural communities to the network.	We have continued to develop our 'MicroResilience' innovation project to investigate the use of micro grids that can operate in-sync with our network or on a standalone basis (as conditions dictate) such as when high voltage supplies are unavailable. This new technology has the potential to enable us to continue supplying power to rural communities even when overhead lines are damaged, for example during storms. It may also allow us to establish supplies to the few truly remote communities in our regions where there is no mains supply at all at present, reduce connection costs for low voltage demand and generation connected in rural areas, improve voltage control and reduce electrical losses. During 2017-18, we completed the high level design for the project and started developing the detailed specification and design for the equipment. Our next step is carrying out lab testing and ultimately a trial of the operation of this technology on our network.	On Track
Provide more customer support vehicles along with more services in them.	Since we wrote our ED1 business plan, we have added three customer support vehicles (CSVs) to our fleet, taking our total to five. In 2017-18 we used our customer support vehicles to provide assistance to 11,495 customers during power cut situations and attended agricultural shows throughout our region (with a potential customer reach of around 65,885) to raise awareness of Northern Powergrid and the services we provide. We provide various services from our CSVs, including hot water and microwave facilities, mobile phone charging points and refrigeration facilities for the storage of medication. We offer customers winter warmer packs (hats, scarves, gloves, blankets etc.) to keep them warm, as well as provide face-to-face updates from Northern Powergrid employees on power cuts and more importantly, when the power is likely to be back on.	On Track

An update on our commitments in detail (continued)

Customer service	Commentary	Status
Use web-based technology to upgrade our process for general enquiries and minor engineering works.	Since the start of the ED1 period, customer satisfaction with our general enquiries services has increased by 5% to 89.4%. In 2015-16 we invested in our systems to provide online self-service for 33 general enquiries services. This included functionality enabling booking of appointments online, paying for services directly on our website, accessing safety information and reporting problems either with equipment at customer properties or on our network, such as vandalism or trees near overhead lines. Web-based technology has made it simpler and quicker for our customers to access our services and we continue to develop and expand the range of services offered, including the launch of a new online service for disconnections in 2018.	Delivered
Continue to improve the quality and speed of our complaint resolution.	We have delivered year-on-year improvements in Day+1 and Day+31 complaint resolution since the start of the RIIO-ED1 period; however, there is still more to do to achieve our stretching targets for the period. In 2017-18 we significantly improved against the prior year, despite falling short of our ED1 business plan target (80%), resolving 72% of complaints within 1 day (up from 65% in 2016-17) and well ahead of Ofgem's 50% target. We also improved in Day+31 complaint resolution, but again missed our ED1 business plan target (95%), resolving 93% in 2017-18 (up from 91% in 2016-17), again ahead of Ofgem's target of 90%. We are continuing to invest in our people, processes and systems to further improve the speed of complaint resolution for our customers. For example, in 2018 we executed a successful trial deploying a handyman service to quickly provide remediation services for customers in response to complaints.	On Track
Make customer service more reliable, better communicated and backed by slicker processes. Be faster, at no extra cost.	We sustained our performance improvement in speed of answer for inbound customer phone calls in 2017-18, answering 90.6% of calls within 20 seconds, exceeding our stretch target of 90% for the second year running. The 'Beast From The East' storms (snow and sub-zero temperatures) in February/March 2018 was a particularly challenging period for answering inbound telephone calls and we fell short of our calls answered target for 2017-18 (97.7% answered against our 99% target). We have continued to improve the consistency of our communication across all our customer contact channels (including web, automated telephony system, social media and voice) and matured our quality framework that helps our Contact Centre team consistently deliver high-quality customer conversations. We have also reviewed the shift patterns of our team members, optimising them to make sure we have the right people, with the right skills, available when our customers need us. We also launched live web chat in 2017-18 as a new contact channel for our customers and introduced a dynamic online knowledgebase tool to provide customers with answers to frequently asked questions. All of these initiatives have enhanced the quality of our services while keeping costs down for customers – doing more for less.	On Track
Provide better information to customers experiencing power cuts through voice or digital communication channels.	In 2017-18, following a successful pilot, we expanded our digital communication channels to include live web chat, initially for our general enquiries services. This builds on our existing suite of digital channels that includes email, text and social media (Facebook, Twitter and Instagram). Our new service is receiving positive feedback with an average customer satisfaction score of 9.1 out of 10. We are continuing to explore further opportunities to extend this digital functionality to our other service lines. We also continued to make improvements to our automated telephony platform (Interactive Voice Response, IVR), to ensure we provide clear and simple navigation to incident updates by postcode area so that customers are given the most up-to-date and relevant information for their query as quickly as possible. In addition, we proactively text customers to inform them about issues with their electricity supply and provide updates on restoration works, including estimated times of restoration. We also maintain a live interactive power cut map that gives updates on where the power is off, whether it's a planned job or an unplanned power cut and what time we aim to have the power back on.	On Track

Customer service	Commentary	Status
Use technology to enable our Contact Centre to move from being largely reactive to mostly proactive.	Our ED1 business plan envisaged moving to a world where 90% of our customer contacts would be outbound and only 10% inbound. Whilst we continue to deploy technology such as web chat and online self-service to provide customers with the information they require before they need to contact us, we have seen an increase in the amount of inbound customer calls received by our Contact Centre following the launch of the '105' single emergency number (26,000 additional calls in 2017/18). Offsetting this, our social media accounts (Facebook, Twitter and Instagram) have seen a continued increase in the number of followers, and, through our proactive text messaging and emails, customers are benefitting from the increase in customer contact information that we hold (55% of customer mobile numbers and 62% of customer email addresses).	On Track
Make it easier for our customers to keep in touch – via internet, mobile, meetings, phone, email, social media, or text.	We know that people keep in touch with each other in different ways and our aim is to make it as easy as we can for our customers to contact us in whatever way they prefer. In addition to our 24-hour Contact Centre, we operate 24/7 social media channels and mobile phone services, and we added our live web chat service in 2017/18. In addition, the launch of the national ('105') power cut number at the end of 2016 has made it even easier and quicker to get in touch with us – more than 46% of inbound calls now come via that route.	On Track

Explaining our financials

We are forecasting a financial return in the ED1 period that we believe is fair and appropriate for a company that is delivering more for less for its customers.

Throughout the year we submit detailed financial information to our industry regulator, Ofgem. This includes information on the financial return that we expect to earn throughout the RIIO-ED1 price control period and how we are performing against the cost allowances that Ofgem set us.

We recognise that some of this information may also be of interest to our stakeholders. We've chosen to publish an annex to our annual stakeholder report that includes a summary of this financial information in a format that we hope will enable our stakeholders to engage with it.

In this annex, we show a step-by-step breakdown of the regulatory return that we expect to earn based on our performance levels, our Return on Regulatory Equity (RoRE), as well as a summary of our cost and output performance against the allowances and targets we were set for the ED1 period. For more information on RoRE and how it is calculated, see page 52-53 of this report.

Return on Regulatory Equity (RoRE)

Our forecast RoRE for the ED1 period is 7.5% and for the ED1 period to date it is 6.8%, taking into account our actual level of gearing (i.e. debt to equity ratio) and debt held by our UK holding company, Northern Powergrid Holdings Company (holdco), outside our two regulatory licensees (Northeast and Yorkshire).

When Ofgem views our regulatory returns it uses a 65% notional assumption for gearing. On this basis, our forecast RoRE for the ED1 period (including holdco debt) is 8.3%. This is 2.3% above the 6.0% base return set by Ofgem for the price control period.

The main contribution to this outperformance is incentive revenue from the interruptions-related quality of service incentive (IIS), generating a 1.8% return. In addition, we forecast that we will achieve around 70% of the available Broad Measure of Customer Service (BMCS) reward generating a return of 0.5%. A fall in corporation tax rates generates a further 0.1% as the price control framework allows network companies to retain some of the benefit of any tax rate changes.

As our actual level of gearing is 60% on average for ED1 (lower than Ofgem's 65% notional assumption), this reduces equity returns as our shareholders have contributed more equity than the notional calculation assumes. This accounts for the 0.8% difference between the 8.3% ED1 forecast under Ofgem's calculation (including holdco debt) and the actual RoRE figure of 7.5%.

Excluding holdco debt, the gearing of our two licensees is around 50%. When viewed in isolation, our forecast RoRE for our Northeast and Yorkshire licensees is 6.4% and 6.0% respectively based on actual gearing, with a more pronounced difference (2.4%) to RoRE on a notional gearing basis.

There has been significant scrutiny of network company returns in recent years. Our returns remain at the lower end of the range of UK network companies and we continue to see our outcome as fair and appropriate for a company delivering significantly improved outputs for customers against a challenging price control settlement.

Northern Powergrid RoRE (including holdco debt)	Notes	Notional gearing		Actual gearing	
		ED1 to date	ED1 period forecast	ED1 to date	ED1 period forecast
Allowed equity return	1	6.0%	6.0%	5.6%	5.3%
Totex outperformance	2	(0.5%)	0.0%	(0.5%)	0.0%
IQI penalty	3	(0.2%)	(0.1%)	(0.2%)	(0.1%)
Broad measure of customer service	4	0.3%	0.5%	0.3%	0.4%
Interruptions-related quality of service	5	1.9%	1.8%	1.8%	1.7%
Incentive on connections engagement	6	–	–	–	–
Time to connect Incentive	7	0.1%	0.0%	0.1%	0.0%
Losses discretionary reward scheme	8	0.0%	0.0%	0.0%	0.0%
Network innovation unrecoverable expenditure	9	0.0%	0.0%	0.0%	0.0%
Penalties and fines	10	0.0%	0.0%	0.0%	0.0%
RoRE – operational performance		**7.6%**	**8.2%**	**7.1%**	**7.3%**
Debt performance	11	(1.0%)	(0.1%)	(0.6%)	0.1%
Tax performance	12	0.4%	0.2%	0.3%	0.1%
RoRE – including financing and tax		**7.0%**	**8.3%**	**6.8%**	**7.5%**
RoRE – including financing and tax – Northeast		8.5%	8.8%	6.4%	6.4%
RoRE – including financing and tax – Yorkshire		6.5%	8.4%	5.2%	6.0%

Explaining our Return on Regulatory Equity

The return on Regulated Equity (RoRE) measures how much a company has earned on its investment in regulatory assets that have been funded by shareholders.

This starts with the base return that Ofgem allows to reflect the cost of equity in capital markets, and is adjusted for the value earned from any incentive schemes to reflect performance, and any difference between how much the company's debt finance costs compared to Ofgem's assumption. In setting the base return, Ofgem assumes notional gearing of 65% (i.e. 65% of regulatory assets are funded by debt and 35% by equity), however a company's actual gearing level will be different to this, which impacts shareholder returns.

Note	RoRE Components	Comments
1	**Allowed Equity Return**	Ofgem's allowed base cost of equity is 6.0%, assuming notional gearing of 65%. The allowed equity return falls to 5.3% when our actual gearing of 60% is taken into account as our shareholders have invested a greater amount of equity than Ofgem's assumed 35% i.e. they receive a lower rate of return (Ofgem's assumed cost of debt) on the additional equity[1].
2	**Totex outperformance**	The Totex Incentive Mechanism (TIM) incentivises DNOs to outperform their total cost allowances, sharing any under/overspend with investors and customers through adjusted network charges. Our expenditure in ED1 to date is £1,144m, 6% (£78m) below our phased cost allowances. Whilst our RoRE for the period to date reflects a small return arising from this underspend, our forecast shows no RoRE impact as we expect expenditure to catch up by the end of the price control period, finishing in line with Ofgem's allowances.
3	**IQI penalty**	The IQI is a mechanism that provides a company with a reward or penalty depending on how close its forecast is to Ofgem's view of efficient costs. We incurred a penalty of £1.5m per annum over the ED1 period, as our Totex forecast exceeded Ofgem's view of efficient costs. This has a negative RoRE impact of 0.1%.
4	**Broad Measure of Customer Service (BMCS)**	BMCS incentivises DNOs to improve customer satisfaction, deal with complaints quickly and effectively and engage with stakeholders to inform how they run their business. We forecast to earn approximately 70% of the available rewards under the BMCS incentive by delivering improvements in customer satisfaction, complaints and stakeholder engagement. For the ED1 period to date, our average annual earnings from this incentive have been £4.0m. Our forecast average annual earnings for the ED1 period as a whole are £5.9m, taking into account projected performance improvements.
5	**Interruptions-related quality of service**	The Interruption Incentive Scheme (IIS) incentivises each DNO to improve performance against their targets for the number of customers interrupted per 100 customers (CI) and the number of customer minutes lost (CML). We have delivered significant network improvements in the ED1 period to date, reducing the number of customer interruptions and minutes lost by 18% and 15% respectively since the start of the ED1 period. This is our primary source of RoRE, earning an annual average of £22.0m against this incentive mechanism in the ED1 period to date, with our forecast annual average earnings at £21.7m for the ED1 period as a whole.
6	**Incentive on Connections Engagement (ICE)**	ICE is a penalty-only mechanism to incentivise DNOs to continuously improve services for major/large connections customers. We have received no penalties against this mechanism during ED1 and we have forecast no penalties for the remainder of the period.
7	**Time to connect (TTC) incentive**	TTC incentivises DNOs to reduce connection times for minor/small connections customers. We expect to improve the time taken to deliver connections to our customers during the ED1 period. For the ED1 period to date, our average annual earnings under the Time to Connect incentive have been £0.8m. Ofgem is currently resetting incentive targets for the second half of the ED1 period and we have therefore not included any forecast incentive returns pending the outcome of this review.
8	**Losses Discretionary Reward (LDR) scheme**	LDR is a discretionary reward to incentivise DNOs to take additional actions to better understand and manage electricity losses on their network. The incentive has a minimal impact on our RoRE. For the ED1 period to date, the average annual earnings from the first tranche of this reward scheme were £0.8m. No DNOs received a reward in the second tranche of the scheme and we have not included any forecast returns for the third tranche.
9	**Network Innovation unrecoverable expenditure**	The Network Innovation Allowance (NIA) is a set allowance received by each DNO to fund smaller technical, commercial or operational innovation projects. 10% of network innovation expenditure is not recovered from customers, causing a a small reduction in our RoRE.
10	**Penalties and fines**	This line item takes into account the small impact on RoRE of payments we make to customers to compensate them when we fail to meet Guaranteed Standards of Performance (GSoP) failures. In 2017/18 we made payments totalling £384,845 to customers under GSoP.
11	**Debt performance**	Debt performance (at notional gearing) shows the difference between our actual cost of debt (on a real basis) and Ofgem's allowed cost of debt. Over the ED1 period, this does not have a significant RoRE impact. The underperformance of -1.0% in ED1 to date is driven by the impact of low inflation (as measured by RPI) in 2015-16 and some historical debt with a relatively high interest rate that matures later in the ED1 period to be replaced with debt at a lower-interest rate, reflecting our expectations of the prevailing market rate. Debt performance improves when viewed at actual gearing, reflecting the impact of increased equity funding and therefore lower actual debt on which interest is paid. This improvement is, however, more than offset by the increased equity portion being funded at Ofgem's allowed cost of debt (which is lower than Ofgem's allowed cost of equity).
12	**Tax performance**	The RoRE impact of forecast tax performance (0.1%) is mainly attributable to the deadband which licensees are allowed to retain when there are changes in the rate of Corporation Tax.

[1] Adjusting the RoRE calculation from notional to actual gearing also impacts other line items as the same monetary value is divided by a greater amount of equity investment.

Explaining our costs and our delivery of outputs

Our headline commitment in ED1 was to deliver more for less for our customers. This has meant keeping a tight grip on our costs while continuing to invest in the health of our network, improving services to customers and innovating for the future.

Controlling our costs to stay inside Ofgem's tough cost allowances...

Our business plan commitment to deliver 'more for less' meant we had to make significant performance improvements in the RIIO-ED1 period at new levels of cost efficiency. The cost reductions imposed by Ofgem in its price control settlement for ED1 increased the scale of that challenge. For that reason we took time to challenge the engineering content of our plan and to re-let key service contracts to deliver efficiencies. We have been operating to a revised plan that includes £200m of cost reductions over the period. Whilst our cost efficiency plans are well established, savings are not earned until they are delivered and we continually update our plans to reflect cost pressures, delivery of efficiencies and changes in stakeholder requirements.

After the third year of the price control, our total expenditure is a little behind the profile of allowances (93.6%). Our investment programme was slightly front-end loaded in our plan and is in reality tracking on a more even basis through the period. We forecast that our expenditure will be in line with allowances for the ED1 period as a whole (see Figure 1).

...while investing in improving the health of our network

We not only intend to deliver the targeted improvement in network health that we committed to in our ED1 business plan, we expect to outperform it.

We are currently 2.4 percentage points ahead of our ED1 annual profile based on our final target for network asset secondary deliverables (i.e. network outputs) and expect to outperform our target by 10-20% by the end of the period (see Figure 2).

Figure 1: Total Expenditure vs. Ofgem Cost Allowances (Totex)

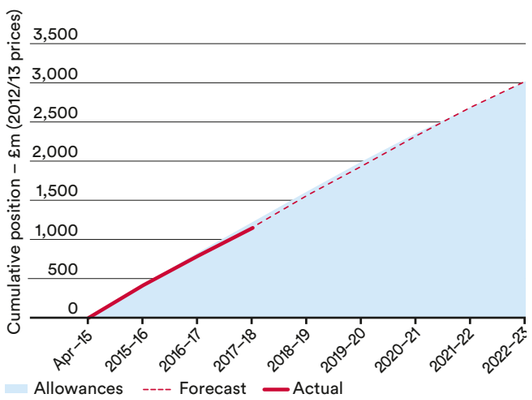
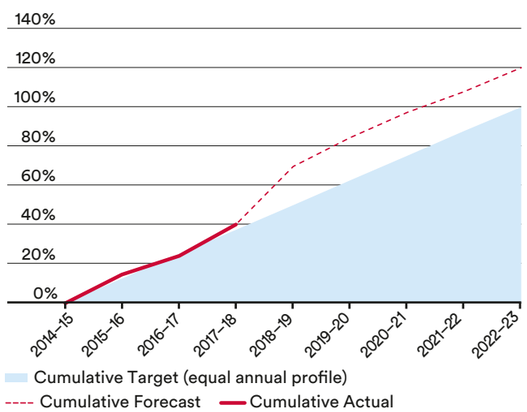


Figure 2: Network Output Delivery (Asset Health and Criticality Index) vs. Target



Our costs are broadly in line with Ofgem allowances for the ED1 period to date, a story that we expect to continue for the remainder of the price control period. The 6% underspend to date, due to phasing of our capital work programmes, will unwind in full over the period to 2023.

ED1 to date

Our expenditure in ED1 to date is £1,144m, 6% (£78m) below our phased allowances (£1,222m), all of which is forecast to unwind by the end of the price control period.

Whilst our ED1 allowances were front-end loaded (based on the profile of our original forecast submitted to Ofgem in our business plan), our actual expenditure is tracking on more of a straight-line profile over the 8-year period due to re-phasing of activity for cost re-engineering work required at the start of the period. As an illustration, our actual expenditure to date is 37.8% of total ED1 allowances, behind the profile of Ofgem allowances (40.4%), but fractionally ahead of a straight-line annual profile for the 8 years (37.5%; i.e. 12.5% per year).

Non-load related capital expenditure (capex) is our largest cost category with spend of £385m in ED1 to date. This includes schemes of work to replace and refurbish our network assets and operational buildings and defend our substations against flooding. The majority of the underspend against allowances in the ED1 period to date is in this category (£95m) due to re-phasing of our work programmes to allow for the cost re-engineering early in the period in response to the cost challenge set by Ofgem.

Network Operating Costs, which include costs of fault repairs, inspections, maintenance and tree cutting activity is our second largest cost category with spend of £297m in ED1 to date. Our expenditure in this category is £22m (8%) above Ofgem allowances and we expect to spend more than the allowances set by Ofgem for the period as a whole as the regulatory settlement in this category was insufficient, particularly in respect of fault costs.

Figure 3: Totex breakdown – ED1 to date

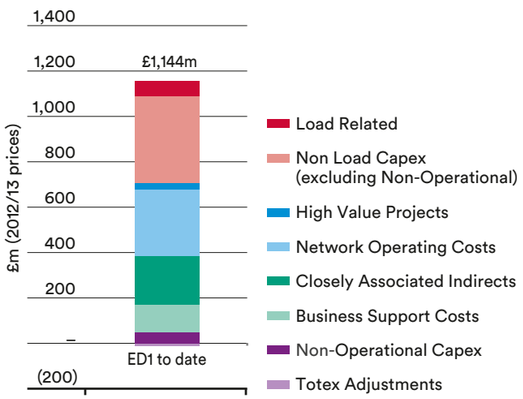
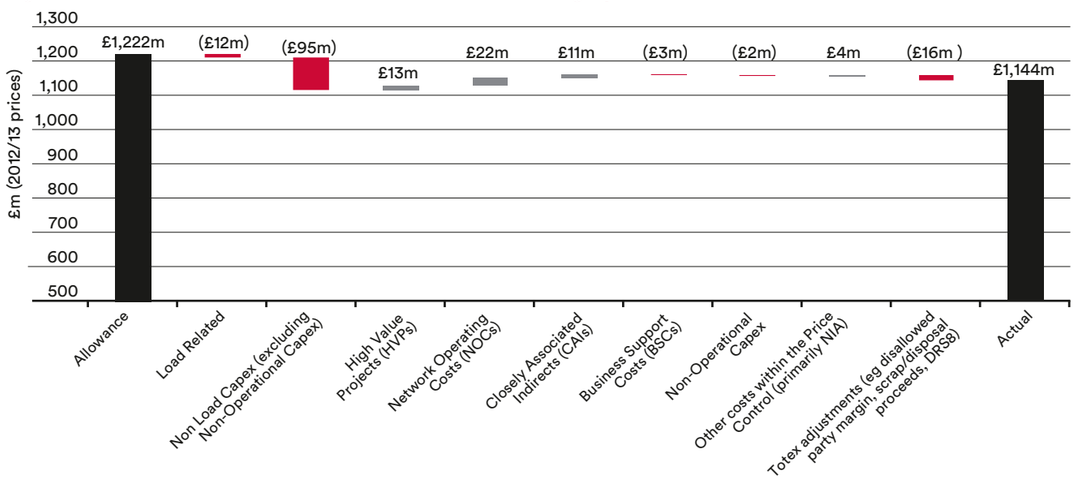


Figure 4: ED1 to date Totex variance to allowances at cost category level



Explaining our costs and our delivery of outputs

We forecast our expenditure for the ED1 period as a whole to be in line with Ofgem allowances whilst delivering outputs in excess of our targets.

ED1 forecast

We forecast that our ED1 expenditure will be £3,025m, in line with the cost allowances Ofgem set us for the RIIO-ED1 period.

We expect to spend more than allowances in the categories of Network Operating Costs (£67m; 9%) and Closely Associated Indirects (£25m; 5%), offset by expenditure less than allowances in Network Investment[1] (-£32m, -2.5%), Non-Operational capex (-£8m; -6.0%) and Business Support Costs (-£22m; -7.0%).

Ofgem's allowances for fault costs in RIIO-ED1 were insufficient to cover the real costs of fault repair, even allowing for some efficiency measures on our part. Despite our cost reduction programme enabling us to outperform our forecasts, we do not expect to be able to operate within allowances for Network Operating Costs. Conversely, we were awarded more than our RIIO-ED1 forecast for Business Support Costs, where we were the most efficient company in Ofgem's analysis, and as such expect to outperform the allowances we were set.

At the time of writing our ED1 business plan we anticipated that unforeseen cost pressures would materialise during the longer eight year price control period. For instance, we have seen pension costs increase (£15m more than allowances over the plan period) and the response required to increasing cyber security threats will increase our IT costs by £27m. We have absorbed these increases and will continue to work to adjust our spend to take account of changing circumstances.

Our current plan is that we expect to accommodate an additional investment of £5m in flood defence work, upgrading a further 98 sites (in line with the outcome of the National Flood Resilience Review and updated flood map analysis) beyond the 156 sites in our original plan. We will add £2m additional expenditure beyond our visual amenity allowance cap and a further £24m on 50km of EHV cables, removing fluid and gas filled cable risk from our network. We will keep our forecast under review to ensure we deliver the best outcome for our customers.

Figure 5: Totex breakdown – ED1 forecast

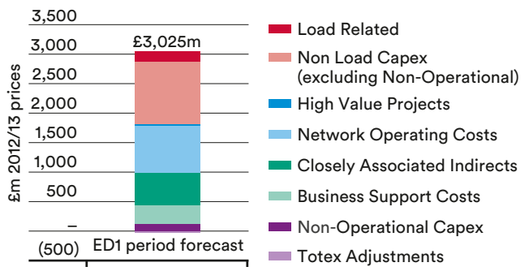
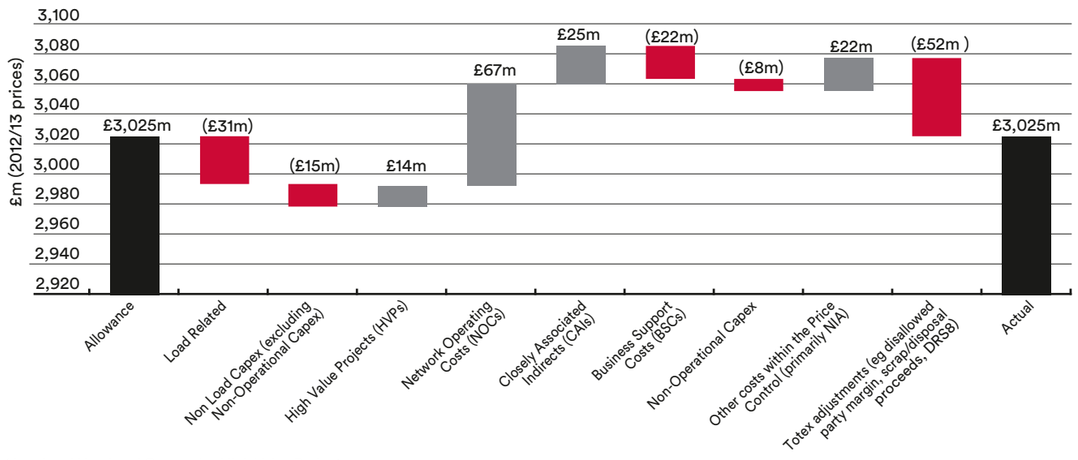


Figure 6: ED1 Forecast Totex variance to allowances by sub-category level



[1] Load and Non Load Capex plus High Value Projects

Glossary
Cost categories

Load Related
The cost of managing the load on the network. For example, the installation of new assets to accommodate changes in the level or pattern of electricity demand and generation.

Non Load Capex (excluding Non-Operational Capex)
Primarily the costs of replacing and refurbishing network assets. This includes costs associated with operational buildings, defending our substations against flooding and the costs of operational IT & telecoms systems/equipment.

High Value Projects
Capital expenditure projects with a particularly high value. For ED1 these are projects expected to cost at least £25m (in 2012/13 prices) and may be Load Related or Non Load Related in nature.

Network Operating Costs
Primarily the cost of repairing faults on the network, inspection and maintenance activities and smart meter related expenditure.

Closely Associated Indirects
The cost of supporting direct activity on the network. This includes the costs of network design, project management, engineering management, clerical support, operational training, call centres and control centres.

Business Support Costs
The cost of running the DNO business, such as costs associated with the CEO, finance, IT, non-operational property running costs, HR and non-operational training.

Non-Operational Capex
Capital expenditure on non-operational IT and telecoms systems/equipment, non-operational property, vehicles, tools and equipment.

Other/Totex Adjustments
Adjustments made to expenditure to remove related party profit margins that are not allowed as Totex and deduct other items prescribed by Ofgem, such as proceeds from the sale of assets, in arriving at the overall Totex value.

Contact us regarding our plan

We believe that our customers and stakeholders are the best judges of our performance. We always want to hear your views and opinions on the services we provide and your ideas for what we could be doing. If you would like to comment, you can contact us in a number of ways:

By email
yourpowergrid@northernpowergrid

On twitter

@northpowergrid
(for power cut information and advice)

@powergridnews
(for information about the company and the work we do in communities)

Online at:
www.northernpowergrid.com

Connections enquiries

By telephone
0800 011 3433

By email
getconnected@northernpowergrid.com

General enquiries

By telephone
0800 011 3332

By email
cus.serv@northernpowergrid.com